

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.42. Principles of Architecture (One Credit), Adopted 2015.
(a) General Requirements. This course is recommended for students in Grades 9-12. Students shall be awarded one credit for successful completion of this course.	
(b) Introduction.	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Principles of Architecture provides an overview to the various fields of architecture, interior design, and construction management. Achieving proficiency in decision making and problem solving is an essential skill for career planning and lifelong learning. Students use self-knowledge, education, and career information to set and achieve realistic career and educational goals. Job-specific training can be provided through training modules that identify career goals in trade and industry areas. Classroom studies include topics such as safety, work ethics, communication, information technology applications, systems, health, environment, leadership, teamwork, ethical and legal responsibility, employability, and career development and include skills such as problem solving, critical thinking, and reading technical drawings.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship, and preparation requirements for careers in the architecture and construction cluster	(i) identify employment opportunities, including entrepreneurship for careers in the architecture and construction cluster
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship, and preparation requirements for careers in the architecture and construction cluster	(ii) identify preparation requirements for careers in the architecture and construction cluster
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(i) demonstrate an understanding of group participation related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(ii) demonstrate an understanding of group participation related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iii) demonstrate an understanding of leadership related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iv) demonstrate an understanding of leadership related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations and appropriate work habits	(i) identify employers' expectations

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations and appropriate work habits	(ii) identify appropriate work habits
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(i) apply the competencies related to resources in appropriate settings
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(ii) apply the competencies related to information in appropriate settings
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(iii) apply the competencies related to systems in appropriate settings
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(iv) apply the competencies related to technology in appropriate settings
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(v) apply the competencies related to resources in appropriate situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(vi) apply the competencies related to information in appropriate situations

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(vii) apply the competencies related to systems in appropriate situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(viii) apply the competencies related to technology in appropriate situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(i) demonstrate knowledge of the concepts related to health and safety in the workplace, as specified by appropriate governmental regulations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(ii) demonstrate knowledge of the skills related to health and safety in the workplace, as specified by appropriate governmental regulations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(A) determine areas and volumes of various structures and estimate materials and supplies using appropriate geometric formulas and calculations	(i) determine areas of various structures using appropriate geometric formulas
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(A) determine areas and volumes of various structures and estimate materials and supplies using appropriate geometric formulas and calculations	(ii) determine areas of various structures using appropriate calculations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(A) determine areas and volumes of various structures and estimate materials and supplies using appropriate geometric formulas and calculations	(iii) determine volumes of various structures using appropriate geometric formulas

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(A) determine areas and volumes of various structures and estimate materials and supplies using appropriate geometric formulas and calculations	(iv) determine volumes of various structures using appropriate calculations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(A) determine areas and volumes of various structures and estimate materials and supplies using appropriate geometric formulas and calculations	(v) estimate materials and supplies using appropriate geometric formulas
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(A) determine areas and volumes of various structures and estimate materials and supplies using appropriate geometric formulas and calculations	(vi) estimate materials and supplies using appropriate calculations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(B) determine percentages and decimals and use percentages and decimals to perform measurement tasks using appropriate formulas and calculations	(i) determine percentages
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(B) determine percentages and decimals and use percentages and decimals to perform measurement tasks using appropriate formulas and calculations	(ii) determine decimals
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(B) determine percentages and decimals and use percentages and decimals to perform measurement tasks using appropriate formulas and calculations	(iii) use percentages to perform measurement tasks using appropriate formulas
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(B) determine percentages and decimals and use percentages and decimals to perform measurement tasks using appropriate formulas and calculations	(iv) use percentages to perform measurement tasks using appropriate calculations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(B) determine percentages and decimals and use percentages and decimals to perform measurement tasks using appropriate formulas and calculations	(v) use decimals to perform measurement tasks using appropriate formulas
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(B) determine percentages and decimals and use percentages and decimals to perform measurement tasks using appropriate formulas and calculations	(vi) use decimals to perform measurement tasks using appropriate calculations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(C) determine ratios, fractions, and proportions using appropriate formulas and calculations	(i) determine ratios using appropriate formulas
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(C) determine ratios, fractions, and proportions using appropriate formulas and calculations	(ii) determine fractions using appropriate formulas
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(C) determine ratios, fractions, and proportions using appropriate formulas and calculations	(iii) determine proportions using appropriate formulas
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(C) determine ratios, fractions, and proportions using appropriate formulas and calculations	(iv) determine ratios using appropriate calculations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(C) determine ratios, fractions, and proportions using appropriate formulas and calculations	(v) determine fractions using appropriate calculations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(C) determine ratios, fractions, and proportions using appropriate formulas and calculations	(vi) determine proportions using appropriate calculations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(D) perform measurement tasks using ratios, fractions, and proportions	(i) perform measurement tasks using ratios
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(D) perform measurement tasks using ratios, fractions, and proportions	(ii) perform measurement tasks using fractions
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(D) perform measurement tasks using ratios, fractions, and proportions	(iii) perform measurement tasks using proportions
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(E) estimate materials and supplies using dimensions, spaces, and structures calculations	(i) estimate materials and supplies using dimensions calculations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(E) estimate materials and supplies using dimensions, spaces, and structures calculations	(ii) estimate materials and supplies using spaces calculations
(2) The student performs mathematical operations to complete tasks such as measuring and estimating materials and supplies. The student is expected to:	(E) estimate materials and supplies using dimensions, spaces, and structures calculations	(iii) estimate materials and supplies using structures calculations

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student uses physics skills to work with materials and load applications. The student is expected to:	(A) apply basic concepts of static and loads to planning	(i) apply basic concepts of static and loads to planning
(3) The student uses physics skills to work with materials and load applications. The student is expected to:	(B) identify the physical properties present when using common construction materials in order to use the materials safely, effectively, and efficiently	(i) identify the physical properties present when using common construction materials in order to use the materials safely
(3) The student uses physics skills to work with materials and load applications. The student is expected to:	(B) identify the physical properties present when using common construction materials in order to use the materials safely, effectively, and efficiently	(ii) identify the physical properties present when using common construction materials in order to use the materials effectively
(3) The student uses physics skills to work with materials and load applications. The student is expected to:	(B) identify the physical properties present when using common construction materials in order to use the materials safely, effectively, and efficiently	(iii) identify the physical properties present when using common construction materials in order to use the materials efficiently
(4) The student manages chemical materials safely. The student is expected to:	(A) recognize the issues present when mixing compatible and incompatible substances to maintain workplace and jobsite safety	(i) recognize the issues present when mixing compatible substances to maintain workplace safety
(4) The student manages chemical materials safely. The student is expected to:	(A) recognize the issues present when mixing compatible and incompatible substances to maintain workplace and jobsite safety	(ii) recognize the issues present when mixing compatible substances to maintain jobsite safety
(4) The student manages chemical materials safely. The student is expected to:	(A) recognize the issues present when mixing compatible and incompatible substances to maintain workplace and jobsite safety	(iii) recognize the issues present when mixing incompatible substances to maintain workplace safety

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student manages chemical materials safely. The student is expected to:	(A) recognize the issues present when mixing compatible and incompatible substances to maintain workplace and jobsite safety	(iv) recognize the issues present when mixing incompatible substances to maintain jobsite safety
(4) The student manages chemical materials safely. The student is expected to:	(B) differentiate between incompatible and compatible substances	(i) differentiate between incompatible and compatible substances
(4) The student manages chemical materials safely. The student is expected to:	(C) describe the chemical process that occurs when using common construction materials to maintain workplace and jobsite safety	(i) describe the chemical process that occurs when using common construction materials to maintain workplace safety
(4) The student manages chemical materials safely. The student is expected to:	(C) describe the chemical process that occurs when using common construction materials to maintain workplace and jobsite safety	(ii) describe the chemical process that occurs when using common construction materials to maintain jobsite safety
(4) The student manages chemical materials safely. The student is expected to:	(D) apply chemical processes in relation to environmental conditions	(i) apply chemical processes in relation to environmental conditions
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(A) use technological applications to transmit reports	(i) use technological applications to transmit reports
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(B) develop written communications such as estimates, work orders, and memos	(i) develop written communications

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(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(C) read and follow technical instructions and manuals	(i) read technical instructions
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(C) read and follow technical instructions and manuals	(ii) read technical manuals
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(C) read and follow technical instructions and manuals	(iii) follow technical instructions
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(C) read and follow technical instructions and manuals	(iv) follow technical manuals
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(D) compose an accurate and organized diary or log of work	(i) compose an accurate diary or log of work

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(D) compose an accurate and organized diary or log of work	(ii) compose an organized diary or log of work
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(E) write reports and documents such as estimates, permits, memos, and technical reports	(i) write reports
(5) The student reads, comprehends, and communicates effectively in the workplace, using proper grammar and workplace terminology when using printed, written, and electronic media. The student is expected to:	(E) write reports and documents such as estimates, permits, memos, and technical reports	(ii) write documents
(6) The student listens attentively and speaks clearly to convey information correctly. The student is expected to:	(A) confirm understanding of verbal and visual instructions	(i) confirm understanding of verbal instructions
(6) The student listens attentively and speaks clearly to convey information correctly. The student is expected to:	(A) confirm understanding of verbal and visual instructions	(ii) confirm understanding of visual instructions
(6) The student listens attentively and speaks clearly to convey information correctly. The student is expected to:	(B) ask relevant questions concerning details of instructions	(i) ask relevant questions concerning details of instructions

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student listens to and speaks clearly with a variety of individuals to enhance communications skills. The student is expected to:	(A) provide verbal instructions	(i) provide verbal instructions
(7) The student listens to and speaks clearly with a variety of individuals to enhance communications skills. The student is expected to:	(B) listen attentively to spoken messages to respond to information	(i) listen attentively to spoken messages to respond to information
(8) The student exhibits public relations skills to address a variety of situations such as increasing internal and external customer and client satisfaction. The student is expected to:	(A) communicate effectively to develop positive customer and client relationships	(i) communicate effectively to develop positive customer and client relationships
(8) The student exhibits public relations skills to address a variety of situations such as increasing internal and external customer and client satisfaction. The student is expected to:	(B) develop and maintain customer relations	(i) develop customer and client relations
(8) The student exhibits public relations skills to address a variety of situations such as increasing internal and external customer and client satisfaction. The student is expected to:	(B) develop and maintain customer relations	(ii) maintain customer and client relations
(8) The student exhibits public relations skills to address a variety of situations such as increasing internal and external customer and client satisfaction. The student is expected to:	(C) define customer and client satisfaction	(i) define customer and client satisfaction

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student exhibits public relations skills to address a variety of situations such as increasing internal and external customer and client satisfaction. The student is expected to:	(D) evaluate customer and client satisfaction	(i) evaluate customer and client satisfaction
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(A) initiate a project, including identifying resources and materials and time-management, labor-management, job-management, and job-site obligations in order to effectively plan	(i) initiate a project, including identifying resources, in order to effectively plan
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(A) initiate a project, including identifying resources and materials and time-management, labor-management, job-management, and job-site obligations in order to effectively plan	(ii) initiate a project, including identifying materials, in order to effectively plan
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(A) initiate a project, including identifying resources and materials and time-management, labor-management, job-management, and job-site obligations in order to effectively plan	(iii) initiate a project, including time-management, in order to effectively plan
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(A) initiate a project, including identifying resources and materials and time-management, labor-management, job-management, and job-site obligations in order to effectively plan	(iv) initiate a project, including labor-management, in order to effectively plan
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(A) initiate a project, including identifying resources and materials and time-management, labor-management, job-management, and job-site obligations in order to effectively plan	(v) initiate a project, including job-management, in order to effectively plan

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(A) initiate a project, including identifying resources and materials and time-management, labor-management, job-management, and job-site obligations in order to effectively plan	(vi) initiate a project, including job-site obligations, in order to effectively plan
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(B) plan a project, including estimating correct amounts of required resources and materials and identifying risks	(i) plan a project, including estimating correct amounts of required resources
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(B) plan a project, including estimating correct amounts of required resources and materials and identifying risks	(ii) plan a project, including estimating correct amounts of required materials
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(B) plan a project, including estimating correct amounts of required resources and materials and identifying risks	(iii) plan a project, including identifying risks
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(C) evaluate the feasibility of alternative suggestions	(i) evaluate the feasibility of alternative suggestions
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(D) execute, monitor, and control a project using available resources and materials effectively	(i) execute a project using available resources effectively

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(D) execute, monitor, and control a project using available resources and materials effectively	(ii) monitor a project using available resources effectively
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(D) execute, monitor, and control a project using available resources and materials effectively	(iii) control a project using available resources effectively
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(D) execute, monitor, and control a project using available resources and materials effectively	(iv) execute a project using available materials effectively
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(D) execute, monitor, and control a project using available resources and materials effectively	(v) monitor a project using available materials effectively
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(D) execute, monitor, and control a project using available resources and materials effectively	(vi) control a project using available materials effectively
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(E) close a project, including identifying lessons learned and evaluating waste of resources and materials	(i) close a project, including identifying lessons learned

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(E) close a project, including identifying lessons learned and evaluating waste of resources and materials	(ii) close a project, including evaluating waste of resources
(9) The student identifies the relationship between available resources and requirements of a project to accomplish realistic planning. The student is expected to:	(E) close a project, including identifying lessons learned and evaluating waste of resources and materials	(iii) close a project, including evaluating waste of materials
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(A) incorporate potential job disruptions into planning timelines	(i) incorporate potential job disruptions into planning timelines
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(B) identify potential events and conditions that disrupt the completion of a job	(i) identify potential events that disrupt the completion of a job
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(B) identify potential events and conditions that disrupt the completion of a job	(ii) identify potential conditions that disrupt the completion of a job
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(C) solve situational problems involved with unexpected events and conditions	(i) solve situational problems involved with unexpected events
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(C) solve situational problems involved with unexpected events and conditions	(ii) solve situational problems involved with unexpected conditions

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(D) adjust plans and schedules to meet project needs	(i) adjust plans to meet project needs
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(D) adjust plans and schedules to meet project needs	(ii) adjust schedules to meet project needs
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(E) modify existing plans and schedules to reflect an unexpected change	(i) modify existing plans to reflect an unexpected change
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(E) modify existing plans and schedules to reflect an unexpected change	(ii) modify existing schedules to reflect an unexpected change
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(F) identify and assess critical situations as they arise to resolve issues with the best solution	(i) identify critical situations as they arise to resolve issues with the best solution
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(F) identify and assess critical situations as they arise to resolve issues with the best solution	(ii) assess critical situations as they arise to resolve issues with the best solution
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(G) present a project update to track changes necessitated by unexpected events and conditions	(i) present a project update to track changes necessitated by unexpected events

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student evaluates and adjusts plans and schedules to respond to unexpected events and conditions. The student is expected to:	(G) present a project update to track changes necessitated by unexpected events and conditions	(ii) present a project update to track changes necessitated by unexpected conditions
(11) The student synthesizes and reports conditions to keep the organization appraised of progress and potential problems. The student is expected to:	(A) provide a project update for stakeholders	(i) provide a project update for stakeholders
(11) The student synthesizes and reports conditions to keep the organization appraised of progress and potential problems. The student is expected to:	(B) present a verbal or written status report on a project	(i) present a verbal or written status report on a project
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(A) manage personal and professional schedules and contact information	(i) manage personal schedules
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(A) manage personal and professional schedules and contact information	(ii) manage personal contact information
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(A) manage personal and professional schedules and contact information	(iii) manage professional schedules

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(A) manage personal and professional schedules and contact information	(iv) manage professional contact information
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(B) manage daily, weekly, and monthly schedules using an application	(i) manage daily schedules using an application
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(B) manage daily, weekly, and monthly schedules using an application	(ii) manage weekly schedules using an application
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(B) manage daily, weekly, and monthly schedules using an application	(iii) manage monthly schedules using an application
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(C) create memos and notes	(i) create memos
(12) The student uses technological applications specific to architecture and construction to access, manage, integrate, and create information. The student is expected to:	(C) create memos and notes	(ii) create notes

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student uses electronic devices to communicate. The student is expected to:	(A) access an electronic system using login and password functions	(i) access an electronic system using login and password functions
(13) The student uses electronic devices to communicate. The student is expected to:	(B) access electronic messages received	(i) access electronic messages received
(13) The student uses electronic devices to communicate. The student is expected to:	(C) create electronic messages in accordance with established business standards such as grammar, word usage, spelling, sentence structure, clarity, and etiquette	(i) create electronic messages in accordance with established business standards
(13) The student uses electronic devices to communicate. The student is expected to:	(D) practice appropriate electronic message etiquette	(i) practice appropriate electronic message etiquette
(13) The student uses electronic devices to communicate. The student is expected to:	(E) send electronic messages	(i) send electronic messages
(13) The student uses electronic devices to communicate. The student is expected to:	(F) use electronic devices to share files and documents	(i) use electronic devices to share files
(13) The student uses electronic devices to communicate. The student is expected to:	(F) use electronic devices to share files and documents	(ii) use electronic devices to share documents
(13) The student uses electronic devices to communicate. The student is expected to:	(G) access electronic devices for attachments	(i) access electronic devices for attachments
(13) The student uses electronic devices to communicate. The student is expected to:	(H) attach documents to electronic messages	(i) attach documents to electronic messages

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student uses electronic devices to communicate. The student is expected to:	(I) save electronic messages and attachments	(i) save electronic messages
(13) The student uses electronic devices to communicate. The student is expected to:	(I) save electronic messages and attachments	(ii) save electronic attachments
(14) The student uses writing and publishing applications. The student is expected to:	(A) prepare simple documents and other business communications	(i) prepare simple documents
(14) The student uses writing and publishing applications. The student is expected to:	(A) prepare simple documents and other business communications	(ii) prepare other business communications
(14) The student uses writing and publishing applications. The student is expected to:	(B) retrieve existing documents	(i) retrieve existing documents
(14) The student uses writing and publishing applications. The student is expected to:	(C) create documents such as letters, memos, and reports using existing forms and templates	(i) create documents using existing forms
(14) The student uses writing and publishing applications. The student is expected to:	(C) create documents such as letters, memos, and reports using existing forms and templates	(ii) create documents using existing templates
(14) The student uses writing and publishing applications. The student is expected to:	(D) safeguard documents using name and save functions	(i) safeguard documents using name functions
(14) The student uses writing and publishing applications. The student is expected to:	(D) safeguard documents using name and save functions	(ii) safeguard documents using save functions

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student uses writing and publishing applications. The student is expected to:	(E) format text using basic formatting functions	(i) format text using basic formatting functions
(14) The student uses writing and publishing applications. The student is expected to:	(F) employ word processing utility tools such as spell check, grammar check, and thesaurus	(i) employ word processing utility tools
(15) The student uses spreadsheet applications. The student is expected to:	(A) create, retrieve, edit, save, and print spreadsheets	(i) create spreadsheets
(15) The student uses spreadsheet applications. The student is expected to:	(A) create, retrieve, edit, save, and print spreadsheets	(ii) retrieve spreadsheets
(15) The student uses spreadsheet applications. The student is expected to:	(A) create, retrieve, edit, save, and print spreadsheets	(iii) edit spreadsheets
(15) The student uses spreadsheet applications. The student is expected to:	(A) create, retrieve, edit, save, and print spreadsheets	(iv) save spreadsheets
(15) The student uses spreadsheet applications. The student is expected to:	(A) create, retrieve, edit, save, and print spreadsheets	(v) print spreadsheets
(15) The student uses spreadsheet applications. The student is expected to:	(B) perform calculations and analysis on data	(i) perform calculations on data
(15) The student uses spreadsheet applications. The student is expected to:	(B) perform calculations and analysis on data	(ii) perform analysis on data

Knowledge and Skill Statement	Student Expectation	Breakout
(15) The student uses spreadsheet applications. The student is expected to:	(C) group worksheets	(i) group worksheets
(15) The student uses spreadsheet applications. The student is expected to:	(D) create charts and graphs from a spreadsheet	(i) create charts from a spreadsheet
(15) The student uses spreadsheet applications. The student is expected to:	(D) create charts and graphs from a spreadsheet	(ii) create graphs from a spreadsheet
(15) The student uses spreadsheet applications. The student is expected to:	(E) perform calculations using simple formulas	(i) perform calculations using simple formulas
(15) The student uses spreadsheet applications. The student is expected to:	(F) input and process data using spreadsheet functions	(i) input data using spreadsheet functions
(15) The student uses spreadsheet applications. The student is expected to:	(F) input and process data using spreadsheet functions	(ii) process data using spreadsheet functions
(16) The student uses database applications. The student is expected to:	(A) manipulate data elements	(i) manipulate data elements
(16) The student uses database applications. The student is expected to:	(B) enter data using a form	(i) enter data using a form
(16) The student uses database applications. The student is expected to:	(C) locate and replace data using search and replace functions	(i) locate data using search and replace functions

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student uses database applications. The student is expected to:	(C) locate and replace data using search and replace functions	(ii) replace data using search and replace functions
(16) The student uses database applications. The student is expected to:	(D) process data using database functions such as structure, format, attributes, and relationships	(i) process data using database functions
(17) The student uses collaborative applications. The student is expected to:	(A) facilitate group work through management of shared schedules and contact information	(i) facilitate group work through management of shared schedules
(17) The student uses collaborative applications. The student is expected to:	(A) facilitate group work through management of shared schedules and contact information	(ii) facilitate group work through management of shared contact information
(17) The student uses collaborative applications. The student is expected to:	(B) manage daily, weekly, and monthly schedules using an application	(i) manage daily schedules using an application
(17) The student uses collaborative applications. The student is expected to:	(B) manage daily, weekly, and monthly schedules using an application	(ii) manage weekly schedules using an application
(17) The student uses collaborative applications. The student is expected to:	(B) manage daily, weekly, and monthly schedules using an application	(iii) manage monthly schedules using an application
(17) The student uses collaborative applications. The student is expected to:	(C) maintain a shared database of contact information	(i) maintain a shared database of contact information
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(A) identify occupation-specific governmental regulations and national, state, and local building codes to establish appropriate regulations and codes	(i) identify occupation-specific governmental regulations to establish appropriate regulations and codes

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(A) identify occupation-specific governmental regulations and national, state, and local building codes to establish appropriate regulations and codes	(ii) identify national building codes to establish appropriate regulations and codes
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(A) identify occupation-specific governmental regulations and national, state, and local building codes to establish appropriate regulations and codes	(iii) identify state building codes to establish appropriate regulations and codes
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(A) identify occupation-specific governmental regulations and national, state, and local building codes to establish appropriate regulations and codes	(iv) identify local building codes to establish appropriate regulations and codes
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(B) comply with governmental regulations and building codes	(i) comply with governmental regulations
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(B) comply with governmental regulations and building codes	(ii) comply with building codes
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(C) read and discuss information on Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and other safety regulations	(i) read information on Occupational Safety and Health Administration (OSHA)
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(C) read and discuss information on Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and other safety regulations	(ii) read information on Environmental Protection Agency (EPA)

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(C) read and discuss information on Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and other safety regulations	(iii) read information on other safety regulations
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(C) read and discuss information on Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and other safety regulations	(iv) discuss information on Occupational Safety and Health Administration (OSHA)
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(C) read and discuss information on Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and other safety regulations	(v) discuss information on Environmental Protection Agency (EPA)
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(C) read and discuss information on Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and other safety regulations	(vi) discuss information on other safety regulations
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(D) read and discuss Safety Data Sheet (SDS) information to manage and dispose of hazardous materials	(i) read Safety Data Sheet (SDS) information to manage hazardous materials
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(D) read and discuss Safety Data Sheet (SDS) information to manage and dispose of hazardous materials	(ii) read Safety Data Sheet (SDS) information to dispose of hazardous materials
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(D) read and discuss Safety Data Sheet (SDS) information to manage and dispose of hazardous materials	(iii) discuss Safety Data Sheet (SDS) information to manage hazardous materials

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student complies with governmental regulations and applicable codes to establish a legal and safe environment. The student is expected to:	(D) read and discuss Safety Data Sheet (SDS) information to manage and dispose of hazardous materials	(iv) discuss Safety Data Sheet (SDS) information to dispose of hazardous materials
(19) The student examines all aspects of the built environment and systems to complete project planning. The student is expected to:	(A) align and incorporate the built environment and its systems to complete the project	(i) align the built environment to complete the project
(19) The student examines all aspects of the built environment and systems to complete project planning. The student is expected to:	(A) align and incorporate the built environment and its systems to complete the project	(ii) align [the built environment's] systems to complete the project
(19) The student examines all aspects of the built environment and systems to complete project planning. The student is expected to:	(A) align and incorporate the built environment and its systems to complete the project	(iii) incorporate the built environment to complete the project
(19) The student examines all aspects of the built environment and systems to complete project planning. The student is expected to:	(A) align and incorporate the built environment and its systems to complete the project	(iv) incorporate [the built environment's] systems to complete the project
(19) The student examines all aspects of the built environment and systems to complete project planning. The student is expected to:	(B) label all systems on a set of construction documents	(i) label all systems on a set of construction documents
(19) The student examines all aspects of the built environment and systems to complete project planning. The student is expected to:	(C) discuss the interrelationship of the systems in the built environment	(i) discuss the interrelationship of the systems in the built environment

Knowledge and Skill Statement	Student Expectation	Breakout
(19) The student examines all aspects of the built environment and systems to complete project planning. The student is expected to:	(D) use a sequential method such as the critical path method so that work progresses efficiently	(i) use a sequential method so that work progresses efficiently
(20) The student applies industry standards and practices to ensure quality work. The student is expected to:	(A) identify current industry standards and practices in order to incorporate quality into projects	(i) identify current industry standards in order to incorporate quality into projects
(20) The student applies industry standards and practices to ensure quality work. The student is expected to:	(A) identify current industry standards and practices in order to incorporate quality into projects	(ii) identify current industry practices in order to incorporate quality into projects
(20) The student applies industry standards and practices to ensure quality work. The student is expected to:	(B) document how quality improves profitability	(i) document how quality improves profitability
(20) The student applies industry standards and practices to ensure quality work. The student is expected to:	(C) report on issues that affect quality	(i) report on issues that affect quality
(20) The student applies industry standards and practices to ensure quality work. The student is expected to:	(D) use industry standards and practices to enhance appreciation for quality workmanship	(i) use industry standards to enhance appreciation for quality workmanship
(20) The student applies industry standards and practices to ensure quality work. The student is expected to:	(D) use industry standards and practices to enhance appreciation for quality workmanship	(ii) use industry practices to enhance appreciation for quality workmanship

Knowledge and Skill Statement	Student Expectation	Breakout
(20) The student applies industry standards and practices to ensure quality work. The student is expected to:	(E) perform work that meets or exceeds the quality standards of the industry	(i) perform work that meets or exceeds the quality standards of the industry
(21) The student observes rules and regulations to comply with personal and occupational health and safety standards. The student is expected to:	(A) follow appropriate safety standards to ensure a safe environment	(i) follow appropriate safety standards to ensure a safe environment
(21) The student observes rules and regulations to comply with personal and occupational health and safety standards. The student is expected to:	(B) practice safety rules and regulations	(i) practice safety rules and regulations
(21) The student observes rules and regulations to comply with personal and occupational health and safety standards. The student is expected to:	(C) identify safety precautions and hazards to ensure a safe environment	(i) identify safety precautions to ensure a safe environment
(21) The student observes rules and regulations to comply with personal and occupational health and safety standards. The student is expected to:	(C) identify safety precautions and hazards to ensure a safe environment	(ii) identify safety hazards to ensure a safe environment
(21) The student observes rules and regulations to comply with personal and occupational health and safety standards. The student is expected to:	(D) use appropriate safety practices and equipment, including personal protective equipment	(i) use appropriate safety practices
(21) The student observes rules and regulations to comply with personal and occupational health and safety standards. The student is expected to:	(D) use appropriate safety practices and equipment, including personal protective equipment	(ii) use appropriate safety equipment, including personal protective equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(A) use human relations skills to work cooperatively with coworkers representing different cultures, genders, and backgrounds	(i) use human relations skills to work cooperatively with coworkers representing different cultures
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(A) use human relations skills to work cooperatively with coworkers representing different cultures, genders, and backgrounds	(ii) use human relations skills to work cooperatively with coworkers representing different genders
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(A) use human relations skills to work cooperatively with coworkers representing different cultures, genders, and backgrounds	(iii) use human relations skills to work cooperatively with coworkers representing different backgrounds
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(B) track team goals to contribute constructively and positively to the team	(i) track team goals to contribute constructively to the team
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(B) track team goals to contribute constructively and positively to the team	(ii) track team goals to contribute positively to the team
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(C) match team members to appropriate activities	(i) match team members to appropriate activities
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(D) manage skills to effectively accomplish assignments	(i) manage skills to effectively accomplish assignments

Knowledge and Skill Statement	Student Expectation	Breakout
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(E) effectively use conflict-resolution skills with coworkers to maintain a smooth workflow	(i) effectively use conflict-resolution skills with coworkers to maintain a smooth workflow
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(F) use mentoring skills to inspire and motivate others to achieve and enhance performance	(i) use mentoring skills to inspire and motivate others to achieve
(22) The student works as an individual and as a team member to accomplish assignments. The student is expected to:	(F) use mentoring skills to inspire and motivate others to achieve and enhance performance	(ii) use mentoring skills to inspire and motivate others to enhance performance
(23) The student exhibits personal accountability, integrity, and responsibility to enhance confidence among coworkers. The student is expected to:	(A) apply the professional and ethical standards of the industry to personal conduct	(i) apply the professional standards of the industry to personal conduct
(23) The student exhibits personal accountability, integrity, and responsibility to enhance confidence among coworkers. The student is expected to:	(A) apply the professional and ethical standards of the industry to personal conduct	(ii) apply the ethical standards of the industry to personal conduct
(23) The student exhibits personal accountability, integrity, and responsibility to enhance confidence among coworkers. The student is expected to:	(B) practice professional and ethical standards	(i) practice professional standards
(23) The student exhibits personal accountability, integrity, and responsibility to enhance confidence among coworkers. The student is expected to:	(B) practice professional and ethical standards	(ii) practice ethical standards

Knowledge and Skill Statement	Student Expectation	Breakout
(23) The student exhibits personal accountability, integrity, and responsibility to enhance confidence among coworkers. The student is expected to:	(C) maintain personal integrity	(i) maintain personal integrity
(23) The student exhibits personal accountability, integrity, and responsibility to enhance confidence among coworkers. The student is expected to:	(D) promote personal and professional integrity in coworkers	(i) promote personal integrity in coworkers

Knowledge and Skill Statement	Student Expectation	Breakout
(23) The student exhibits personal accountability, integrity, and responsibility to enhance confidence among coworkers. The student is expected to:	(D) promote personal and professional integrity in coworkers	(ii) promote professional integrity in coworkers
(23) The student exhibits personal accountability, integrity, and responsibility to enhance confidence among coworkers. The student is expected to:	(E) recognize integrity in others	(i) recognize integrity in others
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(A) study regulations and codes to identify those applicable to the local area	(i) study regulations to identify those applicable to the local area
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(A) study regulations and codes to identify those applicable to the local area	(ii) study codes to identify those applicable to the local area
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(B) locate and implement regulations and codes applicable to tasks and projects	(i) locate regulations applicable to tasks
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(B) locate and implement regulations and codes applicable to tasks and projects	(ii) locate regulations applicable to projects
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(B) locate and implement regulations and codes applicable to tasks and projects	(iii) locate codes applicable to tasks

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(B) locate and implement regulations and codes applicable to tasks and projects	(iv) locate codes applicable to projects
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(B) locate and implement regulations and codes applicable to tasks and projects	(v) implement regulations applicable to tasks
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(B) locate and implement regulations and codes applicable to tasks and projects	(vi) implement regulations applicable to projects
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(B) locate and implement regulations and codes applicable to tasks and projects	(vii) implement codes applicable to tasks
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(B) locate and implement regulations and codes applicable to tasks and projects	(viii) implement codes applicable to projects
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(C) comply with local, state, and federal agencies and model code-setting organizations	(i) comply with local agencies
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(C) comply with local, state, and federal agencies and model code-setting organizations	(ii) comply with state agencies

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(C) comply with local, state, and federal agencies and model code-setting organizations	(iii) comply with federal agencies
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(C) comply with local, state, and federal agencies and model code-setting organizations	(iv) comply with model code-setting organizations
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(D) recognize the definition of specialized words or phrases to fully understand documents and contracts	(i) recognize the definition of specialized words or phrases to fully understand documents
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(D) recognize the definition of specialized words or phrases to fully understand documents and contracts	(ii) recognize the definition of specialized words or phrases to fully understand contracts
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(E) use industry jargon or terminology appropriately	(i) use industry jargon or terminology appropriately
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(F) use industry acronyms correctly	(i) use industry acronyms correctly
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(G) use words with multiple meanings correctly in context	(i) use words with multiple meanings correctly in context

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(H) use ethical and legal standards to avoid conflicts of interest	(i) use ethical standards to avoid conflicts of interest
(24) The student reads regulations and contracts to ensure ethical and safety elements are observed. The student is expected to:	(H) use ethical and legal standards to avoid conflicts of interest	(ii) use legal standards to avoid conflicts of interest
(25) The student recognizes a positive work ethic to comply with employment requirements. The student is expected to:	(A) exhibit behaviors showing reliability and dependability	(i) exhibit behaviors showing reliability
(25) The student recognizes a positive work ethic to comply with employment requirements. The student is expected to:	(A) exhibit behaviors showing reliability and dependability	(ii) exhibit behaviors showing dependability
(25) The student recognizes a positive work ethic to comply with employment requirements. The student is expected to:	(B) recognize appropriate dress for the work environment	(i) recognize appropriate dress for the work environment
(25) The student recognizes a positive work ethic to comply with employment requirements. The student is expected to:	(C) recognize the required employment forms and documentation such as I-9, work visa, W-4, and licensures to meet employment requirements	(i) recognize the required employment forms to meet employment requirements
(25) The student recognizes a positive work ethic to comply with employment requirements. The student is expected to:	(C) recognize the required employment forms and documentation such as I-9, work visa, W-4, and licensures to meet employment requirements	(ii) recognize the required employment documentation to meet employment requirements

Knowledge and Skill Statement	Student Expectation	Breakout
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(A) identify opportunities for career advancement to formulate career goals	(i) identify opportunities for career advancement to formulate career goals
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(B) identify a career ladder	(i) identify a career ladder
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(C) develop a career advancement plan	(i) develop a career advancement plan
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(D) review progress of a career advancement plan	(i) review progress of a career advancement plan
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(E) maintain positive interpersonal skills to enhance advancement potential	(i) maintain positive interpersonal skills to enhance advancement potential
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(F) explore education and training opportunities to acquire skills necessary for career advancement	(i) explore education opportunities to acquire skills necessary for career advancement
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(F) explore education and training opportunities to acquire skills necessary for career advancement	(ii) explore training opportunities to acquire skills necessary for career advancement

Knowledge and Skill Statement	Student Expectation	Breakout
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(G) list postsecondary educational paths associated with the architecture and construction trades, including college, apprenticeship, and specialty trade schools	(i) list postsecondary educational paths associated with the architecture trades, including college
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(G) list postsecondary educational paths associated with the architecture and construction trades, including college, apprenticeship, and specialty trade schools	(ii) list postsecondary educational paths associated with the architecture trades, including apprenticeship
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(G) list postsecondary educational paths associated with the architecture and construction trades, including college, apprenticeship, and specialty trade schools	(iii) list postsecondary educational paths associated with the architecture trades, including specialty trade schools
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(G) list postsecondary educational paths associated with the architecture and construction trades, including college, apprenticeship, and specialty trade schools	(iv) list postsecondary educational paths associated with the construction trades, including college
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(G) list postsecondary educational paths associated with the architecture and construction trades, including college, apprenticeship, and specialty trade schools	(v) list postsecondary educational paths associated with the construction trades, including apprenticeship
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(G) list postsecondary educational paths associated with the architecture and construction trades, including college, apprenticeship, and specialty trade schools	(vi) list postsecondary educational paths associated with the construction trades, including specialty trade schools
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(H) explore costs associated with postsecondary education	(i) explore costs associated with postsecondary education

Knowledge and Skill Statement	Student Expectation	Breakout
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(I) participate in professional development opportunities such as professional organizations and associations, trade shows, and seminars	(i) participate in professional development opportunities
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(J) read professional journals, magazines, manufacturers' catalogs, industry publications, and Internet sites to keep current on industry trends	(i) read professional journals to keep current on industry trends
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(J) read professional journals, magazines, manufacturers' catalogs, industry publications, and Internet sites to keep current on industry trends	(ii) read professional magazines to keep current on industry trends
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(J) read professional journals, magazines, manufacturers' catalogs, industry publications, and Internet sites to keep current on industry trends	(iii) read professional manufacturers' catalogs to keep current on industry trends
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(J) read professional journals, magazines, manufacturers' catalogs, industry publications, and Internet sites to keep current on industry trends	(iv) read professional industry publications to keep current on industry trends
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(J) read professional journals, magazines, manufacturers' catalogs, industry publications, and Internet sites to keep current on industry trends	(v) read professional Internet sites to keep current on industry trends
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(K) identify declining and emerging occupations, practices, and procedures	(i) identify declining occupations

Knowledge and Skill Statement	Student Expectation	Breakout
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(K) identify declining and emerging occupations, practices, and procedures	(ii) identify declining practices
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(K) identify declining and emerging occupations, practices, and procedures	(iii) identify declining procedures
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(K) identify declining and emerging occupations, practices, and procedures	(iv) identify emerging occupations
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(K) identify declining and emerging occupations, practices, and procedures	(v) identify emerging practices
(26) The student recognizes requirements for career advancement to plan for continuing education and training. The student is expected to:	(K) identify declining and emerging occupations, practices, and procedures	(vi) identify emerging procedures
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(A) recognize segments of the construction industry and show the relationships to specialty areas	(i) recognize segments of the construction industry
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(A) recognize segments of the construction industry and show the relationships to specialty areas	(ii) show the relationships to specialty areas

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(B) obtain necessary knowledge and skills to enhance employability	(i) obtain necessary knowledge to enhance employability
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(B) obtain necessary knowledge and skills to enhance employability	(ii) obtain necessary skills to enhance employability
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(C) research local and regional labor markets and job growth information to project potential for advancement	(i) research local labor markets to project potential for advancement
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(C) research local and regional labor markets and job growth information to project potential for advancement	(ii) research regional labor markets to project potential for advancement
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(C) research local and regional labor markets and job growth information to project potential for advancement	(iii) research job growth information to project potential for advancement
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(D) identify sources of career information	(i) identify sources of career information
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(E) identify job opportunities for the trade	(ii) identify job opportunities for the trade

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(F) identify organizations that offer career and job placement	(i) identify organizations that offer career placement
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(F) identify organizations that offer career and job placement	(ii) identify organizations that offer job placement
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(G) analyze potential growth of identified careers	(i) analyze potential growth of identified careers
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(H) apply labor market and job growth information to career goals	(i) apply labor market information to career goals
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(H) apply labor market and job growth information to career goals	(ii) apply job growth information to career goals
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(i) examine licensing requirements at the national level to achieve compliance
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(ii) examine licensing requirements at the state level to achieve compliance

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(iii) examine licensing requirements at the local level to achieve compliance
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(iv) examine certification requirements at the national level to achieve compliance
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(v) examine certification requirements at the state level to achieve compliance
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(vi) examine certification requirements at the local level to achieve compliance
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(vii) examine credentialing requirements at the national level to achieve compliance
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(viii) examine credentialing requirements at the state level to achieve compliance
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(I) examine licensing, certification, and credentialing requirements at the national, state, and local levels to achieve compliance	(ix) examine credentialing requirements at the local level to achieve compliance

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(J) align licensing, certification, and credentialing requirements to career goals in order to plan for career advancement	(i) align licensing requirements to career goals in order to plan for career advancement
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(J) align licensing, certification, and credentialing requirements to career goals in order to plan for career advancement	(ii) align certification requirements to career goals in order to plan for career advancement
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(J) align licensing, certification, and credentialing requirements to career goals in order to plan for career advancement	(iii) align credentialing requirements to career goals in order to plan for career advancement
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(K) use technologies and resources to research licensing, certification, and credentialing	(i) use technologies to research licensing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(K) use technologies and resources to research licensing, certification, and credentialing	(ii) use technologies to research certification
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(K) use technologies and resources to research licensing, certification, and credentialing	(iii) use technologies to research credentialing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(K) use technologies and resources to research licensing, certification, and credentialing	(iv) use resources to research licensing

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(K) use technologies and resources to research licensing, certification, and credentialing	(v) use resources to research certification
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(K) use technologies and resources to research licensing, certification, and credentialing	(vi) use resources to research credentialing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(L) evaluate and select suitable sources of licensing, certification, and credentialing	(i) evaluate suitable sources of licensing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(L) evaluate and select suitable sources of licensing, certification, and credentialing	(ii) evaluate suitable sources of certification
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(L) evaluate and select suitable sources of licensing, certification, and credentialing	(iii) evaluate suitable sources of credentialing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(L) evaluate and select suitable sources of licensing, certification, and credentialing	(iv) select suitable sources of licensing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(L) evaluate and select suitable sources of licensing, certification, and credentialing	(v) select suitable sources of certification

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(L) evaluate and select suitable sources of licensing, certification, and credentialing	(vi) select suitable sources of credentialing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(M) identify licenses, certifications, and credentials applicable to career goals	(i) identify licenses applicable to career goals
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(M) identify licenses, certifications, and credentials applicable to career goals	(ii) identify certifications applicable to career goals
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(M) identify licenses, certifications, and credentials applicable to career goals	(iii) identify credentials applicable to career goals
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(N) document sources and agencies for licensing and certification and credentialing information, including contact information	(i) document sources for licensing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(N) document sources and agencies for licensing and certification and credentialing information, including contact information	(ii) document sources for certification
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(N) document sources and agencies for licensing and certification and credentialing information, including contact information	(iii) document sources for credentialing information, including contact information

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(N) document sources and agencies for licensing and certification and credentialing information, including contact information	(iv) document agencies for licensing
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(N) document sources and agencies for licensing and certification and credentialing information, including contact information	(v) document agencies for certification
(27) The student examines the organization and structure of various segments of the industry to prepare for career advancement. The student is expected to:	(N) document sources and agencies for licensing and certification and credentialing information, including contact information	(vi) document agencies for credentialing information, including contact information
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(A) select education, work history, and skills to create a personal resume	(i) select education to create a personal resume
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(A) select education, work history, and skills to create a personal resume	(ii) select work history to create a personal resume
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(A) select education, work history, and skills to create a personal resume	(iii) select skills to create a personal resume
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(B) develop a resume using word processing technology	(i) develop a resume using word processing technology

Knowledge and Skill Statement	Student Expectation	Breakout
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(C) contact professional references to acquire recommendations	(i) contact professional references to acquire recommendations
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(D) obtain appropriate letters of recommendation	(i) obtain appropriate letters of recommendation
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(i) document a record of work experiences to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(ii) document a record of licenses to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(iii) document a record of certifications to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(iv) document a record of credentials to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(v) document a record of education to build a portfolio

Knowledge and Skill Statement	Student Expectation	Breakout
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(vi) document a record of training to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(vii) maintain a record of work experiences to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(viii) maintain a record of licenses to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(ix) maintain a record of certifications to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(x) maintain a record of credentials to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(xi) maintain a record of education to build a portfolio
(28) The student initiates and maintains a career portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(xii) maintain a record of training to build a portfolio

Knowledge and Skill Statement	Student Expectation	Breakout
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(A) interpret blueprints and drawings to assist with project planning	(i) interpret blueprints to assist with project planning
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(A) interpret blueprints and drawings to assist with project planning	(ii) interpret drawings to assist with project planning
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(B) recognize elements and symbols of blueprints and drawings	(i) recognize elements of blueprints
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(B) recognize elements and symbols of blueprints and drawings	(ii) recognize elements of drawings
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(B) recognize elements and symbols of blueprints and drawings	(iii) recognize symbols of blueprints
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(B) recognize elements and symbols of blueprints and drawings	(iv) recognize symbols of drawings
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(C) relate information on blueprints to actual locations on the print	(i) relate information on blueprints to actual locations on the print
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(D) recognize different classifications of drawings	(i) recognize different classifications of drawings
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(E) interpret and use drawing dimensions	(i) interpret drawing dimensions

Knowledge and Skill Statement	Student Expectation	Breakout
(29) The student reads technical drawings and documents to plan a project. The student is expected to:	(E) interpret and use drawing dimensions	(ii) use drawing dimensions
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(A) select tools, machinery, and equipment to match requirements of the project	(i) select tools to match requirements of the project
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(A) select tools, machinery, and equipment to match requirements of the project	(ii) select machinery to match requirements of the project
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(A) select tools, machinery, and equipment to match requirements of the project	(iii) select equipment to match requirements of the project
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(B) safely operate tools, machinery, and equipment	(i) safely operate tools
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(B) safely operate tools, machinery, and equipment	(ii) safely operate machinery
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(B) safely operate tools, machinery, and equipment	(iii) safely operate equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(C) maintain and care for tools, machines, and equipment	(i) maintain tools
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(C) maintain and care for tools, machines, and equipment	(ii) maintain machines
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(C) maintain and care for tools, machines, and equipment	(iii) maintain equipment
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(C) maintain and care for tools, machines, and equipment	(iv) care for tools
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(C) maintain and care for tools, machines, and equipment	(v) care for machines
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(C) maintain and care for tools, machines, and equipment	(vi) care for equipment
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(D) use tools, machines, and equipment productively and efficiently in alignment with industry standards	(i) use tools productively in alignment with industry standards

Knowledge and Skill Statement	Student Expectation	Breakout
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(D) use tools, machines, and equipment productively and efficiently in alignment with industry standards	(ii) use machines productively in alignment with industry standards
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(D) use tools, machines, and equipment productively and efficiently in alignment with industry standards	(iii) use equipment productively in alignment with industry standards
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(D) use tools, machines, and equipment productively and efficiently in alignment with industry standards	(iv) use tools efficiently in alignment with industry standards
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(D) use tools, machines, and equipment productively and efficiently in alignment with industry standards	(v) use machines efficiently in alignment with industry standards
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(D) use tools, machines, and equipment productively and efficiently in alignment with industry standards	(vi) use equipment efficiently in alignment with industry standards
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(E) identify sources of information concerning state-of-the-art tools, equipment, materials, technologies, and methodologies	(i) identify sources of information concerning state-of-the-art tools
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(E) identify sources of information concerning state-of-the-art tools, equipment, materials, technologies, and methodologies	(ii) identify sources of information concerning state-of-the-art equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(E) identify sources of information concerning state-of-the-art tools, equipment, materials, technologies, and methodologies	(iii) identify sources of information concerning state-of-the-art materials
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(E) identify sources of information concerning state-of-the-art tools, equipment, materials, technologies, and methodologies	(iv) identify sources of information concerning state-of-the-art technologies
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(E) identify sources of information concerning state-of-the-art tools, equipment, materials, technologies, and methodologies	(v) identify sources of information concerning state-of-the-art methodologies
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(F) read current periodicals, industry publications, and manufacturers' catalogs	(i) read current periodicals
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(F) read current periodicals, industry publications, and manufacturers' catalogs	(ii) read current industry publications
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(F) read current periodicals, industry publications, and manufacturers' catalogs	(iii) read current manufacturers' catalogs
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(G) explore state-of-the-art tools, equipment, materials, technologies, and methodologies	(i) explore state-of-the-art tools

Knowledge and Skill Statement	Student Expectation	Breakout
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(G) explore state-of-the-art tools, equipment, materials, technologies, and methodologies	(ii) explore state-of-the-art equipment
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(G) explore state-of-the-art tools, equipment, materials, technologies, and methodologies	(iii) explore state-of-the-art materials
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(G) explore state-of-the-art tools, equipment, materials, technologies, and methodologies	(iv) explore state-of-the-art technologies
(30) The student uses and maintains appropriate tools, machines, and equipment to accomplish project goals. The student is expected to:	(G) explore state-of-the-art tools, equipment, materials, technologies, and methodologies	(v) explore state-of-the-art methodologies

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.43. Principles of Construction (One Credit), Adopted 2015.
(a) General Requirements. This course is recommended for students in Grades 9-12. Students shall be awarded one credit for successful completion of this course.	
(b) Introduction.	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Principles of Construction is intended to provide an introduction and lay a solid foundation for those students entering the construction or craft skilled areas. The course provides a strong knowledge of construction safety, construction mathematics, and common hand and power tools. For safety and liability considerations, limiting course enrollment to 15 students is recommended. This course also provides communication and occupation skills to assist the student in obtaining and maintaining employment.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) explain the role of an employee in the construction industry	(i) explain the role of an employee in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate critical-thinking skills	(i) demonstrate critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate the ability to solve problems using critical-thinking skills	(i) demonstrate the ability to solve problems using critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate knowledge of basic computer systems	(i) demonstrate knowledge of basic computer systems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) explain common uses for computers in the construction industry	(i) explain common uses for computers in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) define effective relationship skills	(i) define effective relationship skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) recognize workplace issues such as sexual harassment, stress, and substance abuse	(i) recognize workplace issues

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(H) explain the Occupational Safety and Health Administration (OSHA) General Duty Clause	(i) explain the Occupational Safety and Health Administration (OSHA) General Duty Clause
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(I) explain OSHA 1926 CFR Subpart C	(i) explain OSHA 1926 CFR Subpart C
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(A) explain the idea of a safety culture	(i) explain the idea of a safety culture
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(B) explain the importance of a safety culture in the construction crafts	(i) explain the importance of a safety culture in the construction crafts
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(C) explain the role of the OSHA in job-site safety	(i) explain the role of the OSHA in job-site safety
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(D) explain fall protection, ladder safety, stair safety, and scaffold safety procedures	(i) explain fall protection procedures
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(D) explain fall protection, ladder safety, stair safety, and scaffold safety procedures	(ii) explain ladder safety procedures

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(D) explain fall protection, ladder safety, stair safety, and scaffold safety procedures	(iii) explain stair safety procedures
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(D) explain fall protection, ladder safety, stair safety, and scaffold safety procedures	(iv) explain scaffold safety procedures
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(i) demonstrate the use of appropriate personal protective equipment, including safety goggles and glasses
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(ii) demonstrate the use of appropriate personal protective equipment, including hard hats
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(iii) demonstrate the use of appropriate personal protective equipment, including gloves
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(iv) demonstrate the use of appropriate personal protective equipment, including safety harnesses

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(v) demonstrate the use of appropriate personal protective equipment, including safety shoes
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(vi) demonstrate the care of appropriate personal protective equipment, including safety goggles and glasses
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(vii) demonstrate the care of appropriate personal protective equipment, including hard hats
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(viii) demonstrate the care of appropriate personal protective equipment, including gloves
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(ix) demonstrate the care of appropriate personal protective equipment, including safety harnesses
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(x) demonstrate the care of appropriate personal protective equipment, including safety shoes

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(F) define safe work procedures around electrical hazards	(i) define safe work procedures around electrical hazards
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(G) explain the importance of Safety Data Sheets (SDS)	(i) explain the importance of Safety Data Sheets (SDS)
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(A) identify causes of accidents	(i) identify causes of accidents
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(B) identify impacts of accident costs	(i) identify impacts of accident costs
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(C) define hazard recognition	(i) define hazard recognition
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(D) identify struck-by hazards	(i) identify struck-by hazards

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(E) identify caught-in-between hazards	(i) identify caught-in-between hazards
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(F) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(i) identify other construction hazards on the jobsite, including hazardous material exposures
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(F) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(ii) identify other construction hazards on the jobsite, including environmental elements
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(F) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(iii) identify other construction hazards on the jobsite, including welding hazards
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(F) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(iv) identify other construction hazards on the jobsite, including cutting hazards
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(F) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(v) identify other construction hazards on the jobsite, including confined spaces

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(F) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(vi) identify other construction hazards on the jobsite, including fires
(3) The student understands the importance of recognizing potential hazards and preventing accidents in the classroom and in the field. The student is expected to:	(G) explain the importance of hazard communication (HazCom)	(i) explain the importance of hazard communication (HazCom)
(4) The student understands basic construction mathematics. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers with and without a calculator	(i) add whole numbers with a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers with and without a calculator	(ii) subtract whole numbers with a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers with and without a calculator	(iii) multiply whole numbers with a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers with and without a calculator	(iv) divide whole numbers with a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers with and without a calculator	(v) add whole numbers without a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers with and without a calculator	(vi) subtract whole numbers without a calculator

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student understands basic construction mathematics. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers with and without a calculator	(vii) multiply whole numbers without a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers with and without a calculator	(viii) divide whole numbers without a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(B) add, subtract, multiply, and divide fractions	(i) add fractions
(4) The student understands basic construction mathematics. The student is expected to:	(B) add, subtract, multiply, and divide fractions	(ii) subtract fractions
(4) The student understands basic construction mathematics. The student is expected to:	(B) add, subtract, multiply, and divide fractions	(iii) multiply fractions
(4) The student understands basic construction mathematics. The student is expected to:	(B) add, subtract, multiply, and divide fractions	(iv) divide fractions
(4) The student understands basic construction mathematics. The student is expected to:	(C) add, subtract, multiply, and divide decimals with and without a calculator	(i) add decimals with a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(C) add, subtract, multiply, and divide decimals with and without a calculator	(ii) subtract decimals with a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(C) add, subtract, multiply, and divide decimals with and without a calculator	(iii) multiply decimals with a calculator

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student understands basic construction mathematics. The student is expected to:	(C) add, subtract, multiply, and divide decimals with and without a calculator	(iv) divide decimals with a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(C) add, subtract, multiply, and divide decimals with and without a calculator	(v) add decimals without a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(C) add, subtract, multiply, and divide decimals with and without a calculator	(vi) subtract decimals without a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(C) add, subtract, multiply, and divide decimals with and without a calculator	(vii) multiply decimals without a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(C) add, subtract, multiply, and divide decimals with and without a calculator	(viii) divide decimals without a calculator
(4) The student understands basic construction mathematics. The student is expected to:	(D) convert decimals to percentages and percentages to decimals	(i) convert decimals to percentages
(4) The student understands basic construction mathematics. The student is expected to:	(D) convert decimals to percentages and percentages to decimals	(ii) convert percentages to decimals
(4) The student understands basic construction mathematics. The student is expected to:	(E) convert fractions to decimals and decimals to fractions	(i) convert fractions to decimals
(4) The student understands basic construction mathematics. The student is expected to:	(E) convert fractions to decimals and decimals to fractions	(ii) convert decimals to fractions

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student demonstrates basic measuring practices. The student is expected to:	(A) use a standard ruler, a metric ruler, a measuring tape, and an architectural/engineering scale to measure	(i) use a standard ruler to measure
(5) The student demonstrates basic measuring practices. The student is expected to:	(A) use a standard ruler, a metric ruler, a measuring tape, and an architectural/engineering scale to measure	(ii) use a metric ruler to measure
(5) The student demonstrates basic measuring practices. The student is expected to:	(A) use a standard ruler, a metric ruler, a measuring tape, and an architectural/engineering scale to measure	(iii) use a measuring tape to measure
(5) The student demonstrates basic measuring practices. The student is expected to:	(A) use a standard ruler, a metric ruler, a measuring tape, and an architectural/engineering scale to measure	(iv) use an architectural/engineering scale to measure
(5) The student demonstrates basic measuring practices. The student is expected to:	(B) explain what the metric system is and how it is important in the construction trade	(i) explain what the metric system is
(5) The student demonstrates basic measuring practices. The student is expected to:	(B) explain what the metric system is and how it is important in the construction trade	(ii) explain how [the metric system] is important in the construction trade
(5) The student demonstrates basic measuring practices. The student is expected to:	(C) recognize and use metric units of length, weight, volume, and temperature	(i) recognize metric units of length
(5) The student demonstrates basic measuring practices. The student is expected to:	(C) recognize and use metric units of length, weight, volume, and temperature	(ii) recognize metric units of weight
(5) The student demonstrates basic measuring practices. The student is expected to:	(C) recognize and use metric units of length, weight, volume, and temperature	(iii) recognize metric units of volume

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student demonstrates basic measuring practices. The student is expected to:	(C) recognize and use metric units of length, weight, volume, and temperature	(iv) recognize metric units of temperature
(5) The student demonstrates basic measuring practices. The student is expected to:	(C) recognize and use metric units of length, weight, volume, and temperature	(v) use metric units of length
(5) The student demonstrates basic measuring practices. The student is expected to:	(C) recognize and use metric units of length, weight, volume, and temperature	(vi) use metric units of weight
(5) The student demonstrates basic measuring practices. The student is expected to:	(C) recognize and use metric units of length, weight, volume, and temperature	(vii) use metric units of volume
(5) The student demonstrates basic measuring practices. The student is expected to:	(C) recognize and use metric units of length, weight, volume, and temperature	(viii) use metric units of temperature
(5) The student demonstrates basic measuring practices. The student is expected to:	(D) recognize some of the basic shapes used in the construction industry and apply basic geometric principles to measure them	(i) recognize some of the basic shapes used in the construction industry
(5) The student demonstrates basic measuring practices. The student is expected to:	(D) recognize some of the basic shapes used in the construction industry and apply basic geometric principles to measure them	(ii) apply basic geometric principles to measure [basic shapes]
(6) The student acquires knowledge about care and identification of hand tools. The student is expected to:	(A) recognize and identify the basic hand tools and their purposes for the construction trades	(i) recognize the basic hand tools
(6) The student acquires knowledge about care and identification of hand tools. The student is expected to:	(A) recognize and identify the basic hand tools and their purposes for the construction trades	(ii) identify the basic hand tools

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student acquires knowledge about care and identification of hand tools. The student is expected to:	(A) recognize and identify the basic hand tools and their purposes for the construction trades	(iii) recognize [the basic hand tools'] purposes for the construction trades
(6) The student acquires knowledge about care and identification of hand tools. The student is expected to:	(A) recognize and identify the basic hand tools and their purposes for the construction trades	(iv) identify [the basic hand tools'] purposes for the construction trades
(6) The student acquires knowledge about care and identification of hand tools. The student is expected to:	(B) inspect basic hand tools visually to determine if they are safe for use	(i) inspect basic hand tools visually to determine if they are safe for use
(6) The student acquires knowledge about care and identification of hand tools. The student is expected to:	(C) use the basic construction hand tools safely and properly	(i) use the basic construction hand tools safely
(6) The student acquires knowledge about care and identification of hand tools. The student is expected to:	(C) use the basic construction hand tools safely and properly	(ii) use the basic construction hand tools properly
(7) The student acquires knowledge about care and identification of powered hand tools. The student is expected to:	(A) identify powered hand tools commonly used in the construction trades	(i) identify powered hand tools commonly used in the construction trades
(7) The student acquires knowledge about care and identification of powered hand tools. The student is expected to:	(B) practice safe and proper application of powered hand tools commonly used in the construction trades	(i) practice safe application of powered hand tools commonly used in the construction trades
(7) The student acquires knowledge about care and identification of powered hand tools. The student is expected to:	(B) practice safe and proper application of powered hand tools commonly used in the construction trades	(ii) practice proper application of powered hand tools commonly used in the construction trades

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student acquires knowledge about care and identification of powered hand tools. The student is expected to:	(C) explain how to properly maintain and clean powered hand tools commonly used in construction trades	(i) explain how to properly maintain powered hand tools commonly used in construction trades
(7) The student acquires knowledge about care and identification of powered hand tools. The student is expected to:	(C) explain how to properly maintain and clean powered hand tools commonly used in construction trades	(ii) explain how to properly clean powered hand tools commonly used in construction trades
(8) The student develops the basics of construction drawing. The student is expected to:	(A) interpret and use drawing dimensions	(i) interpret drawing dimensions
(8) The student develops the basics of construction drawing. The student is expected to:	(A) interpret and use drawing dimensions	(ii) use drawing dimensions
(8) The student develops the basics of construction drawing. The student is expected to:	(B) recognize and identify basic construction terms	(i) recognize basic construction terms
(8) The student develops the basics of construction drawing. The student is expected to:	(B) recognize and identify basic construction terms	(ii) identify basic construction terms
(8) The student develops the basics of construction drawing. The student is expected to:	(C) recognize and identify basic drawing components	(i) recognize basic drawing components
(8) The student develops the basics of construction drawing. The student is expected to:	(C) recognize and identify basic drawing components	(ii) identify basic drawing components
(8) The student develops the basics of construction drawing. The student is expected to:	(D) recognize and identify commonly used drawing symbols	(i) recognize commonly used drawing symbols

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student develops the basics of construction drawing. The student is expected to:	(D) recognize and identify commonly used drawing symbols	(ii) identify commonly used drawing symbols
(8) The student develops the basics of construction drawing. The student is expected to:	(E) relate information on construction drawings to actual locations on the print	(i) relate information on construction drawings to actual locations on the print
(8) The student develops the basics of construction drawing. The student is expected to:	(F) recognize different classifications of construction drawings	(i) recognize different classifications of construction drawings
(9) The student interprets and presents information used in workplace situations. The student is expected to:	(A) interpret information and instructions presented in written form	(i) interpret information presented in written form
(9) The student interprets and presents information used in workplace situations. The student is expected to:	(A) interpret information and instructions presented in written form	(ii) interpret instructions presented in written form
(9) The student interprets and presents information used in workplace situations. The student is expected to:	(B) interpret information and instructions presented in verbal form	(i) interpret information presented in verbal form
(9) The student interprets and presents information used in workplace situations. The student is expected to:	(B) interpret information and instructions presented in verbal form	(ii) interpret instructions presented in verbal form
(9) The student interprets and presents information used in workplace situations. The student is expected to:	(C) communicate effectively using verbal and writing skills	(i) communicate effectively using verbal skills

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student interprets and presents information used in workplace situations. The student is expected to:	(C) communicate effectively using verbal and writing skills	(ii) communicate effectively using writing skills
(9) The student interprets and presents information used in workplace situations. The student is expected to:	(D) communicate effectively on the job using electronic communication devices	(i) communicate effectively on the job using electronic communication devices
(10) The student identifies ergonomic tools and procedures as well as safe material handling standards. The student is expected to:	(A) define a load	(i) define a load
(10) The student identifies ergonomic tools and procedures as well as safe material handling standards. The student is expected to:	(B) establish a pre-task plan prior to moving a load	(i) establish a pre-task plan prior to moving a load
(10) The student identifies ergonomic tools and procedures as well as safe material handling standards. The student is expected to:	(C) apply proper material-handling techniques	(i) apply proper material-handling techniques
(10) The student identifies ergonomic tools and procedures as well as safe material handling standards. The student is expected to:	(D) choose appropriate material-handling equipment for the task	(i) choose appropriate material-handling equipment for the task
(10) The student identifies ergonomic tools and procedures as well as safe material handling standards. The student is expected to:	(E) recognize hazards and follow safety procedures required for material handling	(i) recognize hazards

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student identifies ergonomic tools and procedures as well as safe material handling standards. The student is expected to:	(E) recognize hazards and follow safety procedures required for material handling	(ii) follow safety procedures required for material handling

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.44. Building Maintenance Technology I (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Architecture or Principles of Construction. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Building Maintenance Technology I, students will gain knowledge and skills needed to enter the field of building maintenance as a building maintenance technician or supervisor or secure a foundation for a postsecondary degree in construction management, architecture, or engineering. Students will acquire knowledge and skills in plumbing; electrical; and heating, ventilation, and air conditioning (HVAC) systems. Additionally, students will learn methods for repair and installation of drywall, roof, and insulation systems.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining or conveying written information in a professional comprehensive manner	(i) express ideas to others in a clear, concise, and effective manner, including explaining or conveying written information in a professional comprehensive manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining or conveying written information in a professional comprehensive manner	(ii) express messages to others in a clear, concise, and effective manner, including explaining or conveying written information in a professional comprehensive manner
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) compile data using numbers in various formats to solve job-appropriate problems	(i) compile data using numbers in various formats to solve job-appropriate problems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate how to choose the ethical course of action and comply with all applicable rules, laws, and regulations	(i) demonstrate how to choose the ethical course of action
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate how to choose the ethical course of action and comply with all applicable rules, laws, and regulations	(ii) demonstrate how to comply with all applicable rules, laws, and regulations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed	(i) demonstrate punctuality consistently in reporting for duty

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed	(ii) demonstrate dependability consistently in reporting for duty
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed	(iii) demonstrate reliability consistently in reporting for duty
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed	(iv) demonstrate responsibility consistently in reporting for duty
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed	(v) demonstrate punctuality consistently in performing assigned tasks as directed
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed	(vi) demonstrate dependability consistently in performing assigned tasks as directed
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed	(vii) demonstrate reliability consistently in performing assigned tasks as directed
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate punctuality, dependability, reliability, and responsibility consistently in reporting for duty and performing assigned tasks as directed	(viii) demonstrate responsibility consistently in performing assigned tasks as directed

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations	(i) evaluate systems and operations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations	(ii) identify causes, problems, patterns, or issues
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations	(iii) explore workable solutions or remedies to improve situations
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(A) demonstrate safe working procedures during building maintenance and repair	(i) demonstrate safe working procedures during building maintenance
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(A) demonstrate safe working procedures during building maintenance and repair	(ii) demonstrate safe working procedures during building repair
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(B) explain the purpose of the Occupational Safety and Health Administration (OSHA) and how to promote safety on a worksite	(i) explain the purpose of the Occupational Safety and Health Administration (OSHA)

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(B) explain the purpose of the Occupational Safety and Health Administration (OSHA) and how to promote safety on a worksite	(ii) explain how to promote safety on a worksite
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(C) identify worksite hazards and how to avoid or minimize them on a worksite	(i) identify worksite hazards
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(C) identify worksite hazards and how to avoid or minimize them on a worksite	(i) identify how to avoid or minimize [worksite hazards] on a worksite
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(D) explain safety obligations of workers, supervisors, and managers to ensure a safe worksite	(i) explain safety obligations of workers to ensure a safe worksite
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(D) explain safety obligations of workers, supervisors, and managers to ensure a safe worksite	(ii) explain safety obligations of supervisors to ensure a safe worksite
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(D) explain safety obligations of workers, supervisors, and managers to ensure a safe worksite	(iii) explain safety obligations of managers to ensure a safe worksite

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(E) discuss the causes, effects, impacts, and costs of accidents	(i) discuss the causes of accidents
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(E) discuss the causes, effects, impacts, and costs of accidents	(i) discuss the effects of accidents
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(E) discuss the causes, effects, impacts, and costs of accidents	(i) discuss the impacts of accidents
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(E) discuss the causes, effects, impacts, and costs of accidents	(ii) discuss the costs of accidents
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(F) define safe work procedures for working with hazardous chemicals	(i) define safe work procedures for working with hazardous chemicals
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(G) define proper use of personal protective equipment	(i) define proper use of personal protective equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(H) identify potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(i) identify potential construction hazards, including hazardous material exposures
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(H) identify potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(ii) identify potential construction hazards, including welding
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(H) identify potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(iii) identify potential construction hazards, including cutting hazards
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines such as in electrical work and carpentry. The student is expected to:	(H) identify potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(iv) identify potential construction hazards, including confined spaces
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(A) describe the types of drawings usually included in a set of plans and list the information found on each type	(i) describe the types of drawings usually included in a set of plans

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(A) describe the types of drawings usually included in a set of plans and list the information found on each type	(ii) list the information found on each type [of drawing]
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(B) identify the different types of lines used on blueprint drawings	(i) identify the different types of lines used on blueprint drawings
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(C) identify selected electrical, mechanical, and plumbing symbols commonly used on plans	(i) identify selected electrical symbols commonly used on plans
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(C) identify selected electrical, mechanical, and plumbing symbols commonly used on plans	(ii) identify selected mechanical symbols commonly used on plans

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(C) identify selected electrical, mechanical, and plumbing symbols commonly used on plans	(iii) identify selected plumbing symbols commonly used on plans
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(D) identify selected architectural symbols commonly used to present materials on plans	(i) identify selected architectural symbols commonly used to present materials on plans
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(E) identify selected abbreviations commonly used on plans	(i) identify selected abbreviations commonly used on plans
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(i) read plans contained in basic construction drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(ii) read elevations contained in basic construction drawings
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(iii) read schedules contained in basic construction drawings
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(iv) read sections contained in basic construction drawings
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(v) read details contained in basic construction drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(vi) interpret plans contained in basic construction drawings
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(vii) interpret elevations contained in basic construction drawings
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(viii) interpret schedules contained in basic construction drawings
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(ix) interpret sections contained in basic construction drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(x) interpret details contained in basic construction drawings
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(G) describe the purpose of written specifications	(i) describe the purpose of written specifications
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(H) identify and describe the parts of a specification	(i) identify the parts of a specification
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(H) identify and describe the parts of a specification	(ii) describe the parts of a specification

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student interprets various types of working drawings as they pertain to commercial construction and becomes familiar with all aspects of commercial construction documents, including architectural, engineering, and shop drawings. The student is expected to:	(I) demonstrate how to perform a quantity takeoff for materials	(i) demonstrate how to perform a quantity takeoff for materials
(4) The student demonstrates how to use hand tools that are commonly used in the worksite such as hammers, saws, levels, pullers, and clamps. The student is expected to	(A) explain and demonstrate the specific applications and uses of hand tools	(i) explain the specific applications of hand tools
(4) The student demonstrates how to use hand tools that are commonly used in the worksite such as hammers, saws, levels, pullers, and clamps. The student is expected to	(A) explain and demonstrate the specific applications and uses of hand tools	(ii) explain the specific uses of hand tools
(4) The student demonstrates how to use hand tools that are commonly used in the worksite such as hammers, saws, levels, pullers, and clamps. The student is expected to	(A) explain and demonstrate the specific applications and uses of hand tools	(iii) demonstrate the specific applications of hand tools
(4) The student demonstrates how to use hand tools that are commonly used in the worksite such as hammers, saws, levels, pullers, and clamps. The student is expected to	(A) explain and demonstrate the specific applications and uses of hand tools	(iv) demonstrate the specific uses of hand tools
(4) The student demonstrates how to use hand tools that are commonly used in the worksite such as hammers, saws, levels, pullers, and clamps. The student is expected to	(B) identify the important safety and maintenance requirements for hand tools	(i) identify the important safety requirements for hand tools

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student demonstrates how to use hand tools that are commonly used in the worksite such as hammers, saws, levels, pullers, and clamps. The student is expected to	(B) identify the important safety and maintenance requirements for hand tools	(ii) identify the important maintenance requirements for hand tools
(5) The student demonstrates how to use power tools that are commonly used in the worksite such as drills, grinders, saws, and sanders. The student is expect to:	(A) explain and demonstrate appropriately the specific applications and uses of power tools	(i) explain the specific applications of power tools
(5) The student demonstrates how to use power tools that are commonly used in the worksite such as drills, grinders, saws, and sanders. The student is expect to:	(A) explain and demonstrate appropriately the specific applications and uses of power tools	(ii) explain the specific uses of power tools
(5) The student demonstrates how to use power tools that are commonly used in the worksite such as drills, grinders, saws, and sanders. The student is expect to:	(A) explain and demonstrate appropriately the specific applications and uses of power tools	(iii) demonstrate appropriately the specific applications of power tools
(5) The student demonstrates how to use power tools that are commonly used in the worksite such as drills, grinders, saws, and sanders. The student is expect to:	(A) explain and demonstrate appropriately the specific applications and uses of power tools	(iv) demonstrate appropriately the specific uses of power tools
(5) The student demonstrates how to use power tools that are commonly used in the worksite such as drills, grinders, saws, and sanders. The student is expect to:	(B) identify the important safety and maintenance requirements for power tools	(i) identify the important safety requirements for power tools
(5) The student demonstrates how to use power tools that are commonly used in the worksite such as drills, grinders, saws, and sanders. The student is expect to:	(B) identify the important safety and maintenance requirements for power tools	(ii) identify the important maintenance requirements for power tools

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student demonstrates how to use the latest technologies such as computer numeric control (CNC) machinery and plasma machinery. The student is expected to:	(A) identify the important safety issues of the latest technologies	(i) identify the important safety issues of the latest technologies
(6) The student demonstrates how to use the latest technologies such as computer numeric control (CNC) machinery and plasma machinery. The student is expected to:	(B) identify the important maintenance issues of the latest technologies	(i) identify the important maintenance issues of the latest technologies
(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:	(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials	(i) demonstrate how to properly remove various types of insulation, including batt
(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:	(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials	(ii) demonstrate how to properly remove various types of insulation, including rigid
(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:	(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials	(iii) demonstrate how to properly remove various types of insulation, including blown materials

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:	(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials	(iv) demonstrate how to properly replace various types of insulation, including batt
(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:	(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials	(v) demonstrate how to properly replace various types of insulation, including rigid
(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:	(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials	(vi) demonstrate how to properly replace various types of insulation, including blown materials
(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:	(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials	(vii) demonstrate how to properly install various types of insulation, including batt
(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:	(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials	(viii) demonstrate how to properly install various types of insulation, including rigid

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:</p>	<p>(A) demonstrate how to properly remove, replace, and install various types of insulation, including batt, rigid, and blown materials</p>	<p>(ix) demonstrate how to properly install various types of insulation, including blown materials</p>
<p>(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:</p>	<p>(B) demonstrate how to use and install various vapor barriers and waterproofing materials</p>	<p>(i) demonstrate how to use various vapor barriers</p>
<p>(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:</p>	<p>(B) demonstrate how to use and install various vapor barriers and waterproofing materials</p>	<p>(ii) demonstrate how to use various waterproofing materials</p>
<p>(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:</p>	<p>(B) demonstrate how to use and install various vapor barriers and waterproofing materials</p>	<p>(iii) demonstrate how to install various vapor barriers</p>
<p>(7) The student selects and installs various types of insulation in walls, floors, and attics and becomes familiar with the uses and installation practices for vapor barriers and waterproofing materials. The student is expected to:</p>	<p>(B) demonstrate how to use and install various vapor barriers and waterproofing materials</p>	<p>(iv) demonstrate how to install various waterproofing materials</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(A) demonstrate the proper methods to install exterior finish materials, including wood, metal, vinyl, and cement board siding	(i) demonstrate the proper methods to install exterior finish materials, including wood siding
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(A) demonstrate the proper methods to install exterior finish materials, including wood, metal, vinyl, and cement board siding	(ii) demonstrate the proper methods to install exterior finish materials, including metal siding
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(A) demonstrate the proper methods to install exterior finish materials, including wood, metal, vinyl, and cement board siding	(iii) demonstrate the proper methods to install exterior finish materials, including vinyl siding
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(A) demonstrate the proper methods to install exterior finish materials, including wood, metal, vinyl, and cement board siding	(iv) demonstrate the proper methods to install exterior finish materials, including cement board siding
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(B) identify various fasteners used to install siding, including nails, screws, and adhesives	(i) identify various fasteners used to install siding, including nails
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(B) identify various fasteners used to install siding, including nails, screws, and adhesives	(ii) identify various fasteners used to install siding, including screws
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(B) identify various fasteners used to install siding, including nails, screws, and adhesives	(iii) identify various fasteners used to install siding, including adhesives

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(C) describe the types and applications of stucco and masonry veneer finishes	(i) describe the types of stucco veneer finishes
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(C) describe the types and applications of stucco and masonry veneer finishes	(ii) describe the types of masonry veneer finishes
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(C) describe the types and applications of stucco and masonry veneer finishes	(iii) describe the applications of stucco veneer finishes
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(C) describe the types and applications of stucco and masonry veneer finishes	(iv) describe the applications of masonry veneer finishes
(8) The student installs various exterior siding materials, including wood, metal, vinyl, and cement board siding. The student is expected to:	(D) install three types of siding commonly used in the local area	(i) install three types of siding commonly used in the local area
(9) The student gains knowledge of the types and grades of framing materials and the process for installation of metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(A) identify and use a system to install a frame wall or partition	(i) identify a system to install a frame wall or partition

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student gains knowledge of the types and grades of framing materials and the process for installation of metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(A) identify and use a system to install a frame wall or partition	(ii) use a system to install a frame wall or partition
(9) The student gains knowledge of the types and grades of framing materials and the process for installation of metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(B) identify the fastening methods used for frame systems	(i) identify the fastening methods used for frame systems
(9) The student gains knowledge of the types and grades of framing materials and the process for installation of metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(C) identify methods used to secure steel frame systems to supporting structures	(i) identify methods used to secure steel frame systems to supporting structures
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(A) identify the different types of drywall and their uses	(i) identify the different types of drywall
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(A) identify the different types of drywall and their uses	(ii) identify the uses [of different types of drywall]

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(B) select the type and thickness of drywall required for specific installations	(i) select the type of drywall required for specific installations
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(B) select the type and thickness of drywall required for specific installations	(ii) select the thickness of drywall required for specific installations
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(C) explain the fastener schedules for different types of drywall installations	(i) explain the fastener schedules for different types of drywall installations
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(D) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(i) perform single-layer drywall installations using different types of fastening systems, including nails
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(D) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(ii) perform single-layer drywall installations using different types of fastening systems, including drywall screws
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(D) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(iii) perform single-layer drywall installations using different types of fastening systems, including adhesives

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(D) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(iv) perform multi-layer drywall installations using different types of fastening systems, including nails
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(D) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(v) perform multi-layer drywall installations using different types of fastening systems, including drywall screws
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(D) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(vi) perform multi-layer drywall installations using different types of fastening systems, including adhesives
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(E) install gypsum drywall on steel studs	(i) install gypsum drywall on steel studs
(10) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:	(F) estimate material quantities for a drywall installation	(i) estimate material quantities for a drywall installation
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(A) describe the differences between the six levels of finish established by industry standards and distinguish a finish level by observation	(i) describe the differences among the six levels of finish established by industry standards

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(A) describe the differences between the six levels of finish established by industry standards and distinguish a finish level by observation	(ii) distinguish a finish level by observation
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(B) identify the hand tools used in drywall finishing and demonstrate the ability to use these tools	(i) identify the hand tools used in drywall finishing
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(B) identify the hand tools used in drywall finishing and demonstrate the ability to use these tools	(ii) demonstrate the ability to use these [hand] tools
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(C) identify the automatic tools used in drywall finishing	(i) identify the automatic tools used in drywall finishing
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(i) identify the materials used in drywall finishing
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(ii) describe the purpose of each type of material, including compounds
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(iii) describe the purpose of each type of material, including joint reinforcing tapes

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(iv) describe the purpose of each type of material, including trim materials
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(v) describe the purpose of each type of material, including textures and coatings
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(vi) describe the use of each type of material, including compounds
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(vii) describe the use of each type of material, including joint reinforcing tapes
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(viii) describe the use of each type of material, including trim materials
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and describe the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, and textures and coatings	(ix) describe the use of each type of material, including textures and coatings

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(E) finish drywall using hand tools	(i) finish drywall using hand tools
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(F) recognize various types of problems that occur in drywall finishes	(i) recognize various types of problems that occur in drywall finishes
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(G) identify the causes and correct method for solving each type of problem that occurs in drywall finishes	(i) identify the causes for each type of problem that occurs in drywall finishes
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(G) identify the causes and correct method for solving each type of problem that occurs in drywall finishes	(ii) identify the correct method for solving each type of problem that occurs in drywall finishes
(11) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(H) patch damaged drywall	(i) patch damaged drywall
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(A) identify various types of door jambs and frames and demonstrate the installation procedures for placing selected door jambs and frames in different types of interior partitions	(i) identify various types of door jambs
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(A) identify various types of door jambs and frames and demonstrate the installation procedures for placing selected door jambs and frames in different types of interior partitions	(ii) identify various types of door frames

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(A) identify various types of door jambs and frames and demonstrate the installation procedures for placing selected door jambs and frames in different types of interior partitions	(iii) demonstrate the installation procedures for placing selected door jambs in different types of interior partitions
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(A) identify various types of door jambs and frames and demonstrate the installation procedures for placing selected door jambs and frames in different types of interior partitions	(iv) demonstrate the installation procedures for placing selected door frames in different types of interior partitions
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(B) identify types of interior doors	(i) identify types of interior doors
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(C) identify different types of interior door hardware and demonstrate the installation procedures for selected types	(i) identify different types of interior door hardware
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(C) identify different types of interior door hardware and demonstrate the installation procedures for selected types	(ii) demonstrate the installation procedures for selected types [of interior door hardware]
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(D) list and identify specific items included on a typical door schedule	(i) list specific items included on a typical door schedule
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(D) list and identify specific items included on a typical door schedule	(i) identify specific items included on a typical door schedule

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(E) demonstrate the procedures for placing and hanging a selected door	(i) demonstrate the procedures for placing a selected door
(12) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(E) demonstrate the procedures for placing and hanging a selected door	(ii) demonstrate the procedures for hanging a selected door
(13) The student gains knowledge of the materials, layouts, and installations of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(A) establish a level line	(i) establish a level line
(13) The student gains knowledge of the materials, layouts, and installations of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(B) explain the common terms related to sound waves and acoustical ceiling materials	(i) explain the common terms related to sound waves
(13) The student gains knowledge of the materials, layouts, and installations of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(B) explain the common terms related to sound waves and acoustical ceiling materials	(ii) explain the common terms related to acoustical ceiling materials
(13) The student gains knowledge of the materials, layouts, and installations of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(C) identify the different types of suspended ceilings	(i) identify the different types of suspended ceilings

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(13) The student gains knowledge of the materials, layouts, and installations of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:</p>	<p>(D) interpret plans related to ceiling layout for a suspended ceiling</p>	<p>(i) interpret plans related to ceiling layout for a suspended ceiling</p>
<p>(13) The student gains knowledge of the materials, layouts, and installations of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:</p>	<p>(E) sketch the ceiling layout for a suspended ceiling</p>	<p>(i) sketch the ceiling layout for a suspended ceiling</p>
<p>(13) The student gains knowledge of the materials, layouts, and installations of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:</p>	<p>(F) install selected suspended ceilings</p>	<p>(i) install selected suspended ceilings</p>
<p>(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:</p>	<p>(A) identify the different types of standard moldings and describe their uses</p>	<p>(i) identify the different types of standard moldings</p>
<p>(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:</p>	<p>(A) identify the different types of standard moldings and describe their uses</p>	<p>(ii) describe [the] uses [of different types of standard moldings]</p>
<p>(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:</p>	<p>(B) make square and miter cuts using a miter box or power miter saw</p>	<p>(i) make square cuts using a miter box or power miter saw</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(B) make square and miter cuts using a miter box or power miter saw	(ii) make miter cuts using a miter box or power miter saw
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(C) make coped joint cuts using a coping saw	(i) make coped joint cuts using a coping saw
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(i) select fasteners to install trim, including door trim
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(ii) select fasteners to install trim, including window trim
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(iii) select fasteners to install trim, including base trim
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(iv) select fasteners to install trim, including ceiling trim
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(v) use fasteners to install trim, including door trim

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(vi) use fasteners to install trim, including window trim
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(vii) use fasteners to install trim, including base trim
(14) The student knows the various types of trim used in finish work and the proper methods for selecting, cutting, and fastening trim. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(viii) use fasteners to install trim, including ceiling trim
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(A) describe the classes and sizes of typical base and wall cabinets	(i) describe the classes of typical base cabinets
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(A) describe the classes and sizes of typical base and wall cabinets	(ii) describe the classes of typical wall cabinets
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(A) describe the classes and sizes of typical base and wall cabinets	(iii) describe the sizes of typical base cabinets
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(A) describe the classes and sizes of typical base and wall cabinets	(iv) describe the sizes of typical wall cabinets
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(B) identify cabinet components and hardware and describe their purposes	(i) identify cabinet components

Knowledge and Skill Statement	Student Expectation	Breakout
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(B) identify cabinet components and hardware and describe their purposes	(ii) identify cabinet hardware
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(B) identify cabinet components and hardware and describe their purposes	(iii) describe [the] purposes [of cabinet components]
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(B) identify cabinet components and hardware and describe their purposes	(iv) describe [the] purposes [of cabinet hardware]
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(C) lay out factory-made cabinets, countertops, and backsplashes	(i) lay out factory-made cabinets
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(C) lay out factory-made cabinets, countertops, and backsplashes	(ii) lay out factory-made countertops
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(C) lay out factory-made cabinets, countertops, and backsplashes	(iii) lay out factory-made backsplashes
(15) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(D) install plastic laminate on a countertop core	(i) install plastic laminate on a countertop core
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(A) describe the methods used to install ceramic tile, carpet, and vinyl tile	(i) describe the methods used to install ceramic tile
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(A) describe the methods used to install ceramic tile, carpet, and vinyl tile	(ii) describe the methods used to install carpet

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(A) describe the methods used to install ceramic tile, carpet, and vinyl tile	(iii) describe the methods used to install vinyl tile
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(B) make repairs to ceramic tile, carpet, and vinyl tile	(i) make repairs to ceramic tile
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(B) make repairs to ceramic tile, carpet, and vinyl tile	(ii) make repairs to carpet
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(B) make repairs to ceramic tile, carpet, and vinyl tile	(iii) make repairs to vinyl tile
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(i) use the tools used for the installation of floor systems, including wet saw
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(ii) use the tools used for the installation of floor systems, including trowels
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(iii) use the tools used for the installation of floor systems, including carpet knives

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(iv) use the tools used for the repair of floor systems, including wet saw
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(v) use the tools used for the repair of floor systems, including trowels
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(vi) use the tools used for the repair of floor systems, including carpet knives
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(vii) maintain the tools used for the installation of floor systems, including wet saw
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(viii) maintain the tools used for the installation of floor systems, including trowels
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(ix) maintain the tools used for the installation of floor systems, including carpet knives
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(x) maintain the tools used for the repair of floor systems, including wet saw

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(xi) maintain the tools used for the repair of floor systems, including trowels
(16) The student selects and installs various types of floor coverings, including carpet, vinyl tile, ceramic tile, and wood flooring systems. The student is expected to:	(C) use and maintain the tools used for the installation and repair of floor systems, including wet saw, trowels, and carpet knives	(xii) maintain the tools used for the repair of floor systems, including carpet knives

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.45. Building Maintenance Technology II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Building Maintenance Technology I. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Building Maintenance Technology II, students will continue to gain advanced knowledge and skills needed to enter the workforce as a building maintenance technician or supervisor and construction project manager or secure a foundation for a postsecondary degree in construction management, architecture, or engineering. Students will acquire knowledge and skills in safety, Occupational Safety and Health Administration (OSHA) standards, and safety devices in electrical circuits; maintenance of electrical and heating, ventilation, and air conditioning (HVAC) systems; and concepts of historic preservation.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining and justifying actions convincingly and effectively conveying written information and messages in a socially acceptable manner that is easily understandable	(i) express ideas to others in a clear, concise, and effective manner, including explaining actions convincingly
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining and justifying actions convincingly and effectively conveying written information and messages in a socially acceptable manner that is easily understandable	(ii) express ideas to others in a clear, concise, and effective manner, including justifying actions convincingly
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining and justifying actions convincingly and effectively conveying written information and messages in a socially acceptable manner that is easily understandable	(iii) express ideas to others in a clear, concise, and effective manner, including effectively conveying written information in a socially acceptable manner that is easily understandable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining and justifying actions convincingly and effectively conveying written information and messages in a socially acceptable manner that is easily understandable	(iv) express ideas to others in a clear, concise, and effective manner, including effectively conveying written messages in a socially acceptable manner that is easily understandable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining and justifying actions convincingly and effectively conveying written information and messages in a socially acceptable manner that is easily understandable	(v) express messages to others in a clear, concise, and effective manner, including explaining actions convincingly

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining and justifying actions convincingly and effectively conveying written information and messages in a socially acceptable manner that is easily understandable	(vi) express messages to others in a clear, concise, and effective manner, including justifying actions convincingly
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining and justifying actions convincingly and effectively conveying written information and messages in a socially acceptable manner that is easily understandable	(vii) express messages to others in a clear, concise, and effective manner, including effectively conveying written information in a socially acceptable manner that is easily understandable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) express ideas and messages to others in a clear, concise, and effective manner, including explaining and justifying actions convincingly and effectively conveying written information and messages in a socially acceptable manner that is easily understandable	(viii) express messages to others in a clear, concise, and effective manner, including effectively conveying written messages in a socially acceptable manner that is easily understandable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) compile data using numbers in various formats to solve job-appropriate problems	(i) compile data using numbers in various formats to solve job-appropriate problems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate an ability to be trustworthy and honest, to choose the ethical course of action, and to comply with all applicable rules, laws, and regulations	(i) demonstrate an ability to be trustworthy and honest
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate an ability to be trustworthy and honest, to choose the ethical course of action, and to comply with all applicable rules, laws, and regulations	(ii) demonstrate an ability to choose the ethical course of action

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate an ability to be trustworthy and honest, to choose the ethical course of action, and to comply with all applicable rules, laws, and regulations	(iii) demonstrate an ability to comply with all applicable rules, laws, and regulations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(i) demonstrate consistency in reporting for duty
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(ii) demonstrate consistency in performing assigned tasks as directed
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(iii) demonstrate punctuality in reporting for duty
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(iv) demonstrate punctuality in performing assigned tasks as directed
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(v) demonstrate dependability in reporting for duty
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(vi) demonstrate dependability in performing assigned tasks as directed

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(vii) demonstrate reliability in reporting for duty
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(viii) demonstrate reliability in performing assigned tasks as directed
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(ix) demonstrate responsibility in reporting for duty
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate consistency, punctuality, dependability, reliability, and responsibility in reporting for duty and performing assigned tasks as directed	(x) demonstrate responsibility in performing assigned tasks as directed
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations	(i) evaluate systems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations	(ii) evaluate operations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations	(iii) identify causes, problems, patterns, or issues

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) evaluate systems and operations; identify causes, problems, patterns, or issues; and explore workable solutions or remedies to improve situations	(iv) explore workable solutions or remedies to improve situations
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(A) demonstrate safe working procedures during building maintenance and repair	(i) demonstrate safe working procedures during building maintenance
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(A) demonstrate safe working procedures during building maintenance and repair	(ii) demonstrate safe working procedures during building repair
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(B) explain the purpose of the OSHA and how to promote on-site safety	(i) explain the purpose of the OSHA
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(B) explain the purpose of the OSHA and how to promote on-site safety	(ii) explain how to promote on-site safety
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(C) identify electrical hazards and how to avoid or minimize them	(i) identify electrical hazards
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(C) identify electrical hazards and how to avoid or minimize them	(ii) identify how to avoid or minimize [electrical hazards]

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(D) explain obligations of workers, supervisors, and managers to ensure a safe work environment	(i) explain obligations of workers to ensure a safe work environment
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(D) explain obligations of workers, supervisors, and managers to ensure a safe work environment	(ii) explain obligations of supervisors to ensure a safe work environment
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(D) explain obligations of workers, supervisors, and managers to ensure a safe work environment	(iii) explain obligations of managers to ensure a safe work environment
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(E) discuss the causes, effects, and costs of accidents	(i) discuss the causes of accidents
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(E) discuss the causes, effects, and costs of accidents	(ii) discuss the effects of accidents
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(E) discuss the causes, effects, and costs of accidents	(iii) discuss the costs of accidents
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(F) define safe work procedures regarding personal protective equipment, hazardous chemicals, and potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(i) define safe work procedures regarding personal protective equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(F) define safe work procedures regarding personal protective equipment, hazardous chemicals, and potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(ii) define safe work procedures regarding hazardous chemicals
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(F) define safe work procedures regarding personal protective equipment, hazardous chemicals, and potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(iii) define safe work procedures regarding potential construction hazards, including hazardous material exposures
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(F) define safe work procedures regarding personal protective equipment, hazardous chemicals, and potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(iv) define safe work procedures regarding potential construction hazards, including welding
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(F) define safe work procedures regarding personal protective equipment, hazardous chemicals, and potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(v) define safe work procedures regarding potential construction hazards, including cutting hazards
(2) The student demonstrates knowledge of basic worksite safety regulations and safety guidelines. The student is expected to:	(F) define safe work procedures regarding personal protective equipment, hazardous chemicals, and potential construction hazards, including hazardous material exposures, welding, cutting hazards, and confined spaces	(vi) define safe work procedures regarding potential construction hazards, including confined spaces

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student knows how to interpret blueprint drawings, various symbols, schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(A) explain the basic layout of a blueprint drawing	(i) explain the basic layout of a blueprint drawing
(3) The student knows how to interpret blueprint drawings, various symbols, schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(B) identify the common symbols used on commercial construction drawings	(i) identify the common symbols used on commercial construction drawings
(3) The student knows how to interpret blueprint drawings, various symbols, schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(C) read equipment schedules found on blueprint drawings	(i) read equipment schedules found on blueprint drawings
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(A) explain the necessity of overcurrent protection devices in electrical circuits	(i) explain the necessity of overcurrent protection devices in electrical circuits
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(B) define the terms associated with fuses and circuit breakers	(i) define the terms associated with fuses
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(B) define the terms associated with fuses and circuit breakers	(ii) define the terms associated circuit breakers
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(C) describe the operation of a circuit breaker	(i) describe the operation of a circuit breaker
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(D) describe the operation of single-element and time-delay fuses	(i) describe the operation of single-element fuses

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(D) describe the operation of single-element and time-delay fuses	(ii) describe the operation of time-delay fuses
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(E) explain how ground fault circuit interrupters can save lives	(i) explain how ground fault circuit interrupters can save lives
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(F) describe troubleshooting and maintenance techniques for overcurrent devices	(i) describe troubleshooting techniques for overcurrent devices
(4) The student knows how to handle fuses and circuit breakers. The student is expected to:	(F) describe troubleshooting and maintenance techniques for overcurrent devices	(ii) describe maintenance techniques for overcurrent devices
(5) The student installs various types of lamps and fixtures. The student is expected to:	(A) recognize the different types of lamps and explain the advantages and disadvantages of different types such as incandescent, halogen, fluorescent, and high-intensity discharge	(i) recognize the different types of lamps
(5) The student installs various types of lamps and fixtures. The student is expected to:	(A) recognize the different types of lamps and explain the advantages and disadvantages of different types such as incandescent, halogen, fluorescent, and high-intensity discharge	(ii) explain the advantages of different types [of lamps]
(5) The student installs various types of lamps and fixtures. The student is expected to:	(A) recognize the different types of lamps and explain the advantages and disadvantages of different types such as incandescent, halogen, fluorescent, and high-intensity discharge	(ii) explain the disadvantages of different types [of lamps]
(5) The student installs various types of lamps and fixtures. The student is expected to:	(B) select and install lamps into lighting fixtures	(i) select lamps

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student installs various types of lamps and fixtures. The student is expected to:	(B) select and install lamps into lighting fixtures	(ii) install lamps into lighting fixtures
(5) The student installs various types of lamps and fixtures. The student is expected to:	(C) install various lighting fixtures such as surface mounted, recessed, suspended, and track-mounted	(i) install various lighting fixtures
(6) The student knows various methods to properly select, inspect, use, and maintain common electrical test equipment. The student is expected to:	(A) explain the operation of and describe various test equipment such as ammeter, voltmeter, volt-ohm-multimeter, and continuity tester	(i) explain the operation of various test equipment
(6) The student knows various methods to properly select, inspect, use, and maintain common electrical test equipment. The student is expected to:	(A) explain the operation of and describe various test equipment such as ammeter, voltmeter, volt-ohm-multimeter, and continuity tester	(ii) describe various test equipment
(6) The student knows various methods to properly select, inspect, use, and maintain common electrical test equipment. The student is expected to:	(B) explain how to read and convert from one scale to another using test equipment	(i) explain how to read from one scale to another using test equipment
(6) The student knows various methods to properly select, inspect, use, and maintain common electrical test equipment. The student is expected to:	(B) explain how to read and convert from one scale to another using test equipment	(ii) explain how to convert from one scale to another using test equipment
(6) The student knows various methods to properly select, inspect, use, and maintain common electrical test equipment. The student is expected to:	(C) explain the importance of proper meter polarity	(i) explain the importance of proper meter polarity
(6) The student knows various methods to properly select, inspect, use, and maintain common electrical test equipment. The student is expected to:	(D) define frequency and explain the use of a frequency meter	(i) define frequency

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student knows various methods to properly select, inspect, use, and maintain common electrical test equipment. The student is expected to:	(D) define frequency and explain the use of a frequency meter	(ii) explain the use of a frequency meter
(6) The student knows various methods to properly select, inspect, use, and maintain common electrical test equipment. The student is expected to:	(E) explain the differences between digital and analog meters	(i) explain the differences between digital and analog meters
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(A) describe how to determine electrical service requirements for residential and industrial facilities	(i) describe how to determine electrical service requirements for residential facilities
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(A) describe how to determine electrical service requirements for residential and industrial facilities	(ii) describe how to determine electrical service requirements for industrial facilities
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(B) select the proper wiring methods for various residential and industrial facilities	(i) select the proper wiring methods for various residential facilities
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(B) select the proper wiring methods for various residential and industrial facilities	(ii) select the proper wiring methods for various industrial facilities

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(C) explain the role of the National Electrical Code	(i) explain the role of the National Electrical Code
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(D) compute branch circuit loads and explain their installation requirements	(i) compute branch circuit loads
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(D) compute branch circuit loads and explain their installation requirements	(ii) explain [branch circuit loads'] installation requirements
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(E) explain the types of equipment grounding conductors such as ground fault circuit interrupter (GFCI), light fixtures, receptors, and switches and their purposes	(i) explain the types of equipment grounding conductors
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(F) distinguish between the sizes of outlet boxes and their various wiring methods	(i) distinguish between the sizes of outlet boxes and their various wiring methods
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(F) distinguish between the sizes of outlet boxes and their various wiring methods	(ii) distinguish between [the outlet boxes'] various wiring methods

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(G) describe the rules for installing electric space heating and HVAC systems equipment	(i) describe the rules for installing electric space heating equipment
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(G) describe the rules for installing electric space heating and HVAC systems equipment	(ii) describe the rules for installing HVAC systems equipment
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(H) describe the installation rules for electrical systems around swimming pools, spas, and hot tubs	(i) describe the installation rules for electrical systems around swimming pools
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(H) describe the installation rules for electrical systems around swimming pools, spas, and hot tubs	(ii) describe the installation rules for electrical systems around spas
(7) The student installs and maintains electrical devices and demonstrates wiring techniques common to residential and industrial facilities. The student is expected to:	(H) describe the installation rules for electrical systems around swimming pools, spas, and hot tubs	(iii) describe the installation rules for electrical systems around hot tubs
(8) The student is introduced to the basic principles of HVAC systems. The student is expected to:	(A) explain the principles of HVAC systems	(i) explain the principles of HVAC systems
(8) The student is introduced to the basic principles of HVAC systems. The student is expected to:	(B) describe what the Clean Air Act means to the HVAC systems industry	(i) describe what the Clean Air Act means to the HVAC systems industry

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student is introduced to the basic principles of HVAC systems. The student is expected to:	(C) identify the types of schedules and drawings used in the HVAC systems and refrigeration industries	(i) identify the types of schedules used in the HVAC systems [industry]
(8) The student is introduced to the basic principles of HVAC systems. The student is expected to:	(C) identify the types of schedules and drawings used in the HVAC systems and refrigeration industries	(ii) identify the types of schedules used in the refrigeration [industry]
(8) The student is introduced to the basic principles of HVAC systems. The student is expected to:	(C) identify the types of schedules and drawings used in the HVAC systems and refrigeration industries	(iii) identify the types of drawings used in the HVAC systems [industry]
(8) The student is introduced to the basic principles of HVAC systems. The student is expected to:	(C) identify the types of schedules and drawings used in the HVAC systems and refrigeration industries	(iv) identify the types of drawings used in the refrigeration [industry]
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(A) describe the precautions that must be taken when installing refrigerant piping	(i) describe the precautions that must be taken when installing refrigerant piping
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(B) select the right tubing for a project	(i) select the right tubing for a project
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(C) cut and bend copper tubing	(i) cut copper tubing
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(C) cut and bend copper tubing	(ii) bend copper tubing

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(D) determine the kinds of hangers and supports needed for refrigeration piping	(i) determine the kinds of hangers needed for refrigeration piping
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(D) determine the kinds of hangers and supports needed for refrigeration piping	(ii) determine the kinds of supports needed for refrigeration piping
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(E) describe the requirements for pressure-testing an installed system	(i) describe the requirements for pressure-testing an installed system
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(F) identify types of plastic pipe and describe their uses	(i) identify types of plastic pipe
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(F) identify types of plastic pipe and describe their uses	(ii) describe uses [of types of plastic pipe]
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(G) cut and join lengths of plastic pipe	(i) cut lengths of plastic pipe
(9) The student installs, selects, prepares, joins, and supports copper and plastic pipes and fittings. The student is expected to:	(G) cut and join lengths of plastic pipe	(ii) join lengths of plastic pipe

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student operates, tests, and adjusts conventional and electronic thermostats as well as the common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(A) describe how conventional and electronic thermostats operate	(i) describe how conventional thermostats operate
(10) The student operates, tests, and adjusts conventional and electronic thermostats as well as the common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(A) describe how conventional and electronic thermostats operate	(ii) describe how electronic thermostats operate
(10) The student operates, tests, and adjusts conventional and electronic thermostats as well as the common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(B) describe how pneumatic and electronic circuits are used to control mechanical systems	(i) describe how pneumatic circuits are used to control mechanical systems
(10) The student operates, tests, and adjusts conventional and electronic thermostats as well as the common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(B) describe how pneumatic and electronic circuits are used to control mechanical systems	(ii) describe how electronic circuits are used to control mechanical systems
(10) The student operates, tests, and adjusts conventional and electronic thermostats as well as the common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(C) analyze circuit diagrams for electronic and microprocessor-based controls	(i) analyze circuit diagrams for electronic controls

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student operates, tests, and adjusts conventional and electronic thermostats as well as the common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(C) analyze circuit diagrams for electronic and microprocessor-based controls	(ii) analyze circuit diagrams for microprocessor-based controls
(10) The student operates, tests, and adjusts conventional and electronic thermostats as well as the common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(D) troubleshoot systems using various controls	(i) troubleshoot systems using various controls
(11) The student knows the concepts of historic preservation and local and national resources to maintain and renovate historic structures and landscapes. The student is expected to:	(A) research the U.S. Department of Interior's methods and guides for historic preservation	(i) research the U.S. Department of Interior's methods for historic preservation
(11) The student knows the concepts of historic preservation and local and national resources to maintain and renovate historic structures and landscapes. The student is expected to:	(A) research the U.S. Department of Interior's methods and guides for historic preservation	(ii) research the U.S. Department of Interior's guides for historic preservation
(11) The student knows the concepts of historic preservation and local and national resources to maintain and renovate historic structures and landscapes. The student is expected to:	(B) describe the rules and regulations for historic preservation as prescribed by the Texas Historical Commission	(i) describe the rules and regulations for historic preservation as prescribed by the Texas Historical Commission
(11) The student knows the concepts of historic preservation and local and national resources to maintain and renovate historic structures and landscapes. The student is expected to:	(C) describe the historic preservation building codes for a local area	(i) describe the historic preservation building codes for a local area

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.46. Construction Management I (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Recommended prerequisites: Algebra I, Geometry, and Principles of Architecture or Principles of Construction. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Construction Management I, students will gain knowledge and skills needed to enter the workforce as apprentice carpenters or building maintenance supervisors' assistants or to build a foundation toward a postsecondary degree in architecture, construction science, drafting, or engineering. Construction Management I includes the knowledge of design techniques and tools related to the management of architectural and engineering projects.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship and career preparation requirements in the field of construction management	(i) identify employment opportunities, including entrepreneurship, in the field of construction management
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship and career preparation requirements in the field of construction management	(ii) identify career preparation requirements, in the field of construction management
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to career preparation	(i) demonstrate an understanding of group participation related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to career preparation	(ii) demonstrate an understanding of group leadership related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations, including appropriate work habits	(i) identify employers' expectations, including appropriate work habits
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resource technology in appropriate settings	(i) apply the competencies related to resource technology in appropriate settings
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(i) demonstrate knowledge of the concepts related to health in the workplace, as specified by appropriate governmental regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(ii) demonstrate knowledge of the concepts related to safety in the workplace, as specified by appropriate governmental regulations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(iii) demonstrate skills related to health in the workplace, as specified by appropriate governmental regulations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(iv) demonstrate skills related to safety in the workplace, as specified by appropriate governmental regulations
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(i) demonstrate effective verbal communication skills with individuals from varied cultures, including fellow workers
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(ii) demonstrate effective verbal communication skills with individuals from varied cultures, including managers
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iii) demonstrate effective verbal communication skills with individuals from varied cultures, including customers
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iv) demonstrate effective written communication skills with individuals from varied cultures, including fellow workers

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(v) demonstrate effective written communication skills with individuals from varied cultures, including managers
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(vi) demonstrate effective written communication skills with individuals from varied cultures, including customers
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(B) complete work orders and related paperwork	(i) complete work orders
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(B) complete work orders and related paperwork	(ii) complete related paperwork
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(C) estimate jobs, schedules, and industry standards related to legal restrictions	(i) estimate jobs
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(C) estimate jobs, schedules, and industry standards related to legal restrictions	(ii) estimate schedules
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(C) estimate jobs, schedules, and industry standards related to legal restrictions	(iii) estimate industry standards related to legal restrictions

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(i) read appropriate architectural symbols
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(ii) read appropriate architectural schematics
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(iii) read appropriate architectural blueprints
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(iv) read appropriate architectural work drawings
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(v) read appropriate architectural manuals
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(vi) read appropriate architectural bulletins
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(vii) interpret appropriate architectural symbols

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(viii) interpret appropriate architectural schematics
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(ix) interpret appropriate architectural blueprints
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(x) interpret appropriate architectural work drawings
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(xi) interpret appropriate architectural manuals
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(D) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(xii) interpret appropriate architectural bulletins
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(E) apply descriptive geometry related to auxiliary views, revolutions, intersections, and piping drawings	(i) apply descriptive geometry related to auxiliary views
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(E) apply descriptive geometry related to auxiliary views, revolutions, intersections, and piping drawings	(ii) apply descriptive geometry related to revolutions

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(E) apply descriptive geometry related to auxiliary views, revolutions, intersections, and piping drawings	(iii) apply descriptive geometry related to intersections
(2) The student applies academic skills to the requirements of construction management. The student is expected to:	(E) apply descriptive geometry related to auxiliary views, revolutions, intersections, and piping drawings	(iv) apply descriptive geometry related to piping drawings
(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:	(A) identify various types of construction materials and methods	(i) identify various types of construction materials
(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:	(A) identify various types of construction materials and methods	(ii) identify various types of construction methods
(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:	(B) describe the uses of various types of hardwoods and softwoods	(i) describe the uses of various types of hardwoods

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:</p>	<p>(B) describe the uses of various types of hardwoods and softwoods</p>	<p>(ii) describe the uses of various types of softwoods</p>
<p>(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:</p>	<p>(C) identify the grades and markings of wood building materials</p>	<p>(i) identify the grades of wood building materials</p>
<p>(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:</p>	<p>(C) identify the grades and markings of wood building materials</p>	<p>(ii) identify the markings of wood building materials</p>
<p>(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:</p>	<p>(D) describe the proper method of storing and handling building materials</p>	<p>(i) describe the proper method of storing building materials</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:</p>	<p>(D) describe the proper method of storing and handling building materials</p>	<p>(ii) describe the proper method of handling building materials</p>
<p>(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:</p>	<p>(E) describe the uses of various types of engineered lumber</p>	<p>(i) describe the uses of various types of engineered lumber</p>
<p>(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:</p>	<p>(F) calculate quantities of lumber and wood products using industry-standard methods</p>	<p>(i) calculate quantities of lumber using industry-standard methods</p>
<p>(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:</p>	<p>(F) calculate quantities of lumber and wood products using industry-standard methods</p>	<p>(ii) calculate quantities of wood products using industry-standard methods</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work	(i) describe the fasteners used in construction work
(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work	(ii) describe the anchors used in construction work
(3) The student gains knowledge about building materials used in the construction industry, including lumber, sheet materials, engineered wood products, structural concrete, structural steel, fasteners, and adhesives used in construction settings. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work	(iii) describe the adhesives used in construction work
(4) The student describes how a systems model can be used to describe construction activities, including mechanical, fluid, electrical, and thermal systems. The student is expected to:	(A) apply the universal systems model to construction activities	(i) apply the universal systems model to construction activities
(4) The student describes how a systems model can be used to describe construction activities, including mechanical, fluid, electrical, and thermal systems. The student is expected to:	(B) identify the inputs, processes, outputs, and feedback associated with construction systems	(i) identify the inputs associated with construction systems

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student describes how a systems model can be used to describe construction activities, including mechanical, fluid, electrical, and thermal systems. The student is expected to:	(B) identify the inputs, processes, outputs, and feedback associated with construction systems	(ii) identify the processes associated with construction systems
(4) The student describes how a systems model can be used to describe construction activities, including mechanical, fluid, electrical, and thermal systems. The student is expected to:	(B) identify the inputs, processes, outputs, and feedback associated with construction systems	(iii) identify the outputs associated with construction systems
(4) The student describes how a systems model can be used to describe construction activities, including mechanical, fluid, electrical, and thermal systems. The student is expected to:	(B) identify the inputs, processes, outputs, and feedback associated with construction systems	(iv) identify the feedback associated with construction systems
(4) The student describes how a systems model can be used to describe construction activities, including mechanical, fluid, electrical, and thermal systems. The student is expected to:	(C) describe the subsystems used in construction	(i) describe the subsystems used in construction
(4) The student describes how a systems model can be used to describe construction activities, including mechanical, fluid, electrical, and thermal systems. The student is expected to:	(D) describe how technological systems interact to achieve common goals	(i) describe how technological systems interact to achieve common goals
(5) The student selects and uses the proper construction technology to meet practical objectives. The student is expected to:	(A) distinguish between architectural and civil construction systems	(i) distinguish between architectural and civil construction systems

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student selects and uses the proper construction technology to meet practical objectives. The student is expected to:	(B) apply construction technology to individual or community problems	(i) apply construction technology to individual or community problems
(5) The student selects and uses the proper construction technology to meet practical objectives. The student is expected to:	(C) describe the factors that affect the purchase and use of constructed items	(i) describe the factors that affect the purchase of constructed items
(5) The student selects and uses the proper construction technology to meet practical objectives. The student is expected to:	(C) describe the factors that affect the purchase and use of constructed items	(ii) describe the factors that affect the use of constructed items
(5) The student selects and uses the proper construction technology to meet practical objectives. The student is expected to:	(D) identify and describe the roles of construction	(i) identify the roles of construction
(5) The student selects and uses the proper construction technology to meet practical objectives. The student is expected to:	(D) identify and describe the roles of construction	(ii) describe the roles of construction
(6) The student designs an item for construction using appropriate design processes and techniques. The student is expected to:	(A) describe the design processes and techniques used in construction	(i) describe the design processes used in construction
(6) The student designs an item for construction using appropriate design processes and techniques. The student is expected to:	(A) describe the design processes and techniques used in construction	(ii) describe the design techniques used in construction

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student designs an item for construction using appropriate design processes and techniques. The student is expected to:	(B) develop or improve a building or structure that meets specified needs	(i) develop or improve a building or structure that meets specified needs
(6) The student designs an item for construction using appropriate design processes and techniques. The student is expected to:	(C) identify areas where quality, reliability, and safety can be designed into a building or structure	(i) identify areas where quality can be designed into a building or structure
(6) The student designs an item for construction using appropriate design processes and techniques. The student is expected to:	(C) identify areas where quality, reliability, and safety can be designed into a building or structure	(ii) identify areas where reliability can be designed into a building or structure
(6) The student designs an item for construction using appropriate design processes and techniques. The student is expected to:	(C) identify areas where quality, reliability, and safety can be designed into a building or structure	(iii) identify areas where safety can be designed into a building or structure
(7) The student investigates emerging and innovative construction technologies. The student is expected to:	(A) report on emerging and innovative construction technologies	(i) report on emerging construction technologies
(7) The student investigates emerging and innovative construction technologies. The student is expected to:	(A) report on emerging and innovative construction technologies	(ii) report on innovative construction technologies
(7) The student investigates emerging and innovative construction technologies. The student is expected to:	(B) conduct research and experimentation in construction technology	(i) conduct research in construction technology
(7) The student investigates emerging and innovative construction technologies. The student is expected to:	(B) conduct research and experimentation in construction technology	(ii) conduct experimentation in construction technology

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student describes quality and how it is measured in construction. The student is expected to:	(A) describe different quality control applications in construction	(i) describe different quality control applications in construction
(8) The student describes quality and how it is measured in construction. The student is expected to:	(B) apply continuous quality improvement techniques to the construction of a building or structure	(i) apply continuous quality improvement techniques to the construction of a building or structure
(9) The student builds buildings or structures using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) describe the chemical, mechanical, and physical properties of construction materials	(i) describe the chemical properties of construction materials
(9) The student builds buildings or structures using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) describe the chemical, mechanical, and physical properties of construction materials	(ii) describe the mechanical properties of construction materials
(9) The student builds buildings or structures using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) describe the chemical, mechanical, and physical properties of construction materials	(iii) describe the physical properties of construction materials
(9) The student builds buildings or structures using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(B) describe the processes used in construction	(i) describe the processes used in construction
(9) The student builds buildings or structures using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(C) construct buildings or structures using a variety of tools, equipment, and machines	(i) construct buildings or structures using a variety of tools
(9) The student builds buildings or structures using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(C) construct buildings or structures using a variety of tools, equipment, and machines	(ii) construct buildings or structures using a variety of equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student builds buildings or structures using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(C) construct buildings or structures using a variety of tools, equipment, and machines	(iii) construct buildings or structures using a variety of machines
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(A) master relevant safety tests	(i) master relevant safety tests
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(i) follow safety manuals
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(ii) follow safety instructions
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(iii) follow safety requirements
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(C) identify and classify hazardous materials and wastes	(i) identify hazardous materials
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(C) identify and classify hazardous materials and wastes	(ii) identify hazardous wastes

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(C) identify and classify hazardous materials and wastes	(iii) classify hazardous materials
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(C) identify and classify hazardous materials and wastes	(iv) classify hazardous wastes
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(D) dispose of hazardous materials and wastes appropriately	(i) dispose of hazardous materials appropriately
(10) The student works safely with construction tools, equipment, machines, and materials. The student is expected to:	(D) dispose of hazardous materials and wastes appropriately	(ii) dispose of hazardous wastes appropriately
(11) The student describes the importance of maintenance in construction. The student is expected to:	(A) maintain tools and materials correctly	(i) maintain tools correctly
(11) The student describes the importance of maintenance in construction. The student is expected to:	(A) maintain tools and materials correctly	(ii) maintain materials correctly
(11) The student describes the importance of maintenance in construction. The student is expected to:	(B) perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(i) perform manufacturers' maintenance procedures on selected tools
(11) The student describes the importance of maintenance in construction. The student is expected to:	(B) perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(ii) perform manufacturers' maintenance procedures on selected equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student describes the importance of maintenance in construction. The student is expected to:	(B) perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(iii) perform manufacturers' maintenance procedures on selected machines
(11) The student describes the importance of maintenance in construction. The student is expected to:	(C) describe the results of negligent or improper maintenance	(i) describe the results of negligent or improper maintenance
(12) The student manages a construction project. The student is expected to:	(A) develop a plan for completing a construction project	(i) develop a plan for completing a construction project
(12) The student manages a construction project. The student is expected to:	(B) participate in the organization and operation of a real or simulated construction project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project	(i) participate in the organization of a real or simulated construction project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project
(12) The student manages a construction project. The student is expected to:	(B) participate in the organization and operation of a real or simulated construction project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project	(ii) participate in the operation of a real or simulated construction project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project
(13) The student applies the appropriate codes, laws, standards, or regulations related to construction technology. The student is expected to:	(A) explain the importance of codes, laws, standards, or regulations related to construction technology	(i) explain the importance of codes, laws, standards, or regulations related to construction technology
(13) The student applies the appropriate codes, laws, standards, or regulations related to construction technology. The student is expected to:	(B) identify areas where codes, laws, standards, or regulations related to construction technology may be required	(i) identify areas where codes, laws, standards, or regulations related to construction technology may be required

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student applies the appropriate codes, laws, standards, or regulations related to construction technology. The student is expected to:	(C) comply with appropriate codes, laws, standards, or regulations	(i) comply with appropriate codes, laws, standards, or regulations
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(A) apply an assessment strategy to determine the risks and benefits of technological developments in construction	(i) apply an assessment strategy to determine the risks of technological developments in construction
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(A) apply an assessment strategy to determine the risks and benefits of technological developments in construction	(ii) apply an assessment strategy to determine the benefits of technological developments in construction
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(B) describe how technology has affected individuals, societies, cultures, economies, and environments	(i) describe how technology has affected individuals
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(B) describe how technology has affected individuals, societies, cultures, economies, and environments	(ii) describe how technology has affected societies
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(B) describe how technology has affected individuals, societies, cultures, economies, and environments	(iii) describe how technology has affected cultures
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(B) describe how technology has affected individuals, societies, cultures, economies, and environments	(iv) describe how technology has affected economies

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(B) describe how technology has affected individuals, societies, cultures, economies, and environments	(v) describe how technology has affected environments
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(C) discuss the international effects of construction technology	(i) discuss the international effects of construction technology
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(D) describe the issues related to regional and community planning	(i) describe the issues related to regional planning
(14) The student describes the intended and unintended effects of technological solutions. The student is expected to:	(D) describe the issues related to regional and community planning	(ii) describe the issues related to community planning
(15) The student identifies the factors that influence the evolution of construction technology. The student is expected to:	(A) describe how changes in construction technology affect business and industry	(i) describe how changes in construction technology affect business
(15) The student identifies the factors that influence the evolution of construction technology. The student is expected to:	(A) describe how changes in construction technology affect business and industry	(ii) describe how changes in construction technology affect industry
(15) The student identifies the factors that influence the evolution of construction technology. The student is expected to:	(B) describe how the evolution of construction technology has been influenced by past events	(i) describe how the evolution of construction technology has been influenced by past events

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student solves problems, thinks critically, and makes decisions related to construction technology. The student is expected to:	(A) develop or improve a building or structure by following a problem-solving strategy	(i) develop or improve a building or structure by following a problem-solving strategy
(16) The student solves problems, thinks critically, and makes decisions related to construction technology. The student is expected to:	(B) apply critical-thinking strategies to analyze and evaluate proposed technological solutions	(i) apply critical-thinking strategies to analyze proposed technological solutions
(16) The student solves problems, thinks critically, and makes decisions related to construction technology. The student is expected to:	(B) apply critical-thinking strategies to analyze and evaluate proposed technological solutions	(ii) apply critical-thinking strategies to evaluate proposed technological solutions
(17) The student identifies the factors that influence the cost of goods and services in construction projects. The student is expected to:	(A) develop a budget for a construction project	(i) develop a budget for a construction project
(17) The student identifies the factors that influence the cost of goods and services in construction projects. The student is expected to:	(B) determine the most effective strategies to minimize costs	(i) determine the most effective strategies to minimize costs
(18) The student knows the concepts and skills that form the technical knowledge of building carpentry. The student is expected to:	(A) identify the uses of carpentry hardware and fasteners	(i) identify the uses of carpentry hardware
(18) The student knows the concepts and skills that form the technical knowledge of building carpentry. The student is expected to:	(A) identify the uses of carpentry hardware and fasteners	(ii) identify the uses of carpentry fasteners

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student knows the concepts and skills that form the technical knowledge of building carpentry. The student is expected to:	(B) demonstrate knowledge of fire ratings of construction materials	(i) demonstrate knowledge of fire ratings of construction materials
(19) The student knows the function and application of the tools, equipment, technologies, and materials used in construction carpentry. The student is expected to:	(A) use hand tools, power tools, and equipment commonly employed in carpentry in a safe manner	(i) use hand tools commonly employed in carpentry in a safe manner
(19) The student knows the function and application of the tools, equipment, technologies, and materials used in construction carpentry. The student is expected to:	(A) use hand tools, power tools, and equipment commonly employed in carpentry in a safe manner	(ii) use power tools commonly employed in carpentry in a safe manner
(19) The student knows the function and application of the tools, equipment, technologies, and materials used in construction carpentry. The student is expected to:	(A) use hand tools, power tools, and equipment commonly employed in carpentry in a safe manner	(iii) use equipment commonly employed in carpentry in a safe manner
(19) The student knows the function and application of the tools, equipment, technologies, and materials used in construction carpentry. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in carpentry in the proper manner	(i) handle environmentally hazardous materials used in carpentry in the proper manner
(19) The student knows the function and application of the tools, equipment, technologies, and materials used in construction carpentry. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in carpentry in the proper manner	(ii) dispose of environmentally hazardous materials used in carpentry in the proper manner
(19) The student knows the function and application of the tools, equipment, technologies, and materials used in construction carpentry. The student is expected to:	(C) use the different types of scaffolding employed in building carpentry in a safe manner	(i) use the different types of scaffolding employed in building carpentry in a safe manner

Knowledge and Skill Statement	Student Expectation	Breakout
(19) The student knows the function and application of the tools, equipment, technologies, and materials used in construction carpentry. The student is expected to:	(D) demonstrate knowledge of new and emerging technologies that may affect construction carpentry	(i) demonstrate knowledge of new technologies that may affect construction carpentry
(19) The student knows the function and application of the tools, equipment, technologies, and materials used in construction carpentry. The student is expected to:	(D) demonstrate knowledge of new and emerging technologies that may affect construction carpentry	(i) demonstrate knowledge of emerging technologies that may affect construction carpentry
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(A) square, measure, and cut materials to specified dimensions	(i) square materials to specified dimensions
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(A) square, measure, and cut materials to specified dimensions	(ii) measure materials to specified dimensions
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(A) square, measure, and cut materials to specified dimensions	(iii) cut materials to specified dimensions
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(B) handle different types of loads	(i) handle different types of loads
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(C) use framing techniques for walls, floors, ceilings, rafters, structural timbers, stairs, trusses, and fireproof metal-studs	(i) use framing techniques for walls

Knowledge and Skill Statement	Student Expectation	Breakout
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(C) use framing techniques for walls, floors, ceilings, rafters, structural timbers, stairs, trusses, and fireproof metal-studs	(ii) use framing techniques for floors
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(C) use framing techniques for walls, floors, ceilings, rafters, structural timbers, stairs, trusses, and fireproof metal-studs	(iii) use framing techniques for ceilings
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(C) use framing techniques for walls, floors, ceilings, rafters, structural timbers, stairs, trusses, and fireproof metal-studs	(iv) use framing techniques for rafters
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(C) use framing techniques for walls, floors, ceilings, rafters, structural timbers, stairs, trusses, and fireproof metal-studs	(v) use framing techniques for structural timbers
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(C) use framing techniques for walls, floors, ceilings, rafters, structural timbers, stairs, trusses, and fireproof metal-studs	(vi) use framing techniques for stairs
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(C) use framing techniques for walls, floors, ceilings, rafters, structural timbers, stairs, trusses, and fireproof metal-studs	(vii) use framing techniques for trusses
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(C) use framing techniques for walls, floors, ceilings, rafters, structural timbers, stairs, trusses, and fireproof metal-studs	(viii) use framing techniques for fireproof metal-studs

Knowledge and Skill Statement	Student Expectation	Breakout
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(D) demonstrate the proper principles of drywall application	(i) demonstrate the proper principles of drywall application
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(E) install doors, windows, interior and exterior wall covering, and trim	(i) install doors
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(E) install doors, windows, interior and exterior wall covering, and trim	(ii) install windows
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(E) install doors, windows, interior and exterior wall covering, and trim	(iii) install interior wall covering
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(E) install doors, windows, interior and exterior wall covering, and trim	(iv) install exterior wall covering
(20) The student applies the concepts and skills of the construction industry to simulated or actual work situations. The student is expected to:	(E) install doors, windows, interior and exterior wall covering, and trim	(v) install trim
(21) The student knows the proper and safe use of hand and power tools. The student is expected to:	(A) identify the hand tools commonly used by carpenters and describe their uses	(i) identify the hand tools commonly used by carpenters
(21) The student knows the proper and safe use of hand and power tools. The student is expected to:	(A) identify the hand tools commonly used by carpenters and describe their uses	(ii) describe [the] uses [of hand tools commonly used by carpenters]

Knowledge and Skill Statement	Student Expectation	Breakout
(21) The student knows the proper and safe use of hand and power tools. The student is expected to:	(B) use hand tools safely	(i) use hand tools safely
(21) The student knows the proper and safe use of hand and power tools. The student is expected to:	(C) state the general safety rules for operating all power tools, regardless of type	(i) state the general safety rules for operating all power tools
(21) The student knows the proper and safe use of hand and power tools. The student is expected to:	(D) identify the portable power tools commonly used by carpenters and describe their uses	(i) identify the portable power tools commonly used by carpenters
(21) The student knows the proper and safe use of hand and power tools. The student is expected to:	(D) identify the portable power tools commonly used by carpenters and describe their uses	(ii) describe [the] uses [of portable power tools commonly used by carpenters]
(21) The student knows the proper and safe use of hand and power tools. The student is expected to:	(E) use portable power tools safely	(i) use portable power tools safely
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(A) describe the types of drawings usually included in a set of plans	(i) describe the types of drawings usually included in a set of plans
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(B) identify the different types of lines used on construction drawings	(i) identify the different types of lines used on construction drawings

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:</p>	<p>(C) identify selected architectural symbols commonly used to represent materials on plans</p>	<p>(i) identify selected architectural symbols commonly used to represent materials on plans</p>
<p>(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:</p>	<p>(D) identify selected electrical, mechanical, and plumbing symbols commonly used on plans</p>	<p>(i) identify selected electrical symbols commonly used on plans</p>
<p>(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:</p>	<p>(D) identify selected electrical, mechanical, and plumbing symbols commonly used on plans</p>	<p>(ii) identify selected mechanical symbols commonly used on plans</p>
<p>(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:</p>	<p>(D) identify selected electrical, mechanical, and plumbing symbols commonly used on plans</p>	<p>(iii) identify selected plumbing symbols commonly used on plans</p>
<p>(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:</p>	<p>(E) identify selected abbreviations commonly used on plans</p>	<p>(i) identify selected abbreviations commonly used on plans</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(i) read plans contained in basic construction drawings
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(ii) read elevations contained in basic construction drawings
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(iii) read schedules contained in basic construction drawings
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(iv) read sections contained in basic construction drawings
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(v) read details contained in basic construction drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(vi) interpret plans contained in basic construction drawings
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(vii) interpret elevations contained in basic construction drawings
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(viii) interpret schedules contained in basic construction drawings
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(ix) interpret sections contained in basic construction drawings
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(x) interpret details contained in basic construction drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(G) state the purpose of written specifications	(i) state the purpose of written specifications
(22) The student learns how to interpret architectural and engineering working drawings and specifications. The student will become familiar with the symbols and nomenclature specific to the construction industry. The student is expected to:	(H) demonstrate or describe how to perform a quantity takeoff for materials	(i) demonstrate or describe how to perform a quantity takeoff for materials
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(A) identify the different types of framing systems	(i) identify the different types of framing systems
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(B) interpret drawings with specifications to determine floor system requirements	(i) interpret drawings with specifications to determine floor system requirements
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(C) identify framing and support members as it refers to flooring	(i) identify framing members as it refers to flooring
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(C) identify framing and support members as it refers to flooring	(i) identify support members as it refers to flooring

Knowledge and Skill Statement	Student Expectation	Breakout
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(D) name the methods used to fasten sills to the foundation	(i) name the methods used to fasten sills to the foundation
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(E) given specific floor load and span data, select the proper girder and beam size from a list of available girders and beams	(i) given specific floor load and span data, select the proper girder size from a list of available girders
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(E) given specific floor load and span data, select the proper girder and beam size from a list of available girders and beams	(ii) given specific floor load and span data, select the proper beam size from a list of available beams
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(F) list and recognize different types of bridging	(i) list different types of bridging
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(F) list and recognize different types of bridging	(ii) recognize different types of bridging
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(G) list and recognize different types of flooring materials	(i) list different types of flooring materials

Knowledge and Skill Statement	Student Expectation	Breakout
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(G) list and recognize different types of flooring materials	(ii) recognize different types of flooring materials
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(H) explain the purposes of subflooring and underlayment	(i) explain the purposes of subflooring
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(H) explain the purposes of subflooring and underlayment	(ii) explain the purposes of underlayment
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(I) select the appropriate fasteners to be used in various floor-framing systems	(i) select the appropriate fasteners to be used in various floor-framing systems
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(J) estimate the amount of material needed to frame a floor assembly	(i) estimate the amount of material needed to frame a floor assembly
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) demonstrate the ability to lay out and construct a floor assembly, including installing bridging; installing joists for a cantilever-floor; installing a subfloor using butt-joint plywood or oriented strand board panels; and installing a single floor system using tongue-and-groove plywood or oriented strand board panels	(i) demonstrate the ability to lay out a floor assembly, including installing bridging

Knowledge and Skill Statement	Student Expectation	Breakout
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) demonstrate the ability to lay out and construct a floor assembly, including installing bridging; installing joists for a cantilever-floor; installing a subfloor using butt-joint plywood or oriented strand board panels; and installing a single floor system using tongue-and-groove plywood or oriented strand board panels	(ii) demonstrate the ability to lay out a floor assembly, including installing joists for a cantilever-floor
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) demonstrate the ability to lay out and construct a floor assembly, including installing bridging; installing joists for a cantilever-floor; installing a subfloor using butt-joint plywood or oriented strand board panels; and installing a single floor system using tongue-and-groove plywood or oriented strand board panels	(iii) demonstrate the ability to lay out a floor assembly, including installing a subfloor using butt-joint plywood or oriented strand board panels
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) demonstrate the ability to lay out and construct a floor assembly, including installing bridging; installing joists for a cantilever-floor; installing a subfloor using butt-joint plywood or oriented strand board panels; and installing a single floor system using tongue-and-groove plywood or oriented strand board panels	(iv) demonstrate the ability to lay out a floor assembly, including installing a single floor system using tongue-and-groove plywood or oriented strand board panels
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) demonstrate the ability to lay out and construct a floor assembly, including installing bridging; installing joists for a cantilever-floor; installing a subfloor using butt-joint plywood or oriented strand board panels; and installing a single floor system using tongue-and-groove plywood or oriented strand board panels	(v) demonstrate the ability to construct a floor assembly, including installing bridging

Knowledge and Skill Statement	Student Expectation	Breakout
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) demonstrate the ability to lay out and construct a floor assembly, including installing bridging; installing joists for a cantilever-floor; installing a subfloor using butt-joint plywood or oriented strand board panels; and installing a single floor system using tongue-and-groove plywood or oriented strand board panels	(vi) demonstrate the ability to construct a floor assembly, including installing joists for a cantilever-floor
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) demonstrate the ability to lay out and construct a floor assembly, including installing bridging; installing joists for a cantilever-floor; installing a subfloor using butt-joint plywood or oriented strand board panels; and installing a single floor system using tongue-and-groove plywood or oriented strand board panels	(vii) demonstrate the ability to construct a floor assembly, including installing a subfloor using butt-joint plywood or oriented strand board panels
(23) The student gains knowledge about the basics of wood framing, including layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) demonstrate the ability to lay out and construct a floor assembly, including installing bridging; installing joists for a cantilever-floor; installing a subfloor using butt-joint plywood or oriented strand board panels; and installing a single floor system using tongue-and-groove plywood or oriented strand board panels	(viii) demonstrate the ability to construct a floor assembly, including installing a single floor system using tongue-and-groove plywood or oriented strand board panels
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(A) identify the components of a wall and ceiling layout	(i) identify the components of a wall layout
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(A) identify the components of a wall and ceiling layout	(ii) identify the components of a ceiling layout

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing, and fire stops	(i) describe the procedure for laying out a wood frame wall, including plates
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing, and fire stops	(ii) describe the procedure for laying out a wood frame wall, including corner posts
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing, and fire stops	(iii) describe the procedure for laying out a wood frame wall, including door openings
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing, and fire stops	(iv) describe the procedure for laying out a wood frame wall, including window openings
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing, and fire stops	(v) describe the procedure for laying out a wood frame wall, including partition Ts

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing, and fire stops	(vi) describe the procedure for laying out a wood frame wall, including bracing
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window openings, partition Ts, bracing, and fire stops	(vii) describe the procedure for laying out a wood frame wall, including fire stops
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(C) describe the correct procedure for assembling and erecting an exterior wall	(i) describe the correct procedure for assembling an exterior wall
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(C) describe the correct procedure for assembling and erecting an exterior wall	(ii) describe the correct procedure for erecting an exterior wall
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(D) identify the common materials and methods for installing sheathing on walls	(i) identify the common materials for installing sheathing on walls

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(D) identify the common materials and methods for installing sheathing on walls	(ii) identify the common methods for installing sheathing on walls
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(E) describe or demonstrate how to lay out, assemble, erect, and brace exterior walls for a frame building	(i) describe or demonstrate how to lay out exterior walls for a frame building
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(E) describe or demonstrate how to lay out, assemble, erect, and brace exterior walls for a frame building	(ii) describe or demonstrate how to assemble exterior walls for a frame building
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(E) describe or demonstrate how to lay out, assemble, erect, and brace exterior walls for a frame building	(iii) describe or demonstrate how to erect exterior walls for a frame building
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(E) describe or demonstrate how to lay out, assemble, erect, and brace exterior walls for a frame building	(iv) describe or demonstrate how to brace exterior walls for a frame building

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(F) describe wall-framing techniques used in masonry construction	(i) describe wall-framing techniques used in masonry construction
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(G) explain the use of metal studs in wall framing	(i) explain the use of metal studs in wall framing
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(H) explain how to cut and install ceiling joists on a wood frame building	(i) explain how to cut ceiling joists on a wood frame building
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(H) explain how to cut and install ceiling joists on a wood frame building	(ii) explain how to install ceiling joists on a wood frame building
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(I) estimate the materials required for frame walls and ceilings	(i) estimate the materials required for frame walls

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student understands how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition tee-bracing walls and ceilings, and apply sheathing. The student is expected to:	(I) estimate the materials required for frame walls and ceilings	(ii) estimate the materials required for frame ceilings
(25) The student investigates various types of framed roofs. The student is expected to:	(A) demonstrate an understanding of the terms associated with roof framing	(i) demonstrate an understanding of the terms associated with roof framing
(25) The student investigates various types of framed roofs. The student is expected to:	(B) identify the roof-framing members used in gable and hip roofs	(i) identify the roof-framing members used in gable roofs
(25) The student investigates various types of framed roofs. The student is expected to:	(B) identify the roof-framing members used in gable and hip roofs	(ii) identify the roof-framing members used in hip roofs
(25) The student investigates various types of framed roofs. The student is expected to:	(C) identify the methods used to calculate the length of a rafter	(i) identify the methods used to calculate the length of a rafter
(25) The student investigates various types of framed roofs. The student is expected to:	(D) identify the various types of trusses used in roof framing	(i) identify the various types of trusses used in roof framing
(25) The student investigates various types of framed roofs. The student is expected to:	(E) use a framing square, speed square, and calculator in laying out a roof	(i) use a framing square in laying out a roof
(25) The student investigates various types of framed roofs. The student is expected to:	(E) use a framing square, speed square, and calculator in laying out a roof	(ii) use a speed square in laying out a roof

Knowledge and Skill Statement	Student Expectation	Breakout
(25) The student investigates various types of framed roofs. The student is expected to:	(E) use a framing square, speed square, and calculator in laying out a roof	(iii) use a calculator in laying out a roof
(25) The student investigates various types of framed roofs. The student is expected to:	(F) identify various types of sheathing used in roof construction	(i) identify various types of sheathing used in roof construction
(25) The student investigates various types of framed roofs. The student is expected to:	(G) frame or describe how to frame a gable roof with vent openings	(i) frame or describe how to frame a gable roof with vent openings
(25) The student investigates various types of framed roofs. The student is expected to:	(H) erect, or describe how to erect, a gable roof using trusses	(i) erect, or describe how to erect, a gable roof using trusses
(25) The student investigates various types of framed roofs. The student is expected to:	(I) frame, or describe how to frame, a roof opening	(i) frame, or describe how to frame, a roof opening
(25) The student investigates various types of framed roofs. The student is expected to:	(J) estimate the materials used for framing and sheathing a roof	(i) estimate the materials used for framing a roof
(25) The student investigates various types of framed roofs. The student is expected to:	(J) estimate the materials used for framing and sheathing a roof	(ii) estimate the materials used for sheathing a roof
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(A) identify various types of fixed, sliding, and swinging windows	(i) identify various types of fixed windows
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(A) identify various types of fixed, sliding, and swinging windows	(ii) identify various types of sliding windows

Knowledge and Skill Statement	Student Expectation	Breakout
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(A) identify various types of fixed, sliding, and swinging windows	(iii) identify various types of swinging windows
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(B) identify the parts of a window installation	(i) identify the parts of a window installation
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(C) state the requirements for proper window installation	(i) state the requirements for proper window installation
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(D) explain how to install a pre-hung window	(i) explain how to install a pre-hung window
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(E) identify the common types of exterior doors and explain how they are constructed	(i) identify the common types of exterior doors
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(E) identify the common types of exterior doors and explain how they are constructed	(ii) explain how [the common types of exterior doors] are constructed
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(F) identify the parts of a door installation	(i) identify the parts of a door installation

Knowledge and Skill Statement	Student Expectation	Breakout
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(G) identify types of thresholds used with exterior doors	(i) identify types of thresholds used with exterior doors
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(H) install, or explain the procedure to install, a pre-hung exterior door	(i) install, or explain the procedure to install, a pre-hung exterior door
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(I) identify the various types of locksets used on exterior doors and explain how the locksets are installed	(i) identify the various types of locksets used on exterior doors
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(I) identify the various types of locksets used on exterior doors and explain how the locksets are installed	(ii) explain how the [various types of] locksets are installed
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(J) install a lockset	(i) install a lockset
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(i) identify the use of various other door and window hardware, including security hinges
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(ii) identify the use of various other door and window hardware, including keepers

Knowledge and Skill Statement	Student Expectation	Breakout
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(iii) identify the use of various other door and window hardware, including deadbolts
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(iv) identify the use of various other door and window hardware, including peep holes
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(v) identify the installation of various other door and window hardware, including security hinges
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(vi) identify the installation of various other door and window hardware, including keepers
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(vii) identify the installation of various other door and window hardware, including deadbolts
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(viii) identify the installation of various other door and window hardware, including peep holes
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(ix) explain the use of various other door and window hardware, including security hinges

Knowledge and Skill Statement	Student Expectation	Breakout
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(x) explain the use of various other door and window hardware, including keepers
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xi) explain the use of various other door and window hardware, including deadbolts
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xii) explain the use of various other door and window hardware, including peep holes
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xiii) explain the installation of various other door and window hardware, including security hinges
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xiv) explain the installation of various other door and window hardware, including keepers
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xv) explain the installation of various other door and window hardware, including deadbolts
(26) The student describes various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various other door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xvi) explain the installation of various other door and window hardware, including peep holes

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(A) identify the various types of stairs	(i) identify the various types of stairs
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(B) identify the various parts of stairs	(i) identify the various parts of stairs
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(C) identify the materials used in the construction of stairs	(i) identify the materials used in the construction of stairs
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(D) interpret construction drawings of stairs	(i) interpret construction drawings of stairs
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(i) calculate the total rise required for a given stairway
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(ii) calculate the number of risers required for a given stairway
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(iii) calculate the size of risers required for a given stairway

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(iv) calculate the number of treads required for a given stairway
(27) The student describes various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(v) calculate the size of treads required for a given stairway
(28) The student describes basic product marketing processes and techniques used in construction. The student is expected to[.]	[A] prepare a marketing plan for an idea, product, or service.	[i] prepare a marketing plan for an idea, product, or service.
(29) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(A) describe an area of interest in construction and investigate its entry-level requirements and advancement opportunity requirements and its growth potential	(i) describe an area of interest in construction
(29) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(A) describe an area of interest in construction and investigate its entry-level requirements and advancement opportunity requirements and its growth potential	(ii) investigate [the area's] entry-level requirements
(29) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(A) describe an area of interest in construction and investigate its entry-level requirements and advancement opportunity requirements and its growth potential	(iii) investigate [the area's] advancement opportunity requirements
(29) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(A) describe an area of interest in construction and investigate its entry-level requirements and advancement opportunity requirements and its growth potential	(iv) investigate [the area's] growth potential

Knowledge and Skill Statement	Student Expectation	Breakout
(29) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(B) identify the careers available in construction technology	(i) identify the careers available in construction technology
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(A) describe how teams function	(i) describe how teams function
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(B) describe the use of teamwork to solve problems	(i) describe the use of teamwork to solve problems
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(C) distinguish between the roles of team leaders and team members	(i) distinguish between the roles of team leaders and team members
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(D) identify characteristics of good leaders	(i) identify characteristics of good leaders
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(E) identify employers' expectations and appropriate work habits	(i) identify employers' expectations
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(E) identify employers' expectations and appropriate work habits	(i) identify appropriate work habits

Knowledge and Skill Statement	Student Expectation	Breakout
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(i) define discrimination
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(ii) define harassment
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(iii) define inequality
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) describe the use of time-management techniques to develop and maintain work schedules and meet deadlines	(i) describe the use of time-management techniques to develop work schedules
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) describe the use of time-management techniques to develop and maintain work schedules and meet deadlines	(ii) describe the use of time-management techniques to maintain work schedules
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) describe the use of time-management techniques to develop and maintain work schedules and meet deadlines	(iii) describe the use of time-management techniques to meet deadlines
(30) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) describe the use of time-management techniques to develop and maintain work schedules and meet deadlines	(iv) describe the use of time-management techniques to maintain work deadlines

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.47. Construction Management II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Construction Management I. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Construction Management II, students will gain knowledge and skills needed to enter the workforce as apprentice carpenters or building maintenance supervisors' assistants or to build a foundation toward a postsecondary degree in architecture, construction science, drafting, or engineering. Construction Management II includes knowledge of the design, techniques, and tools related to the management of architectural and engineering projects.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply construction technology to individual or local problems	(i) apply construction technology to individual or local problems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) identify the appropriate resources needed to solve problems	(i) identify the appropriate resources needed to solve problems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) describe the factors that affect the purchase and use of buildings	(i) describe the factors that affect the purchase of buildings
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) describe the factors that affect the purchase and use of buildings	(ii) describe the factors that affect the use of buildings
(2) The student designs or modifies a structure using designated design processes and techniques. The student is expected to:	(A) develop or improve a building design that meets a specified need	(i) develop or improve a building design that meets a specified need
(2) The student designs or modifies a structure using designated design processes and techniques. The student is expected to:	(B) develop and communicate ideas using specified design processes	(i) develop ideas using specified design processes
(2) The student designs or modifies a structure using designated design processes and techniques. The student is expected to:	(B) develop and communicate ideas using specified design processes	(ii) communicate ideas using specified design processes

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student investigates emerging construction technologies. The student is expected to:	(A) report on emerging construction technologies	(i) report on emerging construction technologies
(3) The student investigates emerging construction technologies. The student is expected to:	(B) conduct research in construction technology to determine its effectiveness	(i) conduct research in construction technology to determine its effectiveness
(4) The student describes quality and how it is measured in construction. The student is expected to:	(A) construct items that meet a specified level of quality	(i) construct items that meet a specified level of quality
(4) The student describes quality and how it is measured in construction. The student is expected to:	(B) recommend how the quality of a building can be improved	(i) recommend how the quality of a building can be improved
(4) The student describes quality and how it is measured in construction. The student is expected to:	(C) explain the factors that affect the quality of buildings	(i) explain the factors that affect the quality of buildings
(5) The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) describe the chemical, mechanical, and physical properties and standard units of measure of architectural construction materials such as concrete, masonry, and metals	(i) describe the chemical properties of architectural construction materials
(5) The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) describe the chemical, mechanical, and physical properties and standard units of measure of architectural construction materials such as concrete, masonry, and metals	(ii) describe the mechanical properties of architectural construction materials
(5) The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) describe the chemical, mechanical, and physical properties and standard units of measure of architectural construction materials such as concrete, masonry, and metals	(iii) describe the physical properties of architectural construction materials

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) describe the chemical, mechanical, and physical properties and standard units of measure of architectural construction materials such as concrete, masonry, and metals	(iv) describe the standard units of measure of architectural construction materials
(5) The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(B) describe the processes used in construction	(i) describe the processes used in construction
(5) The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(C) construct a building or a model of a building using a variety of tools, equipment, and machines.	(i) construct a building or a model of a building using a variety of tools
(5) The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(C) construct a building or a model of a building using a variety of tools, equipment, and machines.	(ii) construct a building or a model of a building using a variety of equipment
(5) The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:	(C) construct a building or a model of a building using a variety of tools, equipment, and machines.	(iii) construct a building or a model of a building using a variety of machines
(6) The student works safely with construction technology. The student is expected to:	(A) master relevant safety tests	(i) master relevant safety tests
(6) The student works safely with construction technology. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(i) follow safety manuals

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student works safely with construction technology. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(ii) follow safety instructions
(6) The student works safely with construction technology. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(iii) follow safety requirements
(6) The student works safely with construction technology. The student is expected to:	(C) identify and classify hazardous materials and wastes correctly	(i) identify hazardous materials correctly
(6) The student works safely with construction technology. The student is expected to:	(C) identify and classify hazardous materials and wastes correctly	(ii) identify hazardous wastes correctly
(6) The student works safely with construction technology. The student is expected to:	(C) identify and classify hazardous materials and wastes correctly	(iii) classify hazardous materials correctly
(6) The student works safely with construction technology. The student is expected to:	(C) identify and classify hazardous materials and wastes correctly	(iv) classify hazardous wastes correctly
(6) The student works safely with construction technology. The student is expected to:	(D) dispose of hazardous materials and waste appropriately	(i) dispose of hazardous materials appropriately
(6) The student works safely with construction technology. The student is expected to:	(D) dispose of hazardous materials and waste appropriately	(ii) dispose of hazardous wastes appropriately
(6) The student works safely with construction technology. The student is expected to:	(E) recommend improvements in safety procedures	(i) recommend improvements in safety procedures

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student performs basic maintenance on selected construction equipment and machines. The student is expected to:	(A) maintain tools and materials correctly	(i) maintain tools correctly
(7) The student performs basic maintenance on selected construction equipment and machines. The student is expected to:	(A) maintain tools and materials correctly	(ii) maintain materials correctly
(7) The student performs basic maintenance on selected construction equipment and machines. The student is expected to:	(B) perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(i) perform manufacturers' maintenance procedures on selected tools
(7) The student performs basic maintenance on selected construction equipment and machines. The student is expected to:	(B) perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(ii) perform manufacturers' maintenance procedures on selected equipment
(7) The student performs basic maintenance on selected construction equipment and machines. The student is expected to:	(B) perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(iii) perform manufacturers' maintenance procedures on selected machines
(7) The student performs basic maintenance on selected construction equipment and machines. The student is expected to:	(C) develop a maintenance plan for selected machines and equipment	(i) develop a maintenance plan for selected machines
(7) The student performs basic maintenance on selected construction equipment and machines. The student is expected to:	(C) develop a maintenance plan for selected machines and equipment	(ii) develop a maintenance plan for selected equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student manages construction technology projects. The student is expected to:	(A) initiate a construction technology project	(i) initiate a construction technology project
(8) The student manages construction technology projects. The student is expected to:	(B) plan a construction technology project, including developing a project schedule and describing use of resources needed	(i) plan a construction technology project, including developing a project schedule
(8) The student manages construction technology projects. The student is expected to:	(B) plan a construction technology project, including developing a project schedule and describing use of resources needed	(ii) plan a construction technology project, including describing use of resources needed
(8) The student manages construction technology projects. The student is expected to:	(C) execute a construction technology project	(i) execute a construction technology project
(8) The student manages construction technology projects. The student is expected to:	(D) monitor and control a construction technology project	(i) monitor a construction technology project
(8) The student manages construction technology projects. The student is expected to:	(D) monitor and control a construction technology project	(ii) control a construction technology project
(8) The student manages construction technology projects. The student is expected to:	(E) close a construction technology project	(i) close a construction technology project
(9) The student follows the appropriate codes, laws, standards, or regulations related to architectural construction technology. The student is expected to:	(A) identify areas where codes, laws, standards, or regulations may be required	(i) identify areas where codes, laws, standards, or regulations may be required

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student follows the appropriate codes, laws, standards, or regulations related to architectural construction technology. The student is expected to:	(B) locate the appropriate codes, laws, standards, or regulations	(i) locate the appropriate codes, laws, standards, or regulations
(9) The student follows the appropriate codes, laws, standards, or regulations related to architectural construction technology. The student is expected to:	(C) comply with the appropriate codes, laws, standards, or regulations	(i) comply with the appropriate codes, laws, standards, or regulations
(10) The student solves problems, thinks critically, and makes decisions related to architectural construction. The student is expected to:	(A) develop or improve a building or structure by following a problem-solving strategy	(i) develop or improve a building or structure by following a problem-solving strategy
(10) The student solves problems, thinks critically, and makes decisions related to architectural construction. The student is expected to:	(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(i) apply critical-thinking strategies to the analysis of proposed technological solutions
(10) The student solves problems, thinks critically, and makes decisions related to architectural construction. The student is expected to:	(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(ii) apply critical-thinking strategies to the evaluation of proposed technological solutions
(10) The student solves problems, thinks critically, and makes decisions related to architectural construction. The student is expected to:	(C) apply decision-making techniques to the selection of technological solutions	(i) apply decision-making techniques to the selection of technological solutions
(11) The student determines the cost of constructing a building. The student is expected to:	(A) develop a budget for a construction project	(i) develop a budget for a construction project
(11) The student determines the cost of constructing a building. The student is expected to:	(B) determine the most effective strategies to minimize costs	(i) determine the most effective strategies to minimize costs

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student applies communication, mathematical, and scientific knowledge and skills to construction activities. The student is expected to:	(A) write technical reports	(i) write technical reports
(12) The student applies communication, mathematical, and scientific knowledge and skills to construction activities. The student is expected to:	(B) make technical presentations to groups of individuals	(i) make technical presentations to groups of individuals
(12) The student applies communication, mathematical, and scientific knowledge and skills to construction activities. The student is expected to:	(C) use mathematical concepts in construction technology	(i) use mathematical concepts in construction technology
(12) The student applies communication, mathematical, and scientific knowledge and skills to construction activities. The student is expected to:	(D) apply scientific principles used in construction technology	(i) apply scientific principles used in construction technology
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(A) describe how teams function	(i) describe how teams function
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(B) use teamwork to solve problems	(i) use teamwork to solve problems
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(C) distinguish between the roles of team leaders and team members	(i) distinguish between the roles of team leaders and team members

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(D) identify characteristics of good leaders	(i) identify characteristics of good leaders
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(E) identify employers' expectations for appropriate work habits	(i) identify employers' expectations for appropriate work habits
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(i) define discrimination
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(ii) define harassment
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(iii) define inequality
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop work schedules, maintain work schedules, and meet work schedule deadlines	(i) use time-management techniques to develop work schedules
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop work schedules, maintain work schedules, and meet work schedule deadlines	(ii) use time-management techniques to maintain work schedules

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop work schedules, maintain work schedules, and meet work schedule deadlines	(iii) use time-management techniques to meet work schedule deadlines
(13) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(H) complete work according to established criteria	(i) complete work according to established criteria
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(A) identify the properties of cement	(i) identify the properties of cement
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(B) describe the composition of concrete	(i) describe the composition of concrete
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(C) perform volume estimates for concrete quantity requirements	(i) perform volume estimates for concrete quantity requirements
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(D) describe types of concrete reinforcement materials	(i) describe types of concrete reinforcement materials
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(E) describe various types of footings and explain their uses	(i) describe various types of footings

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(E) describe various types of footings and explain their uses	(ii) explain [various types of footings] uses
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(F) identify the parts of various types of forms	(i) identify the parts of various types of forms
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(G) explain the safety procedures associated with the construction of concrete forms	(i) explain the safety procedures associated with the construction of concrete forms
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(H) explain how to erect, plumb, and brace a simple concrete form with reinforcement	(i) explain how to erect a simple concrete form with reinforcement
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(H) explain how to erect, plumb, and brace a simple concrete form with reinforcement	(ii) explain how to plumb a simple concrete form with reinforcement
(14) The student gains knowledge about the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(H) explain how to erect, plumb, and brace a simple concrete form with reinforcement	(iii) explain how to brace a simple concrete form with reinforcement
(15) The student uses a systems approach to investigate mechanical, fluid, electrical, and thermal systems. The student is expected to:	(A) apply the universal systems model to technological activities	(i) apply the universal systems model to technological activities

Knowledge and Skill Statement	Student Expectation	Breakout
(15) The student uses a systems approach to investigate mechanical, fluid, electrical, and thermal systems. The student is expected to:	(B) identify the inputs, processes, outputs, and feedback associated with each of the systems	(i) identify the inputs associated with each of the systems
(15) The student uses a systems approach to investigate mechanical, fluid, electrical, and thermal systems. The student is expected to:	(B) identify the inputs, processes, outputs, and feedback associated with each of the systems	(ii) identify the processes associated with each of the systems
(15) The student uses a systems approach to investigate mechanical, fluid, electrical, and thermal systems. The student is expected to:	(B) identify the inputs, processes, outputs, and feedback associated with each of the systems	(iii) identify the outputs associated with each of the systems
(15) The student uses a systems approach to investigate mechanical, fluid, electrical, and thermal systems. The student is expected to:	(B) identify the inputs, processes, outputs, and feedback associated with each of the systems	(iv) identify the feedback associated with each of the systems
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(A) master relevant safety tests	(i) master relevant safety tests
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(i) follow safety manuals
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(ii) follow safety instructions

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(B) follow safety manuals, instructions, and requirements	(iii) follow safety requirements
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(C) identify and classify hazardous materials and wastes	(i) identify hazardous materials
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(C) identify and classify hazardous materials and wastes	(ii) identify hazardous wastes
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(C) identify and classify hazardous materials and wastes	(iii) classify hazardous materials
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(C) identify and classify hazardous materials and wastes	(iv) classify hazardous wastes
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(D) dispose of hazardous materials and wastes appropriately	(i) dispose of hazardous materials appropriately
(16) The student works safely with mechanical, fluid, electrical, and thermal technology. The student is expected to:	(D) dispose of hazardous materials and wastes appropriately	(ii) dispose of hazardous wastes appropriately

Knowledge and Skill Statement	Student Expectation	Breakout
(17) The student solves problems, thinks critically, and makes decisions related to construction. The student is expected to:	(A) apply problem-solving strategies	(i) apply problem-solving strategies
(17) The student solves problems, thinks critically, and makes decisions related to construction. The student is expected to:	(B) apply critical-thinking strategies	(i) apply critical-thinking strategies
(17) The student solves problems, thinks critically, and makes decisions related to construction. The student is expected to:	(C) apply decision-making techniques to the selection of technological solutions	(i) apply decision-making techniques to the selection of technological solutions
(17) The student solves problems, thinks critically, and makes decisions related to construction. The student is expected to:	(D) evaluate the impact of technology on scientific thought, society, and the environment	(i) evaluate the impact of technology on scientific thought
(17) The student solves problems, thinks critically, and makes decisions related to construction. The student is expected to:	(D) evaluate the impact of technology on scientific thought, society, and the environment	(ii) evaluate the impact of technology on society
(17) The student solves problems, thinks critically, and makes decisions related to construction. The student is expected to:	(D) evaluate the impact of technology on scientific thought, society, and the environment	(iii) evaluate the impact of technology on the environment
(18) The student applies communication, science, and mathematics knowledge and skills to construction activities. The student is expected to:	(A) prepare technical reports and presentations	(i) prepare technical reports

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student applies communication, science, and mathematics knowledge and skills to construction activities. The student is expected to:	(A) prepare technical reports and presentations	(ii) prepare technical presentations
(18) The student applies communication, science, and mathematics knowledge and skills to construction activities. The student is expected to:	(B) solve algebraic equations	(i) solve algebraic equations
(18) The student applies communication, science, and mathematics knowledge and skills to construction activities. The student is expected to:	(C) solve problems in U.S. standard and metric units	(i) solve problems in U.S. standard units
(18) The student applies communication, science, and mathematics knowledge and skills to construction activities. The student is expected to:	(C) solve problems in U.S. standard and metric units	(ii) solve problems in metric units
(18) The student applies communication, science, and mathematics knowledge and skills to construction activities. The student is expected to:	(D) perform unit conversions	(i) perform unit conversions
(19) The student knows the laws governing motion. The student is expected to:	(A) analyze examples of uniform and accelerated motion, including linear, projectile, and circular motion	(i) analyze examples of uniform motion, including linear motion
(19) The student knows the laws governing motion. The student is expected to:	(A) analyze examples of uniform and accelerated motion, including linear, projectile, and circular motion	(ii) analyze examples of uniform motion, including projectile motion
(19) The student knows the laws governing motion. The student is expected to:	(A) analyze examples of uniform and accelerated motion, including linear, projectile, and circular motion	(iii) analyze examples of uniform motion, including circular motion

Knowledge and Skill Statement	Student Expectation	Breakout
(19) The student knows the laws governing motion. The student is expected to:	(A) analyze examples of uniform and accelerated motion, including linear, projectile, and circular motion	(iv) analyze examples of accelerated motion, including linear motion
(19) The student knows the laws governing motion. The student is expected to:	(A) analyze examples of uniform and accelerated motion, including linear, projectile, and circular motion	(v) analyze examples of accelerated motion, including projectile motion
(19) The student knows the laws governing motion. The student is expected to:	(A) analyze examples of uniform and accelerated motion, including linear, projectile, and circular motion	(vi) analyze examples of accelerated motion, including circular motion
(19) The student knows the laws governing motion. The student is expected to:	(B) evaluate the effects of forces on the motion of objects	(i) evaluate the effects of forces on the motion of objects
(19) The student knows the laws governing motion. The student is expected to:	(C) develop a free-body diagram for force analysis	(i) develop a free-body diagram for force analysis
(19) The student knows the laws governing motion. The student is expected to:	(D) analyze motion relative to different frames of reference	(i) analyze motion relative to different frames of reference
(20) The student knows the concept of momentum. The student is expected to:	(A) identify linear and angular momentum	(i) identify linear momentum
(20) The student knows the concept of momentum. The student is expected to:	(A) identify linear and angular momentum	(ii) identify angular momentum
(20) The student knows the concept of momentum. The student is expected to:	(B) relate the conservation of momentum to linear and angular motion	(i) relate the conservation of momentum to linear motion

Knowledge and Skill Statement	Student Expectation	Breakout
(20) The student knows the concept of momentum. The student is expected to:	(B) relate the conservation of momentum to linear and angular motion	(ii) relate the conservation of momentum to angular motion
(21) The student knows the concept of waves and vibrations. The student is expected to:	(A) evaluate characteristics of wave motion	(i) evaluate characteristics of wave motion
(21) The student knows the concept of waves and vibrations. The student is expected to:	(B) demonstrate how waves transmit energy	(i) demonstrate how waves transmit energy
(22) The student knows the concept of energy conversion. The student is expected to:	(A) evaluate the purpose of energy converters	(i) evaluate the purpose of energy converters
(22) The student knows the concept of energy conversion. The student is expected to:	(B) identify converters that change one form of energy to another	(i) identify converters that change one form of energy to another
(22) The student knows the concept of energy conversion. The student is expected to:	(C) evaluate the efficiency of converting energy from one form to another	(i) evaluate the efficiency of converting energy from one form to another
(23) The student knows the concept of energy transduction. The student is expected to:	(A) identify the function of a transducer	(i) identify the function of a transducer
(23) The student knows the concept of energy transduction. The student is expected to:	(B) distinguish between an energy converter and a transducer	(i) distinguish between an energy converter and a transducer
(23) The student knows the concept of energy transduction. The student is expected to:	(C) identify transducers that change energy signals from one form to another	(i) identify transducers that change energy signals from one form to another

Knowledge and Skill Statement	Student Expectation	Breakout
(24) The student knows the concept of radiant energy. The student is expected to:	(A) describe radiation	(i) describe radiation
(24) The student knows the concept of radiant energy. The student is expected to:	(B) compare fission and fusion in terms of end products, energy, advantages, and availability	(i) compare fission and fusion in terms of end products
(24) The student knows the concept of radiant energy. The student is expected to:	(B) compare fission and fusion in terms of end products, energy, advantages, and availability	(ii) compare fission and fusion in terms of energy
(24) The student knows the concept of radiant energy. The student is expected to:	(B) compare fission and fusion in terms of end products, energy, advantages, and availability	(iii) compare fission and fusion in terms of advantages
(24) The student knows the concept of radiant energy. The student is expected to:	(B) compare fission and fusion in terms of end products, energy, advantages, and availability	(iv) compare fission and fusion in terms of availability
(24) The student knows the concept of radiant energy. The student is expected to:	(C) compare and contrast different types of radioactive decay	(i) compare and contrast different types of radioactive decay
(25) The student knows the concept of light and optics. The student is expected to:	(A) identify characteristics of optical devices	(i) identify characteristics of optical devices
(25) The student knows the concept of light and optics. The student is expected to:	(B) analyze the characteristics of light, including reflection, refraction, and interference	(i) analyze the characteristics of light, including reflection
(25) The student knows the concept of light and optics. The student is expected to:	(B) analyze the characteristics of light, including reflection, refraction, and interference	(ii) analyze the characteristics of light, including refraction

Knowledge and Skill Statement	Student Expectation	Breakout
(25) The student knows the concept of light and optics. The student is expected to:	(B) analyze the characteristics of light, including reflection, refraction, and interference	(iii) analyze the characteristics of light, including interference
(25) The student knows the concept of light and optics. The student is expected to:	(C) interpret the effects of wave characteristics in daily applications such as lasers and optics in industrial and medical technology	(i) interpret the effects of wave characteristics in daily applications
(26) The student knows the concept of time constants. The student is expected to:	(A) define a time constant	(i) define a time constant
(26) The student knows the concept of time constants. The student is expected to:	(B) distinguish between a linear and non-linear increase and decrease of a variable with time	(i) distinguish between a linear and non-linear increase of a variable with time
(26) The student knows the concept of time constants. The student is expected to:	(B) distinguish between a linear and non-linear increase and decrease of a variable with time	(ii) distinguish between a linear and non-linear decrease of a variable with time
(27) The student describes basic product marketing processes and techniques used in construction. The student is expected to:	(A) prepare a marketing plan for an idea, product, or service	(i) prepare a marketing plan for an idea
(27) The student describes basic product marketing processes and techniques used in construction. The student is expected to:	(A) prepare a marketing plan for an idea, product, or service	(ii) prepare a marketing plan for a product
(27) The student describes basic product marketing processes and techniques used in construction. The student is expected to:	(A) prepare a marketing plan for an idea, product, or service	(iii) prepare a marketing plan for a service

Knowledge and Skill Statement	Student Expectation	Breakout
(27) The student describes basic product marketing processes and techniques used in construction. The student is expected to:	(B) discuss the effect of customer satisfaction on the image of a product or company	(i) discuss the effect of customer satisfaction on the image of a product or company
(28) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(A) identify an area of interest in construction and investigate its entry-level and advancement requirements and its growth potential	(i) identify an area of interest in construction
(28) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(A) identify an area of interest in construction and investigate its entry-level and advancement requirements and its growth potential	(ii) investigate [the area's] entry level requirements
(28) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(A) identify an area of interest in construction and investigate its entry-level and advancement requirements and its growth potential	(iii) investigate [the areas] advancement level requirements
(28) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(A) identify an area of interest in construction and investigate its entry-level and advancement requirements and its growth potential	(iv) investigate [the area's] growth potential
(28) The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:	(B) describe the careers available in construction	(i) describe the careers available in construction
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(A) describe how teams function	(i) describe how teams function

Knowledge and Skill Statement	Student Expectation	Breakout
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(B) use teamwork to solve problems	(i) use teamwork to solve problems
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(C) distinguish between the roles of team leaders and team members	(i) distinguish between the roles of team leaders and team members
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(D) identify characteristics of good leaders	(i) identify characteristics of good leaders
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(E) identify employers' expectations and appropriate work habits	(i) identify employers' expectations
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(E) identify employers' expectations and appropriate work habits	(ii) identify appropriate work habits
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(i) define discrimination
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(ii) define harassment

Knowledge and Skill Statement	Student Expectation	Breakout
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(iii) define inequality
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop and maintain work schedules and meet deadlines	(i) use time-management techniques to develop work schedules
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop and maintain work schedules and meet deadlines	(ii) use time-management techniques to maintain work schedules
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop and maintain work schedules and meet deadlines	(iii) use time-management techniques to meet deadlines
(29) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(H) complete work according to established criteria	(i) complete work according to established criteria

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.48. Construction Technology I (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Construction or Principles of Architecture. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Construction Technology I, students will gain knowledge and skills needed to enter the workforce as carpenters or building maintenance supervisors or to prepare for a postsecondary degree in construction management, architecture, or engineering. Students will acquire knowledge and skills in safety, tool usage, building materials, codes, and framing. For safety and liability considerations, limiting course enrollment to 15 students is recommended.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) explain the role of an employee in the construction industry	(i) explain the role of an employee in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) apply critical-thinking skills	(i) apply critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate the ability to solve problems using critical-thinking skills	(i) demonstrate the ability to solve problems using critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate knowledge of basic computer systems	(i) demonstrate knowledge of basic computer systems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) explain common uses for computers in the construction industry	(i) explain common uses for computers in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) define effective relationship skills	(i) define effective relationship skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) recognize workplace issues such as sexual harassment, stress, and substance abuse	(i) recognize workplace issues

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(A) explain the idea of a safety culture	(i) explain the idea of a safety culture
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(B) explain the importance of a safety culture in the construction crafts	(i) explain the importance of a safety culture in the construction crafts
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(C) explain the role of Occupational Safety and Health Administration (OSHA) in job-site safety	(i) explain the role of Occupational Safety and Health Administration (OSHA) in job-site safety
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(D) explain fall protection, ladder safety, stair safety, and scaffold safety procedures	(i) explain fall protection procedures
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(D) explain fall protection, ladder safety, stair safety, and scaffold safety procedures	(ii) explain ladder safety procedures
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(D) explain fall protection, ladder safety, stair safety, and scaffold safety procedures	(iii) explain stair safety procedures
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(D) explain fall protection, ladder safety, stair safety, and scaffold safety procedures	(iv) explain scaffold safety procedures

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(E) explain the importance of hazard communication (HazCom)	(i) explain the importance of hazard communication (HazCom)
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(F) explain the importance of Safety Data Sheets (SDS)	(i) explain the importance of Safety Data Sheets (SDS)
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(G) explain OSHA's General Duty Clause	(i) explain OSHA's General Duty Clause
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(H) explain OSHA 1926 CFR Subpart C	(i) explain OSHA 1926 CFR Subpart C
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(I) identify causes of accidents	(i) identify causes of accidents
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(J) identify impacts of accident costs	(i) identify impacts of accident costs
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(K) identify struck-by hazards	(i) identify struck-by hazards

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(L) identify caught-in-between hazards	(i) identify caught-in-between hazards
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(M) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(i) identify other construction hazards on the jobsite, including hazardous material exposures
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(M) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(ii) identify other construction hazards on the jobsite, including environmental elements
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(M) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(iii) identify other construction hazards on the jobsite, including welding hazards
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(M) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(iv) identify other construction hazards on the jobsite, including cutting hazards
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(M) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(v) identify other construction hazards on the jobsite, including confined spaces

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(M) identify other construction hazards on the jobsite, including hazardous material exposures, environmental elements, welding and cutting hazards, confined spaces, and fires	(vi) identify other construction hazards on the jobsite, including fires
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(N) define safe work procedures around electrical hazards	(i) define safe work procedures around electrical hazards
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(O) define hazard recognition	(i) define hazard recognition
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(P) define risk assessment techniques	(i) define risk assessment techniques
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(i) demonstrate the use of appropriate personal protective equipment, including safety goggles
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(ii) demonstrate the use of appropriate personal protective equipment, including safety glasses

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(iii) demonstrate the use of appropriate personal protective equipment, including hard hats
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(iv) demonstrate the use of appropriate personal protective equipment, including gloves
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(v) demonstrate the use of appropriate personal protective equipment, including safety harnesses
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(vi) demonstrate the use of appropriate personal protective equipment, including safety shoes
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(vii) demonstrate the care of appropriate personal protective equipment, including safety goggles
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(viii) demonstrate the care of appropriate personal protective equipment, including safety glasses

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(ix) demonstrate the care of appropriate personal protective equipment, including hard hats
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(x) demonstrate the care of appropriate personal protective equipment, including gloves
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(xi) demonstrate the care of appropriate personal protective equipment, including safety harnesses
(2) The student understands that safe working standards are imperative in the classroom and in the field. The student is expected to:	(Q) demonstrate the use and care of appropriate personal protective equipment, including safety goggles and glasses, hard hats, gloves, safety harnesses, and safety shoes	(xii) demonstrate the care of appropriate personal protective equipment, including safety shoes
(3) The student identifies various opportunities in the field of carpentry and the characteristics a carpenter should possess. The student is expected to:	(A) identify job opportunities and their accompanying job duties such as carpentry, building maintenance supervisor, architect, and engineer	(i) identify job opportunities
(3) The student identifies various opportunities in the field of carpentry and the characteristics a carpenter should possess. The student is expected to:	(A) identify job opportunities and their accompanying job duties such as carpentry, building maintenance supervisor, architect, and engineer	(ii) identify [job opportunities] accompanying job duties

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student identifies various opportunities in the field of carpentry and the characteristics a carpenter should possess. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve them	(i) research careers along with the education required to achieve them
(3) The student identifies various opportunities in the field of carpentry and the characteristics a carpenter should possess. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve them	(ii) research careers along with the job skills required to achieve them
(3) The student identifies various opportunities in the field of carpentry and the characteristics a carpenter should possess. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve them	(iii) research careers along with the experience required to achieve them
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(A) identify various types of building materials and their uses	(i) identify various types of building materials
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(A) identify various types of building materials and their uses	(ii) identify uses [of various types of building materials]
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(B) state the uses of various types of hardwoods and softwoods	(i) state the uses of various types of hardwoods
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(B) state the uses of various types of hardwoods and softwoods	(ii) state the uses of various types of softwoods

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(C) identify the different grades and markings of wood building materials	(i) identify the different grades of wood building materials
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(C) identify the different grades and markings of wood building materials	(ii) identify the different markings of wood building materials
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(D) describe the proper method of storing and handling building materials	(i) describe the proper method of storing building materials
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(D) describe the proper method of storing and handling building materials	(ii) describe the proper method of handling building materials
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(E) state the uses of various types of engineered lumber	(i) state the uses of various types of engineered lumber
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(F) calculate the quantities of lumber and wood products using industry-standard methods	(i) calculate the quantities of lumber products using industry-standard methods
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(F) calculate the quantities of lumber and wood products using industry-standard methods	(ii) calculate the quantities of wood products using industry-standard methods

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work and explain their uses	(i) describe the fasteners used in construction work
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work and explain their uses	(ii) describe the anchors used in construction work
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work and explain their uses	(iii) describe the adhesives used in construction work
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work and explain their uses	(iv) explain [the uses of] fasteners used in construction work
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work and explain their uses	(v) explain [the uses of] anchors used in construction work
(4) The student gains knowledge about building materials used in the construction industry. The student is expected to:	(G) describe the fasteners, anchors, and adhesives used in construction work and explain their uses	(vi) explain [the uses of] adhesives used in construction work
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(A) identify the hand tools commonly used by carpenters and describe their uses	(i) identify the hand tools commonly used by carpenters

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(A) identify the hand tools commonly used by carpenters and describe their uses	(ii) describe [the] uses [of hand tools commonly used by carpenters]
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(B) use hand tools in a safe and appropriate manner	(i) use hand tools in a safe manner
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(B) use hand tools in a safe and appropriate manner	(ii) use hand tools in [an] appropriate manner
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(C) state the general safety rules for operating all power tools, regardless of type	(i) state the general safety rules for operating all power tools, regardless of type
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(D) identify the portable power tools commonly used by carpenters and describe their uses	(i) identify the portable power tools commonly used by carpenters
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(D) identify the portable power tools commonly used by carpenters and describe their uses	(ii) describe [the] uses [of portable power tools commonly used by carpenters]
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(E) use portable power tools in a safe and appropriate manner	(i) use portable power tools in a safe manner

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the proper and safe use of hand and power tools associated with carpentry. The student is expected to:	(E) use portable power tools in a safe and appropriate manner	(ii) use portable power tools in [an] appropriate manner
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(A) describe the types of drawings usually included in a set of plans and list the information found on each type	(i) describe the types of drawings usually included in a set of plans
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(A) describe the types of drawings usually included in a set of plans and list the information found on each type	(ii) list the information found on each type
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(B) identify the different types of lines used on construction drawings	(i) identify the different types of lines used on construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(C) identify selected architectural symbols commonly used to represent materials on plans	(i) identify selected architectural symbols commonly used to represent materials on plans
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(D) identify selected electrical, mechanical, and plumbing symbols commonly used on plans	(i) identify selected electrical symbols commonly used on plans
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(D) identify selected electrical, mechanical, and plumbing symbols commonly used on plans	(ii) identify selected mechanical symbols commonly used on plans

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(D) identify selected electrical, mechanical, and plumbing symbols commonly used on plans	(iii) identify selected plumbing symbols commonly used on plans
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(E) identify selected abbreviations commonly used on plans	(i) identify selected abbreviations commonly used on plans
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(i) read plans contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(ii) read elevations contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(iii) read schedules contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(iv) read sections contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(v) read details contained in basic construction drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(vi) interpret plans contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(vii) interpret elevations contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(viii) interpret schedules contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(ix) interpret sections contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(F) read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings	(x) interpret details contained in basic construction drawings
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(G) state the purpose of written specifications	(i) state the purpose of written specifications
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(H) identify and describe the parts of a specification	(i) identify the parts of a specification

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(H) identify and describe the parts of a specification	(ii) describe the parts of a specification
(6) The student interprets architectural and engineering working drawings and specifications. The student is expected to:	(I) demonstrate or describe how to perform a quantity takeoff for materials	(i) demonstrate or describe how to perform a quantity takeoff for materials
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(A) identify the different types of framing systems	(i) identify the different types of framing systems
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(B) read and interpret drawings and specifications to determine floor system requirements	(i) read drawings to determine floor system requirements
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(B) read and interpret drawings and specifications to determine floor system requirements	(ii) read specifications to determine floor system requirements
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(B) read and interpret drawings and specifications to determine floor system requirements	(iii) interpret drawings to determine floor system requirements

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(B) read and interpret drawings and specifications to determine floor system requirements	(iv) interpret specifications to determine floor system requirements
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(C) identify floor and sill framing and support members	(i) identify floor framing
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(C) identify floor and sill framing and support members	(ii) identify sill framing
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(C) identify floor and sill framing and support members	(iii) identify support members
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(D) name the methods used to fasten sills to the foundation	(i) name the methods used to fasten sills to the foundation
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(E) select the proper girder or beam size from a list of available girders or beams given specific floor load and span data	(i) select the proper girder or beam size from a list of available girders or beams given specific floor load and span data

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(F) list and recognize different types of bridging	(i) list different types of bridging
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(F) list and recognize different types of bridging	(ii) recognize different types of bridging
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(G) list and recognize different types of flooring materials	(i) list different types of flooring materials
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(G) list and recognize different types of flooring materials	(ii) recognize different types of flooring materials
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(H) explain the purposes of subflooring and underlayment	(i) explain the purposes of subflooring
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(H) explain the purposes of subflooring and underlayment	(ii) explain the purposes of underlayment

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(I) select the appropriate fasteners to be used in various floor framing systems	(i) select the appropriate fasteners to be used in various floor framing systems
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(J) estimate the amount of material needed to frame a floor assembly	(i) estimate the amount of material needed to frame a floor assembly
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) lay out and construct a floor assembly	(i) lay out a floor assembly
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(K) lay out and construct a floor assembly	(ii) construct a floor assembly
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(L) install bridging	(i) install bridging
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(M) install joists for a cantilever-floor	(i) install joists for a cantilever-floor

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(N) install a subfloor using butt-joint plywood or oriented strand board panels	(i) install a subfloor using butt-joint plywood or oriented strand board panels
(7) The student gains knowledge of wood framing and the layout and construction of wood-framed floor systems using common and engineered lumber. The student is expected to:	(O) install a single floor system using tongue-and-groove (T&G) plywood or oriented strand board (OSB) panels	(i) install a single floor system using tongue-and-groove (T&G) plywood or oriented strand board (OSB) panels
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(A) identify the components of a wall and ceiling layout	(i) identify the components of a wall layout
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(A) identify the components of a wall and ceiling layout	(ii) identify the components of a ceiling layout
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including the installation of plates, corner posts, door and window openings, partition Ts, bracings, and firestops	(i) describe the procedure for laying out a wood frame wall, including the installation of plates

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:</p>	<p>(B) describe the procedure for laying out a wood frame wall, including the installation of plates, corner posts, door and window openings, partition Ts, bracings, and firestops</p>	<p>(ii) describe the procedure for laying out a wood frame wall, including corner posts</p>
<p>(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:</p>	<p>(B) describe the procedure for laying out a wood frame wall, including the installation of plates, corner posts, door and window openings, partition Ts, bracings, and firestops</p>	<p>(iii) describe the procedure for laying out a wood frame wall, including door openings</p>
<p>(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:</p>	<p>(B) describe the procedure for laying out a wood frame wall, including the installation of plates, corner posts, door and window openings, partition Ts, bracings, and firestops</p>	<p>(iv) describe the procedure for laying out a wood frame wall, including window openings</p>
<p>(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:</p>	<p>(B) describe the procedure for laying out a wood frame wall, including the installation of plates, corner posts, door and window openings, partition Ts, bracings, and firestops</p>	<p>(v) describe the procedure for laying out a wood frame wall, including partition Ts</p>
<p>(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:</p>	<p>(B) describe the procedure for laying out a wood frame wall, including the installation of plates, corner posts, door and window openings, partition Ts, bracings, and firestops</p>	<p>(vi) describe the procedure for laying out a wood frame wall, including bracings</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(B) describe the procedure for laying out a wood frame wall, including the installation of plates, corner posts, door and window openings, partition Ts, bracings, and firestops	(vii) describe the procedure for laying out a wood frame wall, including firestops
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(C) describe the correct procedure for assembling and erecting an exterior wall	(i) describe the correct procedure for assembling an exterior wall
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(C) describe the correct procedure for assembling and erecting an exterior wall	(ii) describe the correct procedure for erecting an exterior wall
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(D) identify the common materials and methods used for installing sheathing on walls	(i) identify the common materials used for installing sheathing on walls
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(D) identify the common materials and methods used for installing sheathing on walls	(ii) identify the common methods used for installing sheathing on walls

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(E) lay out, assemble, erect, and brace exterior walls for a frame building	(i) lay out exterior walls for a frame building
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(E) lay out, assemble, erect, and brace exterior walls for a frame building	(ii) assemble exterior walls for a frame building
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(E) lay out, assemble, erect, and brace exterior walls for a frame building	(iii) erect exterior walls for a frame building
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(E) lay out, assemble, erect, and brace exterior walls for a frame building	(iv) brace exterior walls for a frame building
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(F) describe wall framing techniques used in masonry construction	(i) describe wall framing techniques used in masonry construction

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(G) explain the use of metal studs in wall framing	(i) explain the use of metal studs in wall framing
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(H) cut and install ceiling joists on a wood frame building	(i) cut ceiling joists on a wood frame building
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(H) cut and install ceiling joists on a wood frame building	(ii) install ceiling joists on a wood frame building
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(I) estimate the materials required for frame walls and ceilings	(i) estimate the materials required for frame walls
(8) The student knows how to lay out and frame walls and ceilings, rough-in door and window openings, construct corners and partition Ts, brace walls and ceilings, and apply sheathing. The student is expected to:	(I) estimate the materials required for frame walls and ceilings	(ii) estimate the materials required for frame ceilings

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(A) demonstrate an understanding of the terms associated with roof framing	(i) demonstrate an understanding of the terms associated with roof framing
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(B) identify the roof framing members used in gable and hip roofs	(i) identify the roof framing members used in gable roofs
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(B) identify the roof framing members used in gable and hip roofs	(ii) identify the roof framing members used in hip roofs
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(C) identify the methods used to calculate the length of a rafter	(i) identify the methods used to calculate the length of a rafter
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(D) identify the various types of trusses used in roof framing	(i) identify the various types of trusses used in roof framing
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(E) use a framing square, speed square, and calculator in laying out a roof	(i) use a framing square in laying out a roof

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(E) use a framing square, speed square, and calculator in laying out a roof	(ii) use a speed square in laying out a roof
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(E) use a framing square, speed square, and calculator in laying out a roof	(iii) use a calculator in laying out a roof
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(F) identify various types of sheathing used in roof construction	(i) identify various types of sheathing used in roof construction
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(G) frame a gable roof with vent openings	(i) frame a gable roof with vent openings
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(H) erect a gable roof using trusses	(i) erect a gable roof using trusses
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(I) frame a roof opening	(i) frame a roof opening

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(J) estimate the materials used for framing and sheathing a roof	(i) estimate the materials used for framing a roof
(9) The student gains knowledge of various types of framed roofs and how to frame these roofs using both stick-build and truss-build systems. The student is expected to:	(J) estimate the materials used for framing and sheathing a roof	(i) estimate the materials used for sheathing a roof
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(A) identify the properties of cement	(i) identify the properties of cement
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(B) describe the composition of concrete	(i) describe the composition of concrete
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(C) perform volume estimates for concrete	(i) perform volume estimates for concrete
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(D) identify types of concrete reinforcement materials and describe their uses	(i) identify types of concrete reinforcement materials
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(D) identify types of concrete reinforcement materials and describe their uses	(ii) describe [the] uses [of types of concrete reinforcement materials]

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(E) identify various types of footings and explain their uses	(i) identify various types of footings
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(E) identify various types of footings and explain their uses	(ii) explain [the] uses [of various types of footings]
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(F) identify the parts of various types of concrete forms	(i) identify the parts of various types of concrete forms
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(G) explain the safety procedures associated with the construction and use of concrete forms	(i) explain the safety procedures associated with the construction of concrete forms
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(G) explain the safety procedures associated with the construction and use of concrete forms	(ii) explain the safety procedures associated with the use of concrete forms
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(H) erect, plumb, and brace a simple concrete form with reinforcement	(i) erect a simple concrete form with reinforcement
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(H) erect, plumb, and brace a simple concrete form with reinforcement	(ii) plumb a simple concrete form with reinforcement

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student knows the ingredients of concrete, various types of concrete, and methods to mix concrete. The student is expected to:	(H) erect, plumb, and brace a simple concrete form with reinforcement	(iii) brace a simple concrete form with reinforcement
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(A) identify various types of fixed, sliding, and swinging windows	(i) identify various types of fixed windows
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(A) identify various types of fixed, sliding, and swinging windows	(ii) identify various types of sliding windows
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(A) identify various types of fixed, sliding, and swinging windows	(iii) identify various types of swinging windows
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(B) identify the parts of a window installation	(i) identify the parts of a window installation
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(C) state the requirements for proper window installation	(i) state the requirements for proper window installation
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(D) install a pre-hung window	(i) install a pre-hung window

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(E) identify the common types of exterior doors and explain how they are constructed	(i) identify the common types of exterior doors
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(E) identify the common types of exterior doors and explain how they are constructed	(ii) explain how [the common types of exterior doors] are constructed
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(F) identify the parts of a door installation	(i) identify the parts of a door installation
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(G) identify types of thresholds used with exterior doors	(i) identify types of thresholds used with exterior doors
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(H) install a pre-hung exterior door	(i) install a pre-hung exterior door
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(I) identify the various types of locksets used on exterior doors and explain how the locksets are installed	(i) identify the various types of locksets used on exterior doors
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(I) identify the various types of locksets used on exterior doors and explain how the locksets are installed	(ii) explain how the locksets are installed

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(J) install a lockset	(i) install a lockset
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(i) identify the use of various door and window hardware, including security hinges
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(ii) identify the use of various door and window hardware, including keepers
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(iii) identify the use of various door and window hardware, including deadbolts
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(iv) identify the use of various door and window hardware, including peep holes
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(v) identify the installation of various door and window hardware, including security hinges
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(vi) identify the installation of various door and window hardware, including keepers

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(vii) identify the installation of various door and window hardware, including deadbolts
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(viii) identify the installation of various door and window hardware, including peep holes
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(ix) explain the use of various door and window hardware, including security hinges
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(x) explain the use of various door and window hardware, including keepers
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xi) explain the use of various door and window hardware, including deadbolts
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xii) explain the use of various door and window hardware, including peep holes
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xiii) explain the installation of various door and window hardware, including security hinges

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xiv) explain the installation of various door and window hardware, including keepers
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xv) explain the installation of various door and window hardware, including deadbolts
(11) The student gains knowledge of various types of windows, skylights, and exterior doors. The student is expected to:	(K) identify and explain the use and installation of various door and window hardware, including security hinges, keepers, deadbolts, and peep holes	(xvi) explain the installation of various door and window hardware, including peep holes
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(A) identify the various types of stairs	(i) identify the various types of stairs
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(B) identify the various parts of stairs	(i) identify the various parts of stairs
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(C) identify the materials used in the construction of stairs	(i) identify the materials used in the construction of stairs
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(D) interpret construction drawings of stairs	(i) interpret construction drawings of stairs

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(i) calculate the total rise required for a given stairway
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(ii) calculate the number of risers required for a given stairway
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(iii) calculate the size of risers required for a given stairway
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(iv) calculate the number of treads required for a given stairway
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(E) calculate the total rise, number and size of risers, and the number and size of treads required for a given stairway	(v) calculate the size of treads required for a given stairway
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(F) lay out and cut stringers, risers, and treads	(i) lay out stringers
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(F) lay out and cut stringers, risers, and treads	(ii) lay out risers

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(F) lay out and cut stringers, risers, and treads	(iii) lay out treads
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(F) lay out and cut stringers, risers, and treads	(iv) cut stringers
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(F) lay out and cut stringers, risers, and treads	(v) cut risers
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(F) lay out and cut stringers, risers, and treads	(vi) cut treads
(12) The student is introduced to various types of stairs and the common building code requirements related to stairs. The student is expected to:	(G) build a small stair unit with a temporary handrail	(i) build a small stair unit with a temporary handrail

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.49. Construction Technology II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Construction Technology I. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Construction Technology II, students will gain advanced knowledge and skills needed to enter the workforce as carpenters, building maintenance technicians, or supervisors or to prepare for a postsecondary degree in construction management, architecture, or engineering. Students will build on the knowledge base from Construction Technology I and are introduced to exterior and interior finish out skills. For safety and liability considerations, limiting course enrollment to 15 students is recommended.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) explain the role of an employee in the construction industry	(i) explain the role of an employee in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate critical-thinking skills	(i) demonstrate critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate the ability to solve problems using critical-thinking skills	(i) demonstrate the ability to solve problems using critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate knowledge of basic computer systems	(i) demonstrate knowledge of basic computer systems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) explain common uses for computers in the construction industry	(i) explain common uses for computers in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) define effective relationship skills	(i) define effective relationship skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) recognize workplace issues such as sexual harassment, stress, and substance abuse	(i) recognize workplace issues

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(A) recognize the difference between commercial and residential construction drawings	(i) recognize the difference between commercial and residential construction drawings
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(B) identify the basic keys, abbreviations, and other references contained in a set of commercial drawings	(i) identify the basic keys contained in a set of commercial drawings
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(B) identify the basic keys, abbreviations, and other references contained in a set of commercial drawings	(ii) identify the abbreviations contained in a set of commercial drawings
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(B) identify the basic keys, abbreviations, and other references contained in a set of commercial drawings	(iii) identify the other references contained in a set of commercial drawings
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(C) accurately read a set of commercial drawings	(i) accurately read a set of commercial drawings
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(D) identify and document specific items from a door and window schedule	(i) identify specific items from a door schedule

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(D) identify and document specific items from a door and window schedule	(ii) identify specific items from a window schedule
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(D) identify and document specific items from a door and window schedule	(iii) document specific items from a door schedule
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(D) identify and document specific items from a door and window schedule	(iv) document specific items from a window schedule
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(E) explain basic construction details and concepts employed in commercial construction	(i) explain basic construction details employed in commercial construction
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(E) explain basic construction details and concepts employed in commercial construction	(ii) explain basic construction concepts employed in commercial construction
(2) The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:	(F) calculate the floor area of each room in a floor plan	(i) calculate the floor area of each room in a floor plan

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(A) identify the materials and methods used in roofing	(i) identify the materials used in roofing
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(A) identify the materials and methods used in roofing	(ii) identify the methods used in roofing
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(B) explain the safety requirements for roof jobs	(i) explain the safety requirements for roof jobs
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(C) install fiberglass shingles on gable and hip roofs	(i) install fiberglass shingles on gable roofs
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(C) install fiberglass shingles on gable and hip roofs	(ii) install fiberglass shingles on hip roofs
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(D) close up a valley using fiberglass shingles	(i) close up a valley using fiberglass shingles
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(E) explain how to make various roof projections watertight when using fiberglass shingles	(i) explain how to make various roof projections watertight when using fiberglass shingles

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(F) complete the proper cuts and install the main and hip ridge caps using fiberglass shingles	(i) complete the proper cuts
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(F) complete the proper cuts and install the main and hip ridge caps using fiberglass shingles	(ii) install the main ridge caps using fiberglass shingles
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(F) complete the proper cuts and install the main and hip ridge caps using fiberglass shingles	(iii) install the hip ridge caps using fiberglass shingles
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(G) lay out, cut, and install a cricket or saddle	(i) lay out a cricket or saddle
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(G) lay out, cut, and install a cricket or saddle	(ii) cut a cricket or saddle
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(G) lay out, cut, and install a cricket or saddle	(iii) install a cricket or saddle
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(H) install wood shingles and shakes on roofs	(i) install wood shingles on roofs

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(H) install wood shingles and shakes on roofs	(ii) install wood shakes on roofs
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(I) describe how to close up a valley using wood shingles and shakes	(i) describe how to close up a valley using wood shingles
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(I) describe how to close up a valley using wood shingles and shakes	(ii) describe how to close up a valley using wood shakes
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(J) complete the cuts and install the main and hip ridge caps using wood shakes or shingles	(i) complete the cuts
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(J) complete the cuts and install the main and hip ridge caps using wood shakes or shingles	(ii) install the main ridge caps using wood shakes or shingles
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(J) complete the cuts and install the main and hip ridge caps using wood shakes or shingles	(iii) install the hip ridge caps using wood shakes or shingles
(3) The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:	(K) demonstrate the techniques for installing other selected types of roofing materials	(i) demonstrate the techniques for installing other selected types of roofing materials

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(A) describe the requirements for insulation	(i) describe the requirements for insulation
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(B) describe the characteristics of various types of insulation material	(i) describe the characteristics of various types of insulation material
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(C) calculate the required amounts of insulation for a structure	(i) calculate the required amounts of insulation for a structure
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(D) install selected insulation materials	(i) install selected insulation materials
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(E) describe the requirements for moisture control and ventilation	(i) describe the requirements for moisture control
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(E) describe the requirements for moisture control and ventilation	(ii) describe the requirements for ventilation
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(F) install selected vapor barriers	(i) install selected vapor barriers

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(G) describe various methods of waterproofing	(i) describe various methods of waterproofing
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(H) describe air infiltration control requirements	(i) describe air infiltration control requirements
(4) The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:	(I) install selected building wraps	(i) install selected building wraps
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(A) describe the purpose of wall insulation and flashing	(i) describe the purpose of wall insulation
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(A) describe the purpose of wall insulation and flashing	(ii) describe the purpose of flashing
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(B) install selected common cornices	(i) install selected common cornices
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(C) demonstrate lap and panel siding estimating methods	(i) demonstrate lap siding estimating methods
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(C) demonstrate lap and panel siding estimating methods	(ii) demonstrate panel siding estimating methods

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(D) describe the types and applications of common wood siding	(i) describe the types of common wood siding
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(D) describe the types and applications of common wood siding	(ii) describe the applications of common wood siding
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(E) describe fiber-cement siding and its uses	(i) describe fiber-cement siding
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(E) describe fiber-cement siding and its uses	(ii) describe [fiber-cement siding's] uses
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(F) describe the types and styles of vinyl and metal siding	(i) describe the types of vinyl siding
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(F) describe the types and styles of vinyl and metal siding	(ii) describe the types of metal siding
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(F) describe the types and styles of vinyl and metal siding	(iii) describe the styles of vinyl siding
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(F) describe the types and styles of vinyl and metal siding	(iv) describe the styles of vinyl siding
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(G) describe the types and applications of stucco and masonry veneer finishes	(i) describe the types of stucco finishes

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(G) describe the types and applications of stucco and masonry veneer finishes	(ii) describe the types of masonry veneer finishes
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(G) describe the types and applications of stucco and masonry veneer finishes	(iii) describe the applications of stucco finishes
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(G) describe the types and applications of stucco and masonry veneer finishes	(iv) describe the applications of masonry veneer finishes
(5) The student learns the processes to install various exterior siding materials. The student is expected to:	(H) install three types of siding commonly used in the local area	(i) install three types of siding commonly used in the local area
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(A) identify the components of a steel framing system	(i) identify the components of a steel framing system
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(B) identify and select the tools and fasteners used in a steel framing system	(i) identify the tools used in a steel framing system
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(B) identify and select the tools and fasteners used in a steel framing system	(ii) identify the fasteners used in a steel framing system

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(B) identify and select the tools and fasteners used in a steel framing system	(iii) select the tools used in a steel framing system
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(B) identify and select the tools and fasteners used in a steel framing system	(iv) select the fasteners used in a steel framing system
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(C) identify applications for steel framing systems	(i) identify applications for steel framing systems
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(D) demonstrate the ability to build back-to-back, box, and L-headers	(i) demonstrate the ability to build back-to-back headers
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(D) demonstrate the ability to build back-to-back, box, and L-headers	(ii) demonstrate the ability to build box headers
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(D) demonstrate the ability to build back-to-back, box, and L-headers	(iii) demonstrate the ability to build L-headers

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(E) layout and install a steel stud structural wall with openings to include bracing and blocking	(i) layout a steel stud structural wall with openings to include bracing
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(E) layout and install a steel stud structural wall with openings to include bracing and blocking	(ii) layout a steel stud structural wall with openings to include blocking
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(E) layout and install a steel stud structural wall with openings to include bracing and blocking	(iii) install a steel stud structural wall with openings to include bracing
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(E) layout and install a steel stud structural wall with openings to include bracing and blocking	(iv) install a steel stud structural wall with openings to include blocking
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(F) layout and install a steel-stud, non-structural wall with openings to include bracing and blocking	(i) layout a steel-stud, non-structural wall with openings to include bracing
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(F) layout and install a steel-stud, non-structural wall with openings to include bracing and blocking	(ii) layout a steel-stud, non-structural wall with openings to include blocking

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(F) layout and install a steel-stud, non-structural wall with openings to include bracing and blocking	(iii) install a steel-stud, non-structural wall with openings to include bracing
(6) The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:	(F) layout and install a steel-stud, non-structural wall with openings to include bracing and blocking	(iv) install a steel-stud, non-structural wall with openings to include blocking
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(A) identify the different types of drywall and their uses	(i) identify the different types of drywall
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(A) identify the different types of drywall and their uses	(ii) identify [the different types of drywall's] uses
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(B) select the type and thickness of drywall required for specific installations	(i) select the type of drywall required for specific installations
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(B) select the type and thickness of drywall required for specific installations	(ii) select the thickness of drywall required for specific installations
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(C) select fasteners for drywall installations	(i) select fasteners for drywall installations

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(D) explain the fastener schedules for different types of drywall installations	(i) explain the fastener schedules for different types of drywall installations
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(E) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(i) perform single-layer drywall installations using different types of fastening systems, including nails
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(E) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(ii) perform single-layer drywall installations using different types of fastening systems, including drywall screws
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(E) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(iii) perform single-layer drywall installations using different types of fastening systems, including adhesives
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(E) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(iv) perform multi-layer drywall installations using different types of fastening systems, including nails
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(E) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(v) perform multi-layer drywall installations using different types of fastening systems, including drywall screws
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(E) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives	(vi) perform multi-layer drywall installations using different types of fastening systems, including adhesives

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(F) install gypsum drywall on steel studs	(i) install gypsum drywall on steel studs
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(G) explain how soundproofing is achieved in drywall installations	(i) explain how soundproofing is achieved in drywall installations
(7) The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expect to:	(H) estimate material quantities for a drywall installation	(i) estimate material quantities for a drywall installation
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(A) state the differences between the six levels of finish established by industry standards and distinguish between finish levels by observation	(i) state the differences between the six levels of finish established by industry standards
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(A) state the differences between the six levels of finish established by industry standards and distinguish between finish levels by observation	(ii) distinguish between finish levels by observation
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(B) identify the hand tools used in drywall finishing and demonstrate the ability to use these tools	(i) identify the hand tools used in drywall finishing
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(B) identify the hand tools used in drywall finishing and demonstrate the ability to use these tools	(ii) demonstrate the ability to use [the hand tools used in drywall finishing]

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(C) identify the automatic tools used in drywall finishing	(i) identify the automatic tools used in drywall finishing
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(i) identify the materials used in drywall finishing
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(ii) state the purpose of each type of material, including compounds
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(iii) state the purpose of each type of material, including joint reinforcing tapes
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(iv) state the purpose of each type of material, including trim materials
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(v) state the purpose of each type of material, including textures

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(vi) state the purpose of each type of material, including coatings
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(vii) state the use of each type of material, including compounds
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(viii) state the use of each type of material, including joint reinforcing tapes
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(ix) state the use of each type of material, including trim materials
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(x) state the use of each type of material, including textures
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings	(xi) state the use of each type of material, including coatings

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(E) finish drywall using hand tools	(i) finish drywall using hand tools
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(F) recognize various types of problems that occur in drywall finishes and identify their causes	(i) recognize various types of problems that occur in drywall finishes
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(F) recognize various types of problems that occur in drywall finishes and identify their causes	(ii) identify [the] causes [of various types of problems that occur in drywall finishes]
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(G) identify the correct methods for solving each type of problem that occurs in drywall finishes	(i) identify the correct methods for solving each type of problem that occurs in drywall finishes
(8) The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:	(H) patch damaged drywall	(i) patch damaged drywall
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(A) identify various types of door jambs and frames	(i) identify various types of door jambs
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(A) identify various types of door jambs and frames	(ii) identify various types of door frames

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(B) demonstrate the installation procedures for placing door jambs and frames in different types of interior partitions	(i) demonstrate the installation procedures for placing door jambs in different types of interior partitions
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(B) demonstrate the installation procedures for placing door jambs and frames in different types of interior partitions	(ii) demonstrate the installation procedures for placing door frames in different types of interior partitions
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(C) identify different types of interior doors	(i) identify different types of interior doors
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(D) identify different types of interior door hardware and demonstrate the installation procedures for them	(i) identify different types of interior door hardware
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(D) identify different types of interior door hardware and demonstrate the installation procedures for them	(ii) demonstrate the installation procedures for [different types of interior door hardware]
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(E) list and identify items included on a typical door schedule	(i) list items included on a typical door schedule
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(E) list and identify items included on a typical door schedule	(ii) identify items included on a typical door schedule

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(F) demonstrate the procedure for placing and hanging a door	(i) demonstrate the procedure for placing a door
(9) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:	(F) demonstrate the procedure for placing and hanging a door	(ii) demonstrate the procedure for hanging a door
(10) The student gains knowledge of the materials, layout, and installation of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(A) establish a level line	(i) establish a level line
(10) The student gains knowledge of the materials, layout, and installation of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(B) explain the common terms related to sound waves and acoustical ceiling materials	(i) explain the common terms related to sound waves
(10) The student gains knowledge of the materials, layout, and installation of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(B) explain the common terms related to sound waves and acoustical ceiling materials	(ii) explain the common terms related to acoustical ceiling materials
(10) The student gains knowledge of the materials, layout, and installation of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(C) identify the different types of suspended ceilings	(i) identify the different types of suspended ceilings

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student gains knowledge of the materials, layout, and installation of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(D) interpret plans related to ceiling layout	(i) interpret plans related to ceiling layout
(10) The student gains knowledge of the materials, layout, and installation of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(E) sketch the ceiling layout for a basic suspended ceiling	(i) sketch the ceiling layout for a basic suspended ceiling
(10) The student gains knowledge of the materials, layout, and installation of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings. The student is expected to:	(F) install selected suspended ceilings	(i) install selected suspended ceilings
(11) The student knows the types of trim used in finish work. The student is expected to:	(A) identify the different types of standard moldings and describe their uses	(i) identify the different types of standard moldings
(11) The student knows the types of trim used in finish work. The student is expected to:	(A) identify the different types of standard moldings and describe their uses	(ii) describe [the different types of standard molding's] uses
(11) The student knows the types of trim used in finish work. The student is expected to:	(B) make square and miter cuts using a miter box or power miter saw	(i) make square cuts using a miter box or power miter saw
(11) The student knows the types of trim used in finish work. The student is expected to:	(B) make square and miter cuts using a miter box or power miter saw	(ii) make miter cuts using a miter box or power miter saw

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student knows the types of trim used in finish work. The student is expected to:	(C) make coped joint cuts using a coping saw	(i) make coped joint cuts using a coping saw
(11) The student knows the types of trim used in finish work. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(i) select fasteners to install trim, including door trim
(11) The student knows the types of trim used in finish work. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(ii) select fasteners to install trim, including window trim
(11) The student knows the types of trim used in finish work. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(iii) select fasteners to install trim, including base trim
(11) The student knows the types of trim used in finish work. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(iv) select fasteners to install trim, including ceiling trim
(11) The student knows the types of trim used in finish work. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(v) use fasteners to install trim, including door trim
(11) The student knows the types of trim used in finish work. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(vi) use fasteners to install trim, including window trim
(11) The student knows the types of trim used in finish work. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(vii) use fasteners to install trim, including base trim
(11) The student knows the types of trim used in finish work. The student is expected to:	(D) select and use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim	(viii) use fasteners to install trim, including ceiling trim

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student knows the types of trim used in finish work. The student is expected to:	(E) estimate the quantities of different trim materials required for selected rooms	(i) estimate the quantities of different trim materials required for selected rooms
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(A) state the classes and sizes of typical base and wall kitchen cabinets	(i) state the classes of typical base cabinets
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(A) state the classes and sizes of typical base and wall kitchen cabinets	(ii) state the classes of typical wall kitchen cabinets
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(A) state the classes and sizes of typical base and wall kitchen cabinets	(iii) state the sizes of typical base cabinets
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(A) state the classes and sizes of typical base and wall kitchen cabinets	(iv) state the sizes of typical wall kitchen cabinets
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(B) identify cabinet components and hardware and describe their purposes	(i) identify cabinet components
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(B) identify cabinet components and hardware and describe their purposes	(ii) identify cabinet hardware
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(B) identify cabinet components and hardware and describe their purposes	(iii) describe [cabinet component's] purposes
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(B) identify cabinet components and hardware and describe their purposes	(iv) describe [cabinet hardware's] purposes

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(C) lay out factory-made cabinets, countertops, and backsplashes	(i) lay out factory-made cabinets
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(C) lay out factory-made cabinets, countertops, and backsplashes	(ii) lay out factory-made countertops
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(C) lay out factory-made cabinets, countertops, and backsplashes	(iii) lay out factory-made backsplashes
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(D) explain the installation of an island base	(i) explain the installation of an island base
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(E) recognize the common types of woods used to make cabinets	(i) recognize the common types of woods used to make cabinets
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(F) identify and cut the various types of joints used in cabinetmaking	(i) identify the various types of joints used in cabinetmaking
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(F) identify and cut the various types of joints used in cabinetmaking	(ii) cut the various types of joints used in cabinetmaking
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(G) build a cabinet from a set of drawings	(i) build a cabinet from a set of drawings
(12) The student selects and installs base and wall cabinets and countertops. The student is expected to:	(H) install plastic laminate on a countertop core	(i) install plastic laminate on a countertop core

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.50. Mill and Cabinet Making Technology (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Recommended prerequisites: Principles of Architecture and Principles of Construction. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Mill and Cabinetmaking Technology, students will gain knowledge and skills needed to enter the workforce in the area of mill work and cabinet manufacturing and installation. Students may also apply these skills to professions in carpentry or building maintenance supervision or use the skills as a foundation for a postsecondary degree in construction management, architecture, or engineering. Students will acquire knowledge and skills in cabinet design, tool usage, jointing methods, finishes, and industry-level practices such as numerical and computer-control production methods.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship and preparation requirements for mill and cabinetmaking	(i) identify employment opportunities, including entrepreneurship for mill and cabinetmaking
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship and preparation requirements for mill and cabinetmaking	(ii) identify employment preparation requirements for mill and cabinetmaking
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(i) demonstrate an understanding of group participation related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(ii) demonstrate an understanding of group participation related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iii) demonstrate an understanding of leadership related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iv) demonstrate an understanding of leadership related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations and appropriate work habits	(i) identify employers' expectations

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations and appropriate work habits	(ii) identify appropriate work habits
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(i) apply the competencies related to resources in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(ii) apply the competencies related to information in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(iii) apply the competencies related to systems in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(iv) apply the competencies related to technology in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate government regulations	(i) demonstrate knowledge of the concepts related to health and safety in the workplace, as specified by appropriate government regulations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate government regulations	(ii) demonstrate knowledge of the skills related to health and safety in the workplace, as specified by appropriate government regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(i) demonstrate effective verbal communication skills with individuals from varied cultures, including fellow workers
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(ii) demonstrate effective verbal communication skills with individuals from varied cultures, including managers
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iii) demonstrate effective verbal communication skills with individuals from varied cultures, including customers
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iv) demonstrate effective written communication skills with individuals from varied cultures, including fellow workers
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(v) demonstrate effective written communication skills with individuals from varied cultures, including managers
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(vi) demonstrate effective written communication skills with individuals from varied cultures, including customers

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(B) complete work orders and related paperwork	(i) complete work orders
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(B) complete work orders and related paperwork	(ii) complete related paperwork
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(C) estimate supplies, materials, and labor costs for work orders	(i) estimate supplies for work orders
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(C) estimate supplies, materials, and labor costs for work orders	(ii) estimate materials for work orders
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(C) estimate supplies, materials, and labor costs for work orders	(iii) estimate labor costs for work orders
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(D) apply the principles of mathematics for accurate standard and metric measurements	(i) apply the principles of mathematics for accurate standard measurements
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(D) apply the principles of mathematics for accurate standard and metric measurements	(ii) apply the principles of mathematics for accurate metric measurements

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(E) read and interpret appropriate blueprints, drawings, charts, and diagrams	(i) read appropriate blueprints
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(E) read and interpret appropriate blueprints, drawings, charts, and diagrams	(ii) read appropriate drawings
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(E) read and interpret appropriate blueprints, drawings, charts, and diagrams	(iii) read appropriate charts
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(E) read and interpret appropriate blueprints, drawings, charts, and diagrams	(iv) read appropriate diagrams
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(E) read and interpret appropriate blueprints, drawings, charts, and diagrams	(v) interpret appropriate blueprints
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(E) read and interpret appropriate blueprints, drawings, charts, and diagrams	(vi) interpret appropriate drawings
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(E) read and interpret appropriate blueprints, drawings, charts, and diagrams	(vii) interpret appropriate charts

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of mill and cabinetmaking. The student is expected to:	(E) read and interpret appropriate blueprints, drawings, charts, and diagrams	(viii) interpret appropriate diagrams
(3) The student knows the concepts and skills that form the core knowledge of mill and cabinetmaking. The student is expected to:	(A) demonstrate knowledge of cabinetmaking design	(i) demonstrate knowledge of cabinetmaking design
(3) The student knows the concepts and skills that form the core knowledge of mill and cabinetmaking. The student is expected to:	(B) demonstrate knowledge of the use of woods, fasteners, hardware, glass, and mirrors	(i) demonstrate knowledge of the use of woods
(3) The student knows the concepts and skills that form the core knowledge of mill and cabinetmaking. The student is expected to:	(B) demonstrate knowledge of the use of woods, fasteners, hardware, glass, and mirrors	(ii) demonstrate knowledge of the use of fasteners
(3) The student knows the concepts and skills that form the core knowledge of mill and cabinetmaking. The student is expected to:	(B) demonstrate knowledge of the use of woods, fasteners, hardware, glass, and mirrors	(iii) demonstrate knowledge of the use of hardware
(3) The student knows the concepts and skills that form the core knowledge of mill and cabinetmaking. The student is expected to:	(B) demonstrate knowledge of the use of woods, fasteners, hardware, glass, and mirrors	(iv) demonstrate knowledge of the use of glass
(3) The student knows the concepts and skills that form the core knowledge of mill and cabinetmaking. The student is expected to:	(B) demonstrate knowledge of the use of woods, fasteners, hardware, glass, and mirrors	(v) demonstrate knowledge of the use of mirrors

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student knows the concepts and skills that form the core knowledge of mill and cabinetmaking. The student is expected to:	(C) demonstrate knowledge of the industrial processes and procedures used in mill and cabinetmaking	(i) demonstrate knowledge of the industrial processes used in mill and cabinetmaking
(3) The student knows the concepts and skills that form the core knowledge of mill and cabinetmaking. The student is expected to:	(C) demonstrate knowledge of the industrial processes and procedures used in mill and cabinetmaking	(ii) demonstrate knowledge of the industrial procedures used in mill and cabinetmaking
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(A) use in a safe manner hand and power tools and equipment commonly employed in mill and cabinetmaking	(i) use in a safe manner hand tools commonly employed in mill and cabinetmaking
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(A) use in a safe manner hand and power tools and equipment commonly employed in mill and cabinetmaking	(ii) use in a safe manner power tools commonly employed in mill and cabinetmaking
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(A) use in a safe manner hand and power tools and equipment commonly employed in mill and cabinetmaking	(iii) use in a safe manner equipment commonly employed in mill and cabinetmaking
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in mill and cabinetmaking	(i) handle environmentally hazardous materials used in mill and cabinetmaking
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in mill and cabinetmaking	(ii) dispose of environmentally hazardous materials used in mill and cabinetmaking

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(C) demonstrate the proper procedures to saw, plane, shape, turn, bore, mortise, and sand various types of woods	(i) demonstrate the proper procedures to saw various types of woods
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(C) demonstrate the proper procedures to saw, plane, shape, turn, bore, mortise, and sand various types of woods	(ii) demonstrate the proper procedures to plane various types of woods
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(C) demonstrate the proper procedures to saw, plane, shape, turn, bore, mortise, and sand various types of woods	(iii) demonstrate the proper procedures to shape various types of woods
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(C) demonstrate the proper procedures to saw, plane, shape, turn, bore, mortise, and sand various types of woods	(iv) demonstrate the proper procedures to turn various types of woods
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(C) demonstrate the proper procedures to saw, plane, shape, turn, bore, mortise, and sand various types of woods	(v) demonstrate the proper procedures to bore various types of woods
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(C) demonstrate the proper procedures to saw, plane, shape, turn, bore, mortise, and sand various types of woods	(vi) demonstrate the proper procedures to mortise various types of woods
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(C) demonstrate the proper procedures to saw, plane, shape, turn, bore, mortise, and sand various types of woods	(vii) demonstrate the proper procedures to sand various types of woods

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(D) demonstrate knowledge of new and emerging technologies that may affect mill and cabinetmaking	(i) demonstrate knowledge of new technologies that may affect mill and cabinetmaking
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in mill and cabinetmaking. The student is expected to:	(D) demonstrate knowledge of new and emerging technologies that may affect mill and cabinetmaking	(ii) demonstrate knowledge of emerging technologies that may affect mill and cabinetmaking
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(A) identify and construct the various joints used in cabinetmaking	(i) identify the various joints used in cabinetmaking
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(A) identify and construct the various joints used in cabinetmaking	(ii) construct the various joints used in cabinetmaking
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(B) demonstrate the proper procedures to glue, clamp, laminate, veneer, and inlay wood	(i) demonstrate the proper procedures to glue wood
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(B) demonstrate the proper procedures to glue, clamp, laminate, veneer, and inlay wood	(ii) demonstrate the proper procedures to clamp wood
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(B) demonstrate the proper procedures to glue, clamp, laminate, veneer, and inlay wood	(iii) demonstrate the proper procedures to laminate wood

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(B) demonstrate the proper procedures to glue, clamp, laminate, veneer, and inlay wood	(iv) demonstrate the proper procedures to veneer wood
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(B) demonstrate the proper procedures to glue, clamp, laminate, veneer, and inlay wood	(v) demonstrate the proper procedures to inlay wood
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(i) demonstrate the proper procedures to construct cabinet doors
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(ii) demonstrate the proper procedures to construct furniture doors
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(iii) demonstrate the proper procedures to construct drawers
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(iv) demonstrate the proper procedures to construct drawer guides

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(v) demonstrate the proper procedures to construct shelves
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(vi) demonstrate the proper procedures to construct cabinet interiors
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(vii) demonstrate the proper procedures to construct legs
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(viii) demonstrate the proper procedures to construct posts
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(ix) demonstrate the proper procedures to construct table tops
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(x) demonstrate the proper procedures to construct cabinet tops

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xi) demonstrate the proper procedures to install cabinet doors
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xii) demonstrate the proper procedures to install furniture doors
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xiii) demonstrate the proper procedures to install drawers
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xiv) demonstrate the proper procedures to install drawer guides
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xv) demonstrate the proper procedures to install shelves
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xvi) demonstrate the proper procedures to install cabinet interiors

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xvii) demonstrate the proper procedures to install legs
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xviii) demonstrate the proper procedures to install posts
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xix) demonstrate the proper procedures to install table tops
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(C) demonstrate the proper procedures to construct and install cabinet doors, furniture doors, drawers, drawer guides, shelves, cabinet interiors, legs, posts, table tops, and cabinet tops	(xx) demonstrate the proper procedures to install cabinet tops
(5) The student applies the concepts and skills of mill and cabinetmaking to simulated and actual work situations. The student is expected to:	(D) apply proper finishing techniques	(i) apply proper finishing techniques

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.51. Masonry Technology I (Two Credits), Adopted 2015.
(a) General Requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Construction. Students shall be awarded two credits for successful completion of this course.	
(b) Introduction.	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Masonry Technology I provides information and techniques related to basic masonry and safety precautions. For safety and liability considerations, limiting course enrollment to 15 students is recommended.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) explain the role of an employee in the construction industry	(i) explain the role of an employee in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate critical-thinking skills	(i) demonstrate critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate the ability to solve problems using critical-thinking skills	(i) demonstrate the ability to solve problems using critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate knowledge of basic computer systems	(i) demonstrate knowledge of basic computer systems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) explain common uses for computers in the construction industry	(i) explain common uses for computers in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) define effective relationship skills	(i) define effective relationship skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) recognize workplace issues such as sexual harassment, stress, and substance abuse	(i) recognize workplace issues

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student describes materials and techniques used in basic masonry. The student is expected to:	(A) explain how concrete masonry units (CMUs), or blocks, are used in construction	(i) explain how concrete masonry units (CMUs), or blocks, are used in construction
(2) The student describes materials and techniques used in basic masonry. The student is expected to:	(B) explain how clay masonry units (bricks) are used in construction	(i) explain how clay masonry units (bricks) are used in construction
(2) The student describes materials and techniques used in basic masonry. The student is expected to:	(C) explain how stone is used in construction	(i) explain how stone is used in construction
(2) The student describes materials and techniques used in basic masonry. The student is expected to:	(D) describe how mortar and grout are used in masonry construction	(i) describe how mortar is used in masonry construction
(2) The student describes materials and techniques used in basic masonry. The student is expected to:	(D) describe how mortar and grout are used in masonry construction	(ii) describe how grout is used in masonry construction
(2) The student describes materials and techniques used in basic masonry. The student is expected to:	(E) describe how wall structures are created using masonry units	(i) describe how wall structures are created using masonry units
(3) The student identifies safe practices and expectations for the masonry industry. The student is expected to:	(A) identify the costs of job accidents	(i) identify the costs of job accidents
(3) The student identifies safe practices and expectations for the masonry industry. The student is expected to:	(B) identify the causes of job accidents	(i) identify the causes of job accidents

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student identifies safe practices and expectations for the masonry industry. The student is expected to:	(C) recognize the hazards	(i) recognize the hazards
(3) The student identifies safe practices and expectations for the masonry industry. The student is expected to:	(D) demonstrate proper housekeeping techniques	(i) demonstrate proper housekeeping techniques
(3) The student identifies safe practices and expectations for the masonry industry. The student is expected to:	(E) observe mortar and concrete safety	(i) observe mortar safety
(3) The student identifies safe practices and expectations for the masonry industry. The student is expected to:	(E) observe mortar and concrete safety	(ii) observe concrete safety
(3) The student identifies safe practices and expectations for the masonry industry. The student is expected to:	(F) observe flammable liquid safety	(i) observe flammable liquid safety
(4) The student demonstrates awareness of safe practices and expectations for the masonry industry and recognizes proper personal protective equipment. The student is expected to:	(A) explain protective lenses and face shields	(i) explain protective lenses
(4) The student demonstrates awareness of safe practices and expectations for the masonry industry and recognizes proper personal protective equipment. The student is expected to:	(A) explain protective lenses and face shields	(ii) explain protective face shields

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student demonstrates awareness of safe practices and expectations for the masonry industry and recognizes proper personal protective equipment. The student is expected to:	(B) describe hearing protection	(i) describe hearing protection
(4) The student demonstrates awareness of safe practices and expectations for the masonry industry and recognizes proper personal protective equipment. The student is expected to:	(C) identify gloves used in the masonry trade	(i) identify gloves used in the masonry trade
(4) The student demonstrates awareness of safe practices and expectations for the masonry industry and recognizes proper personal protective equipment. The student is expected to:	(D) use respirators	(i) use respirators
(5) The student understands the importance of being trained in and aware of safe practices and expectations for the masonry industry, including working safely from elevated surfaces. The student is expected to:	(A) explain fall protection procedures	(i) explain fall protection procedures
(5) The student understands the importance of being trained in and aware of safe practices and expectations for the masonry industry, including working safely from elevated surfaces. The student is expected to:	(B) describe personal fall arrest systems	(i) describe personal fall arrest systems
(5) The student understands the importance of being trained in and aware of safe practices and expectations for the masonry industry, including working safely from elevated surfaces. The student is expected to:	(C) list basic scaffold safety guidelines	(i) list basic scaffold safety guidelines

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student understands the importance of being trained in and aware of safe practices and expectations for the masonry industry, including working safely from elevated surfaces. The student is expected to:	(D) explain how to protect against falling objects	(i) explain how to protect against falling objects
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(A) explain the safe use of hand tools	(i) explain the safe use of hand tools
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(B) demonstrate the safe use of saws	(i) demonstrate the safe use of saws
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(C) explain the safe use of mixers	(i) explain the safe use of mixers
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(D) explain the safe use of grinders	(i) explain the safe use of grinders
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(E) describe the safe use of powder-actuated tools	(i) describe the safe use of powder-actuated tools
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(F) explain how to work safely around a fork lift	(i) explain how to work safely around a fork lift

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(G) list basic electrical safety guidelines	(i) list basic electrical safety guidelines
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(H) explain how to store and stockpile masonry materials safely	(i) explain how to store masonry materials safely
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(H) explain how to store and stockpile masonry materials safely	(ii) explain how to stockpile masonry materials safely
(6) The student explains safe practices and expectations for the masonry industry. The student is expected to:	(I) demonstrate how to stack brick safely	(i) demonstrate how to stack brick safely
(7) The student identifies masonry hand tools. The student is expected to:	(A) demonstrate how to use trowels	(i) demonstrate how to use trowels
(7) The student identifies masonry hand tools. The student is expected to:	(B) demonstrate how to use hammers and chisels	(i) demonstrate how to use hammers
(7) The student identifies masonry hand tools. The student is expected to:	(B) demonstrate how to use hammers and chisels	(ii) demonstrate how to use chisels
(7) The student identifies masonry hand tools. The student is expected to:	(C) demonstrate how to use jointers and brushes	(i) demonstrate how to use jointers

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student identifies masonry hand tools. The student is expected to:	(C) demonstrate how to use jointers and brushes	(ii) demonstrate how to use brushes
(7) The student identifies masonry hand tools. The student is expected to:	(D) identify other hand tools used in masonry	(i) identify other hand tools used in masonry
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(A) demonstrate how to use the modular spacing rule, brick spacing rule, oversized brick spacing rule, and steel tape measure	(i) demonstrate how to use the modular spacing rule
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(A) demonstrate how to use the modular spacing rule, brick spacing rule, oversized brick spacing rule, and steel tape measure	(ii) demonstrate how to use the brick spacing rule
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(A) demonstrate how to use the modular spacing rule, brick spacing rule, oversized brick spacing rule, and steel tape measure	(iii) demonstrate how to use the oversized brick spacing rule
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(A) demonstrate how to use the modular spacing rule, brick spacing rule, oversized brick spacing rule, and steel tape measure	(iv) demonstrate how to use the steel tape measure
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(B) demonstrate how to use levels	(i) demonstrate how to use levels
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(C) demonstrate how to use chalk boxes, squares, plumb-bobs, and laser levels	(i) demonstrate how to use chalk boxes

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(C) demonstrate how to use chalk boxes, squares, plumb-bobs, and laser levels	(ii) demonstrate how to use squares
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(C) demonstrate how to use chalk boxes, squares, plumb-bobs, and laser levels	(iii) demonstrate how to use plumb-bobs
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(C) demonstrate how to use chalk boxes, squares, plumb-bobs, and laser levels	(iv) demonstrate how to use laser levels
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(D) demonstrate how to use corner poles, lines, and fasteners	(i) demonstrate how to use corner poles
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(D) demonstrate how to use corner poles, lines, and fasteners	(ii) demonstrate how to use lines
(8) The student understands the importance of measurements and measuring tools used in masonry. The student is expected to:	(D) demonstrate how to use corner poles, lines, and fasteners	(iii) demonstrate how to use fasteners

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.52. Masonry Technology II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Masonry Technology I. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Masonry Technology II is designed to further enhance the skills and knowledge of the beginning masonry student. For safety and liability considerations, limiting course enrollment to 15 students is recommended.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) explain the role of an employee in the construction industry	(i) explain the role of an employee in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate critical-thinking skills	(i) demonstrate critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate the ability to solve problems using critical-thinking skills	(i) demonstrate the ability to solve problems using critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate knowledge of basic computer systems	(i) demonstrate knowledge of basic computer systems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) explain common uses for computers in the construction industry	(i) explain common uses for computers in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) define effective relationship skills	(i) define effective relationship skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) recognize workplace issues such as sexual harassment, stress, and substance abuse	(i) recognize workplace issues

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(A) read a six-foot rule	(i) read a six-foot rule
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(B) read other measuring devices	(i) read other measuring devices
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(C) read a mason's rule	(i) read a mason's rule
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(D) apply the 3-4-5 formula to square a corner	(i) apply the 3-4-5 formula to square a corner
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(E) recognize modular increments	(i) recognize modular increments
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(F) describe how to determine areas and circumferences	(i) describe how to determine areas
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(F) describe how to determine areas and circumferences	(ii) describe how to determine circumferences

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(G) explain the basic parts of a set of drawings	(i) explain the basic parts of a set of drawings
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(H) identify lines, symbols, and abbreviations used on drawings	(i) identify lines used on drawings
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(H) identify lines, symbols, and abbreviations used on drawings	(ii) identify symbols used on drawings
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(H) identify lines, symbols, and abbreviations used on drawings	(iii) identify abbreviations used on drawings
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(I) explain scales and dimensions used on drawings	(i) explain scales used on drawings
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(I) explain scales and dimensions used on drawings	(ii) explain dimensions used on drawings
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(J) explain types of construction drawings	(i) explain types of construction drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(K) identify the purpose of specifications, standards, and codes used in the building industry and the sections that pertain to masonry	(i) identify the purpose of specifications used in the building industry
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(K) identify the purpose of specifications, standards, and codes used in the building industry and the sections that pertain to masonry	(ii) identify the sections [of specifications used in the building industry] that pertain to masonry
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(K) identify the purpose of specifications, standards, and codes used in the building industry and the sections that pertain to masonry	(iii) identify the purpose of standards used in the building industry
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(K) identify the purpose of specifications, standards, and codes used in the building industry and the sections that pertain to masonry	(iv) identify the sections [of standards used in the building industry] that pertain to masonry
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(K) identify the purpose of specifications, standards, and codes used in the building industry and the sections that pertain to masonry	(v) identify the purpose of codes used in the building industry
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(K) identify the purpose of specifications, standards, and codes used in the building industry and the sections that pertain to masonry	(vi) identify the sections [of codes used in the building industry] that pertain to masonry
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(L) explain the purpose of specifications, standards, and codes	(i) explain the purpose of specifications

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(L) explain the purpose of specifications, standards, and codes	(ii) explain the purpose of standards
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(L) explain the purpose of specifications, standards, and codes	(iii) explain the purpose of codes
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(M) describe the purpose of inspections and testing	(i) describe the purpose of inspections
(2) The student recognizes mathematical concepts used in masonry and is able to apply mathematical concepts used in masonry. The student is expected to:	(M) describe the purpose of inspections and testing	(ii) describe the purpose of testing
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(A) explain the use of Portland cement, hydrated lime, and sand	(i) explain the use of Portland cement
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(A) explain the use of Portland cement, hydrated lime, and sand	(ii) explain the use of hydrated lime
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(A) explain the use of Portland cement, hydrated lime, and sand	(iii) explain the use of sand
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(B) identify masonry cement	(i) identify masonry cement

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(C) explain pre-blended mortars	(i) explain pre-blended mortars
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(D) explain the use of water and admixtures	(i) explain the use of water
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(D) explain the use of water and admixtures	(ii) explain the use of admixtures
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(E) list the types of masonry mortars	(i) list the types of masonry mortars
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(F) explain the properties of plastic mortar	(i) explain the properties of plastic mortar
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(G) identify the properties of hardened mortar	(i) identify the properties of hardened mortar
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(H) identify the common problems found in mortar application and their solutions	(i) identify the common problems found in mortar application
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(H) identify the common problems found in mortar application and their solutions	(ii) identify [the] solutions [to common problems found in mortar application]
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(I) describe the effects of improper proportioning and poor-quality materials	(i) describe the effects of improper proportioning

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(I) describe the effects of improper proportioning and poor-quality materials	(ii) describe the effects of poor-quality materials
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(J) explain the effects of severe weather and tempering	(i) explain the effects of severe weather
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(J) explain the effects of severe weather and tempering	(ii) explain the effects of tempering
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(K) describe efflorescence	(i) describe efflorescence
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(L) set up, maintain, and dispose of mortar	(i) set up mortar
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(L) set up, maintain, and dispose of mortar	(ii) maintain mortar
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(L) set up, maintain, and dispose of mortar	(iii) dispose of mortar
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(M) maintain the mortar mixing area	(i) maintain the mortar mixing area
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(N) set up a mixing area	(i) set up a mixing area

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student learns to describe the ingredients and types of mortar. The student is expected to:	(O) mix mortar with a power mixer	(i) mix mortar with a power mixer
(4) The student describes how to install concrete masonry units. The student is expected to:	(A) identify the characteristics of concrete masonry units	(i) identify the characteristics of concrete masonry units
(4) The student describes how to install concrete masonry units. The student is expected to:	(B) explain how to set up, layout, and bond concrete masonry units	(i) explain how to set up concrete masonry units
(4) The student describes how to install concrete masonry units. The student is expected to:	(B) explain how to set up, layout, and bond concrete masonry units	(ii) explain how to layout concrete masonry units
(4) The student describes how to install concrete masonry units. The student is expected to:	(B) explain how to set up, layout, and bond concrete masonry units	(iii) explain how to bond concrete masonry units
(4) The student describes how to install concrete masonry units. The student is expected to:	(C) explain how to lay and tool concrete masonry units	(i) explain how to lay concrete masonry units
(4) The student describes how to install concrete masonry units. The student is expected to:	(C) explain how to lay and tool concrete masonry units	(ii) explain how to tool concrete masonry units
(4) The student describes how to install concrete masonry units. The student is expected to:	(D) explain how to clean concrete masonry units	(i) explain how to clean concrete masonry units
(4) The student describes how to install concrete masonry units. The student is expected to:	(E) identify the characteristics of brick	(i) identify the characteristics of brick

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student describes how to install concrete masonry units. The student is expected to:	(F) demonstrate how to set up, layout, and bond brick	(i) demonstrate how to set up brick
(4) The student describes how to install concrete masonry units. The student is expected to:	(F) demonstrate how to set up, layout, and bond brick	(ii) demonstrate how to layout brick
(4) The student describes how to install concrete masonry units. The student is expected to:	(F) demonstrate how to set up, layout, and bond brick	(iii) demonstrate how to bond brick
(4) The student describes how to install concrete masonry units. The student is expected to:	(G) demonstrate how to lay and tool brick	(i) demonstrate how to lay brick
(4) The student describes how to install concrete masonry units. The student is expected to:	(G) demonstrate how to lay and tool brick	(ii) demonstrate how to tool brick
(4) The student describes how to install concrete masonry units. The student is expected to:	(H) demonstrate how to clean brick	(i) demonstrate how to clean brick
(4) The student describes how to install concrete masonry units. The student is expected to:	(I) cut with chisels and hammers	(i) cut with chisels
(4) The student describes how to install concrete masonry units. The student is expected to:	(I) cut with chisels and hammers	(ii) cut with hammers
(4) The student describes how to install concrete masonry units. The student is expected to:	(J) cut with masonry hammers	(i) cut with masonry hammers

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student describes how to install concrete masonry units. The student is expected to:	(K) cut with saws and splitters	(i) cut with saws
(4) The student describes how to install concrete masonry units. The student is expected to:	(K) cut with saws and splitters	(ii) cut with splitters
(4) The student describes how to install concrete masonry units. The student is expected to:	(L) check units and cuts	(i) check units
(4) The student describes how to install concrete masonry units. The student is expected to:	(L) check units and cuts	(ii) check cuts
(4) The student describes how to install concrete masonry units. The student is expected to:	(M) install masonry reinforcements	(i) install masonry reinforcements
(4) The student describes how to install concrete masonry units. The student is expected to:	(N) install masonry accessories	(i) install masonry accessories

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.53. Architectural Design I (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Prerequisites: Algebra I and English I. Recommended prerequisites: Geometry, Principles of Architecture, and Principles of Construction. Students shall be awarded one credit for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Architectural Design I, students will gain knowledge and skills needed to enter a career in architecture or construction or prepare a foundation toward a postsecondary degree in architecture, construction science, drafting, interior design, or landscape architecture. Architectural Design I includes the knowledge of the design, design history, techniques, and tools related to the production of drawings, renderings, and scaled models for nonresidential or residential architectural purposes.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship, and preparation requirements in the field of architecture	(i) identify employment opportunities, including entrepreneurship in the field of architecture
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship, and preparation requirements in the field of architecture	(ii) identify employment preparation requirements in the field of architecture
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(i) demonstrate an understanding of group participation related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(ii) demonstrate an understanding of group participation related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iii) demonstrate an understanding of leadership related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iv) demonstrate an understanding of leadership related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations and appropriate work habits	(i) identify employers' expectations

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations and appropriate work habits	(ii) identify appropriate work habits
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(i) apply the competencies related to resources in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(ii) apply the competencies related to information in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(iii) apply the competencies related to systems in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(iv) apply the competencies related to technology in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate government regulations	(i) demonstrate knowledge of the concepts related to health and safety in the workplace, as specified by appropriate government regulations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate government regulations	(ii) demonstrate knowledge of the skills related to health and safety in the workplace, as specified by appropriate government regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(A) self-monitor learning needs and seek assistance when needed	(i) self-monitor learning needs
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(A) self-monitor learning needs and seek assistance when needed	(ii) seek assistance when needed
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(B) practice study habits necessary to manage academic pursuits and requirements	(i) practice study habits necessary to manage academic pursuits
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(B) practice study habits necessary to manage academic pursuits and requirements	(ii) practice study habits necessary to manage academic requirements
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(C) strive for accuracy and precision	(i) strive for accuracy
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(C) strive for accuracy and precision	(ii) strive for precision
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(D) complete and master tasks	(i) complete tasks

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(D) complete and master tasks	(ii) master tasks
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(E) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(i) demonstrate effective verbal communication skills with individuals from varied cultures, including fellow workers
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(E) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(ii) demonstrate effective verbal communication skills with individuals from varied cultures, including managers
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(E) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iii) demonstrate effective verbal communication skills with individuals from varied cultures, including customers
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(E) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iv) demonstrate effective written communication skills with individuals from varied cultures, including fellow workers
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(E) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(v) demonstrate effective written communication skills with individuals from varied cultures, including managers

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(E) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(vi) demonstrate effective written communication skills with individuals from varied cultures, including customers
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(F) complete work orders and related paperwork	(i) complete work orders
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(F) complete work orders and related paperwork	(ii) complete related paperwork
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(G) estimate jobs, schedules, and practices related to legal restrictions	(i) estimate jobs
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(G) estimate jobs, schedules, and practices related to legal restrictions	(ii) estimate schedules
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(G) estimate jobs, schedules, and practices related to legal restrictions	(iii) estimate practices related to legal restrictions
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(i) read appropriate architectural symbols

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(ii) read appropriate architectural schematics
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(iii) read appropriate architectural blue prints
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(iv) read appropriate architectural work drawings
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(v) read appropriate architectural manuals
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(vi) read appropriate architectural bulletins
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(vii) interpret appropriate architectural symbols
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(viii) interpret appropriate architectural schematics

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(ix) interpret appropriate architectural blue prints
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(x) interpret appropriate architectural work drawings
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(xi) interpret appropriate architectural manuals
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(H) read and interpret appropriate architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(xii) interpret appropriate architectural bulletins
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(I) apply descriptive geometry related to auxiliary views, revolutions, and intersections	(i) apply descriptive geometry related to auxiliary views
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(I) apply descriptive geometry related to auxiliary views, revolutions, and intersections	(ii) apply descriptive geometry related to revolutions
(2) The student applies key cognitive skills and academic behaviors to the requirements of architectural studies. The student is expected to:	(I) apply descriptive geometry related to auxiliary views, revolutions, and intersections	(iii) apply descriptive geometry related to intersections

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student knows the concepts and skills that form the technical knowledge of architectural design. The student is expected to:	(A) demonstrate knowledge of architectural design principles	(i) demonstrate knowledge of architectural design principles
(3) The student knows the concepts and skills that form the technical knowledge of architectural design. The student is expected to:	(B) determine building code and zoning requirements for building types in a selected area	(i) determine building code requirements for building types in a selected area
(3) The student knows the concepts and skills that form the technical knowledge of architectural design. The student is expected to:	(B) determine building code and zoning requirements for building types in a selected area	(ii) determine zoning requirements for building types in a selected area
(3) The student knows the concepts and skills that form the technical knowledge of architectural design. The student is expected to:	(C) demonstrate knowledge of the various grades and types of construction materials	(i) demonstrate knowledge of the various grades of construction materials
(3) The student knows the concepts and skills that form the technical knowledge of architectural design. The student is expected to:	(C) demonstrate knowledge of the various grades and types of construction materials	(ii) demonstrate knowledge of the various types of construction materials
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural drawing. The student is expected to:	(A) use the tools, materials, and equipment commonly employed in the field of architecture in a safe manner	(i) use the tools commonly employed in the field of architecture in a safe manner
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural drawing. The student is expected to:	(A) use the tools, materials, and equipment commonly employed in the field of architecture in a safe manner	(ii) use the materials commonly employed in the field of architecture in a safe manner

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural drawing. The student is expected to:	(A) use the tools, materials, and equipment commonly employed in the field of architecture in a safe manner	(iii) use the equipment commonly employed in the field of architecture in a safe manner
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural drawing. The student is expected to:	(B) handle and dispose of environmentally hazardous materials	(i) handle environmentally hazardous materials
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural drawing. The student is expected to:	(B) handle and dispose of environmentally hazardous materials	(ii) dispose of environmentally hazardous materials
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural drawing. The student is expected to:	(C) demonstrate knowledge of new and emerging technologies that may affect the field of architecture	(i) demonstrate knowledge of new technologies that may affect the field of architecture
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural drawing. The student is expected to:	(C) demonstrate knowledge of new and emerging technologies that may affect the field of architecture	(ii) demonstrate knowledge of emerging technologies that may affect the field of architecture
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(A) use problem-solving skills to analyze a situation and identify a problem to be solved	(i) use problem-solving skills to analyze a situation
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(A) use problem-solving skills to analyze a situation and identify a problem to be solved	(ii) use problem-solving skills to identify a problem to be solved

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(B) break a complex problem into component parts that can be analyzed and solved separately	(i) break a complex problem into component parts that can be analyzed separately
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(B) break a complex problem into component parts that can be analyzed and solved separately	(ii) break a complex problem into component parts that can be solved separately
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(C) strive for accuracy and precision	(i) strive for accuracy
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(C) strive for accuracy and precision	(ii) strive for percision
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(D) work independently	(i) work independently
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(E) work collaboratively	(i) work collaboratively
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(F) research an architectural project	(i) research an architectural project

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(G) design and present an effective architectural product	(i) design an effective architectural product
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(G) design and present an effective architectural product	(ii) present an effective architectural product
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(H) present a final architectural product for critique	(i) present a final architectural product for critique
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(I) apply architectural lettering techniques	(i) apply architectural lettering techniques
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(J) develop preliminary sketches of a nonresidential or residential architectural design	(i) develop preliminary sketches of a nonresidential or residential architectural design
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(K) use traditional technical architectural drafting techniques to create drawings	(i) use traditional technical architectural drafting techniques to create drawings
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(L) demonstrate through drawings the development of maximum efficiency of circulation within areas or rooms	(i) demonstrate through drawings the development of maximum efficiency of circulation within areas or rooms

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(M) develop a site plan using maximum orientation of the building relative to views, sun, and wind direction	(i) develop a site plan using maximum orientation of the building relative to views, sun, and wind direction
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(N) develop building designs to ensure compatibility between interior and exterior to enhance overall appearance	(i) develop building designs to ensure compatibility between interior and exterior to enhance overall appearance
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(O) draw schematic site plans, floor plans, building elevations, sections, perspectives, and character sketches from bubble diagrams	(i) draw schematic site plans from bubble diagrams
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(O) draw schematic site plans, floor plans, building elevations, sections, perspectives, and character sketches from bubble diagrams	(ii) draw schematic floor plans from bubble diagrams
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(O) draw schematic site plans, floor plans, building elevations, sections, perspectives, and character sketches from bubble diagrams	(iii) draw schematic building elevations from bubble diagrams
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(O) draw schematic site plans, floor plans, building elevations, sections, perspectives, and character sketches from bubble diagrams	(iv) draw schematic sections from bubble diagrams
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(O) draw schematic site plans, floor plans, building elevations, sections, perspectives, and character sketches from bubble diagrams	(v) draw schematic perspectives from bubble diagrams

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(O) draw schematic site plans, floor plans, building elevations, sections, perspectives, and character sketches from bubble diagrams	(vi) draw schematic character sketches from bubble diagrams
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(P) draw scaled wall thickness plans, elevations, and sections	(i) draw scaled wall thickness plans
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(P) draw scaled wall thickness plans, elevations, and sections	(ii) draw scaled elevations
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(P) draw scaled wall thickness plans, elevations, and sections	(iii) draw scaled sections
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(Q) develop details of floor and wall sections as required	(i) develop details of floor sections as required
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(Q) develop details of floor and wall sections as required	(ii) develop details of wall sections as required
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(R) demonstrate knowledge of the Americans with Disabilities Act	(i) demonstrate knowledge of the Americans with Disabilities Act

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(S) assemble an architectural design in three dimensions	(i) assemble an architectural design in three dimensions
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(T) customize screen menus to fit specific problems or needs	(i) customize screen menus to fit specific problems or needs
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(U) construct points, lines, and other geometric forms using accepted computer-aided design methods	(i) construct points using accepted computer-aided design methods
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(U) construct points, lines, and other geometric forms using accepted computer-aided design methods	(ii) construct lines using accepted computer-aided design methods
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(U) construct points, lines, and other geometric forms using accepted computer-aided design methods	(iii) construct other geometric forms using accepted computer-aided design methods
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(V) create a freehand simple one-point perspective	(i) create a freehand simple one-point perspective
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(W) use a computer system to create a bill of materials	(i) use a computer system to create a bill of materials

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(X) use a computer system to create and modify architectural drawings	(i) use a computer system to create architectural drawings
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(X) use a computer system to create and modify architectural drawings	(ii) use a computer system to modify architectural drawings
(5) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(Y) plot architectural drawings for presentation	(i) plot architectural drawings for presentation
(6) The student begins exploration, development, and organization of ideas from the surroundings. The student is expected to:	(A) begin illustrating ideas for architectural projects from direct observation, experiences, imagination	(i) begin illustrating ideas for architectural projects from direct observation
(6) The student begins exploration, development, and organization of ideas from the surroundings. The student is expected to:	(A) begin illustrating ideas for architectural projects from direct observation, experiences, imagination	(ii) begin illustrating ideas for architectural projects from experiences
(6) The student begins exploration, development, and organization of ideas from the surroundings. The student is expected to:	(A) begin illustrating ideas for architectural projects from direct observation, experiences, imagination	(iii) begin illustrating ideas for architectural projects from imagination
(6) The student begins exploration, development, and organization of ideas from the surroundings. The student is expected to:	(B) begin comparing and contrasting the use of architectural elements such as color, texture, form, line, space, value, and architectural principles such as emphasis, pattern, rhythm, balance, proportion, and unity in personal architectural projects and those of others using vocabulary accurately	(i) begin comparing and contrasting the use of architectural elements in personal architectural projects using vocabulary accurately

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student begins exploration, development, and organization of ideas from the surroundings. The student is expected to:	(B) begin comparing and contrasting the use of architectural elements such as color, texture, form, line, space, value, and architectural principles such as emphasis, pattern, rhythm, balance, proportion, and unity in personal architectural projects and those of others using vocabulary accurately.	(ii) begin comparing and contrasting the use of architectural elements [in projects] of others using vocabulary accurately
(6) The student begins exploration, development, and organization of ideas from the surroundings. The student is expected to:	(B) begin comparing and contrasting the use of architectural elements such as color, texture, form, line, space, value, and architectural principles such as emphasis, pattern, rhythm, balance, proportion, and unity in personal architectural projects and those of others using vocabulary accurately.	(iii) begin comparing and contrasting the use of architectural principles in personal architectural projects using vocabulary accurately
(6) The student begins exploration, development, and organization of ideas from the surroundings. The student is expected to:	(B) begin comparing and contrasting the use of architectural elements such as color, texture, form, line, space, value, and architectural principles such as emphasis, pattern, rhythm, balance, proportion, and unity in personal architectural projects and those of others using vocabulary accurately	(iv) begin comparing and contrasting the use of architectural principles [in projects] of others using vocabulary accurately
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(A) create beginning visual solutions by elaborating on direct observation, experiences, and imagination	(i) create beginning visual solutions by elaborating on direct observation
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(A) create beginning visual solutions by elaborating on direct observation, experiences, and imagination	(ii) create beginning visual solutions by elaborating experiences

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(A) create beginning visual solutions by elaborating on direct observation, experiences, and imagination	(iii) create beginning visual solutions by elaborating on imagination
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(B) create beginning designs for practical applications	(i) create beginning designs for practical applications
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(i) demonstrate beginning effective use of architectural media in design
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(ii) demonstrate beginning effective use of architectural media in drawing
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(iii) demonstrate beginning effective use of architectural media in painting
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(iv) demonstrate beginning effective use of architectural media and tools in printmaking
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(v) demonstrate beginning effective use of architectural media in sculpture

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(vi) demonstrate beginning effective use of architectural tools in design
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(vii) demonstrate beginning effective use of architectural tools in drawing
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(viii) demonstrate beginning effective use of architectural tools in painting
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(ix) demonstrate beginning effective use of architectural tools in printmaking
(7) The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	(C) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building	(x) demonstrate beginning effective use of architectural tools in sculpture
(8) The student demonstrates an understanding of architectural history and culture as records of human achievement from ancient Egypt to the present. The student is expected to:	(A) compare and contrast historical and contemporary styles, identifying general themes and trends	(i) compare and contrast historical styles, identifying general themes
(8) The student demonstrates an understanding of architectural history and culture as records of human achievement from ancient Egypt to the present. The student is expected to:	(A) compare and contrast historical and contemporary styles, identifying general themes and trends	(ii) compare and contrast historical styles, identifying general trends

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student demonstrates an understanding of architectural history and culture as records of human achievement from ancient Egypt to the present. The student is expected to:	(A) compare and contrast historical and contemporary styles, identifying general themes and trends	(iii) compare and contrast contemporary styles, identifying general themes
(8) The student demonstrates an understanding of architectural history and culture as records of human achievement from ancient Egypt to the present. The student is expected to:	(A) compare and contrast historical and contemporary styles, identifying general themes and trends	(iv) compare and contrast contemporary styles, identifying general trends
(8) The student demonstrates an understanding of architectural history and culture as records of human achievement from ancient Egypt to the present. The student is expected to:	(B) describe general characteristics in architectural projects from a variety of cultures	(i) describe general characteristics in architectural projects from a variety of cultures
(8) The student demonstrates an understanding of architectural history and culture as records of human achievement from ancient Egypt to the present. The student is expected to:	(C) compare and contrast career opportunities in architecture	(i) compare and contrast career opportunities in architecture
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(A) interpret, evaluate, and justify architectural artistic decisions in personal architectural projects	(i) interpret architectural artistic decisions in personal architectural projects
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(A) interpret, evaluate, and justify architectural artistic decisions in personal architectural projects	(ii) evaluate architectural artistic decisions in personal architectural projects

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(A) interpret, evaluate, and justify architectural artistic decisions in personal architectural projects	(iii) justify architectural artistic decisions in personal architectural projects
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(i) select original architectural projects by peers or others
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(ii) select original architectural portfolios by peers or others
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(iii) select original architectural exhibitions by peers or others
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(iv) analyze original architectural projects by peers or others to form precise conclusions about formal qualities
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(v) analyze original architectural projects by peers or others to form precise conclusions about historical and cultural contexts

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(vi) analyze original architectural projects by peers or others to form precise conclusions about intents
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(vii) analyze original architectural projects by peers or others to form precise conclusions about meanings
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(viii) analyze original architectural portfolios by peers or others to form precise conclusions about formal qualities
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(ix) analyze original architectural portfolios by peers or others to form precise conclusions about historical and cultural contexts
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(x) analyze original architectural portfolios by peers or others to form precise conclusions about intents
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xi) analyze original architectural portfolios by peers or others to form precise conclusions about meanings

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xii) analyze original architectural exhibitions by peers or others to form precise conclusions about formal qualities
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xiii) analyze original architectural exhibitions by peers or others to form precise conclusions about historical and cultural contexts
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xiv) analyze original architectural exhibitions by peers or others to form precise conclusions about intents
(9) The student makes beginning informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural projects, portfolios, and exhibitions by peers or others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xv) analyze original architectural exhibitions by peers or others to form precise conclusions about meanings
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(A) determine employment and entrepreneurial opportunities and preparation requirements in architecture and related fields	(i) determine employment opportunities in architecture
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(A) determine employment and entrepreneurial opportunities and preparation requirements in architecture and related fields	(ii) determine employment opportunities in fields [related to architecture]

Knowledge and Skill Statement	Student Expectation	Breakout
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(A) determine employment and entrepreneurial opportunities and preparation requirements in architecture and related fields	(iii) determine entrepreneurial opportunities in architecture
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(A) determine employment and entrepreneurial opportunities and preparation requirements in architecture and related fields	(iv) determine entrepreneurial opportunities in fields [related to architecture]
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(A) determine employment and entrepreneurial opportunities and preparation requirements in architecture and related fields	(v) determine employment preparation requirements in architecture
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(A) determine employment and entrepreneurial opportunities and preparation requirements in architecture and related fields	(vi) determine employment preparation requirements in fields [related to architecture]
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(A) determine employment and entrepreneurial opportunities and preparation requirements in architecture and related fields	(vii) determine entrepreneurial preparation requirements in architecture
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(A) determine employment and entrepreneurial opportunities and preparation requirements in architecture and related fields	(viii) determine entrepreneurial preparation requirements in fields [related to architecture]
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(B) propose short-term and long-term career goals	(i) propose short-term career goals
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(B) propose short-term and long-term career goals	(ii) propose long-term career goals

Knowledge and Skill Statement	Student Expectation	Breakout
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(C) describe technology used in architectural careers	(i) describe technology used in architectural careers
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(D) maintain a project portfolio that documents experience by using graphic or written documentation of architectural-related projects .	(i) maintain a project portfolio that documents experience by using graphic or written documentation of architectural-related projects .
(10)The student makes informed career decisions that reflect career goals. The student is expected to:	(E) develop a professional resumé	(i) develop a professional resumé
(11)The student applies communication, science, and mathematics knowledge and skills to architectural projects. The student is expected to:	(A) prepare professional communications, technical reports, and presentations	(i) prepare professional communications
(11)The student applies communication, science, and mathematics knowledge and skills to architectural projects. The student is expected to:	(A) prepare professional communications, technical reports, and presentations	(ii) prepare professional technical reports
(11)The student applies communication, science, and mathematics knowledge and skills to architectural projects. The student is expected to:	(A) prepare professional communications, technical reports, and presentations	(iii) prepare professional presentations
(11)The student applies communication, science, and mathematics knowledge and skills to architectural projects. The student is expected to:	(B) apply mathematical equations	(i) apply mathematical equations
(11)The student applies communication, science, and mathematics knowledge and skills to architectural projects. The student is expected to:	(C) apply scientific principles and concepts	(i) apply scientific principles

Knowledge and Skill Statement	Student Expectation	Breakout
(11)The student applies communication, science, and mathematics knowledge and skills to architectural projects. The student is expected to:	(C) apply scientific principles and concepts	(ii) apply scientific concepts
(12) The student knows the concept of sustainability. The student is expected to:	(A) identify the nature of energy	(i) identify the nature of energy
(12) The student knows the concept of sustainability. The student is expected to:	(B) relate potential energy, kinetic energy, and heat energy to conservation	(i) relate potential energy to conservation
(12) The student knows the concept of sustainability. The student is expected to:	(B) relate potential energy, kinetic energy, and heat energy to conservation	(ii) relate kinetic energy to conservation
(12) The student knows the concept of sustainability. The student is expected to:	(B) relate potential energy, kinetic energy, and heat energy to conservation	(iii) relate heat energy to conservation
(12) The student knows the concept of sustainability. The student is expected to:	(C) create an energy model	(i) create an energy model
(12) The student knows the concept of sustainability. The student is expected to:	(D) evaluate different methods of energy transfer	(i) evaluate different methods of energy transfer
(12) The student knows the concept of sustainability. The student is expected to:	(E) recognize sustainable design as it relates to architectural design	(i) recognize sustainable design as it relates to architectural design
(12) The student knows the concept of sustainability. The student is expected to:	(F) define green architecture as related to the field of architecture	(i) define green architecture as related to the field of architecture

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.54. Architectural Design II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: Architectural Design I or Advanced Interior Design and Geometry. Recommended prerequisites: Principles of Architecture and Principles of Construction. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Architectural Design II, students will gain advanced knowledge and skills needed to enter a career in architecture or construction or prepare a foundation toward a postsecondary degree in architecture, construction science, drafting, interior design, or landscape architecture. Architectural Design II includes the advanced knowledge of the design, design history, techniques, and tools related to the production of drawings, renderings, and scaled models for nonresidential or residential architectural purposes.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship, and preparation requirements in the field of architecture	(i) identify employment opportunities, including entrepreneurship, in the field of architecture
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship, and preparation requirements in the field of architecture	(ii) identify employment preparation requirements in the field of architecture
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(i) demonstrate an understanding of group participation related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(ii) demonstrate an understanding of group participation related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iii) demonstrate an understanding of leadership related to citizenship

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iv) demonstrate an understanding leadership related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations and appropriate work habits	(i) identify employers' expectations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) identify employers' expectations and appropriate work habits	(ii) identify appropriate work habits
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(i) apply the competencies related to resources in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(ii) apply the competencies related to information in appropriate settings and situations

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(iii) apply the competencies related to systems in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations	(iv) apply the competencies related to technology in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(i) demonstrate knowledge of the concepts related to health and safety in the workplace, as specified by appropriate governmental regulations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(ii) demonstrate knowledge of the skills related to health and safety in the workplace, as specified by appropriate governmental regulations
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(i) demonstrate effective verbal communication skills with individuals from varied cultures including fellow workers

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(ii) demonstrate effective verbal communication skills with individuals from varied cultures, including managers
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iii) demonstrate effective verbal communication skills with individuals from varied cultures, including customers
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iv) demonstrate effective written communication skills with individuals from varied cultures, including fellow workers
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(v) demonstrate effective written communication skills with individuals from varied cultures, including managers

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(vi) demonstrate effective written communication skills with individuals from varied cultures, including customers
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(B) complete work orders and related paperwork	(i) complete work orders
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(B) complete work orders and related paperwork	(ii) complete related paperwork
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(C) estimate jobs, schedules, and standard industry practices related to legal restrictions	(i) estimate jobs
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(C) estimate jobs, schedules, and standard industry practices related to legal restrictions	(ii) estimate schedules
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(C) estimate jobs, schedules, and standard industry practices related to legal restrictions	(iii) estimate standard industry practices related to legal restrictions

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(i) read architectural symbols
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(ii) read architectural schematics
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(iii) read architectural blueprints
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(iv) read architectural work drawings
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(v) read architectural manuals

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(vi) read architectural bulletins
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(vii) interpret architectural symbols
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(viii) interpret architectural schematics
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(xix) interpret architectural blueprints
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(x) interpret architectural work drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(xi) interpret architectural manuals
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(D) read and interpret architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins	(xii) interpret architectural bulletins
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(E) apply descriptive geometry related to auxiliary views, revolutions, and intersections	(i) apply descriptive geometry related to auxiliary views
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(E) apply descriptive geometry related to auxiliary views, revolutions, and intersections	(ii) apply descriptive geometry related to revolutions
(2) The student relates core academic skills to the requirements of architecture. The student is expected to:	(E) apply descriptive geometry related to auxiliary views, revolutions, and intersections	(iii) apply descriptive geometry related to intersections
(3) The student knows the concepts and skills that form the technical knowledge of architectural computer-aided drafting. The student is expected to:	(A) demonstrate knowledge of architectural design principles	(i) demonstrate knowledge of architectural design principles

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student knows the concepts and skills that form the technical knowledge of architectural computer-aided drafting. The student is expected to:	(B) determine building code and zoning requirements for building types in a selected area	(i) determine building code requirements for building types in a selected area
(3) The student knows the concepts and skills that form the technical knowledge of architectural computer-aided drafting. The student is expected to:	(B) determine building code and zoning requirements for building types in a selected area	(ii) determine zoning requirements for building types in a selected area
(3) The student knows the concepts and skills that form the technical knowledge of architectural computer-aided drafting. The student is expected to:	(C) demonstrate knowledge of the various grades and types of construction materials	(i) demonstrate knowledge of the various grades of construction materials
(3) The student knows the concepts and skills that form the technical knowledge of architectural computer-aided drafting. The student is expected to:	(C) demonstrate knowledge of the various grades and types of construction materials	(ii) demonstrate knowledge of the various types of construction materials
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:	(A) use the tools, materials, and equipment commonly employed in the field of architectural computer-aided design in a safe manner	(i) use the tools commonly employed in the field of architectural computer-aided design in a safe manner
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:	(A) use the tools, materials, and equipment commonly employed in the field of architectural computer-aided design in a safe manner	(ii) use the materials commonly employed in the field of architectural computer-aided design in a safe manner

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:	(A) use the tools, materials, and equipment commonly employed in the field of architectural computer-aided design in a safe manner	(iii) use the equipment commonly employed in the field of architectural computer-aided design in a safe manner
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in the field of architecture in accordance with the material safety data sheet (MSDS), the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA) regulations	(i) handle environmentally hazardous materials used in the field of architecture in accordance with the material safety data sheet (MSDS)
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in the field of architecture in accordance with the material safety data sheet (MSDS), the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA) regulations	(ii) handle environmentally hazardous materials used in the field of architecture in accordance with the Occupational Safety and Health Administration (OSHA)
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in the field of architecture in accordance with the material safety data sheet (MSDS), the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA) regulations	(iii) environmentally hazardous materials used in the field of architecture in accordance with the Environmental Protection Agency (EPA) regulations

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:</p>	<p>(B) handle and dispose of environmentally hazardous materials used in the field of architecture in accordance with the material safety data sheet (MSDS), the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA) regulations</p>	<p>(iv) dispose of environmentally hazardous materials used in the field of architecture in accordance with the material safety data sheet (MSDS)</p>
<p>(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:</p>	<p>(B) handle and dispose of environmentally hazardous materials used in the field of architecture in accordance with the material safety data sheet (MSDS), the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA) regulations</p>	<p>(v) dispose of environmentally hazardous materials used in the field of architecture in accordance with the Occupational Safety and Health Administration (OSHA)</p>
<p>(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:</p>	<p>(B) handle and dispose of environmentally hazardous materials used in the field of architecture in accordance with the material safety data sheet (MSDS), the Occupational Safety and Health Administration (OSHA), and the Environmental Protection Agency (EPA) regulations</p>	<p>(vi) dispose of environmentally hazardous materials used in the field of architecture in accordance with the Environmental Protection Agency (EPA) regulations</p>
<p>(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:</p>	<p>(C) demonstrate knowledge of new and emerging technologies that may affect the field of architecture</p>	<p>(i) demonstrate knowledge of new technologies that may affect the field of architecture</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural computer-aided design. The student is expected to:	(C) demonstrate knowledge of new and emerging technologies that may affect the field of architecture	(ii) demonstrate knowledge of emerging technologies that may affect the field of architecture
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(A) use problem-solving skills to analyze a situation and identify a problem to be solved	(i) use problem-solving skills to analyze a situation
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(A) use problem-solving skills to analyze a situation and identify a problem to be solved	(ii) use problem-solving skills to identify a problem to be solved
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(B) break a complex problem into component parts that can be analyzed and solved separately	(i) break a complex problem into component parts that can be analyzed separately
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(B) break a complex problem into component parts that can be analyzed and solved separately	(ii) break a complex problem into component parts that can be solved separately
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(C) strive for accuracy and precision	(i) strive for accuracy

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(C) strive for accuracy and precision	(ii) strive for percision
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(D) work independently	(i) work independently
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(E) work collaboratively	(i) work collaboratively
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(F) research an architectural project	(i) research an architectural project
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(G) design and present an effective architectural product	(i) design an effective architectural product
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(G) design and present an effective architectural product	(ii) present an effective architectural product
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(H) present a final architectural product for critique	(i) present a final architectural product for critique

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(I) apply architectural lettering techniques	(i) apply architectural lettering techniques
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(J) develop preliminary sketches of a residential plan or nonresidential plan	(i) develop preliminary sketches of a residential plan or nonresidential plan
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(K) demonstrate through drawings the development of maximum efficiency of circulation within areas or rooms	(i) demonstrate through drawings the development of maximum efficiency of circulation within areas or rooms
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(L) develop a site plan using maximum orientation of the building relative to views, sun, and wind direction	(i) develop a site plan using maximum orientation of the building relative to views, sun, and wind direction
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(M) draw building designs and styles to ensure compatibility between interior and exterior to enhance overall appearance	(i) draw building designs to ensure compatibility between interior and exterior to enhance overall appearance
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(M) draw building designs and styles to ensure compatibility between interior and exterior to enhance overall appearance	(ii) draw building styles to ensure compatibility between interior and exterior to enhance overall appearance
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(N) draw schematic site plans, floor plans, roof plans, building elevations, sections, perspectives, and character sketches using design development techniques	(i) draw schematic site plans using design development techniques

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(N) draw schematic site plans, floor plans, roof plans, building elevations, sections, perspectives, and character sketches using design development techniques	(ii) draw schematic floor plans using design development techniques
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(N) draw schematic site plans, floor plans, roof plans, building elevations, sections, perspectives, and character sketches using design development techniques	(iii) draw schematic roof plans using design development techniques
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(N) draw schematic site plans, floor plans, roof plans, building elevations, sections, perspectives, and character sketches using design development techniques	(iv) draw schematic building elevations using design development techniques
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(N) draw schematic site plans, floor plans, roof plans, building elevations, sections, perspectives, and character sketches using design development techniques	(v) draw schematic sections using design development techniques
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(N) draw schematic site plans, floor plans, roof plans, building elevations, sections, perspectives, and character sketches using design development techniques	(vi) draw schematic perspectives using design development techniques
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(N) draw schematic site plans, floor plans, roof plans, building elevations, sections, perspectives, and character sketches using design development techniques	(vii) draw schematic character sketches using design development techniques

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(O) draw scaled wall thickness plans, interior elevations, and sections	(i) draw scaled wall thickness plans
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(O) draw scaled wall thickness plans, interior elevations, and sections	(ii) draw scaled elevations
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(O) draw scaled wall thickness plans, interior elevations, and sections	(iii) draw scaled sections
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(P) develop details, sections, floor and wall sections, ceiling and roof sections, door and window sections, and other sections as required	(i) develop details as required
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(P) develop details, sections, floor and wall sections, ceiling and roof sections, door and window sections, and other sections as required	(ii) develop sections as required
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(P) develop details, sections, floor and wall sections, ceiling and roof sections, door and window sections, and other sections as required	(iii) develop floor and wall sections as required
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(P) develop details, sections, floor and wall sections, ceiling and roof sections, door and window sections, and other sections as required	(iv) develop details ceiling and roof sections as required

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(P) develop details, sections, floor and wall sections, ceiling and roof sections, door and window sections, and other sections as required	(v) develop door and window sections as required
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(P) develop details, sections, floor and wall sections, ceiling and roof sections, door and window sections, and other sections as required	(vi) develop other sections as required
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(Q) assemble an architectural design in three dimensions	(i) assemble an architectural design in three dimensions
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(R) research the Green Building Rating System as defined by the U.S. Green Building Council	(i) research the Green Building Rating System as defined by the U.S. Green Building Council
(5) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(S) create a project demonstrating sustainable design as it relates to architectural design as defined by the U.S. Green Building Council	(i) create a project demonstrating sustainable design as it relates to architectural design as defined by the U.S. Green Building Council
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(A) customize screen menus to fit specific problems or needs	(i) customize screen menus to fit specific problems or needs
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(B) construct architectural drawings using advanced computer-aided design drafting skills	(i) construct architectural drawings using advanced computer-aided design drafting skills

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(C) create two- or three-point perspectives	(i) create two- or three-point perspectives
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(D) create three-dimensional solid models	(i) create three-dimensional solid models
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(E) view three-dimensional objects in several different positions	(i) view three-dimensional objects in several different positions
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(F) use a computer system to create a bill of materials	(i) use a computer system to create a bill of materials
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(G) use a computer-aided drafting system to create and modify nonresidential or residential architectural drawings	(i) use a computer-aided drafting system to create nonresidential or residential architectural drawings
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(G) use a computer-aided drafting system to create and modify nonresidential or residential architectural drawings	(ii) use a computer-aided drafting system modify nonresidential or residential architectural drawings
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(H) plot architectural drawings for presentation	(i) plot architectural drawings for presentation

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies the concepts and skills of the trade to simulated and actual work situations. The student is expected to:	(I) render three-dimensional objects with applied materials	(i) render three-dimensional objects with applied materials
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(A) describe how teams function	(i) describe how teams function
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(B) use teamwork to solve problems	(i) use teamwork to solve problems
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(C) distinguish between the roles of team leaders and team members	(i) distinguish between the roles of team leaders and team members
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(D) identify characteristics of good leaders	(i) identify characteristics of good leaders
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(E) identify employers' expectations and appropriate work habits	(i) identify employers' expectations
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(E) identify employers' expectations and appropriate work habits	(ii) identify appropriate work habits

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(i) define discrimination
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(ii) define harassment
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(F) define discrimination, harassment, and inequality	(iii) define inequality
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop and maintain work schedules and meet deadlines	(i) use time-management techniques to develop work schedules
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop and maintain work schedules and meet deadlines	(ii) use time-management techniques to maintain work schedules
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(G) use time-management techniques to develop and maintain work schedules and meet deadlines	(iii) use time-management techniques to meet deadlines
(7) The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:	(H) complete work according to established criteria	(i) complete work according to established criteria

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student sustains exploration, development, and organization of ideas from their surroundings. The student is expected to:	(A) use advanced skills to illustrate ideas for architectural projects from direct observation, experiences, and imagination	(i) use advanced skills to illustrate ideas for architectural projects from direct observation
(8) The student sustains exploration, development, and organization of ideas from their surroundings. The student is expected to:	(A) use advanced skills to illustrate ideas for architectural projects from direct observation, experiences, and imagination	(ii) use advanced skills to illustrate ideas for architectural projects from experiences
(8) The student sustains exploration, development, and organization of ideas from their surroundings. The student is expected to:	(A) use advanced skills to illustrate ideas for architectural projects from direct observation, experiences, and imagination	(iii) use advanced skills to illustrate ideas for architectural projects from imagination
(8) The student sustains exploration, development, and organization of ideas from their surroundings. The student is expected to:	(B) use advanced skills comparing and contrasting the use of architectural elements such as color, texture, form, line, space, and value and architectural principles such as emphasis, pattern, rhythm, balance, proportion, and unity in personal architectural projects and those of others using vocabulary accurately	(i) use advanced skills comparing and contrasting the use of architectural elements in personal architectural projects using vocabulary accurately
(8) The student sustains exploration, development, and organization of ideas from their surroundings. The student is expected to:	(B) use advanced skills comparing and contrasting the use of architectural elements such as color, texture, form, line, space, and value and architectural principles such as emphasis, pattern, rhythm, balance, proportion, and unity in personal architectural projects and those of others using vocabulary accurately	(ii) use advanced skills comparing and contrasting the use of architectural elements in [the projects of] others using vocabulary accurately

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student sustains exploration, development, and organization of ideas from their surroundings. The student is expected to:	(B) use advanced skills comparing and contrasting the use of architectural elements such as color, texture, form, line, space, and value and architectural principles such as emphasis, pattern, rhythm, balance, proportion, and unity in personal architectural projects and those of others using vocabulary accurately	(iii) use advanced skills in comparing and contrasting the use of architectural principles in personal architectural projects using vocabulary accurately
(8) The student sustains exploration, development, and organization of ideas from their surroundings. The student is expected to:	(B) use advanced skills comparing and contrasting the use of architectural elements such as color, texture, form, line, space, and value and architectural principles such as emphasis, pattern, rhythm, balance, proportion, and unity in personal architectural projects and those of others using vocabulary accurately	(iv) use advanced skills in comparing and contrasting the use of architectural principles in [the projects of] others using vocabulary accurately
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(A) create, using advanced skills, visual solutions by elaborating on direct observation, experiences, and imagination	(i) create, using advanced skills, visual solutions by elaborating on direct observation
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(A) create, using advanced skills, visual solutions by elaborating on direct observation, experiences, and imagination	(ii) create, using advanced skills, visual solutions by elaborating on experiences
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(A) create, using advanced skills, visual solutions by elaborating on direct observation, experiences, and imagination	(iii) create, using advanced skills, visual solutions by elaborating on imagination
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(B) create, using advanced skills, designs for practical applications	(i) create, using advanced skills, designs for practical applications

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(i) demonstrate, using advanced skills, effective use of architectural media in design
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(ii) demonstrate, using advanced skills, effective use of architectural media in drawing
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(iii) demonstrate, using advanced skills, effective use of architectural media in painting
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(iv) demonstrate, using advanced skills, effective use of architectural media in printmaking
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(v) demonstrate, using advanced skills, effective use of architectural media in sculpture
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(vi) demonstrate, using advanced skills, effective use of architectural tools in design

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(vii) demonstrate, using advanced skills, effective use of architectural tools in drawing
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(viii) demonstrate, using advanced skills, effective use of architectural tools in painting
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(ix) demonstrate, using advanced skills, effective use of architectural tools in printmaking
(9) The student uses advanced skills expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to	(C) demonstrate, using advanced skills, effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as advanced model building	(x) demonstrate, using advanced skills, effective use of architectural tools in sculpture
(10) The student demonstrates an understanding of architectural history and culture as records of human achievement by examining the connections between twentieth and twenty-first century architecture and art and connections between Greek and Roman architecture and art. The student is expected to:	(A) compare and contrast historical and contemporary styles by identifying general themes and trends	(i) compare and contrast historical styles by identifying general themes

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student demonstrates an understanding of architectural history and culture as records of human achievement by examining the connections between twentieth and twenty-first century architecture and art and connections between Greek and Roman architecture and art. The student is expected to:	(A) compare and contrast historical and contemporary styles by identifying general themes and trends	(ii) compare and contrast historical styles by identifying general trends
(10) The student demonstrates an understanding of architectural history and culture as records of human achievement by examining the connections between twentieth and twenty-first century architecture and art and connections between Greek and Roman architecture and art. The student is expected to:	(A) compare and contrast historical and contemporary styles by identifying general themes and trends	(iii) compare and contrast contemporary styles by identifying general themes
(10) The student demonstrates an understanding of architectural history and culture as records of human achievement by examining the connections between twentieth and twenty-first century architecture and art and connections between Greek and Roman architecture and art. The student is expected to:	(A) compare and contrast historical and contemporary styles by identifying general themes and trends	(iv) compare and contrast contemporary styles by identifying general trends
(10) The student demonstrates an understanding of architectural history and culture as records of human achievement by examining the connections between twentieth and twenty-first century architecture and art and connections between Greek and Roman architecture and art. The student is expected to:	(B) describe general characteristics in architectural artworks from a variety of cultures	(i) describe general characteristics in architectural artworks from a variety of cultures

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student demonstrates an understanding of architectural history and culture as records of human achievement by examining the connections between twentieth and twenty-first century architecture and art and connections between Greek and Roman architecture and art. The student is expected to:	(C) compare and contrast career opportunities in architecture	(i) compare and contrast career opportunities in architecture
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(A) interpret, evaluate, and justify architectural artistic decisions in personal architectural artworks	(i) interpret architectural artistic decisions in personal architectural artworks
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(A) interpret, evaluate, and justify architectural artistic decisions in personal architectural artworks	(ii) evaluate architectural artistic decisions in personal architectural artworks
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(A) interpret, evaluate, and justify architectural artistic decisions in personal architectural artworks	(iii) justify architectural artistic decisions in personal architectural artworks
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(i) select original architectural artworks by peers and others
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(ii) select original architectural portfolios by peers and others

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(iii) select original architectural exhibitions by peers and others
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(iv) analyze original architectural artworks by peers and others to form precise conclusions about formal qualities
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(v) analyze original architectural artworks by peers and others to form precise conclusions about historical and cultural contexts
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(vi) analyze original architectural artworks by peers and others to form precise conclusions about intents
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(vii) analyze original architectural artworks by peers and others to form precise conclusions about meanings
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(viii) analyze original architectural portfolios by peers and others to form precise conclusions about formal qualities

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(ix) analyze original architectural portfolios by peers and others to form precise conclusions about historical and cultural contexts
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(x) analyze original architectural portfolios by peers and others to form precise conclusions about intents
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xi) analyze original architectural portfolios by peers and others to form precise conclusions about meanings
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xii) analyze original architectural exhibitions by peers and others to form precise conclusions about formal qualities
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xiii) analyze original architectural exhibitions by peers and others to form precise conclusions about historical and cultural contexts
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xiv) analyze original architectural exhibitions by peers and others to form precise conclusions about intents

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student makes advanced, informed judgments about personal architectural projects and the architectural projects of others. The student is expected to:	(B) select and analyze original architectural artworks, portfolios, and exhibitions by peers and others to form precise conclusions about formal qualities, historical and cultural contexts, intents, and meanings	(xv) analyze original architectural exhibitions by peers and others to form precise conclusions about meanings
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(i) demonstrate effective verbal communication skills
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(ii) demonstrate effective nonverbal communication skills
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(iii) demonstrate effective written communication skills
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(iv) demonstrate effective electronic communication skills
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(i) demonstrate effective methods to secure employment
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(ii) demonstrate effective methods to maintain employment

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(iii) demonstrate effective methods to terminate employment
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(i) demonstrate positive interpersonal skills, including conflict resolution
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(ii) demonstrate positive interpersonal skills, including negotiation
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(iii) demonstrate positive interpersonal skills, including teamwork
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(iv) demonstrate positive interpersonal skills, including leadership
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(i) evaluate the relationship of good physical health to job success
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(ii) evaluate the relationship of good physical health to job achievement

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(iii) evaluate the relationship of good mental health to job success
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(iv) evaluate the relationship of good mental health to job achievement
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(E) demonstrate appropriate grooming and appearance for the workplace	(i) demonstrate appropriate grooming for the workplace
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(E) demonstrate appropriate grooming and appearance for the workplace	(ii) demonstrate appropriate appearance for the workplace
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(F) demonstrate appropriate business and personal etiquette in the workplace	(i) demonstrate appropriate business etiquette in the workplace
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(F) demonstrate appropriate business and personal etiquette in the workplace	(ii) demonstrate appropriate personal etiquette in the workplace
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(G) exhibit productive work habits and attitudes	(i) exhibit productive work habits

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(G) exhibit productive work habits and attitudes	(ii) exhibit productive work attitudes
(12) The student exhibits employability skills that lead to job success in the architectural design industry. The student is expected to:	(H) maintain a project portfolio that documents architectural projects using a variety of multimedia techniques	(i) maintain a project portfolio that documents architectural projects using a variety of multimedia techniques

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.55. Interior Design I (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Prerequisites: Algebra I and English I. Recommended prerequisites: Principles of Architecture and Principles of Construction or Architectural Design I. Students shall be awarded one credit for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Interior Design I is a technical course that addresses psychological, physiological, and sociological needs of individuals by enhancing the environments in which they live and work. Students will use knowledge and skills related to interior and exterior environments, construction, and furnishings to make wise consumer decisions, increase productivity, promote sustainability, and compete in industry.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(i) apply oral communication skills clearly to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(ii) apply oral communication skills concisely to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(iii) apply oral communication skills convincingly to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(iv) apply oral communication skills effectively to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(v) apply written communication skills clearly to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(vi) apply written communication skills concisely to explain actions in a socially acceptable manner that is easily understood by others

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(vii) apply written communication skills convincingly to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(viii) apply written communication skills effectively to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(ix) apply oral communication skills clearly to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(x) apply oral communication skills concisely to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(xi) apply oral communication skills convincingly to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(xii) apply oral communication skills effectively to justify actions in a socially acceptable manner that is easily understood by others

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(xiii) apply written communication skills clearly to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(xiv) apply written communication skills concisely to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(xv) apply written communication skills convincingly to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(xvi) apply written communication skills effectively to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) solve problems using job-appropriate mathematical skills	(i) solve problems using job-appropriate mathematical skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate an understanding of leadership skills	(i) demonstrate an understanding of leadership skills

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(i) cooperate as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(ii) contribute as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(iii) collaborate as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(i) exhibit professionalism through dress that is appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(ii) exhibit professionalism through speech that is appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(iii) exhibit professionalism through manners that is appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(iv) exhibit professionalism through dress that is appropriate to the worksite

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(v) exhibit professionalism through speech that is appropriate to the worksite
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(vi) exhibit professionalism through manners that is appropriate to the worksite
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review accurately both quantitative and qualitative work processes and end products	(i) review accurately quantitative work processes
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review accurately both quantitative and qualitative work processes and end products	(ii) review accurately quantitative end products
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review accurately both quantitative and qualitative work processes and end products	(iii) review accurately qualitative work processes
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review accurately both quantitative and qualitative work processes and end products	(iv) review accurately qualitative end products
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(i) follow written instructions

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(ii) follow oral instructions
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(iii) adhere to established practices, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(iv) adhere to established policies and procedures, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(H) use and apply task- and job-appropriate computer applications such as printing and plotting elevations, floor plans, and additional presentation documents or illustrations	(i) use task-appropriate computer applications
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(H) use and apply task- and job-appropriate computer applications such as printing and plotting elevations, floor plans, and additional presentation documents or illustrations	(ii) use job-appropriate computer applications
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(H) use and apply task- and job-appropriate computer applications such as printing and plotting elevations, floor plans, and additional presentation documents or illustrations	(ii) apply job-appropriate computer applications

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(A) determine housing characteristics common to various world cultures and regions such as roof styles and materials, foundation types, and construction materials	(i) determine housing characteristics common to various world cultures
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(A) determine housing characteristics common to various world cultures and regions such as roof styles and materials, foundation types, and construction materials	(ii) determine housing characteristics common to various regions
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(B) describe factors affecting housing choices	(i) describe factors affecting housing choices
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(C) describe the relationship between family housing and economics	(i) describe the relationship between family housing and economics
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(D) assess the impact of demographic trends on psychological, physiological, and social needs when making housing decisions	(i) assess the impact of demographic trends on psychological needs when making housing decisions
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(D) assess the impact of demographic trends on psychological, physiological, and social needs when making housing decisions	(ii) assess the impact of demographic trends on physiological needs when making housing decisions
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(D) assess the impact of demographic trends on psychological, physiological, and social needs when making housing decisions	(iii) assess the impact of demographic trends on social needs when making housing decisions

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(E) analyze the impact of housing decisions on family relationships and the management of multiple family, community, and wage-earner roles	(i) analyze the impact of housing decisions on family relationships
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(E) analyze the impact of housing decisions on family relationships and the management of multiple family, community, and wage-earner roles	(ii) analyze the impact of housing decisions on the management of multiple family roles
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(E) analyze the impact of housing decisions on family relationships and the management of multiple family, community, and wage-earner roles	(iii) analyze the impact of housing decisions on the management of community roles
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(E) analyze the impact of housing decisions on family relationships and the management of multiple family, community, and wage-earner roles	(iv) analyze the impact of housing decisions on the management of wage-earner roles
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(F) analyze aspects of community planning that impact housing decisions	(i) analyze aspects of community planning that impact housing decisions
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(G) compare the availability, desirability, and financial feasibility of housing alternatives	(i) compare the availability of housing alternatives
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(G) compare the availability, desirability, and financial feasibility of housing alternatives	(ii) compare the desirability of housing alternatives

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates effective decision-making skills related to housing needs throughout the life cycle. The student is expected to:	(G) compare the availability, desirability, and financial feasibility of housing alternatives	(iii) compare the financial feasibility of housing alternatives
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(A) research consumer rights and responsibilities associated with housing	(i) research consumer rights associated with housing
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(A) research consumer rights and responsibilities associated with housing	(ii) research consumer responsibilities associated with housing
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(B) contrast the impact of needs and wants on the costs of housing	(i) contrast the impact of needs and wants on the costs of housing
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(C) analyze legal and financial aspects of purchasing, leasing, and renting housing	(i) analyze legal aspects of purchasing housing
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(C) analyze legal and financial aspects of purchasing, leasing, and renting housing	(ii) analyze legal aspects of leasing housing
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(C) analyze legal and financial aspects of purchasing, leasing, and renting housing	(ii) analyze legal aspects of renting housing

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(C) analyze legal and financial aspects of purchasing, leasing, and renting housing	(iv) analyze financial aspects of purchasing housing
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(C) analyze legal and financial aspects of purchasing, leasing, and renting housing	(v) analyze financial aspects of leasing housing
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(C) analyze legal and financial aspects of purchasing, leasing, and renting housing	(vi) analyze financial aspects of renting housing
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(D) summarize laws and public policies that impact housing decisions and costs	(i) summarize laws that impact housing decisions
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(D) summarize laws and public policies that impact housing decisions and costs	(ii) summarize laws that impact housing costs
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(D) summarize laws and public policies that impact housing decisions and costs	(iii) summarize public policies that impact housing decisions
(3) The student demonstrates effective management practices related to the housing budget. The student is expected to:	(D) summarize laws and public policies that impact housing decisions and costs	(iv) summarize public policies that impact housing costs

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student recommends practices that will create a safe, secure, and well-maintained home. The student is expected to:	(A) research the effect of housing conditions on health, safety, and the environment	(i) research the effect of housing conditions on health
(4) The student recommends practices that will create a safe, secure, and well-maintained home. The student is expected to:	(A) research the effect of housing conditions on health, safety, and the environment	(ii) research the effect of housing conditions on safety
(4) The student recommends practices that will create a safe, secure, and well-maintained home. The student is expected to:	(A) research the effect of housing conditions on health, safety, and the environment	(iii) research the effect of housing conditions on the environment
(4) The student recommends practices that will create a safe, secure, and well-maintained home. The student is expected to:	(B) develop a plan for detecting safety hazards and maintaining a safe home	(i) develop a plan for detecting safety hazards
(4) The student recommends practices that will create a safe, secure, and well-maintained home. The student is expected to:	(B) develop a plan for detecting safety hazards and maintaining a safe home	(ii) develop a plan for maintaining a safe home
(4) The student recommends practices that will create a safe, secure, and well-maintained home. The student is expected to:	(C) research and describe housing features for individuals with special needs	(i) research housing features for individuals with special needs
(4) The student recommends practices that will create a safe, secure, and well-maintained home. The student is expected to:	(C) research and describe housing features for individuals with special needs	(ii) describe housing features for individuals with special needs

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student proposes methods to create quality living environments. The student is expected to:	(A) apply elements and principles of design to living environments	(i) apply elements of design to living environments
(5) The student proposes methods to create quality living environments. The student is expected to:	(A) apply elements and principles of design to living environments	(ii) apply principles of design to living environments
(5) The student proposes methods to create quality living environments. The student is expected to:	(B) apply principles of space utilization, zoning, and traffic patterns in planning and furnishing housing	(i) apply principles of space utilization in planning housing
(5) The student proposes methods to create quality living environments. The student is expected to:	(B) apply principles of space utilization, zoning, and traffic patterns in planning and furnishing housing	(ii) apply principles of space utilization in furnishing housing
(5) The student proposes methods to create quality living environments. The student is expected to:	(B) apply principles of space utilization, zoning, and traffic patterns in planning and furnishing housing	(iii) apply principles of zoning in planning housing
(5) The student proposes methods to create quality living environments. The student is expected to:	(B) apply principles of space utilization, zoning, and traffic patterns in planning and furnishing housing	(iv) apply principles of zoning in furnishing housing
(5) The student proposes methods to create quality living environments. The student is expected to:	(B) apply principles of space utilization, zoning, and traffic patterns in planning and furnishing housing	(v) apply principles of traffic patterns in planning housing
(5) The student proposes methods to create quality living environments. The student is expected to:	(B) apply principles of space utilization, zoning, and traffic patterns in planning and furnishing housing	(vi) apply principles of traffic patterns in furnishing housing
(5) The student proposes methods to create quality living environments. The student is expected to:	(C) propose design and furnishings features to meet the special needs of individuals and families	(i) propose design features to meet the special needs of individuals

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student proposes methods to create quality living environments. The student is expected to:	(C) propose design and furnishings features to meet the special needs of individuals and families	(ii) propose design features to meet the special needs of families
(5) The student proposes methods to create quality living environments. The student is expected to:	(C) propose design and furnishings features to meet the special needs of individuals and families	(iii) propose furnishings features to meet the special needs of individuals
(5) The student proposes methods to create quality living environments. The student is expected to:	(C) propose design and furnishings features to meet the special needs of individuals and families	(iv) propose furnishings features to meet the special needs of families
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(A) identify architectural styles and architectural features exemplified in housing	(i) identify architectural styles exemplified in housing
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(A) identify architectural styles and architectural features exemplified in housing	(ii) identify architectural features exemplified in housing
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(B) summarize considerations for housing site selection	(i) summarize considerations for housing site selection
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(C) evaluate basic housing construction and finishing considerations	(i) evaluate basic housing construction considerations

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(C) evaluate basic housing construction and finishing considerations	(ii) evaluate basic housing finishing considerations
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(D) research and describe the effects of technology on current and future housing trends	(i) research the effects of technology on current housing trends
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(D) research and describe the effects of technology on current and future housing trends	(ii) describe the effects of technology on current housing trends
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(D) research and describe the effects of technology on current and future housing trends	(iii) research the effects of technology on future housing trends
(6) The student considers factors affecting housing construction when making plans and consumer decisions related to housing. The student is expected to:	(D) research and describe the effects of technology on current and future housing trends	(iv) describe the effects of technology on future housing trends
(7) The student evaluates factors influencing the housing industry. The student is expected to:	(A) research and describe the interrelationship of the housing industry with the economy	(i) research the interrelationship of the housing industry with the economy
(7) The student evaluates factors influencing the housing industry. The student is expected to:	(A) research and describe the interrelationship of the housing industry with the economy	(ii) describe the interrelationship of the housing industry with the economy

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student evaluates factors influencing the housing industry. The student is expected to:	(B) determine sources and availability of construction materials	(i) determine sources of construction materials
(7) The student evaluates factors influencing the housing industry. The student is expected to:	(B) determine sources and availability of construction materials	(ii) determine availability of construction materials
(8) The student assesses environmental issues affecting housing. The student is expected to:	(A) evaluate the effects of landscaping on housing and the larger environment	(i) evaluate the effects of landscaping on housing
(8) The student assesses environmental issues affecting housing. The student is expected to:	(A) evaluate the effects of landscaping on housing and the larger environment	(ii) evaluate the effects of landscaping on the larger environment
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(i) determine techniques that can be used in housing to conserve energy
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(ii) determine materials that can be used in housing to conserve energy
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(iii) determine technological applications that can be used in housing to conserve energy
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(iv) determine techniques that can be used in housing to conserve other resources

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(v) determine materials that can be used in housing to conserve other resources
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(vi) determine technological applications that can be used in housing to conserve other resources
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(vii) determine techniques that can be used in housing to promote sustainability
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(viii) determine materials that can be used in housing to promote sustainability
(8) The student assesses environmental issues affecting housing. The student is expected to:	(B) determine techniques, materials, and technological applications that can be used in housing to conserve energy and other resources and promote sustainability	(ix) determine technological applications that can be used in housing to promote sustainability
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(A) apply elements and principles of design to interiors	(i) apply elements of design to interiors
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(A) apply elements and principles of design to interiors	(ii) apply principles of design to interiors

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(B) plan for effective use of space zones and placement of furnishings	(i) plan for effective use of space zones
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(B) plan for effective use of space zones and placement of furnishings	(ii) plan for effective placement of furnishings
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(C) apply drafting techniques, including scaled drawings that facilitate space planning and technological applications	(i) apply drafting techniques, including scaled drawings that facilitate space planning
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(C) apply drafting techniques, including scaled drawings that facilitate space planning and technological applications	(ii) apply drafting techniques, including technological applications
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(D) determine the effect of technological applications on interior design practices	(i) determine the effect of technological applications on interior design practices
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(E) differentiate design practices to meet individual, business, and special needs	(i) differentiate design practices to meet individual needs
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(E) differentiate design practices to meet individual, business, and special needs	(ii) differentiate design practices to meet business needs

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(E) differentiate design practices to meet individual, business, and special needs	(iii) differentiate design practices to meet special needs
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(F) research energy conservation and sustainability practices that affect interior design	(i) research energy conservation practices that affect interior design
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(F) research energy conservation and sustainability practices that affect interior design	(ii) research sustainability practices that affect interior design
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(G) summarize laws, public policies, and regulations impacting interior environments	(i) summarize laws impacting interior environments
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(G) summarize laws, public policies, and regulations impacting interior environments	(ii) summarize public policies impacting interior environments
(9) The student uses effective design practices to evaluate residential and nonresidential interiors. The student is expected to:	(G) summarize laws, public policies, and regulations impacting interior environments	(iii) summarize regulations impacting interior environments
(10) The student determines appropriate lighting for residential and nonresidential interiors	(A) analyze the functions and principles of lighting	(i) analyze the functions of lighting
(10) The student determines appropriate lighting for residential and nonresidential interiors	(A) analyze the functions and principles of lighting	(ii) analyze the principles of lighting

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student determines appropriate lighting for residential and nonresidential interiors	(B) compare lighting types and methods of control	(i) compare lighting types
(10) The student determines appropriate lighting for residential and nonresidential interiors	(B) compare lighting types and methods of control	(ii) compare methods of control
(10) The student determines appropriate lighting for residential and nonresidential interiors	(C) recommend lighting applications for specific interior needs, including safety, conservation, and sustainability.	(i) recommend lighting applications for specific interior needs, including safety
(10) The student determines appropriate lighting for residential and nonresidential interiors	(C) recommend lighting applications for specific interior needs, including safety, conservation and sustainability	(ii) recommend lighting applications for specific interior needs, including conservation
(10) The student determines appropriate lighting for residential and nonresidential interiors	(C) recommend lighting applications for specific interior needs, including safety, conservation and sustainability	(iii) recommend lighting applications for specific interior needs, including sustainability
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(A) compare criteria for selection, use, and care of floor coverings	(i) compare criteria for selection of floor coverings
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(A) compare criteria for selection, use, and care of floor coverings	(ii) compare criteria for use of floor coverings

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(A) compare criteria for selection, use, and care of floor coverings	(iii) compare criteria for care of floor coverings
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(B) evaluate selection, use, and care of wall treatments	(i) evaluate selection of wall treatments
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(B) evaluate selection, use, and care of wall treatments	(ii) evaluate use of wall treatments
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(B) evaluate selection, use, and care of wall treatments	(iii) evaluate care of wall treatments
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(C) evaluate selection and care of ceilings	(i) evaluate selection of ceilings
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(C) evaluate selection and care of ceilings	(ii) evaluate care of ceilings

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(D) evaluate selection, use, and care of window treatments and their suitability for various window types	(i) evaluate selection of window treatments
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(D) evaluate selection, use, and care of window treatments and their suitability for various window types	(ii) evaluate use of window treatments
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(D) evaluate selection, use, and care of window treatments and their suitability for various window types	(iii) evaluate care of window treatments
(11) The student chooses appropriate background materials to complement various residential and nonresidential interior settings. The student is expected to:	(D) evaluate selection, use, and care of window treatments and their suitability for various window types	(iv) evaluate suitability [of window treatments] for various window types
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(A) examine the relationship of interior decisions to individual and family needs and wants	(i) examine the relationship of interior decisions to individual needs
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(A) examine the relationship of interior decisions to individual and family needs and wants	(ii) examine the relationship of interior decisions to individual wants

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(A) examine the relationship of interior decisions to individual and family needs and wants	(iii) examine the relationship of interior decisions to family needs
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(A) examine the relationship of interior decisions to individual and family needs and wants	(iv) examine the relationship of interior decisions to family wants
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(B) examine the influences of demographics, society, and culture on interior design decisions	(i) examine the influences of demographics on interior design decisions
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(B) examine the influences of demographics, society, and culture on interior design decisions	(ii) examine the influences of society on interior design decisions
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(B) examine the influences of demographics, society, and culture on interior design decisions	(iii) examine the influences of culture on interior design decisions
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(C) explain the relationship of local and global economics to interior environments	(i) explain the relationship of local economics to interior environments

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(C) explain the relationship of local and global economics to interior environments	(ii) explain the relationship of global economics to interior environments
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(D) propose strategies for controlling costs and allocating resources	(i) propose strategies for controlling costs
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(D) propose strategies for controlling costs and allocating resources	(ii) propose strategies for allocating resources
(12) The student demonstrates effective decision-making skills in applying principles of design and space to residential and nonresidential interior environments. The student is expected to:	(E) budget for acquisition of products to enhance interior environments	(i) budget for acquisition of products to enhance interior environments
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(A) distinguish between various characteristics of period styles throughout history	(i) distinguish between various characteristics of period styles throughout history
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(B) determine the influence of period styles on interior design throughout history	(i) determine the influence of period styles on interior design throughout history

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(C) summarize selection and care of quality furniture	(i) summarize selection of quality furniture
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(C) summarize selection and care of quality furniture	(ii) summarize care of quality furniture
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(D) assess aesthetic and functional aspects of furniture, including ergonomics and special needs requirements	(i) assess aesthetic aspects of furniture
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(D) assess aesthetic and functional aspects of furniture, including ergonomics and special needs requirements	(ii) assess functional aspects of furniture, including ergonomics
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(D) assess aesthetic and functional aspects of furniture, including ergonomics and special needs requirements	(iii) assess functional aspects of furniture, including special needs requirements
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(E) research and describe the impact of technology on furniture, including current trends	(i) research the impact of technology on furniture, including current trends
(13) The student evaluates the role of furniture in interior design for residential and nonresidential settings. The student is expected to:	(E) research and describe the impact of technology on furniture, including current trends	(ii) describe the impact of technology on furniture, including current trends

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student determines the role of appliances in interior design for residential and nonresidential settings. The student is expected to:	(A) analyze the functional and aesthetic aspects of appliances	(i) analyze the functional aspects of appliances
(14) The student determines the role of appliances in interior design for residential and nonresidential settings. The student is expected to:	(A) analyze the functional and aesthetic aspects of appliances	(ii) analyze the aesthetic aspects of appliances
(14) The student determines the role of appliances in interior design for residential and nonresidential settings. The student is expected to:	(B) determine the process for selection of appliances, including consideration of special needs	(i) determine the process for selection of appliances, including consideration of special needs
(14) The student determines the role of appliances in interior design for residential and nonresidential settings. The student is expected to:	(C) research and explain the safe use and care of appliances, including current trends	(i) research the safe use of appliances, including current trends
(14) The student determines the role of appliances in interior design for residential and nonresidential settings. The student is expected to:	(C) research and explain the safe use and care of appliances, including current trends	(ii) research the care of appliances, including current trends
(14) The student determines the role of appliances in interior design for residential and nonresidential settings. The student is expected to:	(C) research and explain the safe use and care of appliances, including current trends	(iii) explain the safe use of appliances, including current trends
(14) The student determines the role of appliances in interior design for residential and nonresidential settings. The student is expected to:	(C) research and explain the safe use and care of appliances, including current trends	(iv) explain the care of appliances, including current trends

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student determines the role of appliances in interior design for residential and nonresidential settings. The student is expected to:	(D) research technological advancements in appliances	(i) research technological advancements in appliances
(15) The student evaluates the role of accessories in interior design for residential and nonresidential settings. The student is expected to:	(A) identify types of accessories, including eco-friendly accessories	(i) identify types of accessories, including eco-friendly accessories
(15) The student evaluates the role of accessories in interior design for residential and nonresidential settings. The student is expected to:	(B) describe criteria for selection of accessories	(i) describe criteria for selection of accessories
(15) The student evaluates the role of accessories in interior design for residential and nonresidential settings. The student is expected to:	(C) analyze care of accessories	(i) analyze care of accessories
(15) The student evaluates the role of accessories in interior design for residential and nonresidential settings. The student is expected to:	(D) demonstrate a knowledge of arranging accessories	(i) demonstrate a knowledge of arranging accessories
(15) The student evaluates the role of accessories in interior design for residential and nonresidential settings. The student is expected to:	(E) research eco-friendly options for accessories	(i) research eco-friendly options for accessories
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(A) customize screen menus to fit specific problems or needs	(i) customize screen menus to fit specific problems or needs

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(B) construct points, lines, and other geometric forms using accepted computer-aided design methods	(i) construct points using accepted computer-aided design methods
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(B) construct points, lines, and other geometric forms using accepted computer-aided design methods	(ii) construct lines using accepted computer-aided design methods
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(B) construct points, lines, and other geometric forms using accepted computer-aided design methods	(iii) construct other geometric forms using accepted computer-aided design methods
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(C) create a freehand, simple one-point perspective	(i) create a freehand, simple one-point perspective
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(D) use applications to create a bill of materials, including budgeting considerations	(i) use applications to create a bill of materials, including budgeting considerations
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(E) use technological applications to create and modify architectural interior drawings	(i) use technological applications to create architectural interior drawings
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(E) use technological applications to create and modify architectural interior drawings	(i) use technological applications to modify architectural interior drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(F) print and plot architectural interior drawings for presentation	(i) print architectural interior drawings for presentation
(16) The student applies the concepts and skills of the industry to simulated work situations. The student is expected to:	(F) print and plot architectural interior drawings for presentation	(ii) plot architectural interior drawings for presentation
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(A) illustrate ideas for interior design from direct observation, experiences, and imagination	(i) illustrate ideas for interior design from direct observation
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(A) illustrate ideas for interior design from direct observation, experiences, and imagination	(ii) illustrate ideas for interior design from experiences
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(A) illustrate ideas for interior design from direct observation, experiences, and imagination	(iii) illustrate ideas for interior design from imagination
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(B) compare and contrast the use of interior design elements and principles in personal design plans and design plans of others using industry terminology	(i) compare and contrast the use of interior design elements in personal design plans using industry terminology
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(B) compare and contrast the use of interior design elements and principles in personal design plans and design plans of others using industry terminology	(ii) compare and contrast the use of interior design principles in personal design plans using industry terminology

Knowledge and Skill Statement	Student Expectation	Breakout
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(B) compare and contrast the use of interior design elements and principles in personal design plans and design plans of others using industry terminology	(iii) compare and contrast the use of interior design elements in [the] design plans of others using industry terminology
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(B) compare and contrast the use of interior design elements and principles in personal design plans and design plans of others using industry terminology	(iv) compare and contrast the use of interior design principles in [the] design plans of others using industry terminology
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(C) create visual solutions by elaborating on direct observation, experience, and imagination	(i) create visual solutions by elaborating on direct observation
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(C) create visual solutions by elaborating on direct observation, experience, and imagination	(ii) create visual solutions by elaborating on experience
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(C) create visual solutions by elaborating on direct observation, experience, and imagination	(iii) create visual solutions by elaborating on imagination
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(D) create designs for practical applications	(i) create designs for practical applications
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(i) demonstrate effective use of interior design media in designing

Knowledge and Skill Statement	Student Expectation	Breakout
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(ii) demonstrate effective use of interior design media in drawing
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(iii) demonstrate effective use of interior design media in painting
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(iv) demonstrate effective use of interior design media in printmaking
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(v) demonstrate effective use of interior design media in sculpting
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(vi) demonstrate effective use of interior design tools in designing
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(vii) demonstrate effective use of interior design tools in drawing
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(viii) demonstrate effective use of interior design tools in painting

Knowledge and Skill Statement	Student Expectation	Breakout
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(ix) demonstrate effective use of interior design tools in printmaking
(17) The student creates a professional portfolio featuring original projects using a variety of media. The student is expected to:	(E) demonstrate effective use of interior design media and tools in designing, drawing, painting, printmaking, and sculpture making such as model building	(x) demonstrate effective use of interior design tools in sculpting
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(A) select educational and work history highlights to create a personal resumé	(i) select educational highlights to create a personal resumé
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(A) select educational and work history highlights to create a personal resumé	(ii) select work history highlights to create a personal resumé
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(B) develop a resumé using word processing technology	(i) develop a resumé using word processing technology
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(C) contact professional references to acquire recommendations	(i) contact professional references to acquire recommendations

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(D) obtain appropriate letters of recommendation	(i) obtain appropriate letters of recommendation
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(i) document work experiences to build a portfolio
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(ii) document licenses to build a portfolio
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(iii) document certifications to build a portfolio
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(iv) document credentials to build a portfolio
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(v) document education and training to build a portfolio
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(vi) maintain a record of work experiences to build a portfolio

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(vii) maintain a record of licenses to build a portfolio
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(viii) maintain a record of certifications to build a portfolio
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(ix) maintain a record of credentials to build a portfolio
(18) The student maintains a professional portfolio to document knowledge, skills, and abilities. The student is expected to:	(E) document and maintain a record of work experiences, licenses, certifications, credentials, and education and training to build a portfolio	(x) maintain a record of education and training to build a portfolio
(19) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(A) use problem-solving skills to analyze a situation and to identify a problem to be solved	(i) use problem-solving skills to analyze a situation
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(A) use problem-solving skills to analyze a situation and to identify a problem to be solved	(ii) use problem-solving skills to identify a problem to be solved
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(B) break a complex problem into component parts that can be analyzed and solved separately	(i) break a complex problem into component parts that can be analyzed separately

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(B) break a complex problem into component parts that can be analyzed and solved separately	(ii) break a complex problem into component parts that can be solved separately
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(C) strive for accuracy and precision	(i) strive for accuracy
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(C) strive for accuracy and precision	(ii) strive for precision
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(D) work independently	(i) work independently
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(E) work collaboratively	(i) work collaboratively
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(F) research an interior design project	(i) research an interior design project
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(G) design and present an effective interior design product	(i) design an effective interior design product

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(G) design and present an effective interior design product	(ii) present an effective interior design product
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(H) present a final interior design product for critique that demonstrates clear and effective communication	(i) present a final interior design product for critique that demonstrates clear communication
(18) The student applies the concepts and skills of the profession to simulated or actual work situations. The student is expected to:	(H) present a final interior design product for critique that demonstrates clear and effective communication	(ii) present a final interior design product for critique that demonstrates effective communication

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.56. Interior Design II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisites: English II, Geometry, and Interior Design I. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Interior Design II is a technical laboratory course that includes the application of the employability characteristics, principles, processes, technologies, communication, tools, equipment, and materials related to interior design to meet industry standards.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(i) apply oral communication skills clearly, concisely, convincingly, and effectively to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(ii) apply oral communication skills clearly, concisely, convincingly, and effectively to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(iii) apply written communication skills clearly, concisely, convincingly, and effectively to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(iv) apply written communication skills clearly, concisely, convincingly, and effectively to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) problem-solve using job-appropriate mathematical skills	(i) problem-solve using job-appropriate mathematical skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate an understanding of leadership skills	(i) demonstrate an understanding of leadership skills

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(i) cooperate as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(ii) contribute as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(iii) collaborate as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(i) exhibit professionalism through dress that is appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(ii) exhibit professionalism through speech that is appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(iii) exhibit professionalism through manners that [are] appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(iv) exhibit professionalism through dress that is appropriate to the worksite

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(v) exhibit professionalism through speech that is appropriate to the worksite
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(vi) exhibit professionalism through manners that [are] appropriate to the worksite
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review quantitative and qualitative work processes and end products	(i) review quantitative work processes
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review quantitative and qualitative work processes and end products	(ii) review quantitative end products
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review quantitative and qualitative work processes and end products	(iii) review qualitative work processes
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review quantitative and qualitative work processes and end products	(iv) review qualitative end products
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(i) follow written instructions, including health and safety rules

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(ii) follow oral instructions, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(iii) adhere to established practices, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(iv) adhere to established policies, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(v) adhere to established procedures, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(H) use and apply job-appropriate computer applications for the given task such as printing and plotting elevations, floor plans, and additional presentation documents or illustrations.	(i) use job-appropriate computer applications for the given task
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(H) use and apply job-appropriate computer applications for the given task such as printing and plotting elevations, floor plans, and additional presentation documents or illustrations.	(ii) apply job-appropriate computer applications for the given task
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(A) research employment opportunities, including internship and entrepreneurship, and preparation requirements, in the field of architectural interior design	(i) research employment opportunities, including internship, in the field of architectural interior design

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(A) research employment opportunities, including internship and entrepreneurship, and preparation requirements, in the field of architectural interior design	(ii) research employment opportunities, including entrepreneurship, in the field of architectural interior design
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(A) research employment opportunities, including internship and entrepreneurship, and preparation requirements, in the field of architectural interior design	(iii) research preparation requirements, in the field of architectural interior design
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(i) demonstrate an understanding of group participation related to citizenship
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(ii) demonstrate an understanding of group participation related to career preparation
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iii) demonstrate an understanding of leadership related to citizenship
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iv) demonstrate an understanding of leadership related to career preparation
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(C) research employers' expectations and appropriate work habits	(i) research employers' expectations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(C) research employers' expectations and appropriate work habits	(ii) research appropriate work habits
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(D) apply the competencies related to resources, information systems, and technology in appropriate settings and situations	(i) apply the competencies related to resources in appropriate settings
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(D) apply the competencies related to resources, information systems, and technology in appropriate settings and situations	(ii) apply the competencies related to information systems in appropriate settings
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(D) apply the competencies related to resources, information systems, and technology in appropriate settings and situations	(iii) apply the competencies related to technology in appropriate settings
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(D) apply the competencies related to resources, information systems, and technology in appropriate settings and situations	(iv) apply the competencies related to resources in appropriate situations
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(D) apply the competencies related to resources, information systems, and technology in appropriate settings and situations	(v) apply the competencies related to information systems in appropriate situations
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(D) apply the competencies related to resources, information systems, and technology in appropriate settings and situations	(vi) apply the competencies related to technology in appropriate situations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(i) demonstrate knowledge of the concepts related to health in the workplace, as specified by appropriate governmental regulations
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(ii) demonstrate knowledge of the concepts related to safety in the workplace, as specified by appropriate governmental regulations
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(iii) demonstrate knowledge of the skills related to health in the workplace, as specified by appropriate governmental regulations
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations	(iv) demonstrate knowledge of the skills related to safety in the workplace, as specified by appropriate governmental regulations
(2) The student knows the employability characteristics of a successful worker in the modern workplace. The student is expected to:	(F) maintain a project portfolio that documents interior design projects using a variety of multimedia techniques with a professional resume reflecting current trends	(i) maintain a project portfolio that documents interior design projects using a variety of multimedia techniques with a professional resume reflecting current trends
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(i) demonstrate effective verbal communication skills with individuals from varied cultures, including fellow workers
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(ii) demonstrate effective verbal communication skills with individuals from varied cultures, including managers

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iii) demonstrate effective verbal communication skills with individuals from varied cultures, including customers
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iv) demonstrate effective written communication skills with individuals from varied cultures, including fellow workers
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(v) demonstrate effective written communication skills with individuals from varied cultures, including managers
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(vi) demonstrate effective written communication skills with individuals from varied cultures, including customers
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(B) complete work orders and related paperwork	(i) complete work orders
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(B) complete work orders and related paperwork	(ii) complete related paperwork

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(C) estimate cost of supplies, materials, and labor	(i) estimate cost of supplies
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(C) estimate cost of supplies, materials, and labor	(ii) estimate cost of materials
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(C) estimate cost of supplies, materials, and labor	(iii) estimate cost of labor
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(i) read schematics
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(ii) read floor plans
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(iii) read work drawings
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(iv) read catalogs

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(v) read manuals
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(vi) read bulletins
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(vii) interpret schematics
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(viii) interpret floor plans
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(ix) interpret work drawings
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(x) interpret catalogs
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(xi) interpret manuals

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies core academic skills to the requirements of architectural interior design. The student is expected to:	(D) read and interpret schematics, floor plans, work drawings, catalogs, manuals, and bulletins	(xii) interpret bulletins
(4) The student knows the concepts and skills that form the core knowledge of architectural interior design. The student is expected to:	(A) demonstrate knowledge of interior design theory	(i) demonstrate knowledge of interior design theory
(4) The student knows the concepts and skills that form the core knowledge of architectural interior design. The student is expected to:	(B) apply layout and design lines, symbols, and drawings	(i) apply layout and design lines
(4) The student knows the concepts and skills that form the core knowledge of architectural interior design. The student is expected to:	(B) apply layout and design lines, symbols, and drawings	(ii) apply layout and design symbols
(4) The student knows the concepts and skills that form the core knowledge of architectural interior design. The student is expected to:	(B) apply layout and design lines, symbols, and drawings	(iii) apply layout and design drawings
(4) The student knows the concepts and skills that form the core knowledge of architectural interior design. The student is expected to:	(C) demonstrate knowledge of the theory and use of color in interior design	(i) demonstrate knowledge of the theory of color in interior design
(4) The student knows the concepts and skills that form the core knowledge of architectural interior design. The student is expected to:	(C) demonstrate knowledge of the theory and use of color in interior design	(ii) demonstrate knowledge of the use of color in interior design

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student knows the concepts and skills that form the core knowledge of architectural interior design. The student is expected to:	(D) demonstrate knowledge of the principles of computer-aided drafting	(i) demonstrate knowledge of the principles of computer-aided drafting
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(A) use tools, materials, and equipment commonly employed in the field of architectural interior design in a safe manner	(i) use tools commonly employed in the field of architectural interior design in a safe manner
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(A) use tools, materials, and equipment commonly employed in the field of architectural interior design in a safe manner	(ii) use materials commonly employed in the field of architectural interior design in a safe manner
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(A) use tools, materials, and equipment commonly employed in the field of architectural interior design in a safe manner	(iii) use equipment commonly employed in the field of architectural interior design in a safe manner
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(B) demonstrate an understanding of how to properly handle and dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with the material safety data sheet (MSDS), Occupational Safety and Health Administration (OSHA), and Environmental Protection Agency (EPA) regulations	(i) demonstrate an understanding of how to properly handle environmentally hazardous materials used in the field of architectural interior design in accordance with the material safety data sheet (MSDS)

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(B) demonstrate an understanding of how to properly handle and dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with the material safety data sheet (MSDS), Occupational Safety and Health Administration (OSHA), and Environmental Protection Agency (EPA) regulations	(ii) demonstrate an understanding of how to properly handle environmentally hazardous materials used in the field of architectural interior design in accordance with the Occupational Safety and Health Administration (OSHA)
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(B) demonstrate an understanding of how to properly handle and dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with the material safety data sheet (MSDS), Occupational Safety and Health Administration (OSHA), and Environmental Protection Agency (EPA) regulations	(iii) demonstrate an understanding of how to properly handle environmentally hazardous materials used in the field of architectural interior design in accordance with Environmental Protection Agency (EPA) regulations
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(B) demonstrate an understanding of how to properly handle and dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with the material safety data sheet (MSDS), Occupational Safety and Health Administration (OSHA), and Environmental Protection Agency (EPA) regulations	(iv) demonstrate an understanding of how to properly dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with the material safety data sheet (MSDS)
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(B) demonstrate an understanding of how to properly handle and dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with the material safety data sheet (MSDS), Occupational Safety and Health Administration (OSHA), and Environmental Protection Agency (EPA) regulations	(v) demonstrate an understanding of how to properly dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with the Occupational Safety and Health Administration (OSHA)

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(B) demonstrate an understanding of how to properly handle and dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with the material safety data sheet (MSDS), Occupational Safety and Health Administration (OSHA), and Environmental Protection Agency (EPA) regulations	(vi) demonstrate an understanding of how to properly dispose of environmentally hazardous materials used in the field of architectural interior design in accordance with Environmental Protection Agency (EPA) regulations
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(C) demonstrate knowledge of new and emerging technologies that may affect the field of architectural interior design	(i) demonstrate knowledge of new technologies that may affect the field of architectural interior design
(5) The student knows the function and application of the tools, equipment, technologies, and materials used in architectural interior design. The student is expected to:	(C) demonstrate knowledge of new and emerging technologies that may affect the field of architectural interior design	(ii) demonstrate knowledge of emerging technologies that may affect the field of architectural interior design
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(A) apply architectural lettering techniques	(i) apply architectural lettering techniques
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(B) render freehand nonresidential or residential interior design working drawings	(i) render freehand nonresidential or residential interior design working drawings
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(C) draw a single-line floor plan from design development techniques for a residential or nonresidential project	(i) draw a single-line floor plan from design development techniques for a residential or nonresidential project

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(D) select interior furnishings and finish materials for a residence or a nonresidential office interior	(i) select interior furnishings for a residence or a nonresidential office interior
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(D) select interior furnishings and finish materials for a residence or a nonresidential office interior	(ii) select finish materials for a residence or a nonresidential office interior
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(E) prepare and draw dimension plans for construction documents	(i) prepare dimension plans for construction documents
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(E) prepare and draw dimension plans for construction documents	(ii) draw dimension plans for construction documents
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(F) produce interior drawings using one-point and two-point perspective	(i) produce interior drawings using one-point perspective
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(F) produce interior drawings using one-point and two-point perspective	(ii) produce interior drawings using two-point perspective
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(G) develop and complete schematic design drawings	(i) develop schematic design drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(G) develop and complete schematic design drawings	(ii) complete schematic design drawings
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(H) apply the essential knowledge and skills in architectural interior design to career preparation learning experiences, including job shadowing, mentoring, or apprenticeship training programs	(i) apply the essential knowledge and skills in architectural interior design to career preparation learning experiences, including job shadowing, mentoring, or apprenticeship training programs
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(I) create an original, sustainable design as it relates to interior design	(i) create an original, sustainable design as it relates to interior design
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(J) customize screen menus in drawing programs	(i) customize screen menus in drawing programs
(6) The student applies the concepts and skills of interior design to simulated and actual work situations. The student is expected to:	(K) apply industry-accepted, computer-aided drafting skills	(i) apply industry-accepted, computer-aided drafting skills
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(A) research and define green architecture as related to the field of interior design	(i) research green architecture as related to the field of interior design
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(A) research and define green architecture as related to the field of interior design	(ii) define green architecture as related to the field of interior design

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(B) research the Americans with Disabilities Act	(i) research the Americans with Disabilities Act
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(C) research the guidelines for kitchen and bath design as defined by The National Kitchen and Bath Industry (NKBA)	(i) research the guidelines for kitchen design as defined by The National Kitchen and Bath Industry (NKBA)
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(C) research the guidelines for kitchen and bath design as defined by The National Kitchen and Bath Industry (NKBA)	(ii) research the guidelines for bath design as defined by The National Kitchen and Bath Industry (NKBA)
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(D) research traditional and period design styles of upholstery	(i) research traditional design styles of upholstery
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(D) research traditional and period design styles of upholstery	(ii) research period design styles of upholstery
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(E) research new and emerging technologies that may affect the field of furniture repair and upholstery services	(i) research new technologies that may affect the field of furniture and upholstery repair services
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(E) research new and emerging technologies that may affect the field of furniture repair and upholstery services	(ii) research emerging technologies that may affect the field of furniture and upholstery services

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(i) research types of paints
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(ii) research types of varnishes
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(iii) research types of polishes
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(iv) research types of waxes
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(v) research the properties of paints
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(vi) research the properties of varnishes
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(vii) research the properties of polishes

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(viii) research the properties of waxes
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(ix) research the uses of paints
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(x) research the uses of varnishes
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(xi) research the uses of polishes
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(F) research the types, properties, and uses of paints, varnishes, polishes, and waxes	(xii) research the uses of waxes
(7) The student uses valid and reliable research strategies to determine current industry standards. The student is expected to:	(G) research an architectural project such as urban renewal, green architecture, or innovative design	(i) research an architectural project
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(A) identify styles and periods of furniture	(i) identify styles of furniture

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(A) identify styles and periods of furniture	(ii) identify periods of furniture
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(B) identify the various types and properties of woods	(i) identify the various types of woods
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(B) identify the various types and properties of woods	(ii) identify the various properties of woods
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(C) identify different fabrics, materials, and finishes and their characteristics	(i) identify different fabrics
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(C) identify different fabrics, materials, and finishes and their characteristics	(ii) identify different materials
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(C) identify different fabrics, materials, and finishes and their characteristics	(iii) identify different finishes
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(C) identify different fabrics, materials, and finishes and their characteristics	(iv) identify [the] characteristics [of different fabrics]

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(C) identify different fabrics, materials, and finishes and their characteristics	(v) identify [the] characteristics [of different materials]
(8) The student understands the concepts and skills that form the core knowledge of furniture repair and upholstery. The student is expected to:	(C) identify different fabrics, materials, and finishes and their characteristics	(vi) identify [the] characteristics [of different finishes]
(9) The student knows the function and application of the tools, equipment, technologies, and materials used in furniture repair and upholstery. The student is expected to:	(A) use tools, materials, and equipment commonly employed in the field of furniture repair and upholstery services	(i) use tools commonly employed in the field of furniture repair and upholstery services
(9) The student knows the function and application of the tools, equipment, technologies, and materials used in furniture repair and upholstery. The student is expected to:	(A) use tools, materials, and equipment commonly employed in the field of furniture repair and upholstery services	(ii) use materials commonly employed in the field of furniture repair and upholstery services
(9) The student knows the function and application of the tools, equipment, technologies, and materials used in furniture repair and upholstery. The student is expected to:	(A) use tools, materials, and equipment commonly employed in the field of furniture repair and upholstery services	(iii) use equipment commonly employed in the field of furniture repair and upholstery services
(9) The student knows the function and application of the tools, equipment, technologies, and materials used in furniture repair and upholstery. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in the field of furniture repair and upholstery	(i) handle environmentally hazardous materials used in the field of furniture repair and upholstery

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student knows the function and application of the tools, equipment, technologies, and materials used in furniture repair and upholstery. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in the field of furniture repair and upholstery	(ii) dispose of environmentally hazardous materials used in the field of furniture repair and upholstery
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(A) apply the woodworking skills required for furniture finishing and repair	(i) apply the woodworking skills required for furniture finishing
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(A) apply the woodworking skills required for furniture finishing and repair	(ii) apply the woodworking skills required for furniture repair
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(i) demonstrate knowledge of the types of paints
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(ii) demonstrate knowledge of the properties of paints
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(iii) demonstrate knowledge of the uses of paints
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(iv) demonstrate knowledge of the types of varnishes

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(v) demonstrate knowledge of the properties of varnishes
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(vi) demonstrate knowledge of the uses of varnishes
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(vii) demonstrate knowledge of the types of polishes
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(viii) demonstrate knowledge of the properties of polishes
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(ix) demonstrate knowledge of the uses of polishes
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(x) demonstrate knowledge of the types of waxes
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(xi) demonstrate knowledge of the properties of waxes

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(B) demonstrate knowledge of the types, properties, and uses of paints, varnishes, polishes, and waxes	(xii) demonstrate knowledge of the uses of waxes
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(C) disassemble and reassemble furniture	(i) disassemble furniture
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(C) disassemble and reassemble furniture	(ii) reassemble furniture
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(D) repair dents, marks, and scratches by using fillers and stains	(i) repair dents by using fillers and stains
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(D) repair dents, marks, and scratches by using fillers and stains	(ii) repair marks by using fillers and stains
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(D) repair dents, marks, and scratches by using fillers and stains	(iii) repair scratches by using fillers and stains
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(E) perform the tasks of fabrication and repair and disassembly and reassembly such as tacking, nailing, gluing, measuring, layout, cutting, sewing, and fitting materials	(i) perform the tasks of fabrication and repair

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(E) perform the tasks of fabrication and repair and disassembly and reassembly such as tacking, nailing, gluing, measuring, layout, cutting, sewing, and fitting materials	(ii) perform the tasks of disassembly and reassembly
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(F) apply materials to furniture such as filling, padding, springs, and fabric	(i) apply materials to furniture
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(G) use problem-solving skills to analyze a situation to identify a problem to be solved	(i) use problem-solving skills to analyze a situation to identify a problem to be solved
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(H) break a complex problem into component parts that can be separately analyzed and solved	(i) break a complex problem into component parts that can be separately analyzed
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(H) break a complex problem into component parts that can be separately analyzed and solved	(ii) break a complex problem into component parts that can be separately solved
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(I) strive for accuracy and precision	(i) strive for accuracy
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(I) strive for accuracy and precision	(i) strive for precision

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(J) work independently	(i) work independently
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(K) work collaboratively	(i) work collaboratively
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(L) design and present an effective interior design product	(i) design an effective interior design product
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(L) design and present an effective interior design product	(ii) present an effective interior design product
(10) The student applies the concepts and skills of furniture repair and upholstery to simulated and actual work situations. The student is expected to:	(M) present a final interior design product for critique that demonstrates clear and effective communication	(i) present a final interior design product for critique that demonstrates clear and effective communication

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.57. Electrical Technology I (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Architecture or Principles of Construction. Students shall be awarded one credit for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Electrical Technology I, students will gain knowledge and skills needed to enter the workforce as an electrician or building maintenance supervisor, prepare for a postsecondary degree in a specified field of construction or construction management, or pursue an approved apprenticeship program. Students will acquire knowledge and skills in safety, electrical theory, tools, codes, installation of electrical equipment, and the reading of electrical drawings, schematics, and specifications.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify job opportunities with their accompanying job duties such as electrician, building maintenance technician, manager, and electrical engineer	(i) identify job opportunities with their accompanying job duties
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways, including education, job skills, and experience required to achieve that pathway	(i) research career pathways, including education required to achieve that pathway
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways, including education, job skills, and experience required to achieve that pathway	(ii) research career pathways, including job skills required to achieve that pathway
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways, including education, job skills, and experience required to achieve that pathway	(iii) research career pathways, including experience required to achieve that pathway
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(A) demonstrate safe working procedures in a construction environment	(i) demonstrate safe working procedures in a construction environment
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(B) explain the purpose of the Occupational Safety and Health Administration (OSHA) and how it promotes safety on the job	(i) explain the purpose of the Occupational Safety and Health Administration (OSHA)
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(B) explain the purpose of the Occupational Safety and Health Administration (OSHA) and how it promotes safety on the job	(ii) explain how [OSHA] promotes safety on the job

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(C) identify electrical hazards and how to avoid or minimize them in the workplace	(i) identify electrical hazards
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(C) identify electrical hazards and how to avoid or minimize them in the workplace	(ii) identify how to avoid or minimize [electrical hazards] in the workplace
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(i) explain safety issues concerning lockout and tagout procedures
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(ii) explain safety issues concerning personal protection using assured grounding programs
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(iii) explain safety issues concerning personal protection using isolation programs
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(iv) explain safety issues concerning confined space entry

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(v) explain safety issues concerning respiratory protection
(2) The student identifies the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(vi) explain safety issues concerning fall protection
(3) The student learns conduit bending and installation. The student is expected to:	(A) identify the methods of hand bending conduit	(i) identify the methods of hand bending conduit
(3) The student learns conduit bending and installation. The student is expected to:	(B) identify the various methods used to install conduit	(i) identify the various methods used to install conduit
(3) The student learns conduit bending and installation. The student is expected to:	(C) use mathematical formulas to determine conduit bends	(i) use mathematical formulas to determine conduit bends
(3) The student learns conduit bending and installation. The student is expected to:	(D) make 90 degree bends, back-to-back bends, offsets, kicks, and saddle bends using a hand bender	(i) make 90 degree bends using a hand bender
(3) The student learns conduit bending and installation. The student is expected to:	(D) make 90 degree bends, back-to-back bends, offsets, kicks, and saddle bends using a hand bender	(ii) make back-to-back bends using a hand bender
(3) The student learns conduit bending and installation. The student is expected to:	(D) make 90 degree bends, back-to-back bends, offsets, kicks, and saddle bends using a hand bender	(iii) make offsets using a hand bender

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student learns conduit bending and installation. The student is expected to:	(D) make 90 degree bends, back-to-back bends, offsets, kicks, and saddle bends using a hand bender	(iv) make kicks using a hand bender
(3) The student learns conduit bending and installation. The student is expected to:	(D) make 90 degree bends, back-to-back bends, offsets, kicks, and saddle bends using a hand bender	(v) make saddle bends using a hand bender
(3) The student learns conduit bending and installation. The student is expected to:	(E) cut, ream, and thread conduit	(i) cut conduit
(3) The student learns conduit bending and installation. The student is expected to:	(E) cut, ream, and thread conduit	(ii) ream conduit
(3) The student learns conduit bending and installation. The student is expected to:	(E) cut, ream, and thread conduit	(iii) thread conduit
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(A) identify and explain the use of threaded fasteners	(i) identify the use of threaded fasteners
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(A) identify and explain the use of threaded fasteners	(ii) explain the use of threaded fasteners
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(B) identify and explain the use of non-threaded fasteners	(i) identify the use of non-threaded fasteners

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(B) identify and explain the use of non-threaded fasteners	(ii) explain the use of non-threaded fasteners
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(C) identify and explain the use of anchors	(i) identify the use of anchors
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(C) identify and explain the use of anchors	(ii) explain the use of anchors
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(D) demonstrate the correct applications for fasteners and anchors	(i) demonstrate the correct applications for fasteners
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(D) demonstrate the correct applications for fasteners and anchors	(ii) demonstrate the correct applications for anchors
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(E) install fasteners and anchors	(i) install fasteners

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student gains knowledge of the hardware and systems used by an electrician to mount and support boxes, receptacles, and other electrical components. The student is expected to:	(E) install fasteners and anchors	(ii) install anchors
(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:	(A) recognize what atoms are and what atoms are composed of	(i) recognize what atoms are
(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:	(A) recognize what atoms are and what atoms are composed of	(ii) recognize what atoms are composed of
(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:	(B) define voltage and identify the ways in which it can be produced	(i) define voltage
(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:	(B) define voltage and identify the ways in which it can be produced	(ii) identify the ways in which [voltage] can be produced

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(C) explain the difference between conductors and insulators</p>	<p>(i) explain the difference between conductors and insulators</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(D) define the units of measurement used to measure the properties of electricity</p>	<p>(i) define the units of measurement used to measure the properties of electricity</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(E) explain how voltage, current, and resistance are related to each other</p>	<p>(i) explain how voltage, current, and resistance are related to each other</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(F) calculate an unknown value using the formula for Ohm's law</p>	<p>(i) calculate an unknown value using the formula for Ohm's law</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(G) explain the different types of meters used to measure voltage, current, and resistance</p>	<p>(i) explain the different types of meters used to measure voltage</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(G) explain the different types of meters used to measure voltage, current, and resistance</p>	<p>(ii) explain the different types of meters used to measure current</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(G) explain the different types of meters used to measure voltage, current, and resistance</p>	<p>(iii) explain the different types of meters used to measure resistance</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(H) calculate the amount of power used by a circuit using the power formula</p>	<p>(i) calculate the amount of power used by a circuit using the power formula</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(I) explain the basic characteristics of a series, parallel, and combined series-parallel circuit</p>	<p>(i) explain the basic characteristics of a series circuit</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(I) explain the basic characteristics of a series, parallel, and combined series-parallel circuit</p>	<p>(ii) explain the basic characteristics of a parallel circuit</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(I) explain the basic characteristics of a series, parallel, and combined series-parallel circuit</p>	<p>(iii) explain the basic characteristics of a combined series-parallel circuit</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(J) calculate, using Kirchhoff's current law, the total current in parallel and series-parallel circuits</p>	<p>(i) calculate, using Kirchhoff's current law, the total current in parallel circuits</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(J) calculate, using Kirchhoff's current law, the total current in parallel and series-parallel circuits</p>	<p>(ii) calculate, using Kirchhoff's current law, the total current in series-parallel circuits</p>
<p>(5) The student learns the electrical concepts used in Ohm's law applied to direct current and series circuits and understands series parallel circuits, resistive circuits, Kirchhoff's voltage and current laws, and circuit analysis. The student is expected to:</p>	<p>(K) find the total amount of resistance in a series, parallel, or combined series-parallel circuit</p>	<p>(i) find the total amount of resistance in a series, parallel, or combined series-parallel circuit</p>
<p>(6) The student gains knowledge in selecting, using, and safely maintaining common electrical test equipment. The student is expect to:</p>	<p>(A) explain how to operate test equipment such as ammeter, ohmmeter, volt-ohm-multimeter, continuity tester, and voltage tester</p>	<p>(i) explain how to operate test equipment</p>
<p>(6) The student gains knowledge in selecting, using, and safely maintaining common electrical test equipment. The student is expect to:</p>	<p>(B) explain how to read specific test equipment and convert from one scale to another when using specified test equipment</p>	<p>(i) explain how to read specific test equipment</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student gains knowledge in selecting, using, and safely maintaining common electrical test equipment. The student is expect to:	(B) explain how to read specific test equipment and convert from one scale to another when using specified test equipment	(ii) explain how to convert from one scale to another when using specified test equipment
(6) The student gains knowledge in selecting, using, and safely maintaining common electrical test equipment. The student is expect to:	(C) explain the importance of proper meter polarity	(i) explain the importance of proper meter polarity
(6) The student gains knowledge in selecting, using, and safely maintaining common electrical test equipment. The student is expect to:	(D) explain the difference between digital and analog meters	(i) explain the difference between digital and analog meters
(7) The student uses the National Electrical Code. The student is expected to:	(A) explain the purpose and history of the National Electrical Code	(i) explain the purpose of the National Electrical Code
(7) The student uses the National Electrical Code. The student is expected to:	(A) explain the purpose and history of the National Electrical Code	(ii) explain the history of the National Electrical Code
(7) The student uses the National Electrical Code. The student is expected to:	(B) describe the layout of and explain how to navigate the National Electrical Code	(i) describe the layout of the National Electrical Code
(7) The student uses the National Electrical Code. The student is expected to:	(B) describe the layout of and explain how to navigate the National Electrical Code	(ii) explain how to navigate the National Electrical Code
(7) The student uses the National Electrical Code. The student is expected to:	(C) describe the purpose of the National Electrical Manufacturers Association and National Fire Protection Association	(i) describe the purpose of the National Electrical Manufacturers Association

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student uses the National Electrical Code. The student is expected to:	(C) describe the purpose of the National Electrical Manufacturers Association and National Fire Protection Association	(ii) describe the purpose of the National Fire Protection Association
(7) The student uses the National Electrical Code. The student is expected to:	(D) explain the role of testing laboratories	(i) explain the role of testing laboratories
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(A) describe various types of cable trays and raceways	(i) describe various types of cable trays
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(A) describe various types of cable trays and raceways	(ii) describe various types of raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(B) identify and select various types and sizes of raceways	(i) identify various types of raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(B) identify and select various types and sizes of raceways	(ii) identify various sizes of raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(B) identify and select various types and sizes of raceways	(iii) select various types of raceways

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(B) identify and select various types and sizes of raceways	(iv) select various sizes of raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(C) identify and select various types and sizes of cable raceways	(i) identify various types of cable raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(C) identify and select various types and sizes of cable raceways	(ii) identify various sizes of cable raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(C) identify and select various types and sizes of cable raceways	(iii) select various types of cable raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(C) identify and select various types and sizes of cable raceways	(iv) select various sizes of cable raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(D) identify and select various types of raceway fittings	(i) identify various types of raceway fittings
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(D) identify and select various types of raceway fittings	(ii) select various types of raceway fittings

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(E) identify various methods used to install raceways	(i) identify various methods used to install raceways
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(F) demonstrate knowledge of National Electrical Code raceway requirements	(i) demonstrate knowledge of National Electrical Code raceway requirements
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(G) describe procedures for installing raceways and boxes on masonry surfaces, metal stud systems, wood-framed systems, and drywall surfaces	(i) describe procedures for installing raceways on masonry surfaces
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(G) describe procedures for installing raceways and boxes on masonry surfaces, metal stud systems, wood-framed systems, and drywall surfaces	(ii) describe procedures for installing raceways on metal stud systems
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(G) describe procedures for installing raceways and boxes on masonry surfaces, metal stud systems, wood-framed systems, and drywall surfaces	(iii) describe procedures for installing raceways on wood-framed systems
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(G) describe procedures for installing raceways and boxes on masonry surfaces, metal stud systems, wood-framed systems, and drywall surfaces	(iv) describe procedures for installing raceways on drywall surfaces
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(G) describe procedures for installing raceways and boxes on masonry surfaces, metal stud systems, wood-framed systems, and drywall surfaces	(v) describe procedures for installing boxes on masonry surfaces

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(G) describe procedures for installing raceways and boxes on masonry surfaces, metal stud systems, wood-framed systems, and drywall surfaces	(vi) describe procedures for installing boxes on metal stud systems
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(G) describe procedures for installing raceways and boxes on masonry surfaces, metal stud systems, wood-framed systems, and drywall surfaces	(vii) describe procedures for installing boxes on wood-framed systems
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(G) describe procedures for installing raceways and boxes on masonry surfaces, metal stud systems, wood-framed systems, and drywall surfaces	(viii) describe procedures for installing boxes on drywall surfaces
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(H) recognize safety precautions that must be followed when working with boxes and raceways	(i) recognize safety precautions that must be followed when working with boxes
(8) The student learns the types and applications of raceways, wireways, and ducts. The student is expected to:	(H) recognize safety precautions that must be followed when working with boxes and raceways	(ii) recognize safety precautions that must be followed when working with raceways
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(A) demonstrate the various wire sizes using a wire in accordance with American Wire Gauge standards	(i) demonstrate the various wire sizes using a wire in accordance with American Wire Gauge standards
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(B) identify insulation and jacket types according to conditions and applications	(i) identify insulation types according to conditions

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(B) identify insulation and jacket types according to conditions and applications	(ii) identify insulation types according to applications
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(B) identify insulation and jacket types according to conditions and applications	(iii) identify jacket types according to conditions
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(B) identify insulation and jacket types according to conditions and applications	(iv) identify jacket types according to applications
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(C) describe voltage ratings of conductors and cables	(i) describe voltage ratings of conductors
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(C) describe voltage ratings of conductors and cables	(ii) describe voltage ratings of cables
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(D) read and identify markings on conductors and cables	(i) read markings on conductors
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(D) read and identify markings on conductors and cables	(ii) read markings on cables

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(D) read and identify markings on conductors and cables	(iii) identify markings on conductors
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(D) read and identify markings on conductors and cables	(iv) identify markings on cables
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(E) use the tables in the National Electrical Code to determine the ampacity of a conductor	(i) use the tables in the National Electrical Code to determine the ampacity of a conductor
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(F) state the purpose of stranded wire	(i) state the purpose of stranded wire
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(G) state the purpose of compressed conductors	(i) state the purpose of compressed conductors
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(H) describe the different materials from which conductors are made	(i) describe the different materials from which conductors are made
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(I) describe the different types of conductor insulation	(i) describe the different types of conductor insulation

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(J) describe the color coding of insulation	(i) describe the color coding of insulation
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(K) describe instrumentation control wiring	(i) describe instrumentation control wiring
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(L) describe the equipment required for pulling wire through conduit	(i) describe the equipment required for pulling wire through conduit
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(M) describe the procedure for pulling wire through conduit	(i) describe the procedure for pulling wire through conduit
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(N) install conductors in conduit	(i) install conductors in conduit
(9) The student learns the types and applications of conductors and wiring techniques. The student is expected to:	(O) pull conductors in a conduit system	(i) pull conductors in a conduit system
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(A) explain the basic layout of a design drawing	(i) explain the basic layout of a design drawing

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(B) describe the information included in the title block of a drawing	(i) describe the information included in the title block of a drawing
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(C) identify common symbols and the various types of lines used on drawings	(i) identify common symbols used on drawings
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(C) identify common symbols and the various types of lines used on drawings	(ii) identify the various types of lines used on drawings
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(D) understand the use of architect's and engineer's scales	(i) understand the use of architect's scales
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(D) understand the use of architect's and engineer's scales	(ii) understand the use of engineer's scales
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(E) interpret electrical drawings such as site plans, floor plans, and detail drawings	(i) interpret electrical drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(F) read equipment schedules found on electrical drawings	(i) read equipment schedules found on electrical drawings
(10) The student learns electrical symbols and their use in design drawings. Additionally, students learn to interpret schematics, one-line diagrams, and wiring diagrams. The student is expected to:	(G) describe the type of information included in electrical specifications	(i) describe the type of information included in electrical specifications
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(A) identify and state the functions and ratings of special switches such as single-pole, double-pole, three-way, four-way, dimmer, and safety switches	(i) identify the functions of special switches
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(A) identify and state the functions and ratings of special switches such as single-pole, double-pole, three-way, four-way, dimmer, and safety switches	(ii) identify the ratings of special switches
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(A) identify and state the functions and ratings of special switches such as single-pole, double-pole, three-way, four-way, dimmer, and safety switches	(iii) state the functions of special switches
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(A) identify and state the functions and ratings of special switches such as single-pole, double-pole, three-way, four-way, dimmer, and safety switches	(iv) state the ratings of special switches

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(B) explain National Electrical Manufacturers Association classifications as they relate to switches and enclosures	(i) explain National Electrical Manufacturers Association classifications as they relate to switches
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(B) explain National Electrical Manufacturers Association classifications as they relate to switches and enclosures	(ii) explain National Electrical Manufacturers Association classifications as they relate to enclosures
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(C) explain the National Electrical Building Code requirements concerning wiring devices	(i) explain the National Electrical Building Code requirements concerning wiring devices
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(D) identify and state the functions and ratings of wiring devices such as straight blade, twist lock, and pin and sleeve receptacles	(i) identify the functions of wiring devices
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(D) identify and state the functions and ratings of wiring devices such as straight blade, twist lock, and pin and sleeve receptacles	(ii) identify the ratings of wiring devices
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(D) identify and state the functions and ratings of wiring devices such as straight blade, twist lock, and pin and sleeve receptacles	(iii) state the functions of wiring devices

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(D) identify and state the functions and ratings of wiring devices such as straight blade, twist lock, and pin and sleeve receptacles	(iv) state the ratings of wiring devices
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(E) identify and define receptacle terminals and disconnects	(i) identify receptacle terminals
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(E) identify and define receptacle terminals and disconnects	(ii) identify disconnects
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(E) identify and define receptacle terminals and disconnects	(iii) define receptacle terminals
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(E) identify and define receptacle terminals and disconnects	(iv) define disconnects
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(F) identify and define ground fault circuit interrupters	(i) identify ground fault circuit interrupters

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(F) identify and define ground fault circuit interrupters	(ii) define ground fault circuit interrupters
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(G) explain the box mounting requirements in the National Building Code	(i) explain the box mounting requirements in the National Building Code
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(H) use appropriate tools and connectors to strip and splice wires together	(i) use appropriate tools to strip and splice wires together
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(H) use appropriate tools and connectors to strip and splice wires together	(ii) use appropriate connectors to strip and splice wires together
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(I) identify and state the functions of limit switches and relays	(i) identify the functions of limit switches
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(I) identify and state the functions of limit switches and relays	(ii) identify the functions of relays

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(I) identify and state the functions of limit switches and relays	(iii) state the functions of limit switches
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(I) identify and state the functions of limit switches and relays	(iv) state the functions of relays
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(J) identify and state the function of switchgear	(i) identify the function of switchgear
(11) The student learns the electrical devices and wiring techniques used in commercial and industrial construction and maintenance. The student is expected to:	(J) identify and state the function of switchgear	(ii) state the function of switchgear
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(A) describe how to determine electric service requirements for dwellings	(i) describe how to determine electric service requirements for dwellings
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(B) explain the grounding requirements of a residential electric service	(i) explain the grounding requirements of a residential electric service

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(C) calculate and select service-entrance equipment	(i) calculate service-entrance equipment
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(C) calculate and select service-entrance equipment	(ii) select service-entrance equipment
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(D) select the proper wiring methods for various types of residences	(i) select the proper wiring methods for various types of residences
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(E) explain the role of the National Electrical Code in residential wiring	(i) explain the role of the National Electrical Code in residential wiring
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(F) compute branch circuit loads and explain their installation requirements	(i) compute branch circuit loads
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(F) compute branch circuit loads and explain their installation requirements	(ii) explain [branch circuit load's] installation requirements
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(G) explain the types and purposes of equipment grounding conductors	(i) explain the types of equipment grounding conductors

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(G) explain the types and purposes of equipment grounding conductors	(ii) explain the purposes of equipment grounding conductors
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(H) explain the purpose of ground-fault circuit interrupters and tell where they must be installed	(i) explain the purpose of ground-fault circuit interrupters
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(H) explain the purpose of ground-fault circuit interrupters and tell where they must be installed	(ii) tell where [ground-fault circuit interrupters] must be installed
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(I) determine the size of outlet boxes and select the proper type for different wiring methods	(i) determine the size of outlet boxes
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(I) determine the size of outlet boxes and select the proper type for different wiring methods	(ii) select the proper type [of outlet boxes] for different wiring methods
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(J) describe rules for installing electric space heating and heating, ventilating, and air conditioning equipment	(i) describe rules for installing electric space heating
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(J) describe rules for installing electric space heating and heating, ventilating, and air conditioning equipment	(ii) describe rules for installing heating equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(J) describe rules for installing electric space heating and heating, ventilating, and air conditioning equipment	(iii) describe rules for installing ventilating equipment
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(J) describe rules for installing electric space heating and heating, ventilating, and air conditioning equipment	(iv) describe rules for installing air conditioning equipment
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(K) describe the installation rules for electrical systems around swimming pools, spas, and hot tubs	(i) describe the installation rules for electrical systems around swimming pools
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(K) describe the installation rules for electrical systems around swimming pools, spas, and hot tubs	(ii) describe the installation rules for electrical systems around spas
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(K) describe the installation rules for electrical systems around swimming pools, spas, and hot tubs	(iii) describe the installation rules for electrical systems around hot tubs
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(L) describe the installation and control of lighting fixtures	(i) describe the installation of lighting fixtures
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(L) describe the installation and control of lighting fixtures	(ii) describe the control of lighting fixtures

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(M) explain how wiring devices are selected and installed	(i) explain how wiring devices are selected
(12) The student learns the electrical devices and wiring techniques used in residential construction maintenance. The student is expected to:	(M) explain how wiring devices are selected and installed	(ii) explain how wiring devices are installed

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.58. Electrical Technology II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Electrical Technology I. Recommended prerequisite: Principles of Architecture or Principles of Construction. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Electrical Technology II, students will gain advanced knowledge and skills needed to enter the workforce as an electrician, a building maintenance technician, or a supervisor; prepare for a postsecondary degree in a specified field of construction or construction management; or pursue an approved apprenticeship program. Students will acquire knowledge and skills in safety, electrical theory, tools, codes, installation of electrical equipment, alternating current and direct current motors, conductor installation, installation of electrical services, and electric lighting installation.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify job opportunities with their accompanying job duties such as electrician, building maintenance technician, manager, and electrical engineer	(i) identify job opportunities with their accompanying job duties
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve a career goal	(i) research careers along with the education required to achieve a career goal
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve a career goal	(ii) research careers along with the job skills required to achieve a career goal
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve a career goal	(iii) research careers along with the experience required to achieve a career goal
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(A) demonstrate safe working procedures in a construction environment	(i) demonstrate safe working procedures in a construction environment
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(B) explain the purpose of the Occupational Safety and Health Administration (OSHA) and how it promotes safety on the job	(i) explain the purpose of the Occupational Safety and Health Administration (OSHA)
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(B) explain the purpose of the Occupational Safety and Health Administration (OSHA) and how it promotes safety on the job	(ii) explain how [OSHA] promotes safety on the job

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(C) identify electrical hazards and how to avoid or minimize them in the workplace	(i) identify electrical hazards
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(C) identify electrical hazards and how to avoid or minimize them in the workplace	(ii) identify how to avoid or minimize [electrical hazards] in the workplace
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(i) explain safety issues concerning lockout and tagout procedures
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(ii) explain safety issues concerning personal protection using assured grounding programs
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(iii) explain safety issues concerning personal protection using isolation programs
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(iv) explain safety issues concerning confined space entry

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(v) explain safety issues concerning respiratory protection
(2) The student knows the issues associated with electrical hazards found on a jobsite. The student is expected to:	(D) explain safety issues concerning lockout and tagout procedures, personal protection using assured grounding and isolation programs, confined space entry, respiratory protection, and fall protection	(vi) explain safety issues concerning fall protection
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(A) define terms such as ampacity, branch circuit, circuit breaker, controller, duty, full-load amps, ground fault circuit interrupter, interrupting rating, motor circuit switch, thermal protector, National Electrical Manufacturers Association design letter, non-automatic, overcurrent, overload, rated full-load speed, rated horsepower, remote control circuit, service factor, and thermal cutout	(i) define terms
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(B) describe the various types of motor enclosures	(i) describe the various types of motor enclosures
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(C) describe how the rated voltage of a motor differs from the system voltage	(i) describe how the rated voltage of a motor differs from the system voltage

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(D) describe the basic construction and components of a three-phase squirrel cage induction motor	(i) describe the basic construction of a three-phase squirrel cage induction motor
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(D) describe the basic construction and components of a three-phase squirrel cage induction motor	(ii) describe the basic components of a three-phase squirrel cage induction motor
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(E) explain the relationships among speed, frequency, and the number of poles in a three-phase induction motor	(i) explain the relationships among speed, frequency, and the number of poles in a three-phase induction motor
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(F) describe how torque is developed in an induction motor	(i) describe how torque is developed in an induction motor
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(G) explain how and why torque varies with rotor reactance and slip	(i) explain how torque varies with rotor reactance and slip
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(G) explain how and why torque varies with rotor reactance and slip	(ii) explain why torque varies with rotor reactance and slip

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(H) define percent slip and speed regulation	(i) define percent slip
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(H) define percent slip and speed regulation	(ii) define speed regulation
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(I) explain how the direction of a three-phase motor is reversed	(i) explain how the direction of a three-phase motor is reversed
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(J) describe the component parts and operating characteristics of a three-phase wound-rotor induction motor	(i) describe the component parts of a three-phase wound-rotor induction motor
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(J) describe the component parts and operating characteristics of a three-phase wound-rotor induction motor	(ii) describe the operating characteristics of a three-phase wound-rotor induction motor
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(K) define torque, starting current, and armature reaction as they apply to direct current motors	(i) define torque as [it applies] to direct current motors

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(K) define torque, starting current, and armature reaction as they apply to direct current motors	(ii) define starting current as [it applies] to direct current motors
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(K) define torque, starting current, and armature reaction as they apply to direct current motors	(iii) define armature reaction as [it applies] to direct current motors
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(L) explain how the direction of rotation of a direct current motor is changed	(i) explain how the direction of rotation of a direct current motor is changed
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(M) describe the design and characteristics of direct current shunt, series, and compound motors	(i) describe the design of direct current shunt motors
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(M) describe the design and characteristics of direct current shunt, series, and compound motors	(ii) describe the design of direct current series motors
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(M) describe the design and characteristics of direct current shunt, series, and compound motors	(iii) describe the design of direct current compound motors

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(M) describe the design and characteristics of direct current shunt, series, and compound motors	(iv) describe the characteristics of direct current shunt motors
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(M) describe the design and characteristics of direct current shunt, series, and compound motors	(v) describe the characteristics of direct current series motors
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(M) describe the design and characteristics of direct current shunt, series, and compound motors	(vi) describe the characteristics of direct current compound motors
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(N) describe dual-voltage motors and their applications	(i) describe dual-voltage motors
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(N) describe dual-voltage motors and their applications	(ii) describe [dual-voltage motors'] applications
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(O) describe the methods for determining various motor connections	(i) describe the methods for determining various motor connections

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student gains knowledge of alternating current and direct current motors with specific attention being given to main parts, circuits, and connections. The student is expected to:	(P) describe general motor protection requirements as delineated by the National Electrical Code	(i) describe general motor protection requirements as delineated by the National Electrical Code
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(A) explain the purpose of grounding and the scope of the National Electrical Code	(i) explain the purpose of grounding
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(A) explain the purpose of grounding and the scope of the National Electrical Code	(ii) explain the scope of the National Electrical Code
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(B) distinguish between a short circuit and a ground fault	(i) distinguish between a short circuit and a ground fault
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(C) define the National Electrical Code ground-related terms	(i) define the National Electrical Code ground-related terms
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(D) distinguish between system grounding and equipment grounding	(i) distinguish between system grounding and equipment grounding
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(E) use the National Electrical Code to size the grounding electrode conductor for various alternating current systems	(i) use the National Electrical Code to size the grounding electrode conductor for various alternating current systems
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(F) explain the National Electrical Code requirements for the installation and physical protection of grounding electrode conductors	(i) explain the National Electrical Code requirements for the installation of grounding electrode conductors

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(F) explain the National Electrical Code requirements for the installation and physical protection of grounding electrode conductors	(ii) explain the National Electrical Code requirements for the physical protection of grounding electrode conductors
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(G) explain the function of the grounding electrode system and determine which grounding electrodes must be used	(i) explain the function of the grounding electrode system
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(G) explain the function of the grounding electrode system and determine which grounding electrodes must be used	(ii) determine which grounding electrodes must be used
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(H) define electrodes and explain the resistance requirements for electrodes using the National Electrical Code	(i) define electrodes
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(H) define electrodes and explain the resistance requirements for electrodes using the National Electrical Code	(ii) explain the resistance requirements for electrodes using the National Electrical Code
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(I) use the National Electrical Code to size the equipment grounding conductor for raceways and equipment	(i) use the National Electrical Code to size the equipment grounding conductor for raceways
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(I) use the National Electrical Code to size the equipment grounding conductor for raceways and equipment	(ii) use the National Electrical Code to size the equipment grounding conductor for equipment
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(J) explain the function of the main bonding jumper and system bonding jumpers in the grounding system and size the bonding jumpers for various applications	(i) explain the function of the main bonding jumper in the grounding system

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(J) explain the function of the main bonding jumper and system bonding jumpers in the grounding system and size the bonding jumpers for various applications	(ii) explain the function of the system bonding jumpers in the grounding system
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(J) explain the function of the main bonding jumper and system bonding jumpers in the grounding system and size the bonding jumpers for various applications	(iii) size the bonding jumpers for various applications
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(K) size the main bonding jumper for a service using multiple service disconnecting means	(i) size the main bonding jumper for a service using multiple service disconnecting means
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(L) explain the National Electrical Code requirements for bonding of enclosures and equipment	(i) explain the National Electrical Code requirements for bonding of enclosures
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(L) explain the National Electrical Code requirements for bonding of enclosures and equipment	(ii) explain the National Electrical Code requirements for bonding of equipment
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(M) explain effective grounding and its importance in clearing ground faults and short circuits	(i) explain effective grounding
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(M) explain effective grounding and its importance in clearing ground faults and short circuits	(ii) explain [effective grounding's] importance in clearing ground faults
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(M) explain effective grounding and its importance in clearing ground faults and short circuits	(iii) explain [effective grounding's] importance in clearing short circuits
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(N) explain the purposes of the grounded conductor neutral in operation of overcurrent devices	(i) explain the purposes of the grounded conductor neutral in operation of overcurrent devices

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(O) explain the National Electrical Code requirements for grounding separately derived systems, including transformers and generators	(i) explain the National Electrical Code requirements for grounding separately derived systems, including transformers
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(O) explain the National Electrical Code requirements for grounding separately derived systems, including transformers and generators	(ii) explain the National Electrical Code requirements for grounding separately derived systems, including generators
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(P) explain the National Electrical Code requirements for grounding at more than one building	(i) explain the National Electrical Code requirements for grounding at more than one building
(4) The student learns the purpose for grounding and bonding electrical systems. The student is expected to:	(O) explain the National Electrical Code grounding requirements for systems over 600 volts	(i) explain the National Electrical Code grounding requirements for systems over 600 volts
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(A) describe the process of conduit bending using power tools	(i) describe the process of conduit bending using power tools
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(B) identify all parts of popular electric and hydraulic benders	(i) identify all parts of popular electric benders
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(B) identify all parts of popular electric and hydraulic benders	(ii) identify all parts of popular hydraulic benders
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(C) avoid excessive waste when working with conduit systems	(i) avoid excessive waste when working with conduit systems
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(D) bend offsets, kicks, saddles, and segmented and parallel bends	(i) bend offsets

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(D) bend offsets, kicks, saddles, and segmented and parallel bends	(ii) bend kicks
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(D) bend offsets, kicks, saddles, and segmented and parallel bends	(iii) bend saddles
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(D) bend offsets, kicks, saddles, and segmented and parallel bends	(iv) bend segmented bends
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(D) bend offsets, kicks, saddles, and segmented and parallel bends	(v) bend parallel bends
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(E) explain the requirements for the National Electrical Code for bending conduit	(i) explain the requirements for the National Electrical Code for bending conduit
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(F) compute the radius, degrees in bend, developed length, and gain for conduit up to six inches	(i) compute the radius for conduit up to six inches
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(F) compute the radius, degrees in bend, developed length, and gain for conduit up to six inches	(ii) compute the degrees in bend for conduit up to six inches
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(F) compute the radius, degrees in bend, developed length, and gain for conduit up to six inches	(iii) compute the developed length for conduit up to six inches
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(F) compute the radius, degrees in bend, developed length, and gain for conduit up to six inches	(iv) compute the gain for conduit up to six inches

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(G) explain how to correct damaged conduit and modify existing bends	(i) explain how to correct damaged conduit
(5) The student properly bends all sizes of conduit up to six inches. The student is expected to:	(G) explain how to correct damaged conduit and modify existing bends	(ii) explain how to modify existing bends
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(A) describe the different types of nonmetallic and metallic boxes	(i) describe the different types of nonmetallic boxes
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(A) describe the different types of nonmetallic and metallic boxes	(ii) describe the different types of metallic boxes
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(B) calculate the required box size for any number and size of conductors	(i) calculate the required box size for any number of conductors
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(B) calculate the required box size for any number and size of conductors	(ii) calculate the required box size for any size of conductors
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(C) explain the National Electrical Code regulations for volume required per conductor in outlet boxes	(i) explain the National Electrical Code regulations for volume required per conductor in outlet boxes
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(D) locate, install, and support boxes of all types	(i) locate boxes of all types

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(D) locate, install, and support boxes of all types	(ii) install boxes of all types
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(D) locate, install, and support boxes of all types	(iii) support boxes of all types
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(E) describe the National Electrical Code regulations governing pull and junction boxes	(i) describe the National Electrical Code regulations governing pull boxes
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(E) describe the National Electrical Code regulations governing pull and junction boxes	(ii) describe the National Electrical Code regulations governing junction boxes
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(F) explain the radius rule when installing conductors in pull boxes	(i) explain the radius rule when installing conductors in pull boxes
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(G) understand the National Electrical Code requirements for boxes supporting lighting fixtures	(i) understand the National Electrical Code requirements for boxes supporting lighting fixtures
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(H) describe the purpose of conduit bodies and Type FS boxes	(i) describe the purpose of conduit bodies

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(H) describe the purpose of conduit bodies and Type FS boxes	(ii) describe the purpose of Type FS boxes
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(I) install the different types of fittings used in conjunction with boxes	(i) install the different types of fittings used in conjunction with boxes
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(J) describe the installation rules for boxes and fittings in hazardous areas	(i) describe the installation rules for boxes in hazardous areas
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(J) describe the installation rules for boxes and fittings in hazardous areas	(ii) describe the installation rules for fittings in hazardous areas
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(K) explain how boxes and fittings are selected and installed	(i) explain how boxes are selected
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(K) explain how boxes and fittings are selected and installed	(ii) explain how boxes are installed
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(K) explain how boxes and fittings are selected and installed	(iii) explain how fittings are selected

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(K) explain how boxes and fittings are selected and installed	(iv) explain how fittings are installed
(6) The student learns to select and size outlet boxes, pull boxes, and junction boxes. The student is expected to:	(L) describe the various types of box supports	(i) describe the various types of box supports
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(A) describe the various methods of installing conductors in conduit	(i) describe the various methods of installing conductors in conduit
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(B) plan and set up for a cable pull	(i) plan for a cable pull
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(B) plan and set up for a cable pull	(ii) set up for a cable pull
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(C) describe how cable reels are transported to the pulling site	(i) describe how cable reels are transported to the pulling site

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(D) set up reel stands and spindles for a wire-pulling installation	(i) set up reel stands for a wire-pulling installation
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(D) set up reel stands and spindles for a wire-pulling installation	(ii) set up spindles for a wire-pulling installation
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(E) explain how mandrels, swabs, and brushes are used to prepare conduit for conductors	(i) explain how mandrels are used to prepare conduit for conductors
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(E) explain how mandrels, swabs, and brushes are used to prepare conduit for conductors	(ii) explain how swabs are used to prepare conduit for conductors
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(E) explain how mandrels, swabs, and brushes are used to prepare conduit for conductors	(iii) explain how brushes are used to prepare conduit for conductors
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(F) install a pull line for a cable-pulling operation	(i) install a pull line for a cable-pulling operation

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(G) explain the operation of power fish tape systems	(i) explain the operation of power fish tape systems
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(H) prepare the ends of conductors for pulling	(i) prepare the ends of conductors for pulling
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(I) describe the types of cable pullers	(i) describe the types of cable pullers
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(J) describe the process of high-force cable pulling	(i) describe the process of high-force cable pulling
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(K) explain how to support conductors in vertical conduit runs	(i) explain how to support conductors in vertical conduit runs
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(L) describe the installation of cables in cable trays	(i) describe the installation of cables in cable trays

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(M) explain the importance of communication during a cable-pulling operation	(i) explain the importance of communication during a cable-pulling operation
(7) The student knows transportation, storage, and setup of cable reels, methods of rigging, and procedures to complete cable pulls in raceways and cable trays. The student is expected to:	(N) calculate the probable stress or tension in cable pulls	(i) calculate the probable stress or tension in cable pulls
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(A) describe the components that make up a cable tray assembly	(i) describe the components that make up a cable tray assembly
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(B) explain the methods used to hang and secure a cable tray	(i) explain the methods used to hang a cable tray
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(B) explain the methods used to hang and secure a cable tray	(ii) explain the methods used to secure a cable tray
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(C) describe how cable enters and exits cable trays	(i) describe how cable enters cable trays
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(C) describe how cable enters and exits cable trays	(ii) describe how cable exits cable trays
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(D) select the proper cable tray fitting for the situation	(i) select the proper cable tray fitting for the situation

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(E) explain the National Electrical Manufacturers Association standards for cable tray installations	(i) explain the National Electrical Manufacturers Association standards for cable tray installations
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(F) explain the National Electrical Code requirements for cable tray installations	(i) explain the National Electrical Code requirements for cable tray installations
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(G) select the required fittings to ensure equipment grounding continuity in cable tray systems	(i) select the required fittings to ensure equipment grounding continuity in cable tray systems
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(H) interpret electrical working drawings showing cable tray fittings	(i) interpret electrical working drawings showing cable tray fittings
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(I) size a cable tray for the number and type of conductors contained in the system	(i) size a cable tray for the number of conductors contained in the system
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(I) size a cable tray for the number and type of conductors contained in the system	(ii) size a cable tray for the type of conductors contained in the system
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(J) select rollers and sheaves for pulling cable in specific cable tray situations	(i) select rollers for pulling cable in specific cable tray situations
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(J) select rollers and sheaves for pulling cable in specific cable tray situations	(ii) select sheaves for pulling cable in specific cable tray situations
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(K) designate the required locations of rollers and sheaves for a specific cable pull	(i) designate the required locations of rollers for a specific cable pull

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student installs cable trays and modifies cable trays and cable. The student is expected to:	(K) designate the required locations of rollers and sheaves for a specific cable pull	(ii) designate the required locations of sheaves for a specific cable pull
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(A) describe how to make a good conductor termination	(i) describe how to make a good conductor termination
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(B) prepare cable ends for terminations and splices	(i) prepare cable ends for terminations
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(B) prepare cable ends for terminations and splices	(ii) prepare cable ends for splices
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(C) install lugs and connector onto conductors	(i) install lugs onto conductors
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(C) install lugs and connector onto conductors	(ii) install [a] connector onto conductors

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(D) train cable at termination points	(i) train cable at termination points
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(E) explain the role of the National Electrical Code in making cable terminations and splices	(i) explain the role of the National Electrical Code in making cable terminations
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(E) explain the role of the National Electrical Code in making cable terminations and splices	(ii) explain the role of the National Electrical Code in making cable splices
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(F) explain why mechanical stress should be avoided at cable termination points	(i) explain why mechanical stress should be avoided at cable termination points
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(G) describe the importance of using proper bolt torque when bolting lugs onto bus bars	(i) describe the importance of using proper bolt torque when bolting lugs onto bus bars
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(H) describe crimping techniques	(i) describe crimping techniques

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(I) select the proper lug or connector for the job	(i) select the proper lug or connector for the job
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(J) describe splicing techniques	(i) describe splicing techniques
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(K) explain how to use hand and power crimping tools	(i) explain how to use hand crimping tools
(9) The student knows the methods of terminating and splicing conductors of all types and sizes and the preparation and taping of conductors. The student is expected to:	(K) explain how to use hand and power crimping tools	(ii) explain how to use power crimping tools
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(A) describe various types of electric services for commercial and industrial installations	(i) describe various types of electric services for commercial installations
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(A) describe various types of electric services for commercial and industrial installations	(ii) describe various types of electric services for industrial installations

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(B) read electrical drawings and diagrams describing service installation	(i) read electrical drawings describing service installation
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(B) read electrical drawings and diagrams describing service installation	(ii) read electrical diagrams describing service installation
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(C) calculate and select service-entrance equipment	(i) calculate service-entrance equipment
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(C) calculate and select service-entrance equipment	(ii) select service-entrance equipment
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(D) explain the role of the National Electrical Code in service installations	(i) explain the role of the National Electrical Code in service installations
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(E) install main disconnect switches, panel boards, and overcurrent protection devices	(i) install main disconnect switches
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(E) install main disconnect switches, panel boards, and overcurrent protection devices	(ii) install panel boards

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(E) install main disconnect switches, panel boards, and overcurrent protection devices	(iii) install overcurrent protection devices
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(F) identify the circuit loads, number of circuits required, and installation requirements for distribution panels	(i) identify the circuit loads for distribution panels
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(F) identify the circuit loads, number of circuits required, and installation requirements for distribution panels	(ii) identify the number of circuits required for distribution panels
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(F) identify the circuit loads, number of circuits required, and installation requirements for distribution panels	(iii) identify the installation requirements for distribution panels
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(G) explain the types and purposes of service grounding	(i) explain the types of service grounding
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(G) explain the types and purposes of service grounding	(ii) explain the purposes of service grounding
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(H) explain the purpose and required locations of ground fault circuit interrupters	(i) explain the purpose of ground fault circuit interrupters

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(H) explain the purpose and required locations of ground fault circuit interrupters	(ii) explain the required locations of ground fault circuit interrupters
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(I) describe single-phase service connections	(i) describe single-phase service connections
(10) The student installs single- and three-phase services, including metering equipment. The student is expected to:	(J) describe both wye-phase and delta-connected three-phase services	(i) describe both wye-phase and delta-connected three-phase services
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(A) explain the necessity of overcurrent protection devices in electrical circuits	(i) explain the necessity of overcurrent protection devices in electrical circuits
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(B) define the terms associated with fuses and circuit breakers	(i) define the terms associated with fuses
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(B) define the terms associated with fuses and circuit breakers	(ii) define the terms associated with circuit breakers
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(C) describe the operation of a circuit breaker	(i) describe the operation of a circuit breaker
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(D) select the most suitable overcurrent device for the application	(i) select the most suitable overcurrent device for the application

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(E) describe the operation of single-element and time-delay fuses	(i) describe the operation of single-element fuses
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(E) describe the operation of single-element and time-delay fuses	(ii) describe the operation of time-delay fuses
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(F) explain how ground fault circuit interrupters can save lives	(i) explain how ground fault circuit interrupters can save lives
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(G) calculate short circuit currents	(i) calculate short circuit currents
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(H) describe troubleshooting and maintenance techniques for overcurrent devices	(i) describe troubleshooting techniques for overcurrent devices
(11) The student knows the practical application of fuses and circuit breakers. The student is expected to:	(H) describe troubleshooting and maintenance techniques for overcurrent devices	(ii) describe maintenance techniques for overcurrent devices
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(A) describe the operating principles of contactors and relays	(i) describe the operating principles of contactors
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(A) describe the operating principles of contactors and relays	(ii) describe the operating principles of relays
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(B) select contactors and relays for use in specific electrical systems	(i) select contactors for use in specific electrical systems

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(B) select contactors and relays for use in specific electrical systems	(ii) select relays for use in specific electrical systems
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(C) explain how mechanical contactors operate	(i) explain how mechanical contactors operate
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(D) explain how solid-state contactors operate	(i) explain how solid-state contactors operate
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(E) install contactors and relays according to National Electrical Code requirements	(i) install contactors according to National Electrical Code requirements
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(E) install contactors and relays according to National Electrical Code requirements	(ii) install relays according to National Electrical Code requirements
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(F) select and install contactors and relays for lighting control	(i) select contactors for lighting control
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(F) select and install contactors and relays for lighting control	(ii) select relays for lighting control
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(F) select and install contactors and relays for lighting control	(iii) install contactors for lighting control
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(F) select and install contactors and relays for lighting control	(iv) install relays for lighting control

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(G) describe how overload relays operate	(i) describe how overload relays operate
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(H) connect a simple control circuit	(i) connect a simple control circuit
(12) The student knows the practical applications of contactors and relays. The student is expected to:	(I) test control circuits	(i) test control circuits
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(A) explain how the human eye works	(i) explain how the human eye works
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(B) describe the characteristics of light	(i) describe the characteristics of light
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(i) recognize the different kinds of lamps
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(ii) explain the advantages of each type [of lamp], including incandescent

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(iii) explain the advantages of each type [of lamp], including halogen
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(iv) explain the advantages of each type [of lamp], including fluorescent
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(v) explain the advantages of each type [of lamp], including high-intensity discharge
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(vi) explain the disadvantages of each type [of lamp], including incandescent
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(vii) explain the disadvantages of each type [of lamp], including halogen
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(viii) explain the disadvantages of each type [of lamp], including fluorescent

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(C) recognize the different kinds of lamps and explain the advantages and disadvantages of each type, including incandescent, halogen, fluorescent, and high-intensity discharge	(ix) explain the disadvantages of each type [of lamp], including high-intensity discharge
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(D) select and install lamps into lighting fixtures	(i) select lamps
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(D) select and install lamps into lighting fixtures	(ii) install lamps into lighting fixtures
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(E) recognize and install various types of lighting fixtures, including surface mounted, recessed, suspended, and track-mounted units	(i) recognize various types of lighting fixtures, including surface mounted
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(E) recognize and install various types of lighting fixtures, including surface mounted, recessed, suspended, and track-mounted units	(ii) recognize various types of lighting fixtures, including recessed
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(E) recognize and install various types of lighting fixtures, including surface mounted, recessed, suspended, and track-mounted units	(iii) recognize various types of lighting fixtures, including suspended
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(E) recognize and install various types of lighting fixtures, including surface mounted, recessed, suspended, and track-mounted units	(iv) recognize various types of lighting fixtures, including track-mounted units

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(E) recognize and install various types of lighting fixtures, including surface mounted, recessed, suspended, and track-mounted units	(v) install various types of lighting fixtures, including surface mounted
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(E) recognize and install various types of lighting fixtures, including surface mounted, recessed, suspended, and track-mounted units	(vi) install various types of lighting fixtures, including recessed
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(E) recognize and install various types of lighting fixtures, including surface mounted, recessed, suspended, and track-mounted units	(vii) install various types of lighting fixtures, including suspended
(13) The student learns the basic principles of human vision and the characteristics of light. The student is expected to:	(E) recognize and install various types of lighting fixtures, including surface mounted, recessed, suspended, and track-mounted units	(viii) install various types of lighting fixtures, including track-mounted units

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.59. Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Technology I (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Architecture, Principles of Construction, or Construction Technology I. Students shall be awarded one credit for successful completion of this course.</p>	
<p>(b) Introduction</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Technology I, students will gain knowledge and skills needed to enter the industry as technicians in the HVAC and refrigeration industry or building maintenance industry, prepare for a postsecondary degree in a specified field of construction management, or pursue an approved apprenticeship program. Students will acquire knowledge and skills in safety, principles of HVAC theory, use of tools, codes, and installation of HVAC and refrigeration equipment.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify job opportunities with their accompanying job duties in occupations such as electrician, building maintenance technician or manager, and electrical engineer	(i) identify job opportunities with their accompanying job duties in occupations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways along with the education, job skills, and experience required to achieve a career goal	(i) research career pathways along with the education required to achieve a career goal
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways along with the education, job skills, and experience required to achieve a career goal	(ii) research career pathways along with the job skills required to achieve a career goal
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways along with the education, job skills, and experience required to achieve a career goal	(iii) research career pathways along with the experience required to achieve a career goal
(2) The student learns the basic principles of HVAC and refrigeration. The student is expected to:	(A) explain the basic principles of HVAC	(i) explain the basic principles of HVAC
(2) The student learns the basic principles of HVAC and refrigeration. The student is expected to:	(B) describe what the Clean Air Act means to the HVAC and refrigeration industry	(i) describe what the Clean Air Act means to the HVAC and refrigeration industry
(2) The student learns the basic principles of HVAC and refrigeration. The student is expected to:	(C) identify the types of schedules and drawings used by the HVAC and refrigeration industry	(i) identify the types of schedules used by the HVAC and refrigeration industry
(2) The student learns the basic principles of HVAC and refrigeration. The student is expected to:	(C) identify the types of schedules and drawings used by the HVAC and refrigeration industry	(ii) identify the types of drawings used by the HVAC and refrigeration industry

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(A) identify similar units of measurement in both English and the International System (SI) of units	(i) identify similar units of measurement in both English and the International System (SI) of units
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(B) calculate and convert measured values and volumes expressed in mathematical equations and formulas	(i) calculate measured values expressed in mathematical equations
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(B) calculate and convert measured values and volumes expressed in mathematical equations and formulas	(ii) convert measured values expressed in mathematical equations
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(B) calculate and convert measured values and volumes expressed in mathematical equations and formulas	(iii) calculate measured values expressed in mathematical formulas
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(B) calculate and convert measured values and volumes expressed in mathematical equations and formulas	(iv) convert measured values expressed in mathematical formulas
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(B) calculate and convert measured values and volumes expressed in mathematical equations and formulas	(v) calculate measured volumes expressed in mathematical equations
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(B) calculate and convert measured values and volumes expressed in mathematical equations and formulas	(vi) convert measured volumes expressed in mathematical equations

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(B) calculate and convert measured values and volumes expressed in mathematical equations and formulas	(vii) calculate measured volumes expressed in mathematical formulas
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(B) calculate and convert measured values and volumes expressed in mathematical equations and formulas	(viii) convert measured volumes expressed in mathematical formulas
(3) The student applies knowledge and skills in mathematics as they relate to HVAC and the principles of refrigeration. The student is expected to:	(C) convert temperature values between Celsius and Fahrenheit	(i) convert temperature values between Celsius and Fahrenheit
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(A) state the precautions that must be taken when installing refrigerant piping	(i) state the precautions that must be taken when installing refrigerant piping
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(B) select, cut, and bend the right copper tubing for the job	(i) select the right copper tubing for the job
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(B) select, cut, and bend the right copper tubing for the job	(ii) cut the right copper tubing for the job
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(B) select, cut, and bend the right copper tubing for the job	(iii) bend the right copper tubing for the job
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(C) safely connect tubing, using flare and compression fittings	(i) safely connect tubing, using flare fittings
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(C) safely connect tubing, using flare and compression fittings	(ii) safely connect tubing, using compression fittings

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(D) determine the correct hardware and supports needed for refrigerant pipe installations	(i) determine the correct hardware needed for refrigerant pipe installations
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(D) determine the correct hardware and supports needed for refrigerant pipe installations	(ii) determine the correct supports needed for refrigerant pipe installations
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(E) describe the basic requirements needed to identify and install various types of plastic pipe and state their uses	(i) describe the basic requirements needed to identify various types of plastic pipe
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(E) describe the basic requirements needed to identify and install various types of plastic pipe and state their uses	(ii) describe the basic requirements needed to install various types of plastic pipe
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(E) describe the basic requirements needed to identify and install various types of plastic pipe and state their uses	(iii) state [various types of plastic pipes'] uses
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(F) demonstrate various methods used to pressure test HVAC systems	(i) demonstrate various methods used to pressure test HVAC systems
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(G) identify types of plastic pipe and state their uses	(i) identify types of plastic pipe
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(G) identify types of plastic pipe and state their uses	(ii) state [types of plastic pipes'] uses

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(H) cut and join lengths of plastic pipe	(i) cut lengths of plastic pipe
(4) The student selects, prepares, connects, and installs copper and plastic piping and fittings. The student is expected to:	(H) cut and join lengths of plastic pipe	(ii) join lengths of plastic pipe
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(A) assemble and operate the tools used for soldering	(i) assemble the tools used for soldering
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(A) assemble and operate the tools used for soldering	(ii) operate the tools used for soldering
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(B) prepare tubing and fittings for soldering	(i) prepare tubing for soldering
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(B) prepare tubing and fittings for soldering	(ii) prepare fittings for soldering
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(C) identify the purposes and uses of solder and solder fluxes	(i) identify the purposes of solder
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(C) identify the purposes and uses of solder and solder fluxes	(ii) identify the uses of solder
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(C) identify the purposes and uses of solder and solder fluxes	(iii) identify the purposes of solder fluxes

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(C) identify the purposes and uses of solder and solder fluxes	(iv) identify the uses of solder fluxes
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(D) solder copper tubing fittings	(i) solder copper tubing fittings
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(E) assemble and operate the tools used for brazing	(i) assemble the tools used for brazing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(E) assemble and operate the tools used for brazing	(ii) operate the tools used for brazing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(F) prepare tubing and fittings for brazing	(i) prepare tubing for brazing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(F) prepare tubing and fittings for brazing	(ii) prepare fittings for brazing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(G) identify the purposes and uses of filler metals and fluxes used for brazing	(i) identify the purposes of filler metals used for brazing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(G) identify the purposes and uses of filler metals and fluxes used for brazing	(ii) identify the uses of filler metals used for brazing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(G) identify the purposes and uses of filler metals and fluxes used for brazing	(iii) identify the purposes of fluxes used for brazing

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(G) identify the purposes and uses of filler metals and fluxes used for brazing	(iv) identify the uses of fluxes used for brazing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(H) braze copper tubing and fittings	(i) braze copper tubing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(H) braze copper tubing and fittings	(ii) braze copper fittings
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(I) identify the inert gases that can be used safely to purge tubing when brazing	(i) identify the inert gases that can be used safely to purge tubing when brazing
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(J) identify the types of ferrous metal pipes	(i) identify the types of ferrous metal pipes
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(K) accurately measure the sizes of ferrous metal pipes	(i) accurately measure the sizes of ferrous metal pipes
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(L) identify the common malleable iron fittings	(i) identify the common malleable iron fittings
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(M) cut, ream, and thread ferrous metal pipe	(i) cut ferrous metal pipe
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(M) cut, ream, and thread ferrous metal pipe	(ii) ream ferrous metal pipe

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(M) cut, ream, and thread ferrous metal pipe	(iii) thread ferrous metal pipe
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(N) join lengths of threaded pipe together and install fittings	(i) join lengths of threaded pipe together
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(N) join lengths of threaded pipe together and install fittings	(ii) install fittings
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(O) describe the main points to consider when installing pipe runs	(i) describe the main points to consider when installing pipe runs
(5) The student cuts, threads, and joins ferrous piping. The student is expected to:	(P) describe the methods used to join grooved piping	(i) describe the methods used to join grooved piping
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(A) explain how electrical power is distributed	(i) explain how electrical power is distributed
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(B) describe how voltage, current, resistance, and power are related	(i) describe how voltage, current, resistance, and power are related
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(C) calculate the current, voltage, and resistance in a circuit using Ohm's law	(i) calculate the current in a circuit using Ohm's law

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(C) calculate the current, voltage, and resistance in a circuit using Ohm's law	(ii) calculate the voltage in a circuit using Ohm's law
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(C) calculate the current, voltage, and resistance in a circuit using Ohm's law	(iii) calculate the resistance in a circuit using Ohm's law
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(D) calculate how much power is consumed by a circuit using the power formula	(i) calculate how much power is consumed by a circuit using the power formula
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(E) describe the differences between series and parallel circuits and calculate loads in each	(i) describe the differences between series and parallel circuits
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(E) describe the differences between series and parallel circuits and calculate loads in each	(ii) calculate loads in [series circuits]
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(E) describe the differences between series and parallel circuits and calculate loads in each	(iii) calculate loads in [parallel circuits]

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(F) describe the purpose and operation of the various electrical components used in HVAC equipment	(i) describe the purpose of the various electrical components used in HVAC equipment
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(F) describe the purpose and operation of the various electrical components used in HVAC equipment	(ii) describe the operation of the various electrical components used in HVAC equipment
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(G) state and demonstrate the safety precautions that must be followed when working on electrical equipment	(i) state the safety precautions that must be followed when working on electrical equipment
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(G) state and demonstrate the safety precautions that must be followed when working on electrical equipment	(ii) demonstrate the safety precautions that must be followed when working on electrical equipment
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(H) make voltage, current, and resistance measurements using electrical test equipment	(i) make voltage measurements using electrical test equipment
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(H) make voltage, current, and resistance measurements using electrical test equipment	(ii) make current measurements using electrical test equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(H) make voltage, current, and resistance measurements using electrical test equipment	(iii) make resistance measurements using electrical test equipment
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(I) read and interpret common electrical symbols	(i) read common electrical symbols
(6) The student knows electrical principles, power generation and distribution, electrical components, direct current circuits, and electrical safety. The student is expected to:	(I) read and interpret common electrical symbols	(ii) interpret common electrical symbols
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(A) explain how heat transfer occurs in a cooling system, demonstrating an understanding of the terms and concepts used in the refrigeration cycle	(i) explain how heat transfer occurs in a cooling system, demonstrating an understanding of the terms used in the refrigeration cycle
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(A) explain how heat transfer occurs in a cooling system, demonstrating an understanding of the terms and concepts used in the refrigeration cycle	(ii) explain how heat transfer occurs in a cooling system, demonstrating an understanding of the concepts used in the refrigeration cycle
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(B) calculate the temperature and pressure relationships at key points in the refrigeration cycle	(i) calculate the temperature and pressure relationships at key points in the refrigeration cycle

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(C) under supervision, use temperature- and pressure-measuring instruments to make readings at key points in the refrigeration cycle	(i) under supervision, use temperature-measuring instruments to make readings at key points in the refrigeration cycle
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(C) under supervision, use temperature- and pressure-measuring instruments to make readings at key points in the refrigeration cycle	(ii) under supervision, use pressure-measuring instruments to make readings at key points in the refrigeration cycle
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(D) identify commonly used refrigerants and demonstrate the procedures for handling these refrigerants	(i) identify commonly used refrigerants
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(D) identify commonly used refrigerants and demonstrate the procedures for handling these refrigerants	(ii) demonstrate the procedures for handling [commonly used] refrigerants
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(E) identify the major components of a cooling system and explain how each type works	(i) identify the major components of a cooling system
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(E) identify the major components of a cooling system and explain how each type works	(ii) explain how each type [of the major components of a cooling system] works

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(F) identify the major accessories available for cooling systems and explain how each works	(i) identify the major accessories available for cooling systems
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(F) identify the major accessories available for cooling systems and explain how each works	(ii) explain how each [of the major accessories available for a cooling system] works
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(G) identify the control devices used in cooling systems and explain how each works	(i) identify the control devices used in cooling systems
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(G) identify the control devices used in cooling systems and explain how each works	(ii) explain how each [of the control devices used in cooling systems] works
(7) The student learns the principles of heat transfer, refrigeration, pressure temperature relationships, and the components and accessories used in air conditioning systems. The student is expected to:	(H) demonstrate the correct methods to be used when piping a refrigeration system	(i) demonstrate the correct methods to be used when piping a refrigeration system
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(A) explain the three methods by which heat is transferred and give an example of each	(i) explain the three methods by which heat is transferred

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(A) explain the three methods by which heat is transferred and give an example of each	(ii) give an example of each [of the three methods by which heat is transferred]
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(B) describe how combustion occurs and identify the by-products of combustion	(i) describe how combustion occurs
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(B) describe how combustion occurs and identify the by-products of combustion	(ii) identify the by-products of combustion
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(C) identify the various types of fuels used in heating	(i) identify the various types of fuels used in heating
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(D) identify the major components and accessories of an induced draft and condensing gas furnace and explain the function of each component	(i) identify the major components of an induced draft furnace
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(D) identify the major components and accessories of an induced draft and condensing gas furnace and explain the function of each component	(ii) identify the major accessories of an induced draft furnace

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(D) identify the major components and accessories of an induced draft and condensing gas furnace and explain the function of each component	(iii) identify the major components of a condensing gas furnace
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(D) identify the major components and accessories of an induced draft and condensing gas furnace and explain the function of each component	(iv) identify the major accessories of a condensing gas furnace
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(D) identify the major components and accessories of an induced draft and condensing gas furnace and explain the function of each component	(v) explain the function of each component [of an induced draft furnace]
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(D) identify the major components and accessories of an induced draft and condensing gas furnace and explain the function of each component	(vi) explain the function of each component [of a condensing gas furnace]
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(E) describe the factors that must be considered when installing a furnace	(i) describe the factors that must be considered when installing a furnace
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(F) identify the major components of a gas furnace and describe how each works	(i) identify the major components of a gas furnace

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(F) identify the major components of a gas furnace and describe how each works	(ii) describe how each [of the major components of a gas furnace] works
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(G) use a manometer under supervision to measure and adjust manifold pressure on a gas furnace	(i) use a manometer under supervision to measure manifold pressure on a gas furnace
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(G) use a manometer under supervision to measure and adjust manifold pressure on a gas furnace	(ii) use a manometer under supervision to adjust manifold pressure on a gas furnace
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(H) identify the major components of an oil furnace and describe how each component works	(i) identify the major components of an oil furnace
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(H) identify the major components of an oil furnace and describe how each component works	(ii) describe how each component [of an oil furnace] works
(8) The student learns heating fundamentals, types and designs of furnaces and their components, and basic procedures for installing and servicing furnaces. The student is expected to:	(I) perform furnace preventive maintenance procedures such as cleaning and filter replacement under supervision	(i) perform furnace preventive maintenance procedures under supervision

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(A) describe the airflow and pressures in a basic forced-air distribution system	(i) describe the airflow in a basic forced-air distribution system
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(A) describe the airflow and pressures in a basic forced-air distribution system	(ii) describe the pressures in a basic forced-air distribution system
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(B) explain the differences between propeller and centrifugal fans and blowers	(i) explain the differences between propeller and centrifugal fans and blowers
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(C) identify the various types of duct systems and explain why and where each type is used	(i) identify the various types of duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(C) identify the various types of duct systems and explain why and where each type is used	(ii) explain why each type [of duct system] is used
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(C) identify the various types of duct systems and explain why and where each type is used	(iii) explain where each type [of duct system] is used
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(D) demonstrate or explain the installation of metal, fiberboard, and flexible duct	(i) demonstrate or explain the installation of metal duct
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(D) demonstrate or explain the installation of metal, fiberboard, and flexible duct	(ii) demonstrate or explain the installation of fiberboard duct
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(D) demonstrate or explain the installation of metal, fiberboard, and flexible duct	(iii) demonstrate or explain the installation of flexible duct

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(E) demonstrate or explain the installation of fittings and transitions used in duct systems	(i) demonstrate or explain the installation of fittings used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(E) demonstrate or explain the installation of fittings and transitions used in duct systems	(ii) demonstrate or explain the installation of transitions used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(F) demonstrate or explain the use and installation of diffusers, registers, and grilles used in duct systems	(i) demonstrate or explain the use of diffusers used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(F) demonstrate or explain the use and installation of diffusers, registers, and grilles used in duct systems	(ii) demonstrate or explain the installation of diffusers used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(F) demonstrate or explain the use and installation of diffusers, registers, and grilles used in duct systems	(iii) demonstrate or explain the use of registers used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(F) demonstrate or explain the use and installation of diffusers, registers, and grilles used in duct systems	(iv) demonstrate or explain the installation of registers used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(F) demonstrate or explain the use and installation of diffusers, registers, and grilles used in duct systems	(v) demonstrate or explain the use of grilles used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(F) demonstrate or explain the use and installation of diffusers, registers, and grilles used in duct systems	(vi) demonstrate or explain the installation of grilles used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(G) demonstrate or explain the use and installation of dampers used in duct systems	(i) demonstrate or explain the use of dampers used in duct systems

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(G) demonstrate or explain the use and installation of dampers used in duct systems	(ii) demonstrate or explain the installation of dampers used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(H) demonstrate or explain the use and installation of insulation and vapor barriers used in duct systems	(i) demonstrate or explain the use of insulation used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(H) demonstrate or explain the use and installation of insulation and vapor barriers used in duct systems	(ii) demonstrate or explain the installation of insulation used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(H) demonstrate or explain the use and installation of insulation and vapor barriers used in duct systems	(iii) demonstrate or explain the use of vapor barriers used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(H) demonstrate or explain the use and installation of insulation and vapor barriers used in duct systems	(iv) demonstrate or explain the installation of vapor barriers used in duct systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(I) identify the instruments used to make measurements in air systems and explain the use of each instrument	(i) identify the instruments used to make measurements in air systems
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(I) identify the instruments used to make measurements in air systems and explain the use of each instrument	(ii) explain the use of each instrument [used to make measurements in air systems]
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(J) make accurate temperature, air pressure, and velocity measurements in an air distribution system	(i) make accurate temperature measurements in an air distribution system
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(J) make accurate temperature, air pressure, and velocity measurements in an air distribution system	(ii) make accurate air pressure measurements in an air distribution system

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student gains knowledge and skills related to air distribution systems. The student is expected to:	(J) make accurate temperature, air pressure, and velocity measurements in an air distribution system	(iii) make accurate velocity measurements in an air distribution system

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.60. Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Technology II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Technology I. Recommended prerequisite: Principles of Architecture or Principles of Construction. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Technology II, students will gain advanced knowledge and skills needed to enter the industry as HVAC and refrigeration technicians or building maintenance technicians or supervisors, prepare for a postsecondary degree in a specified field of construction or construction management, or pursue an approved apprenticeship program. Students will acquire knowledge and skills in safety, electrical theory, use of tools, codes, installation of commercial HVAC equipment, heat pumps, troubleshooting techniques, various duct systems, and maintenance practices.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify job opportunities with their accompanying job duties in occupations such as electrician, building maintenance technician or manager, and electrical engineer	(i) identify job opportunities with their accompanying job duties in occupations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways along with the education, job skills, and experience required to achieve a career goal	(i) research career pathways along with the education required to achieve a career goal
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways along with the education, job skills, and experience required to achieve a career goal	(ii) research career pathways along with the job skills required to achieve a career goal
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) research career pathways along with the education, job skills, and experience required to achieve a career goal	(iii) research career pathways along with the experience required to achieve a career goal
(2) The student learns the principles of commercial air systems. The student is expected to:	(A) identify the differences between types of commercial air systems	(i) identify the differences between types of commercial air systems
(2) The student learns the principles of commercial air systems. The student is expected to:	(B) identify the type of building in which a particular type of system is used	(i) identify the type of building in which a particular type of system is used
(2) The student learns the principles of commercial air systems. The student is expected to:	(C) explain the typical range of capacities for a commercial air system	(i) explain the typical range of capacities for a commercial air system

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(A) describe the principles of combustion and explain complete and incomplete combustion	(i) describe the principles of combustion
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(A) describe the principles of combustion and explain complete and incomplete combustion	(ii) explain complete combustion
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(A) describe the principles of combustion and explain complete and incomplete combustion	(iii) explain incomplete combustion
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(B) describe the content of flue gas and explain how it is vented	(i) describe the content of flue gas
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(B) describe the content of flue gas and explain how it is vented	(ii) explain how [flue gas] is vented
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(C) identify the components of a furnace vent system	(i) identify the components of a furnace vent system

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(D) describe how to select and install a vent system	(i) describe how to select a vent system
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(D) describe how to select and install a vent system	(ii) describe how to install a vent system
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(E) perform the adjustments necessary to achieve proper combustion in a gas furnace	(i) perform the adjustments necessary to achieve proper combustion in a gas furnace
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(F) describe the techniques for venting different types of furnaces	(i) describe the techniques for venting different types of furnaces
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(G) explain the various draft control devices used with natural-draft furnaces	(i) explain the various draft control devices used with natural-draft furnaces
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(H) calculate the size of a vent required for a given application	(i) calculate the size of a vent required for a given application

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student knows the principles of venting fossil-fuel furnaces and the proper methods for selecting and installing vent systems for gas-fired heating equipment. The student is expected to:	(I) adjust a thermostat heat anticipator	(i) adjust a thermostat heat anticipator
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(A) explain the terms and concepts used when working with hot-water heating	(i) explain the terms used when working with hot-water heating
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(A) explain the terms and concepts used when working with hot-water heating	(ii) explain the concepts used when working with hot-water heating
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(B) identify the major components of hot-water heating	(i) identify the major components of hot-water heating
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(C) explain the purpose of each component of hot-water heating	(i) explain the purpose of each component of hot-water heating
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(D) demonstrate the safety precautions used when working with hot-water systems	(i) demonstrate the safety precautions used when working with hot-water systems

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(E) demonstrate how to operate selected hot-water systems	(i) demonstrate how to operate selected hot-water systems
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(F) demonstrate how to safely perform selected operating procedures on low-pressure systems	(i) demonstrate how to safely perform selected operating procedures on low-pressure systems
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(G) identify the common piping configurations used with hot-water heating	(i) identify the common piping configurations used with hot-water heating
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(H) explain how to read the pressure across a water system circulating pump	(i) explain how to read the pressure across a water system circulating pump
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(I) calculate heating water flow rates	(i) calculate heating water flow rates
(4) The student gains knowledge of hot water heating systems, focusing on safe operation of the low-pressure boiler and piping systems commonly used in residential applications. The student is expected to:	(J) select a pump for a given application	(i) select a pump for a given application

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(A) explain why it is important to control humidity in a building</p>	<p>(i) explain why it is important to control humidity in a building</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(B) recognize the various kinds of humidifiers used with HVAC systems and explain why each is used</p>	<p>(i) recognize the various kinds of humidifiers used with HVAC systems</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(B) recognize the various kinds of humidifiers used with HVAC systems and explain why each is used</p>	<p>(ii) explain why each [kind of humidifier] is used</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(C) demonstrate how to install and service the humidifiers used in HVAC systems</p>	<p>(i) demonstrate how to install the humidifiers used in HVAC systems</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(C) demonstrate how to install and service the humidifiers used in HVAC systems</p>	<p>(ii) demonstrate how to service the humidifiers used in HVAC systems</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(D) recognize the kinds of air filters used with HVAC systems and explain why each is used</p>	<p>(i) recognize the kinds of air filters used with HVAC systems</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(D) recognize the kinds of air filters used with HVAC systems and explain why each is used</p>	<p>(ii) explain why each [kind of air filter] is used</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(E) demonstrate how to install and service the filters used in HVAC systems</p>	<p>(i) demonstrate how to install the filters used in HVAC systems</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(E) demonstrate how to install and service the filters used in HVAC systems</p>	<p>(ii) demonstrate how to service the filters used in HVAC systems</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(F) use a manometer or differential pressure gauge to measure the friction loss of an air filter</p>	<p>(i) use a manometer or differential pressure gauge to measure the friction loss of an air filter</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(G) identify accessories commonly used with air conditioning systems to improve indoor air quality and reduce energy cost and explain the function of each, including humidity control devices, air filtration devices, and energy conservation devices</p>	<p>(i) identify accessories commonly used with air conditioning systems to improve indoor air quality</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(G) identify accessories commonly used with air conditioning systems to improve indoor air quality and reduce energy cost and explain the function of each, including humidity control devices, air filtration devices, and energy conservation devices</p>	<p>(ii) identify accessories commonly used with air conditioning systems to reduce energy cost</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(G) identify accessories commonly used with air conditioning systems to improve indoor air quality and reduce energy cost and explain the function of each, including humidity control devices, air filtration devices, and energy conservation devices</p>	<p>(iii) explain the function of each [accessory], including humidity control devices</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(G) identify accessories commonly used with air conditioning systems to improve indoor air quality and reduce energy cost and explain the function of each, including humidity control devices, air filtration devices, and energy conservation devices</p>	<p>(iv) explain the function of each [accessory], including air filtration devices</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(G) identify accessories commonly used with air conditioning systems to improve indoor air quality and reduce energy cost and explain the function of each, including humidity control devices, air filtration devices, and energy conservation devices</p>	<p>(v) explain the function of each [accessory], including energy conservation devices</p>
<p>(5) The student learns the basic principles, processes, and devices used to control humidity and air clean-lines as well as devices used to conserve energy in HVAC systems. The student is expected to:</p>	<p>(H) demonstrate or describe how to clean an electronic air cleaner</p>	<p>(i) demonstrate or describe how to clean an electronic air cleaner</p>
<p>(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:</p>	<p>(A) identify the common types of leak detectors and explain how each is used</p>	<p>(i) identify the common types of leak detectors</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(A) identify the common types of leak detectors and explain how each is used	(ii) explain how each [type of leak detector] is used
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(B) perform leak detection tests using selected methods	(i) perform leak detection tests using selected methods
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(C) identify the service equipment used for evacuating a system and explain why each item of equipment is used	(i) identify the service equipment used for evacuating a system
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(C) identify the service equipment used for evacuating a system and explain why each item of equipment is used	(ii) explain why each item of equipment is used
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(D) perform system evacuation and dehydration	(i) perform system evacuation

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(D) perform system evacuation and dehydration	(ii) perform system dehydration
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(E) identify the service equipment used for recovering refrigerant from a system and for recycling the recovered refrigerant and explain why each item of equipment is used	(i) identify the service equipment used for recovering refrigerant from a system
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(E) identify the service equipment used for recovering refrigerant from a system and for recycling the recovered refrigerant and explain why each item of equipment is used	(ii) identify the service equipment used for recycling the recovered refrigerant
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(E) identify the service equipment used for recovering refrigerant from a system and for recycling the recovered refrigerant and explain why each item of equipment is used	(iii) explain why each item of equipment is used
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(F) perform a refrigerant recovery	(i) perform a refrigerant recovery

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(G) evacuate a system to a deep vacuum	(i) evacuate a system to a deep vacuum
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(H) identify the service equipment used for charging refrigerant into a system and explain why each item of equipment is used	(i) identify the service equipment used for charging refrigerant into a system
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(H) identify the service equipment used for charging refrigerant into a system and explain why each item of equipment is used	(ii) explain why each item of equipment is used
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(I) use nitrogen to purge a system	(i) use nitrogen to purge a system
(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:	(J) charge refrigerant into a system using various methods, including weight, superheat, sub-cooling, and charging pressure chart	(i) charge refrigerant into a system using various methods, including weight chart

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:</p>	<p>(J) charge refrigerant into a system using various methods, including weight, superheat, sub-cooling, and charging pressure chart</p>	<p>(ii) charge refrigerant into a system using various methods, including superheat chart</p>
<p>(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:</p>	<p>(J) charge refrigerant into a system using various methods, including weight, superheat, sub-cooling, and charging pressure chart</p>	<p>(iii) charge refrigerant into a system using various methods, including sub-cooling chart</p>
<p>(6) The student gains the knowledge and skills in the handling of refrigerant and equipment servicing procedures to service HVAC systems in an environmentally safe manner. The student is expected to:</p>	<p>(J) charge refrigerant into a system using various methods, including weight, superheat, sub-cooling, and charging pressure chart</p>	<p>(iv) charge refrigerant into a system using various methods, including charging pressure chart</p>
<p>(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:</p>	<p>(A) describe the operation of various types of transformers</p>	<p>(i) describe the operation of various types of transformers</p>
<p>(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:</p>	<p>(B) explain how alternating current is developed and draw a sine wave</p>	<p>(i) explain how alternating current is developed</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(B) explain how alternating current is developed and draw a sine wave	(ii) draw a sine wave
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(C) identify single-phase and three-phase wiring arrangements	(i) identify single-phase wiring arrangements
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(C) identify single-phase and three-phase wiring arrangements	(ii) identify three-phase wiring arrangements
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(D) explain how phase shift occurs in inductors and capacitors	(i) explain how phase shift occurs in inductors

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(D) explain how phase shift occurs in inductors and capacitors	(ii) explain how phase shift occurs in capacitors
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(E) describe the types of capacitors and their applications	(i) describe the types of capacitors
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(E) describe the types of capacitors and their applications	(ii) describe [the types of capacitors'] applications
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(F) explain the operation of single-phase and three-phase induction motors	(i) explain the operation of single-phase induction motors

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:</p>	<p>(F) explain the operation of single-phase and three-phase induction motors</p>	<p>(ii) explain the operation of three-phase induction motors</p>
<p>(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:</p>	<p>(G) identify the various types of single-phase motors and their applications</p>	<p>(i) identify the various types of single-phase motors</p>
<p>(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:</p>	<p>(G) identify the various types of single-phase motors and their applications</p>	<p>(ii) identify [the various types of single-phase motors] applications</p>
<p>(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:</p>	<p>(H) state and demonstrate the safety precautions that must be followed when working with electrical equipment</p>	<p>(i) state the safety precautions that must be followed when working with electrical equipment</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(H) state and demonstrate the safety precautions that must be followed when working with electrical equipment	(ii) demonstrate the safety precautions that must be followed when working with electrical equipment
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(I) test alternating current components, including capacitors, transformers, and motors	(i) test alternating current components, including capacitors
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(I) test alternating current components, including capacitors, transformers, and motors	(ii) test alternating current components, including transformers
(7) The student gains knowledge of transformers, single-phase and three-phase power distribution, capacitors, theory and operation of induction motors, and instruments and techniques used in testing alternating current circuits and components. The student is expected to:	(I) test alternating current components, including capacitors, transformers, and motors	(iii) test alternating current components, including motors
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(A) explain the theory of electronics and semiconductors	(i) explain the theory of electronics

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(A) explain the theory of electronics and semiconductors	(ii) explain the theory of semiconductors
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(B) explain how various semiconductor devices such as diodes, light emitting diodes, and photo diodes work and how the devices are used in power and control circuits	(i) explain how various semiconductor devices work
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(B) explain how various semiconductor devices such as diodes, light emitting diodes, and photo diodes work and how the devices are used in power and control circuits	(ii) explain how the devices are used in power circuits
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(B) explain how various semiconductor devices such as diodes, light emitting diodes, and photo diodes work and how the devices are used in power and control circuits	(iii) explain how the devices are used in control circuits
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(C) identify different types of resistors and explain how their resistance values can be determined	(i) identify different types of resistors
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(C) identify different types of resistors and explain how their resistance values can be determined	(ii) explain how [different types of resistors] resistance values can be determined

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(D) describe the operation and function of thermistors and cad cells	(i) describe the operation of thermistors
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(D) describe the operation and function of thermistors and cad cells	(ii) describe the function of thermistors
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(D) describe the operation and function of thermistors and cad cells	(iii) describe the operation of cad cells
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(D) describe the operation and function of thermistors and cad cells	(iv) describe the function of cad cells
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(E) test semiconductor components	(i) test semiconductor components
(8) The student learns the theory of solid-state electronics as well as the operation, use, and testing of the various electronic components used in HVAC equipment. The student is expected to:	(F) identify the connectors on a personal computer	(i) identify the connectors on a personal computer

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(A) explain the function of a thermostat in an HVAC system	(i) explain the function of a thermostat in an HVAC system
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(B) describe different types of thermostats and explain how the thermostats are used	(i) describe different types of thermostats
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(B) describe different types of thermostats and explain how the thermostats are used	(ii) explain how the thermostats are used
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(C) demonstrate the correct installation and adjustment of a thermostat	(i) demonstrate the correct installation of a thermostat
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(C) demonstrate the correct installation and adjustment of a thermostat	(ii) demonstrate the correct adjustment of a thermostat

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(D) explain the principles applicable to all control systems	(i) explain the principles applicable to all control systems
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(i) identify the various types of electromechanical HVAC controls
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(ii) explain [the various types of electromechanical HVAC controls'] function
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(iii) explain [the various types of electromechanical HVAC controls'] operation
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(iv) identify the various types of electronic HVAC controls

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(v) explain [the various types of electronic HVAC controls'] function
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(vi) explain [the various types of electronic HVAC controls'] operation
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(vii) identify the various types of pneumatic HVAC controls
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(viii) explain [the various types of pneumatic HVAC controls'] function
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(E) identify the various types of electromechanical, electronic, and pneumatic HVAC controls and explain their function and operation	(ix) explain [the various types of pneumatic HVAC controls'] operation

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(F) describe a systematic approach for electrical troubleshooting of HVAC equipment and components	(i) describe a systematic approach for electrical troubleshooting of HVAC equipment
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(F) describe a systematic approach for electrical troubleshooting of HVAC equipment and components	(ii) describe a systematic approach for electrical troubleshooting of HVAC components
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(G) recognize and use equipment manufacturers' troubleshooting aids to troubleshoot HVAC equipment	(i) recognize equipment manufacturers' troubleshooting aids to troubleshoot HVAC equipment
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(G) recognize and use equipment manufacturers' troubleshooting aids to troubleshoot HVAC equipment	(ii) use equipment manufacturers' troubleshooting aids to troubleshoot HVAC equipment
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(H) demonstrate how to isolate electrical problems to faulty power distribution, load, or control circuits	(i) demonstrate how to isolate electrical problems to faulty power distribution, load, or control circuits

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(I) identify the service instruments needed to troubleshoot HVAC electrical equipment	(i) identify the service instruments needed to troubleshoot HVAC electrical equipment
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(J) make electrical troubleshooting checks and measurements on circuits and components common to all HVAC equipment	(i) make electrical troubleshooting checks on circuits common to all HVAC equipment
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(J) make electrical troubleshooting checks and measurements on circuits and components common to all HVAC equipment	(ii) make electrical troubleshooting measurements on circuits common to all HVAC equipment
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(J) make electrical troubleshooting checks and measurements on circuits and components common to all HVAC equipment	(iii) make electrical troubleshooting checks on components common to all HVAC equipment
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(J) make electrical troubleshooting checks and measurements on circuits and components common to all HVAC equipment	(iv) make electrical troubleshooting measurements on components common to all HVAC equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(K) isolate and correct malfunctions in a cooling system control circuit	(i) isolate malfunctions in a cooling system control circuit
(9) The student learns the operation, testing, and adjustment of conventional and electronic thermostats as well as the operation of common electrical, electronic, and pneumatic circuits used to control HVAC systems. The student is expected to:	(K) isolate and correct malfunctions in a cooling system control circuit	(ii) correct malfunctions in a cooling system control circuit
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(A) describe the operating sequence for gas heating equipment	(i) describe the operating sequence for gas heating equipment
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(B) interpret control circuit diagrams for gas heating systems	(i) interpret control circuit diagrams for gas heating systems
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(C) describe the operation of various types of burner ignition methods	(i) describe the operation of various types of burner ignition methods
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(D) identify the tools and instruments used when troubleshooting gas heating systems	(i) identify the tools used when troubleshooting gas heating systems

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(D) identify the tools and instruments used when troubleshooting gas heating systems	(ii) identify the instruments used when troubleshooting gas heating systems
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(E) demonstrate using the tools and instruments required for troubleshooting gas heating systems	(i) demonstrate using the tools required for troubleshooting gas heating systems
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(E) demonstrate using the tools and instruments required for troubleshooting gas heating systems	(ii) demonstrate using the instruments required for troubleshooting gas heating systems
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(F) isolate and correct malfunctions in gas heating systems	(i) isolate malfunctions in gas heating systems
(10) The student learns the tools, instruments, and techniques used in troubleshooting gas heating appliances, including how to isolate and correct faults. The student is expected to:	(F) isolate and correct malfunctions in gas heating systems	(ii) correct malfunctions in gas heating systems
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(A) describe a systematic approach for troubleshooting cooling systems and components	(i) describe a systematic approach for troubleshooting cooling systems

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(A) describe a systematic approach for troubleshooting cooling systems and components	(ii) describe a systematic approach for troubleshooting cooling components
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(B) isolate problems to electrical and mechanical functions in cooling systems	(i) isolate problems to electrical functions in cooling systems
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(B) isolate problems to electrical and mechanical functions in cooling systems	(ii) isolate problems to mechanical functions in cooling systems
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(C) recognize and use equipment manufacturers' troubleshooting aids to troubleshoot cooling systems	(i) recognize equipment manufacturers' troubleshooting aids to troubleshoot cooling systems
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(C) recognize and use equipment manufacturers' troubleshooting aids to troubleshoot cooling systems	(ii) use equipment manufacturers' troubleshooting aids to troubleshoot cooling systems
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(D) identify and use the service instruments needed to troubleshoot cooling systems	(i) identify the service instruments needed to troubleshoot cooling systems

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(D) identify and use the service instruments needed to troubleshoot cooling systems	(ii) use the service instruments needed to troubleshoot cooling systems
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(E) troubleshoot selected problems in cooling equipment	(i) troubleshoot selected problems in cooling equipment
(11) The student learns the techniques and equipment used in troubleshooting cooling equipment and analyzing system temperatures and pressures in order to isolate faults. The student is expected to:	(F) state the safety precautions associated with cooling troubleshooting	(i) state the safety precautions associated with cooling troubleshooting
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(A) describe the principles of reverse-cycle heating	(i) describe the principles of reverse-cycle heating
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(B) identify heat pumps by type and general classification	(i) identify heat pumps by type

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(B) identify heat pumps by type and general classification	(ii) identify heat pumps by general classification
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(C) describe various types of geothermal water loops and their application	(i) describe various types of geothermal water loops
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(C) describe various types of geothermal water loops and their application	(ii) describe [various types of geothermal water loops] application
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(D) list the components of heat pump systems	(i) list the components of heat pump systems
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(E) describe the role and operation of electric heat in common heat pump systems	(i) describe the role of electric heat in common heat pump systems

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(E) describe the role and operation of electric heat in common heat pump systems	(ii) describe the operation of electric heat in common heat pump systems
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(F) describe common heat pump ratings such as coefficient of performance, heating season performance factor, and seasonal energy efficiency ratio	(i) describe common heat pump ratings
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(G) demonstrate heat pump installation and service procedures	(i) demonstrate heat pump installation procedures
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(G) demonstrate heat pump installation and service procedures	(ii) demonstrate heat pump service procedures
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(H) identify and install refrigerant circuit accessories commonly associated with heat pumps	(i) identify refrigerant circuit accessories commonly associated with heat pumps

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(H) identify and install refrigerant circuit accessories commonly associated with heat pumps	(ii) install refrigerant circuit accessories commonly associated with heat pumps
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(I) analyze a heat pump control circuit	(i) analyze a heat pump control circuit
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(J) isolate and correct malfunctions in a heat pump	(i) isolate malfunctions in a heat pump
(12) The student learns the principles of reverse-cycle heating, the operation of various types of heat pumps, and the mechanisms of heat pump control circuits and learns to install and service heat pumps. The student is expected to:	(J) isolate and correct malfunctions in a heat pump	(ii) correct malfunctions in a heat pump
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(A) identify, explain, and install threaded and non-threaded fasteners	(i) identify threaded fasteners

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(A) identify, explain, and install threaded and non-threaded fasteners	(ii) explain threaded fasteners
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(A) identify, explain, and install threaded and non-threaded fasteners	(iii) install threaded fasteners
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(A) identify, explain, and install threaded and non-threaded fasteners	(iv) identify non-threaded fasteners
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(A) identify, explain, and install threaded and non-threaded fasteners	(v) explain non-threaded fasteners
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(A) identify, explain, and install threaded and non-threaded fasteners	(vi) install non-threaded fasteners

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(i) identify types of gaskets
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(ii) remove gaskets
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(iii) install gaskets
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(iv) identify types of packings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(v) remove packings

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(vi) install packings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(vii) identify types of seals
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(viii) remove seals
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(B) identify, remove, and install types of gaskets, packings, and seals	(ix) install seals
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(C) identify types of lubricants and explain their uses	(i) identify types of lubricants

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(C) identify types of lubricants and explain their uses	(ii) explain [types of lubricants'] uses
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(D) use lubrication equipment to lubricate motor bearings	(i) use lubrication equipment to lubricate motor bearings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(E) identify the types of belt drives, explain their uses, and demonstrate procedures used to install or adjust them	(i) identify the types of belt drives
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(E) identify the types of belt drives, explain their uses, and demonstrate procedures used to install or adjust them	(ii) explain [the types of belt drives'] uses
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(E) identify the types of belt drives, explain their uses, and demonstrate procedures used to install or adjust them	(iii) demonstrate procedures used to install or adjust [the types of belt drives]

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(F) identify and explain types of couplings	(i) identify types of couplings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(F) identify and explain types of couplings	(ii) explain types of couplings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(G) demonstrate procedures used to remove, install, and align couplings	(i) demonstrate procedures used to remove couplings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(G) demonstrate procedures used to remove, install, and align couplings	(ii) demonstrate procedures used to install couplings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(G) demonstrate procedures used to remove, install, and align couplings	(iii) demonstrate procedures used to align couplings

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(H) identify types of bearings and explain their uses	(i) identify types of bearings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(H) identify types of bearings and explain their uses	(ii) explain [types of bearings'] uses
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(I) explain causes of bearing failures	(i) explain causes of bearing failures
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(J) demonstrate procedures used to remove and install bearings	(i) demonstrate procedures used to remove bearings
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(J) demonstrate procedures used to remove and install bearings	(ii) demonstrate procedures used to install bearings

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(K) perform preventive maintenance inspection and cleaning procedures	(i) perform preventive maintenance inspection procedures
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(K) perform preventive maintenance inspection and cleaning procedures	(ii) perform preventative maintenance cleaning procedures
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(L) list ways to develop and maintain good customer relations	(i) list ways to develop good customer relations
(13) The student selects the application and installation of various types of fasteners, gaskets, seals, and lubricants as well as the installation and adjustment of different types of belt drives, bearings, and couplings. The student is expected to:	(L) list ways to develop and maintain good customer relations	(ii) list ways to maintain good customer relations
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(A) identify and describe the types of sheet metal	(i) identify the types of sheet metal
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(A) identify and describe the types of sheet metal	(ii) describe the types of sheet metal

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(B) define properties of steel and aluminum alloys	(i) define properties of steel alloys
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(B) define properties of steel and aluminum alloys	(ii) define properties of aluminum alloys
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(C) describe a layout method and perform proper cutting	(i) describe a layout method
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(C) describe a layout method and perform proper cutting	(ii) perform proper cutting
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(D) join sheet metal duct sections using proper seams and connectors	(i) join sheet metal duct sections using proper seams
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(D) join sheet metal duct sections using proper seams and connectors	(ii) join sheet metal duct sections using proper connectors
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(E) describe proper hanging and support methods for sheet metal ductwork	(i) describe proper hanging methods for sheet metal ductwork

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(E) describe proper hanging and support methods for sheet metal ductwork	(ii) describe proper support methods for sheet metal ductwork
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(F) describe thermal and acoustic insulation principles	(i) describe thermal insulation principles
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(F) describe thermal and acoustic insulation principles	(ii) describe acoustic insulation principles
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(G) select, apply, and seal the proper insulation for sheet metal ductwork	(i) select the proper insulation for sheet metal ductwork
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(G) select, apply, and seal the proper insulation for sheet metal ductwork	(ii) apply the proper insulation for sheet metal ductwork
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(G) select, apply, and seal the proper insulation for sheet metal ductwork	(iii) seal the proper insulation for sheet metal ductwork
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(H) describe guidelines for installing components such as register, diffusers, grilles, dampers, access doors, and zoning accessories	(i) describe guidelines for installing components

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(I) install takeoffs and attach flexible duct to a sheet metal duct	(i) install takeoffs to a sheet metal duct
(14) The student demonstrates how to lay out, fabricate, install, and join sheet metal ductwork. The student is expected to:	(I) install takeoffs and attach flexible duct to a sheet metal duct	(ii) attach flexible duct to a sheet metal duct
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(A) identify types of fiberglass duct, including flexible duct	(i) identify types of fiberglass duct, including flexible duct
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(B) describe fiberglass duct layout and some basic fabrication methods	(i) describe fiberglass duct layout methods
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(B) describe fiberglass duct layout and some basic fabrication methods	(ii) describe some basic fabrication methods
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(C) describe the various closure methods for sealing fiberglass duct	(i) describe the various closure methods for sealing fiberglass duct
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(D) fabricate selected duct modules and fittings using the appropriate tools	(i) fabricate selected duct modules using the appropriate tools

Knowledge and Skill Statement	Student Expectation	Breakout
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(D) fabricate selected duct modules and fittings using the appropriate tools	(ii) fabricate selected duct fittings using the appropriate tools
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(E) describe hanging and support methods for fiberglass duct	(i) describe hanging methods for fiberglass duct
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(E) describe hanging and support methods for fiberglass duct	(ii) describe support methods for fiberglass duct
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(F) describe how to repair major and minor damage to fiberglass duct	(i) describe how to repair major damage to fiberglass duct
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(F) describe how to repair major and minor damage to fiberglass duct	(ii) describe how to repair minor damage to fiberglass duct
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(G) install takeoffs and attach flexible duct to a fiberglass duct	(i) install takeoffs to a fiberglass duct
(15) The student gains the knowledge and skills to lay out, fabricate, install, join, attach, and support fiberglass ductwork and fittings. The student is expected to:	(G) install takeoffs and attach flexible duct to a fiberglass duct	(ii) attach flexible duct to a fiberglass duct

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.61. Plumbing Technology I (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: Principles of Architecture, Principles of Construction, or Construction Technology I. Students shall be awarded one credit for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Plumbing Technology I, students will gain knowledge and skills needed to enter the industry as a plumbing apprentice, building maintenance technician, or supervisor or prepare for a postsecondary degree in construction management, architecture, or engineering. Students will acquire knowledge and skills in industry workplace basics and employer/customer expectations, including how to use a plumbing code book; how to identify and use power and hand tools; how to be safe on the jobsite and when using hand and power tools; how to apply basic plumbing mathematics and plumbing drawing; and how to identify, fit, and use plastic, copper, cast iron, carbon steel, and corrugated stainless steel pipe. In addition, students will be introduced to gas, drainage, and water supply systems and continue their knowledge of workplace basics and green technologies.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(i) demonstrate oral communication
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(ii) demonstrate written communication
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(iii) demonstrate leadership skills
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(iv) demonstrate teamwork skills
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(v) demonstrate conflict management

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(vi) demonstrate customer service
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(vii) demonstrate professionalism
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(viii) demonstrate work ethic
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(ix) demonstrate integrity
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(x) demonstrate multitasking

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(xi) demonstrate initiative
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(xii) demonstrate creativity
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate oral communication, written communication, leadership skills, teamwork skills, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(xiii) demonstrate how to follow directions
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(B) understand the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest	(i) understand the importance of showing up to work on time
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(B) understand the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest	(ii) understand the importance of maintaining appropriate personal appearance
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(B) understand the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest	(iii) understand the importance of working as a team member

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(B) understand the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest	(iv) understand the importance of being honest
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate an understanding of the responsibilities of driving a company vehicle	(i) demonstrate an understanding of the responsibilities of driving a company vehicle
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate an understanding of why and how listening is a critical life skill	(i) demonstrate an understanding of why listening is a critical life skill
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate an understanding of why and how listening is a critical life skill	(ii) demonstrate an understanding of how listening is a critical life skill
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate an understanding of the importance of being a self-starter and of increasing one's knowledge and skills in a chosen career field	(i) demonstrate an understanding of the importance of being a self-starter
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate an understanding of the importance of being a self-starter and of increasing one's knowledge and skills in a chosen career field	(ii) demonstrate an understanding of the importance of increasing one's knowledge in a chosen career field
(1) The student is expected to demonstrate professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate an understanding of the importance of being a self-starter and of increasing one's knowledge and skills in a chosen career field	(iii) demonstrate an understanding of the importance of increasing one's skills in a chosen career field

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(A) describe the common unsafe acts and conditions that cause accidents	(i) describe the common unsafe acts that cause accidents
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(A) describe the common unsafe acts and conditions that cause accidents	(ii) describe the common unsafe conditions that cause accidents
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(B) describe how to handle unsafe acts and conditions	(i) describe how to handle unsafe acts
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(B) describe how to handle unsafe acts and conditions	(ii) describe how to handle unsafe conditions
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(C) explain the impact and cost of accidents and illnesses	(i) explain the impact of accidents
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(C) explain the impact and cost of accidents and illnesses	(ii) explain the impact of illnesses

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(C) explain the impact and cost of accidents and illnesses	(iii) explain the cost of accidents
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(C) explain the impact and cost of accidents and illnesses	(iv) explain the cost of illnesses
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(D) demonstrate the use and care of appropriate personal protective equipment	(i) demonstrate the use of appropriate personal protective equipment
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(D) demonstrate the use and care of appropriate personal protective equipment	(ii) demonstrate the care of appropriate personal protective equipment
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(E) identify job-site hazards specific to plumbers	(i) identify job-site hazards specific to plumbers
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(F) demonstrate the proper use of ladders	(i) demonstrate the proper use of ladders

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(G) explain how to work around a trench	(i) explain how to work around a trench
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(H) describe and demonstrate the lockout/tagout process	(i) describe the lockout/tagout process
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(H) describe and demonstrate the lockout/tagout process	(ii) demonstrate the lockout/tagout process
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(I) understand the purpose of material safety data sheets (MSDS) and their importance to job-site and personal safety	(i) understand the purpose of material safety data sheets (MSDS)
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(I) understand the purpose of material safety data sheets (MSDS) and their importance to job-site and personal safety	(ii) understand [material safety data sheets'] importance to job-site safety
(2) The student understands the causes of accidents and their consequences and repercussions in terms of delays, increased expenses, injury, and loss of life. The student is expected to:	(I) understand the purpose of material safety data sheets (MSDS) and their importance to job-site and personal safety	(iii) understand [material safety data sheets'] importance to personal safety

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(A) identify job opportunities and their accompanying job duties such as a plumber, building maintenance technician or supervisor, manager, and mechanical engineer	(i) identify job opportunities
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(A) identify job opportunities and their accompanying job duties such as a plumber, building maintenance technician or supervisor, manager, and mechanical engineer	(ii) identify [job opportunities] accompanying job duties
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve career goals	(i) research careers along with the education required to achieve career goals
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve career goals	(ii) research careers along with the job skills required to achieve career goals
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve career goals	(iii) research careers along with the experience required to achieve career goals
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(C) identify the industries and associations that make up the modern plumbing profession	(i) identify the industries that make up the modern plumbing profession

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(C) identify the industries and associations that make up the modern plumbing profession	(ii) identify the associations that make up the modern plumbing profession
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(D) demonstrate how to properly treat company and customer property	(i) demonstrate how to properly treat company property
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(D) demonstrate how to properly treat company and customer property	(ii) demonstrate how to properly treat customer property
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(E) understand the importance of keeping the work area clean and how that applies to job safety	(i) understand the importance of keeping the work area clean
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(E) understand the importance of keeping the work area clean and how that applies to job safety	(ii) understand how [keeping the work area clean] applies to job safety
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(F) understand the importance of using industry standards and techniques for the job	(i) understand the importance of using industry standards for the job

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student understands and demonstrates what employer and customer expectations are and is familiar with industry workplace basics and their importance. The student is expected to:	(F) understand the importance of using industry standards and techniques for the job	(ii) understand the importance of using industry techniques for the job
(4) The student understands and demonstrates what green technology is and how it relates to the plumbing profession and environment. The student is expected to:	(A) identify different green plumbing fixtures	(i) identify different green plumbing fixtures
(4) The student understands and demonstrates what green technology is and how it relates to the plumbing profession and environment. The student is expected to:	(B) identify different types of reuse plumbing systems	(i) identify different types of reuse plumbing systems
(4) The student understands and demonstrates what green technology is and how it relates to the plumbing profession and environment. The student is expected to:	(C) design and demonstrate a particular reuse water plumbing system	(i) design a particular reuse water plumbing system
(4) The student understands and demonstrates what green technology is and how it relates to the plumbing profession and environment. The student is expected to:	(C) design and demonstrate a particular reuse water plumbing system	(ii) demonstrate a particular reuse water plumbing system
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(A) identify the hand and power tools used in the plumbing industry	(i) identify the hand tools used in the plumbing industry

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(A) identify the hand and power tools used in the plumbing industry	(ii) identify the power tools used in the plumbing industry
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(B) demonstrate the proper use of hand and power plumbing tools	(i) demonstrate the proper use of hand plumbing tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(B) demonstrate the proper use of hand and power plumbing tools	(ii) demonstrate the proper use of power plumbing tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(C) demonstrate the ability to know when and how to select the proper tools for tasks	(i) demonstrate the ability to know when to select the proper tools for tasks
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(C) demonstrate the ability to know when and how to select the proper tools for tasks	(ii) demonstrate the ability to know how to select the proper tools for tasks
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(D) demonstrate proper maintenance and care for hand and power tools	(i) demonstrate proper maintenance for hand tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(D) demonstrate proper maintenance and care for hand and power tools	(ii) demonstrate proper maintenance for power tools

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(D) demonstrate proper maintenance and care for hand and power tools	(iii) demonstrate proper care for hand tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(D) demonstrate proper maintenance and care for hand and power tools	(iv) demonstrate proper care for power tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(E) demonstrate how to prepare a surface for tool use	(i) demonstrate how to prepare a surface for tool use
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(F) describe the safety requirements for using plumbing tools	(i) describe the safety requirements for using plumbing tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(G) identify and demonstrate how to read and use various rulers and measuring tools	(i) identify how to read various rulers
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(G) identify and demonstrate how to read and use various rulers and measuring tools	(ii) identify how to read various measuring tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(G) identify and demonstrate how to read and use various rulers and measuring tools	(iii) identify how to use various rulers

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(G) identify and demonstrate how to read and use various rulers and measuring tools	(iv) demonstrate how to use various measuring tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(G) identify and demonstrate how to read and use various rulers and measuring tools	(v) demonstrate how to read various rulers
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(G) identify and demonstrate how to read and use various rulers and measuring tools	(vi) demonstrate how to read various measuring tools
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(G) identify and demonstrate how to read and use various rulers and measuring tools	(vii) demonstrate how to use various rulers
(5) The student selects and safely uses different types of hand and power tools related to a specific task. The student is expected to:	(G) identify and demonstrate how to read and use various rulers and measuring tools	(viii) demonstrate how to use various measuring tools
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(i) add whole numbers
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(ii) add fractions

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(iii) add decimals
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(iv) subtract whole numbers
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(v) subtract fractions
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(vi) subtract decimals
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(vii) multiply whole numbers
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(viii) multiply fractions

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(ix) multiply decimals
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(x) divide whole numbers
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(xi) divide fractions
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(A) add, subtract, multiply, and divide whole numbers, fractions, and decimals	(xii) divide decimals
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(B) convert fractions to decimals and decimals to fractions	(i) convert fractions to decimals
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(B) convert fractions to decimals and decimals to fractions	(ii) convert decimals to fractions

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(C) demonstrate mathematical competency in the metric system and how the metric system is used in the plumbing industry	(i) demonstrate mathematical competency in the metric system
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(C) demonstrate mathematical competency in the metric system and how the metric system is used in the plumbing industry	(ii) demonstrate how the metric system is used in the plumbing industry
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(D) square various numbers and determine the square roots of numbers with and without a calculator	(i) square various numbers with a calculator
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(D) square various numbers and determine the square roots of numbers with and without a calculator	(ii) square various numbers without a calculator
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(D) square various numbers and determine the square roots of numbers with and without a calculator	(iii) determine the square roots of numbers with a calculator
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(D) square various numbers and determine the square roots of numbers with and without a calculator	(iv) determine the square roots of numbers without a calculator

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(E) identify and demonstrate the parts of a plumbing fitting and use common pipe-measuring techniques	(i) identify the parts of a plumbing fitting
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(E) identify and demonstrate the parts of a plumbing fitting and use common pipe-measuring techniques	(ii) demonstrate the parts of a plumbing fitting
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(E) identify and demonstrate the parts of a plumbing fitting and use common pipe-measuring techniques	(iii) use common pipe-measuring techniques
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(F) use fitting dimensions tables to determine fitting allowances and thread makeup	(i) use fitting dimensions tables to determine fitting allowances
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(F) use fitting dimensions tables to determine fitting allowances and thread makeup	(ii) use fitting dimensions tables to determine thread makeup
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(G) demonstrate how to measure end-to-end, center-to-center, and end-to-center measurements using fitting allowances and thread makeup	(i) demonstrate how to measure end-to-end measurements using fitting allowances

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(G) demonstrate how to measure end-to-end, center-to-center, and end-to-center measurements using fitting allowances and thread makeup	(ii) demonstrate how to measure end-to-end measurements using thread makeup
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(G) demonstrate how to measure end-to-end, center-to-center, and end-to-center measurements using fitting allowances and thread makeup	(iii) demonstrate how to measure center-to-center measurements using fitting allowances
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(G) demonstrate how to measure end-to-end, center-to-center, and end-to-center measurements using fitting allowances and thread makeup	(iv) demonstrate how to measure center-to-center measurements using thread makeup
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(G) demonstrate how to measure end-to-end, center-to-center, and end-to-center measurements using fitting allowances and thread makeup	(v) demonstrate how to measure end-to-center measurements using fitting allowances
(6) The student applies mathematical concepts to whole numbers, fractions, decimals, and squared numbers and examines how these concepts apply to specific situations. The student is expected to:	(G) demonstrate how to measure end-to-end, center-to-center, and end-to-center measurements using fitting allowances and thread makeup	(vi) demonstrate how to measure end-to-center measurements using thread makeup
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(A) use current architectural technology to identify pictorial, isometric and oblique, schematic, and orthographic drawings and discuss how different views are used to depict information about objects	(i) use current architectural technology to identify pictorial drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(A) use current architectural technology to identify pictorial, isometric and oblique, schematic, and orthographic drawings and discuss how different views are used to depict information about objects	(ii) use current architectural technology to identify isometric and oblique drawings
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(A) use current architectural technology to identify pictorial, isometric and oblique, schematic, and orthographic drawings and discuss how different views are used to depict information about objects	(iii) use current architectural technology to identify schematic drawings
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(A) use current architectural technology to identify pictorial, isometric and oblique, schematic, and orthographic drawings and discuss how different views are used to depict information about objects	(iv) use current architectural technology to identify orthographic drawings
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(A) use current architectural technology to identify pictorial, isometric and oblique, schematic, and orthographic drawings and discuss how different views are used to depict information about objects	(v) discuss how different views are used to depict information about objects
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(B) identify the basic symbols used in schematic drawings of pipe assemblies	(i) identify the basic symbols used in schematic drawings of pipe assemblies
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(C) explain the types of drawings that may be included in a set of plumbing drawings and the relationship among the different drawings	(i) explain the types of drawings that may be included in a set of plumbing drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(C) explain the types of drawings that may be included in a set of plumbing drawings and the relationship among the different drawings	(ii) explain the relationship among the different drawings [that may be included in a set of plumbing drawings]
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(D) interpret plumbing-related information from a set of drawings	(i) interpret plumbing-related information from a set of drawings
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(E) demonstrate how to sketch orthographic drawings	(i) demonstrate how to sketch orthographic drawings
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(F) demonstrate the use of an architect's scale to draw lines to scale and to measure lines drawn to scale	(i) demonstrate the use of an architect's scale to draw lines to scale
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(F) demonstrate the use of an architect's scale to draw lines to scale and to measure lines drawn to scale	(ii) demonstrate the use of an architect's scale to measure lines drawn to scale
(7) The student learns the various types of drawings used in the plumbing industry to lay out and install plumbing systems. The student is expected to:	(G) explain how code requirements apply to certain drawings	(i) explain how code requirements apply to certain drawings

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(A) identify types of materials and schedules of plastic piping</p>	<p>(i) identify types of materials of plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(A) identify types of materials and schedules of plastic piping</p>	<p>(ii) identify types of schedules of plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(B) identify proper and improper applications of plastic piping</p>	<p>(i) identify proper applications of plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(B) identify proper and improper applications of plastic piping</p>	<p>(ii) identify improper applications of plastic piping</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(C) identify types of fittings and valves used with plastic fittings</p>	<p>(i) identify types of fittings used with plastic fittings</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(C) identify types of fittings and valves used with plastic fittings</p>	<p>(ii) identify types of valves used with plastic fittings</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(D) identify and determine the kinds of hangers and supports needed for plastic piping</p>	<p>(i) identify the kinds of hangers needed for plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(D) identify and determine the kinds of hangers and supports needed for plastic piping</p>	<p>(ii) identify the kinds of supports needed for plastic piping</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(D) identify and determine the kinds of hangers and supports needed for plastic piping</p>	<p>(iii) determine the kinds of hangers needed for plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(D) identify and determine the kinds of hangers and supports needed for plastic piping</p>	<p>(iv) determine the kinds of supports needed for plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(E) identify the various techniques used in hanging and supporting plastic piping</p>	<p>(i) identify the various techniques used in hanging plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(E) identify the various techniques used in hanging and supporting plastic piping</p>	<p>(ii) identify the various techniques used in supporting plastic piping</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(F) demonstrate how to measure, cut, and join the different types of plastic piping</p>	<p>(i) demonstrate how to measure the different types of plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(F) demonstrate how to measure, cut, and join the different types of plastic piping</p>	<p>(ii) demonstrate how to cut the different types of plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(F) demonstrate how to measure, cut, and join the different types of plastic piping</p>	<p>(iii) demonstrate how to join the different types of plastic piping</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(G) explain proper procedures for the handling, storage, and protection of plastic pipes</p>	<p>(i) explain proper procedures for the handling of plastic pipes</p>

Knowledge and Skill Statement	Student Expectation	Breakout
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(G) explain proper procedures for the handling, storage, and protection of plastic pipes</p>	<p>(ii) explain proper procedures for the storage of plastic pipes</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(G) explain proper procedures for the handling, storage, and protection of plastic pipes</p>	<p>(iii) explain proper procedures for the protection of plastic pipes</p>
<p>(8) The student learns the types and schedules of plastic pipe and fittings used in plumbing applications, including acrylonitrile butadiene styrene or ABS, polyvinyl chloride or PVC, chlorinated polyvinyl chloride or CPVC, polyethylene or Poly pipe, crosslinked polyethylene or PEX, and polybutylene. The student is expected to:</p>	<p>(H) explain how code requirements apply to different types of plastic pipe</p>	<p>(i) explain how code requirements apply to different types of plastic pipe</p>
<p>(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:</p>	<p>(A) identify the different types of copper tubing</p>	<p>(i) identify the different types of copper tubing</p>

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(B) identify the material properties and storage and handling requirements of copper tubing	(i) identify the material properties of copper tubing
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(B) identify the material properties and storage and handling requirements of copper tubing	(ii) identify the storage requirements of copper tubing
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(B) identify the material properties and storage and handling requirements of copper tubing	(iii) identify the handling requirements of copper tubing
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(C) identify the types of fittings and valves used with copper tubing	(i) identify the types of fittings used with copper tubing
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(C) identify the types of fittings and valves used with copper tubing	(ii) identify the types of valves used with copper tubing

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(D) identify the various techniques used in hanging and supporting copper tubing	(i) identify the various techniques used in hanging copper tubing
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(D) identify the various techniques used in hanging and supporting copper tubing	(ii) identify the various techniques used in supporting copper tubing
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(E) demonstrate, using industry standards, how to safely solder copper tubing using different heat sources	(i) demonstrate, using industry standards, how to safely solder copper tubing using different heat sources
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(F) demonstrate how to measure, ream, and cut copper piping	(i) demonstrate how to measure copper piping
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(F) demonstrate how to measure, ream, and cut copper piping	(ii) demonstrate how to ream copper piping

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(F) demonstrate how to measure, ream, and cut copper piping	(iii) demonstrate how to cut copper piping
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(G) identify the hazards and safety precautions associated with copper piping	(i) identify the hazards associated with copper piping
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(G) identify the hazards and safety precautions associated with copper piping	(ii) identify the safety precautions associated with copper piping
(9) The student understands the applications of copper pipe and fittings, the types of valves that can be used on copper pipe systems, and the methods for cutting, reaming, joining, and installing copper tubing. The student is expected to:	(H) explain how code requirements apply to copper tubing	(i) explain how code requirements apply to copper tubing
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(A) recognize proper applications of carbon steel piping	(i) recognize proper applications of carbon steel piping

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(B) identify the material properties, storage, and handling requirements of carbon steel piping	(i) identify the material properties of carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(B) identify the material properties, storage, and handling requirements of carbon steel piping	(ii) identify the storage requirements of carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(B) identify the material properties, storage, and handling requirements of carbon steel piping	(iii) identify the handling requirements of carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(C) identify the various techniques used in hanging and supporting carbon steel piping	(i) identify the various techniques used in hanging carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(C) identify the various techniques used in hanging and supporting carbon steel piping	(ii) identify the various techniques used in supporting carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(D) demonstrate how to measure, cut, ream, thread, and join carbon steel piping	(i) demonstrate how to measure carbon steel piping

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(D) demonstrate how to measure, cut, ream, thread, and join carbon steel piping	(ii) demonstrate how to cut carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(D) demonstrate how to measure, cut, ream, thread, and join carbon steel piping	(iii) demonstrate how to ream carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(D) demonstrate how to measure, cut, ream, thread, and join carbon steel piping	(iv) demonstrate how to thread carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(D) demonstrate how to measure, cut, ream, thread, and join carbon steel piping	(v) demonstrate how to join carbon steel piping
(10) The student measures, cuts, threads, reams, joins, and hangs carbon steel pipe and becomes familiar with labeling and sizing carbon steel pipe. The student is expected to:	(E) explain how code requirements apply to carbon steel pipe	(i) explain how code requirements apply to carbon steel pipe
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(A) identify the common manufacturers of corrugated stainless steel tubing	(i) identify the common manufacturers of corrugated stainless steel tubing

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(B) recognize proper and improper applications of corrugated stainless steel tubing	(i) recognize proper applications of corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(B) recognize proper and improper applications of corrugated stainless steel tubing	(ii) recognize improper applications of corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(C) identify the various techniques used in hanging and supporting corrugated stainless steel tubing	(i) identify the various techniques used in hanging corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(C) identify the various techniques used in hanging and supporting corrugated stainless steel tubing	(ii) identify the various techniques used in supporting corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(D) demonstrate how to measure, cut, and join corrugated stainless steel tubing	(i) demonstrate how to measure corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(D) demonstrate how to measure, cut, and join corrugated stainless steel tubing	(ii) demonstrate how to cut corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(D) demonstrate how to measure, cut, and join corrugated stainless steel tubing	(iii) demonstrate how to join corrugated stainless steel tubing

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(E) identify the material properties, storage, and handling requirements of corrugated stainless steel tubing	(i) identify the material properties of corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(E) identify the material properties, storage, and handling requirements of corrugated stainless steel tubing	(ii) identify the storage requirements of corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(E) identify the material properties, storage, and handling requirements of corrugated stainless steel tubing	(iii) identify the handling requirements of corrugated stainless steel tubing
(11) The student gains knowledge and skills to connect and install corrugated stainless steel tubing in various installation conditions. The student is expected to:	(F) explain how code requirements apply to corrugated stainless steel tubing	(i) explain how code requirements apply to corrugated stainless steel tubing
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(A) explain how waste moves from a fixture through the drain system to the public or private sewer system	(i) explain how waste moves from a fixture through the drain system to the public or private sewer system
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(B) identify the major components of a drainage system and describe their functions	(i) identify the major components of a drainage system

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(B) identify the major components of a drainage system and describe their functions	(ii) describe [the] functions [of the major components of a drainage system]
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(C) identify the different types of traps and their components, explain the importance of traps, and identify the ways that traps can lose their seals	(i) identify the different types of traps
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(C) identify the different types of traps and their components, explain the importance of traps, and identify the ways that traps can lose their seals	(ii) identify [the] components [of different types of traps]
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(C) identify the different types of traps and their components, explain the importance of traps, and identify the ways that traps can lose their seals	(iii) explain the importance of traps
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(C) identify the different types of traps and their components, explain the importance of traps, and identify the ways that traps can lose their seals	(iv) identify the ways that traps can lose their seals

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(D) identify the various types of drain, waste, and vent fittings and describe their applications	(i) identify the various types of drain fittings
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(D) identify the various types of drain, waste, and vent fittings and describe their applications	(ii) identify the various types of waste fittings
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(D) identify the various types of drain, waste, and vent fittings and describe their applications	(iii) identify the various types of vent fittings
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(D) identify the various types of drain, waste, and vent fittings and describe their applications	(iv) describe [various types of drain, waste, and vent fittings'] applications
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(i) identify significant code issues related to drain systems

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(ii) identify significant code issues related to waste systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(iii) identify significant code issues related to vent systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(iv) identify significant health issues related to drain systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(v) identify significant health issues related to waste systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(vi) identify significant health issues related to vent systems

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(vii) identify significant code violations related to drain systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(viii) identify significant code violations related to waste systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(ix) identify significant code violations related to vent systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(x) identify significant health consequences related to drain systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(xi) identify significant health consequences related to waste systems

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(E) identify significant code and health issues, violations, and consequences related to drain, waste, and vent systems	(xii) identify significant health consequences related to vent systems
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(F) identify DWV symbols and lines on an isometric drawing and a floor plan	(i) identify DWV symbols on an isometric drawing
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(F) identify DWV symbols and lines on an isometric drawing and a floor plan	(ii) identify DWV symbols on a floor plan
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(F) identify DWV symbols and lines on an isometric drawing and a floor plan	(iii) identify DWV lines on an isometric drawing
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(F) identify DWV symbols and lines on an isometric drawing and a floor plan	(iv) identify DWV lines on a floor plan

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(G) demonstrate how to draw an isometric DWV system to make a materials list	(i) demonstrate how to draw an isometric DWV system to make a materials list
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(H) recognize and explain the use of different pipe and fitting materials used for DWV piping and how they are assembled	(i) recognize the use of different pipe materials used for DWV piping
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(H) recognize and explain the use of different pipe and fitting materials used for DWV piping and how they are assembled	(ii) recognize the use of different fitting materials used for DWV piping
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(H) recognize and explain the use of different pipe and fitting materials used for DWV piping and how they are assembled	(iii) explain the use of different pipe materials used for DWV piping
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(H) recognize and explain the use of different pipe and fitting materials used for DWV piping and how they are assembled	(iv) explain the use of different fitting materials used for DWV piping

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(H) recognize and explain the use of different pipe and fitting materials used for DWV piping and how they are assembled	(v) explain how [different pipe materials used for DWV piping] are assembled
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(H) recognize and explain the use of different pipe and fitting materials used for DWV piping and how they are assembled	(vi) explain how [different fitting materials used for DWV piping] are assembled
(12) The student understands the way drain, waste, and vent systems remove waste safely. The student understands how pipes, drains, traps, and vents work and the different types of materials used for drain waste and vent (DWV) piping. The student is expected to:	(I) understand how code requirements apply to DWV systems	(i) understand how code requirements apply to DWV systems
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(A) describe and explain the earth's water cycle	(i) describe the earth's water cycle
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(A) describe and explain the earth's water cycle	(ii) explain the earth's water cycle

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(B) describes different water sources	(i) describes different water sources
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(C) describe and show how water gets from the water well or water meter to the house or building	(i) describe how water gets from the water well or water meter to the house or building
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(C) describe and show how water gets from the water well or water meter to the house or building	(ii) show how water gets from the water well or water meter to the house or building
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(D) discuss and explain different types of valves and devices found in a residential or commercial water system	(i) discuss different types of valves found in a residential or commercial water system
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(D) discuss and explain different types of valves and devices found in a residential or commercial water system	(ii) discuss different types of devices found in a residential or commercial water system
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(D) discuss and explain different types of valves and devices found in a residential or commercial water system	(iii) explain different types of valves found in a residential or commercial water system

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student identifies major components of a municipal water system and how water is distributed to residential or commercial houses or buildings. The student is expected to:	(D) discuss and explain different types of valves and devices found in a residential or commercial water system	(iv) explain different types of devices found in a residential or commercial water system
(14) The student identifies and draws hot and cold water lines on a floor plan using an isometric drawing. The student is expected to:	(A) identify hot and cold water lines and their symbols on a floor plan	(i) identify hot water lines on a floor plan
(14) The student identifies and draws hot and cold water lines on a floor plan using an isometric drawing. The student is expected to:	(A) identify hot and cold water lines and their symbols on a floor plan	(ii) identify cold water lines on a floor plan
(14) The student identifies and draws hot and cold water lines on a floor plan using an isometric drawing. The student is expected to:	(A) identify hot and cold water lines and their symbols on a floor plan	(iii) identify [hot water lines'] symbols on a floor plan
(14) The student identifies and draws hot and cold water lines on a floor plan using an isometric drawing. The student is expected to:	(A) identify hot and cold water lines and their symbols on a floor plan	(iv) identify [cold water lines'] symbols on a floor plan
(14) The student identifies and draws hot and cold water lines on a floor plan using an isometric drawing. The student is expected to:	(B) demonstrate how to draw hot and cold water lines on a floor plan using an isometric drawing	(i) demonstrate how to draw hot water lines on a floor plan using an isometric drawing
(14) The student identifies and draws hot and cold water lines on a floor plan using an isometric drawing. The student is expected to:	(B) demonstrate how to draw hot and cold water lines on a floor plan using an isometric drawing	(ii) demonstrate how to draw cold water lines on a floor plan using an isometric drawing

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student identifies and draws hot and cold water lines on a floor plan using an isometric drawing. The student is expected to:	(C) demonstrate how to properly size a residential hot and cold water system	(i) demonstrate how to properly size a residential hot water system
(14) The student identifies and draws hot and cold water lines on a floor plan using an isometric drawing. The student is expected to:	(C) demonstrate how to properly size a residential hot and cold water system	(ii) demonstrate how to properly size a residential cold water system
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(A) explain why and where open-close valves are used	(i) explain why open-close valves are used
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(A) explain why and where open-close valves are used	(ii) explain where open-close valves are used
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(B) explain why and where flow regulation valves are used	(i) explain why flow regulation valves are used
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(B) explain why and where flow regulation valves are used	(ii) explain where flow regulation valves are used
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(C) explain why and where pressure reducing valves are used	(i) explain why pressure reducing valves are used

Knowledge and Skill Statement	Student Expectation	Breakout
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(C) explain why and where pressure reducing valves are used	(ii) explain where pressure reducing valves are used
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(D) explain why and where pressure and vacuum relief valves are used	(i) explain why pressure relief valves are used
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(D) explain why and where pressure and vacuum relief valves are used	(ii) explain why vacuum relief valves are used
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(D) explain why and where pressure and vacuum relief valves are used	(iii) explain where pressure relief valves are used
(15) The student describes and demonstrates the different types of valves and their uses. The student is expected to:	(D) explain why and where pressure and vacuum relief valves are used	(iv) explain where vacuum relief valves are used

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.62. Plumbing Technology II (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grades 11 and 12. Prerequisite: Plumbing Technology I. Students shall be awarded two credits for successful completion of this course.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Plumbing Technology II, students will gain the advanced knowledge and skills needed to enter the industry as a plumber, building maintenance technician, or supervisor or prepare for a postsecondary degree in mechanical engineering. Students will acquire knowledge and skills in plumbing codes, industry workplace basics, and employer/customer expectations, including tool and jobsite safety, advanced plumbing mathematics, commercial drawings, basic electricity, hanger installation, supports and structural penetrations, roof drains, fixture installation, valves and faucets, and oxy-fuel safety. Students will also learn about setup, cutting, brazing and welding water system sizing; gas, drain, waste and vent installation and testing; and water heater installation.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(i) use industry standards to demonstrate oral communication
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(ii) use industry standards to demonstrate written communication
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(iii) use industry standards to demonstrate leadership
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(iv) use industry standards to demonstrate teamwork
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(v) use industry standards to demonstrate conflict management

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(vi) use industry standards to demonstrate customer service
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(vii) use industry standards to demonstrate professionalism
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(viii) use industry standards to demonstrate work ethic
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(ix) use industry standards to demonstrate integrity
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(x) use industry standards to demonstrate multitasking

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(xi) use industry standards to demonstrate initiative
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(xii) use industry standards to demonstrate creativity
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) use industry standards to demonstrate oral communication, written communication, leadership, teamwork, conflict management, customer service, professionalism, work ethic, integrity, multitasking, initiative, creativity, and how to follow directions	(xiii) use industry standards to demonstrate how to follow directions
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest	(i) demonstrate an understanding of the importance of showing up to work on time
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest	(ii) demonstrate an understanding of the importance of maintaining appropriate personal appearance

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest	(iii) demonstrate an understanding of the importance of working as a team member
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of the importance of showing up to work on time, maintaining appropriate personal appearance, working as a team member, and being honest	(iv) demonstrate an understanding of the importance of being honest
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate an understanding of the responsibilities of driving a company vehicle	(i) demonstrate an understanding of the responsibilities of driving a company vehicle
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate an understanding of why and how listening is a critical skill	(i) demonstrate an understanding of why listening is a critical skill
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate an understanding of why and how listening is a critical skill	(ii) demonstrate an understanding of how listening is a critical skill
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate an understanding of the importance of being a self-starter and of increasing one's knowledge and skills in a chosen career field	(i) demonstrate an understanding of the importance of being a self-starter
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate an understanding of the importance of being a self-starter and of increasing one's knowledge and skills in a chosen career field	(ii) demonstrate an understanding of the importance of increasing one's knowledge in a chosen career field

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate an understanding of the importance of being a self-starter and of increasing one's knowledge and skills in a chosen career field	(iii) demonstrate an understanding of the importance of increasing one's skills in a chosen career field
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(A) demonstrate how to measure with a 6-foot folding rule and 25-foot measuring tape	(i) demonstrate how to measure with a 6-foot folding rule
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(A) demonstrate how to measure with a 6-foot folding rule and 25-foot measuring tape	(ii) demonstrate how to measure with a 25-foot measuring tape
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(B) read and use rulers and measuring devices	(i) read rulers
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(B) read and use rulers and measuring devices	(ii) read measuring devices

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(B) read and use rulers and measuring devices	(iii) use rulers
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(B) read and use rulers and measuring devices	(iv) use measuring devices
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(C) demonstrate how to measure end-to-end, center-to-center, and end-to-center pipe measurements	(i) demonstrate how to measure end-to-end pipe measurements
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(C) demonstrate how to measure end-to-end, center-to-center, and end-to-center pipe measurements	(ii) demonstrate how to measure center-to-center pipe measurements
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(C) demonstrate how to measure end-to-end, center-to-center, and end-to-center pipe measurements	(iii) demonstrate how to measure end-to-center pipe measurements

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(D) identify and safely demonstrate the use of selected hand and power tools	(i) identify selected hand tools
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(D) identify and safely demonstrate the use of selected hand and power tools	(ii) identify selected power tools
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(D) identify and safely demonstrate the use of selected hand and power tools	(iii) safely demonstrate the use of selected hand tools
(2) The student identifies and demonstrates the use of hand and power tools such as pipe wrenches; rulers; measuring devices; drill bits; pipe stands; pipe vises; levels; pipe fabrication tools; and pipe cutting, threading, and reaming tools. The student is expected to:	(D) identify and safely demonstrate the use of selected hand and power tools	(iv) safely demonstrate the use of selected power tools
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(A) explain the differences among and applications for masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(i) explain the differences among masonry, twist steel, hole saw, paddle, and self-feeding wood bits
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(A) explain the differences among and applications for masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(ii) explain applications for masonry wood bits

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(A) explain the differences among and applications for masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(iii) explain applications for twist steel wood bits
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(A) explain the differences among and applications for masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(iv) explain applications for hole saw wood bits
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(A) explain the differences among and applications for masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(v) explain applications for paddle wood bits
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(A) explain the differences among and applications for masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(vi) explain applications for self-feeding wood bits
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(B) demonstrate the use and application of masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(i) demonstrate the use and application of masonry wood bits
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(B) demonstrate the use and application of masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(ii) demonstrate the use and application of twist steel wood bits
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(B) demonstrate the use and application of masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(iii) demonstrate the use and application of hole saw wood bits

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(B) demonstrate the use and application of masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(iv) demonstrate the use and application of paddle wood bits
(3) The student understands different types of drill bits used in the plumbing profession. The student is expected to:	(B) demonstrate the use and application of masonry, twist steel, hole saw, paddle, and self-feeding wood bits	(v) demonstrate the use and application of self-feeding wood bits
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(A) demonstrate how to determine the volume of a cylinder	(i) demonstrate how to determine the volume of a cylinder
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(B) demonstrate how to determine volume and length measurements using cubic feet and yards	(i) demonstrate how to determine volume measurements using cubic feet
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(B) demonstrate how to determine volume and length measurements using cubic feet and yards	(ii) demonstrate how to determine volume measurements using cubic yards
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(B) demonstrate how to determine volume and length measurements using cubic feet and yards	(iii) demonstrate how to determine length measurements using feet
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(B) demonstrate how to determine volume and length measurements using cubic feet and yards	(iv) demonstrate how to determine length measurements using yards
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(C) demonstrate how to determine fall and grades of a pipe	(i) demonstrate how to determine fall of a pipe
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(C) demonstrate how to determine fall and grades of a pipe	(ii) demonstrate how to determine grades of a pipe

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(D) demonstrate how to calculate simple and rolling offsets on parallel runs using constants	(i) demonstrate how to calculate simple offsets on parallel runs using constants
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(D) demonstrate how to calculate simple and rolling offsets on parallel runs using constants	(ii) demonstrate how to calculate rolling offsets on parallel runs using constants
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(E) demonstrate how to calculate pressure, velocity, friction, and flow	(i) demonstrate how to calculate pressure
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(E) demonstrate how to calculate pressure, velocity, friction, and flow	(ii) demonstrate how to calculate velocity
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(E) demonstrate how to calculate pressure, velocity, friction, and flow	(iii) demonstrate how to calculate friction
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(E) demonstrate how to calculate pressure, velocity, friction, and flow	(iv) demonstrate how to calculate flow
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(F) size a water system based on velocity limitations and pressure drop	(i) size a water system based on velocity limitations
(4) The student applies algebra and geometry to solve plumbing-related problems. The student is expected to:	(F) size a water system based on velocity limitations and pressure drop	(ii) size a water system based on pressure drop
(5) The student reviews employer and customer expectations. The student is expected to:	(A) identify job opportunities such as a plumber, building maintenance technician or supervisor, manager, and mechanical engineer and their accompanying job duties	(i) identify job opportunities

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student reviews employer and customer expectations. The student is expected to:	(A) identify job opportunities such as a plumber, building maintenance technician or supervisor, manager, and mechanical engineer and their accompanying job duties	(ii) identify [job opportunities'] accompanying job duties
(5) The student reviews employer and customer expectations. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve career goals	(i) research careers along with the education required to achieve career goals
(5) The student reviews employer and customer expectations. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve career goals	(ii) research careers along with job skills required to achieve career goals
(5) The student reviews employer and customer expectations. The student is expected to:	(B) research careers along with the education, job skills, and experience required to achieve career goals	(iii) research careers along with experience required to achieve career goals
(5) The student reviews employer and customer expectations. The student is expected to:	(C) identify the industries and associations that make up the modern plumbing profession	(i) identify the industries that make up the modern plumbing profession
(5) The student reviews employer and customer expectations. The student is expected to:	(C) identify the industries and associations that make up the modern plumbing profession	(ii) identify the associations that make up the modern plumbing profession
(5) The student reviews employer and customer expectations. The student is expected to:	(D) demonstrate an understanding of how to properly treat company and customer property	(i) demonstrate an understanding of how to properly treat company property
(5) The student reviews employer and customer expectations. The student is expected to:	(D) demonstrate an understanding of how to properly treat company and customer property	(ii) demonstrate an understanding of how to properly treat customer property

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student reviews employer and customer expectations. The student is expected to:	(E) demonstrate an understanding of the importance of keeping the work area clean and how that applies to job safety	(i) demonstrate an understanding of the importance of keeping the work area clean
(5) The student reviews employer and customer expectations. The student is expected to:	(E) demonstrate an understanding of the importance of keeping the work area clean and how that applies to job safety	(ii) demonstrate how [keeping the work area clean] applies to job safety
(5) The student reviews employer and customer expectations. The student is expected to:	(F) demonstrate an understanding of the importance of using proper methods and techniques for the job being performed	(i) demonstrate an understanding of the importance of using proper methods for the job being performed
(5) The student reviews employer and customer expectations. The student is expected to:	(F) demonstrate an understanding of the importance of using proper methods and techniques for the job being performed	(ii) demonstrate an understanding of the importance of using proper techniques for the job being performed
(6) The student understands and applies electrical testing equipment. The student is expected to:	(A) apply the use of a volt/ohm meter to different kinds of plumbing equipment	(i) apply the use of a volt/ohm meter to different kinds of plumbing equipment
(6) The student understands and applies electrical testing equipment. The student is expected to:	(B) install hangers and supports and make penetrations according to plumbing code	(i) install hangers according to plumbing code
(6) The student understands and applies electrical testing equipment. The student is expected to:	(B) install hangers and supports and make penetrations according to plumbing code	(ii) install supports according to plumbing code
(6) The student understands and applies electrical testing equipment. The student is expected to:	(B) install hangers and supports and make penetrations according to plumbing code	(iii) make penetrations according to plumbing code

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student understands and applies electrical testing equipment. The student is expected to:	(C) demonstrate an understanding of how to choose the right hanger for the application	(i) demonstrate an understanding of how to choose the right hanger for the application
(6) The student understands and applies electrical testing equipment. The student is expected to:	(D) choose and build pipe supports	(i) choose pipe supports
(6) The student understands and applies electrical testing equipment. The student is expected to:	(D) choose and build pipe supports	(ii) build pipe supports
(6) The student understands and applies electrical testing equipment. The student is expected to:	(E) demonstrate an understanding of code standards on structural penetrations	(i) demonstrate an understanding of code standards on structural penetrations
(6) The student understands and applies electrical testing equipment. The student is expected to:	(F) size and install roof drains according to plumbing code	(i) size roof drains according to plumbing code
(6) The student understands and applies electrical testing equipment. The student is expected to:	(F) size and install roof drains according to plumbing code	(ii) install roof drains according to plumbing code
(7) The student understands and applies how to install plumbing fixtures according to plumbing code. The student is expected to:	(A) demonstrate how to install a toilet	(i) demonstrate how to install a toilet
(7) The student understands and applies how to install plumbing fixtures according to plumbing code. The student is expected to:	(B) demonstrate how to install sinks and different faucets	(i) demonstrate how to install sinks

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student understands and applies how to install plumbing fixtures according to plumbing code. The student is expected to:	(B) demonstrate how to install sinks and different faucets	(ii) demonstrate how to install different faucets
(8) The student learns plot plans, structural design, shop drawings, elevation drawings, as-built drawings, equipment arrangement drawings, pipe and instrumentation drawings, isometric drawings, and detail drawings. The student is expected to:	(A) identify types of drawings	(i) identify types of drawings
(8) The student learns plot plans, structural design, shop drawings, elevation drawings, as-built drawings, equipment arrangement drawings, pipe and instrumentation drawings, isometric drawings, and detail drawings. The student is expected to:	(B) identify and use drawing symbols associated with piping plans and details	(i) identify drawing symbols associated with piping plans
(8) The student learns plot plans, structural design, shop drawings, elevation drawings, as-built drawings, equipment arrangement drawings, pipe and instrumentation drawings, isometric drawings, and detail drawings. The student is expected to:	(B) identify and use drawing symbols associated with piping plans and details	(ii) identify drawing symbols associated with piping details
(8) The student learns plot plans, structural design, shop drawings, elevation drawings, as-built drawings, equipment arrangement drawings, pipe and instrumentation drawings, isometric drawings, and detail drawings. The student is expected to:	(B) identify and use drawing symbols associated with piping plans and details	(iii) use drawing symbols associated with piping plans

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student learns plot plans, structural design, shop drawings, elevation drawings, as-built drawings, equipment arrangement drawings, pipe and instrumentation drawings, isometric drawings, and detail drawings. The student is expected to:	(B) identify and use drawing symbols associated with piping plans and details	(iv) use drawing symbols associated with piping details
(8) The student learns plot plans, structural design, shop drawings, elevation drawings, as-built drawings, equipment arrangement drawings, pipe and instrumentation drawings, isometric drawings, and detail drawings. The student is expected to:	(C) create field sketches	(i) create field sketches
(8) The student learns plot plans, structural design, shop drawings, elevation drawings, as-built drawings, equipment arrangement drawings, pipe and instrumentation drawings, isometric drawings, and detail drawings. The student is expected to:	(D) interpret drawing indexes and line lists	(i) interpret drawing indexes
(8) The student learns plot plans, structural design, shop drawings, elevation drawings, as-built drawings, equipment arrangement drawings, pipe and instrumentation drawings, isometric drawings, and detail drawings. The student is expected to:	(D) interpret drawing indexes and line lists	(ii) interpret line lists
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(A) identify types of valves that start and stop flow	(i) identify types of valves that start and stop flow
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(B) identify types of valves that regulate flow	(i) identify types of valves that regulate flow

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(C) identify valves that relieve pressure	(i) identify valves that relieve pressure
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(D) identify valves that regulate the direction of flow	(i) identify valves that regulate the direction of flow
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(E) identify types of valve actuators	(i) identify types of valve actuators
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(F) explain how to properly store and handle valves	(i) explain how to properly store valves
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(F) explain how to properly store and handle valves	(ii) explain how to properly handle valves
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(G) explain valve locations and positions	(i) explain valve locations
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(G) explain valve locations and positions	(ii) explain valve positions
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(H) explain the factors that influence valve selection	(i) explain the factors that influence valve selection
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(I) interpret valve markings and nameplate information	(i) interpret valve markings

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student installs, stores, and handles various types of valves. The student is expected to:	(I) interpret valve markings and nameplate information	(ii) interpret nameplate information
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(A) demonstrate an understanding of different parts of oxy-fuel equipment	(i) demonstrate an understanding of different parts of oxy-fuel equipment
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(i) identify the proper procedure for attaching oxy fuel pressure regulators to oxy fuel bottles
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(ii) identify the proper procedure for attaching gauges to oxy fuel bottles
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(iii) identify the proper procedure for attaching hoses to oxy fuel bottles
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(iv) identify the proper procedure for attaching torches to oxy fuel bottles
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(v) identify the proper procedure for adjusting oxy fuel pressure regulators

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(vi) identify the proper procedure for adjusting gauges
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(vii) identify the proper procedure for adjusting hoses
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(viii) identify the proper procedure for adjusting torches
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(ix) implement the proper procedure for attaching oxy fuel pressure regulators to oxy fuel bottles
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(x) implement the proper procedure for attaching gauges to oxy fuel bottles
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(xi) implement the proper procedure for attaching hoses to oxy fuel bottles
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(xii) implement the proper procedure for attaching torches to oxy fuel bottles

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(xiii) implement the proper procedure for adjusting oxy fuel pressure regulators
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(xiv) implement the proper procedure for adjusting gauges
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(xv) implement the proper procedure for adjusting hoses
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(B) identify and implement the proper procedure for attaching and adjusting oxy fuel pressure regulators, gauges, hoses, and torches to oxy fuel bottles	(xvi) implement the proper procedure for adjusting torches
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(C) identify and apply fillers and fluxes for soldering and brazing	(i) identify fillers for soldering
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(C) identify and apply fillers and fluxes for soldering and brazing	(ii) identify fillers for brazing
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(C) identify and apply fillers and fluxes for soldering and brazing	(iii) identify fluxes for soldering

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(C) identify and apply fillers and fluxes for soldering and brazing	(iv) identify fluxes for brazing
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(C) identify and apply fillers and fluxes for soldering and brazing	(v) apply fillers for soldering
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(C) identify and apply fillers and fluxes for soldering and brazing	(vi) apply fillers for brazing
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(C) identify and apply fillers and fluxes for soldering and brazing	(vii) apply fluxes for soldering
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(C) identify and apply fillers and fluxes for soldering and brazing	(viii) apply fluxes for brazing
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(D) demonstrate an understanding of safety and safety equipment used with oxy-fuel equipment	(i) demonstrate an understanding of safety with oxy-fuel equipment
(10) The student understands and applies how to braze weld and cut with oxy-fuel torch. The student is expected to:	(D) demonstrate an understanding of safety and safety equipment used with oxy-fuel equipment	(ii) demonstrate an understanding of safety equipment used with oxy-fuel equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student understands and applies how to size, install, and test a residential water piping system according to plumbing code. The student is expected to:	(A) identify what factors are critical for sizing a water system such as water pressure, velocity, friction, and flow	(i) identify what factors are critical for sizing a water system
(11) The student understands and applies how to size, install, and test a residential water piping system according to plumbing code. The student is expected to:	(B) identify what fixture units are and how they apply to sizing a water system	(i) identify what fixture units are
(11) The student understands and applies how to size, install, and test a residential water piping system according to plumbing code. The student is expected to:	(B) identify what fixture units are and how they apply to sizing a water system	(ii) identify how [fixture units] apply to sizing a water system
(11) The student understands and applies how to size, install, and test a residential water piping system according to plumbing code. The student is expected to:	(C) install a water piping system	(i) install a water piping system
(11) The student understands and applies how to size, install, and test a residential water piping system according to plumbing code. The student is expected to:	(D) test a water piping system	(i) test a water piping system
(12) The student understands what cross connections are and their degree of hazard and how to protect against them. The student is expected to:	(A) identify different types of backflow such as gravity, back-pressure, and back siphonage	(i) identify different types of backflow
(12) The student understands what cross connections are and their degree of hazard and how to protect against them. The student is expected to:	(B) demonstrate an understanding of degree of hazard such as toxic, nontoxic, polluted, and contaminated	(i) demonstrate an understanding of degree of hazard

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student understands what cross connections are and their degree of hazard and how to protect against them. The student is expected to:	(C) demonstrate an understanding of cross connection protection such as air gap, reduced pressure zone backflow preventer, double check valve assembly, pressure type vacuum breaker, and atmospheric type vacuum breaker	(i) demonstrate an understanding of cross connection protection
(13) The student understands and applies how to size, install, and test a natural gas system according to plumbing code. The student is expected to:	(A) identify the factors involved in sizing a natural gas system	(i) identify the factors involved in sizing a natural gas system
(13) The student understands and applies how to size, install, and test a natural gas system according to plumbing code. The student is expected to:	(B) size, install, and test a natural gas system using carbon steel pipe and corrugated stainless steel tubing	(i) size a natural gas system using carbon steel pipe
(13) The student understands and applies how to size, install, and test a natural gas system according to plumbing code. The student is expected to:	(B) size, install, and test a natural gas system using carbon steel pipe and corrugated stainless steel tubing	(ii) install a natural gas system using carbon steel pipe
(13) The student understands and applies how to size, install, and test a natural gas system according to plumbing code. The student is expected to:	(B) size, install, and test a natural gas system using carbon steel pipe and corrugated stainless steel tubing	(iii) test a natural gas system using carbon steel pipe
(13) The student understands and applies how to size, install, and test a natural gas system according to plumbing code. The student is expected to:	(B) size, install, and test a natural gas system using carbon steel pipe and corrugated stainless steel tubing	(iv) size a natural gas system using corrugated stainless steel tubing
(13) The student understands and applies how to size, install, and test a natural gas system according to plumbing code. The student is expected to:	(B) size, install, and test a natural gas system using carbon steel pipe and corrugated stainless steel tubing	(v) install a natural gas system using corrugated stainless steel tubing

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student understands and applies how to size, install, and test a natural gas system according to plumbing code. The student is expected to:	(B) size, install, and test a natural gas system using carbon steel pipe and corrugated stainless steel tubing	(vi) test a natural gas system using corrugated stainless steel tubing
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(A) identify different types of DWV fittings and their use	(i) identify different types of DWV fittings
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(A) identify different types of DWV fittings and their use	(ii) identify [DWV fittings] use
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(B) size a DWV system	(i) size a DWV system
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(C) identify and apply different materials used for a DWV system	(i) identify different materials used for a DWV system
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(C) identify and apply different materials used for a DWV system	(ii) apply different materials used for a DWV system
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(D) determine slope of a pipe using formulas	(i) determine slope of a pipe using formulas

Knowledge and Skill Statement	Student Expectation	Breakout
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(E) demonstrate an understanding of how to test a DWV system	(i) demonstrate an understanding of how to test a DWV system
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(F) demonstrate an understanding of the different parts and their purpose of a DWV system such as stacks, vents, traps, building drain, and building sewer	(i) demonstrate an understanding of the different parts of a DWV system
(14) The student understands how to size, install, and test a drain waste and vent (DWV) system according to plumbing code. The student is expected to:	(F) demonstrate an understanding of the different parts and their purpose of a DWV system such as stacks, vents, traps, building drain, and building sewer	(ii) demonstrate an understanding of [the] purpose of [the different parts] of a DWV system
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(A) demonstrate an understanding of storage tank (electric and gas), point of use, on demand (electric and gas), and solar water heaters	(i) demonstrate an understanding of [electric] storage tank water heaters
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(A) demonstrate an understanding of storage tank (electric and gas), point of use, on demand (electric and gas), and solar water heaters	(ii) demonstrate an understanding of [gas] storage tank water heaters
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(A) demonstrate an understanding of storage tank (electric and gas), point of use, on demand (electric and gas), and solar water heaters	(iii) demonstrate an understanding of point of use water heaters

Knowledge and Skill Statement	Student Expectation	Breakout
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(A) demonstrate an understanding of storage tank (electric and gas), point of use, on demand (electric and gas), and solar water heaters	(iv) demonstrate an understanding of [electric] on demand water heaters
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(A) demonstrate an understanding of storage tank (electric and gas), point of use, on demand (electric and gas), and solar water heaters	(v) demonstrate an understanding of [gas] on demand water heaters
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(A) demonstrate an understanding of storage tank (electric and gas), point of use, on demand (electric and gas), and solar water heaters	(vi) demonstrate an understanding of solar water heaters
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(B) demonstrate an understanding of parts of the different heaters	(i) demonstrate an understanding of parts of the different heaters
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(C) demonstrate an understanding of the installation of a gas and electric water heater	(i) demonstrate an understanding of the installation of a gas water heater
(15) The student understands different types of water heaters, water heaters parts, and their proper installation according to plumbing code. The student is expected to:	(C) demonstrate an understanding of the installation of a gas and electric water heater	(ii) demonstrate an understanding of the installation of an electric water heater

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.63. Practicum in Construction Management (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. Prerequisite: Construction Management II. Students shall be awarded two credits for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Practicum in Construction Management is an occupationally specific course designed to provide classroom technical instruction or on-the-job training experiences. Safety and career opportunities are included in addition to work ethics and job-related study in the classroom.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(i) demonstrate effective verbal communication skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(ii) demonstrate effective nonverbal communication skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(iii) demonstrate effective written communication skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(iv) demonstrate effective electronic communication skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(i) demonstrate effective methods to secure employment
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(ii) demonstrate effective methods to maintain employment
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(iii) demonstrate effective methods to terminate employment

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(i) demonstrate positive interpersonal skills, including conflict resolution
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(ii) demonstrate positive interpersonal skills, including negotiation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(iii) demonstrate positive interpersonal skills, including teamwork
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(iv) demonstrate positive interpersonal skills, including leadership
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(i) evaluate the relationship of good physical health to job success
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(ii) evaluate the relationship of good physical health to job achievement
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(iii) evaluate the relationship of good mental health to job success

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(iv) evaluate the relationship of good mental health to job achievement
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate appropriate grooming and appearance for the workplace	(i) demonstrate appropriate grooming for the workplace
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate appropriate grooming and appearance for the workplace	(ii) demonstrate appropriate appearance for the workplace
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) demonstrate appropriate business and personal etiquette in the workplace	(i) demonstrate appropriate business etiquette in the workplace
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) demonstrate appropriate business and personal etiquette in the workplace	(ii) demonstrate appropriate personal etiquette in the workplace
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) exhibit productive work habits and attitudes	(i) exhibit productive work habits
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) exhibit productive work habits and attitudes	(ii) exhibit productive work attitudes

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student develops a management plan for a project or an activity. The student is expected to:	(A) identify and describe the steps required to complete a project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project	(i) identify the steps required to complete a project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project
(2) The student develops a management plan for a project or an activity. The student is expected to:	(A) identify and describe the steps required to complete a project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project	(ii) describe the steps required to complete a project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project
(2) The student develops a management plan for a project or an activity. The student is expected to:	(B) determine and acquire the resources needed to complete a project	(i) determine the resources needed to complete a project
(2) The student develops a management plan for a project or an activity. The student is expected to:	(B) determine and acquire the resources needed to complete a project	(ii) acquire the resources needed to complete a project
(2) The student develops a management plan for a project or an activity. The student is expected to:	(C) develop a project schedule	(i) develop a project schedule
(3) The student applies the appropriate codes, laws, standards, or regulations related to a research and development project. The student is expected to:	(A) identify areas where codes, laws, standards, or regulations may be required	(i) identify areas where codes, laws, standards, or regulations may be required
(3) The student applies the appropriate codes, laws, standards, or regulations related to a research and development project. The student is expected to:	(B) locate the appropriate codes, laws, standards, or regulations	(i) locate the appropriate codes, laws, standards, or regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies the appropriate codes, laws, standards, or regulations related to a research and development project. The student is expected to:	(C) interpret the appropriate codes, laws, standards, or regulations	(i) interpret the appropriate codes, laws, standards, or regulations
(4) The student describes the intended and unintended effects of construction management solutions. The student is expected to:	(A) use an assessment strategy to determine the risks and benefits of a research project	(i) use an assessment strategy to determine the risks of a research project
(4) The student describes the intended and unintended effects of construction management solutions. The student is expected to:	(A) use an assessment strategy to determine the risks and benefits of a research project	(ii) use an assessment strategy to determine the benefits of a research project
(4) The student describes the intended and unintended effects of construction management solutions. The student is expected to:	(B) describe how construction management has affected individuals, societies, cultures, economies, and environments	(i) describe how construction management has affected individuals
(4) The student describes the intended and unintended effects of construction management solutions. The student is expected to:	(B) describe how construction management has affected individuals, societies, cultures, economies, and environments	(ii) describe how construction management has affected societies
(4) The student describes the intended and unintended effects of construction management solutions. The student is expected to:	(B) describe how construction management has affected individuals, societies, cultures, economies, and environments	(iii) describe how construction management has affected cultures
(4) The student describes the intended and unintended effects of construction management solutions. The student is expected to:	(B) describe how construction management has affected individuals, societies, cultures, economies, and environments	(iv) describe how construction management has affected economies

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student describes the intended and unintended effects of construction management solutions. The student is expected to:	(B) describe how construction management has affected individuals, societies, cultures, economies, and environments	(v) describe how construction management has affected environments
(5) The student solves problems, thinks critically, and makes decisions related to research, design, and development. The student is expected to:	(A) develop or improve a product by following a problem-solving strategy	(i) develop or improve a product by following a problem-solving strategy
(5) The student solves problems, thinks critically, and makes decisions related to research, design, and development. The student is expected to:	(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(i) apply critical-thinking strategies to the analysis of proposed technological solutions
(5) The student solves problems, thinks critically, and makes decisions related to research, design, and development. The student is expected to:	(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(ii) apply critical-thinking strategies to the evaluation of proposed technological solutions
(5) The student solves problems, thinks critically, and makes decisions related to research, design, and development. The student is expected to:	(C) apply decision-making techniques to the selection of technological solutions	(i) apply decision-making techniques to the selection of technological solutions
(6) The student describes the costs associated with research and development activities. The student is expected to:	(A) develop a budget for a research and development project	(i) develop a budget for a research and development project
(6) The student describes the costs associated with research and development activities. The student is expected to:	(B) determine the most effective way to minimize project costs	(i) determine the most effective way to minimize project costs

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student applies knowledge and skills in communication, mathematics, and science to construction management activities. The student is expected to:	(A) write technical reports	(i) write technical reports
(7) The student applies knowledge and skills in communication, mathematics, and science to construction management activities. The student is expected to:	(B) deliver technical presentations to groups of individuals	(i) deliver technical presentations to groups of individuals
(7) The student applies knowledge and skills in communication, mathematics, and science to construction management activities. The student is expected to:	(C) apply the mathematical concepts used in projects	(i) apply the mathematical concepts used in projects
(7) The student applies knowledge and skills in communication, mathematics, and science to construction management activities. The student is expected to:	(D) apply the science concepts used in projects	(i) apply the science concepts used in projects
(8) The student predicts the marketability of a project, product, or service. The student is expected to:	(A) determine the customer's expectations concerning a project, product, or service	(i) determine the customer's expectations concerning a project, product, or service
(8) The student predicts the marketability of a project, product, or service. The student is expected to:	(B) evaluate a project, product, or service to determine if it will meet the customer's expectations	(i) evaluate a project, product, or service to determine if it will meet the customer's expectations
(8) The student predicts the marketability of a project, product, or service. The student is expected to:	(C) assess customer responses	(i) assess customer responses

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student uses advanced tools, materials, processes, and procedures in construction management. The student is expected to:	(A) determine and use the appropriate technology needed to solve a problem or complete a task	(i) determine the appropriate technology needed to solve a problem or complete a task
(9) The student uses advanced tools, materials, processes, and procedures in construction management. The student is expected to:	(A) determine and use the appropriate technology needed to solve a problem or complete a task	(ii) use the appropriate technology needed to solve a problem or complete a task
(9) The student uses advanced tools, materials, processes, and procedures in construction management. The student is expected to:	(B) evaluate the use of technology in a given situation	(i) evaluate the use of technology in a given situation
(9) The student uses advanced tools, materials, processes, and procedures in construction management. The student is expected to:	(C) describe the factors that influence the use of technology in a variety of situations	(i) describe the factors that influence the use of technology in a variety of situations
(10) The student designs a project using appropriate design processes and techniques. The student is expected to:	(A) design an object or a service using an accepted design process	(i) design an object or a service using an accepted design process
(10) The student designs a project using appropriate design processes and techniques. The student is expected to:	(B) develop drawings, illustrations, or models	(i) develop drawings, illustrations, or models
(10) The student designs a project using appropriate design processes and techniques. The student is expected to:	(C) establish design criteria and constraints	(i) establish design criteria

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student designs a project using appropriate design processes and techniques. The student is expected to:	(C) establish design criteria and constraints	(ii) establish design constraints
(11) The student predicts the impacts of emerging applications of construction technology. The student is expected to:	(A) describe the emerging technologies in a field	(i) describe the emerging technologies in a field
(11) The student predicts the impacts of emerging applications of construction technology. The student is expected to:	(B) identify the factors that may influence the adoption of emerging technologies	(i) identify the factors that may influence the adoption of emerging technologies
(12) The student improves the quality of a product or service using different quality-control techniques. The student is expected to:	(A) define quality	(i) define quality
(12) The student improves the quality of a product or service using different quality-control techniques. The student is expected to:	(B) assess the quality of a specific product or service	(i) assess the quality of a specific product or service
(12) The student improves the quality of a product or service using different quality-control techniques. The student is expected to:	(C) determine how the quality of a product or service can be improved	(i) determine how the quality of a product or service can be improved
(13) The student recommends new ways to build products using different tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) build products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(i) build products in a more efficient manner using a variety of tools

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student recommends new ways to build products using different tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) build products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(ii) build products in a more efficient manner using a variety of equipment
(13) The student recommends new ways to build products using different tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) build products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(iii) build products in a more efficient manner using a variety of machines
(13) The student recommends new ways to build products using different tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) build products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(iv) build products in a more efficient manner using a variety of materials
(13) The student recommends new ways to build products using different tools, equipment, machines, materials, and technical processes. The student is expected to:	(A) build products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(v) build products in a more efficient manner using a variety of processes
(13) The student recommends new ways to build products using different tools, equipment, machines, materials, and technical processes. The student is expected to:	(B) demonstrate advanced construction-management skills	(i) demonstrate advanced construction-management skills
(14) The student proposes safety devices required to complete different tasks. The student is expected to:	(A) recommend improvements to safety standards	(i) recommend improvements to safety standards
(14) The student proposes safety devices required to complete different tasks. The student is expected to:	(B) specify safety devices that allow for the safe completion of a task	(i) specify safety devices that allow for the safe completion of a task

Knowledge and Skill Statement	Student Expectation	Breakout
(15) The student performs advanced equipment maintenance. The student is expected to:	(A) maintain tools and materials correctly	(i) maintain tools correctly
(15) The student performs advanced equipment maintenance. The student is expected to:	(A) maintain tools and materials correctly	(ii) maintain materials correctly
(15) The student performs advanced equipment maintenance. The student is expected to:	(B) locate and perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(i) locate manufacturers' maintenance procedures on selected tools
(15) The student performs advanced equipment maintenance. The student is expected to:	(B) locate and perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(ii) locate manufacturers' maintenance procedures on selected equipment
(15) The student performs advanced equipment maintenance. The student is expected to:	(B) locate and perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(iii) locate manufacturers' maintenance procedures on selected machines
(15) The student performs advanced equipment maintenance. The student is expected to:	(B) locate and perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(iv) perform manufacturers' maintenance procedures on selected tools
(15) The student performs advanced equipment maintenance. The student is expected to:	(B) locate and perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(v) perform manufacturers' maintenance procedures on selected equipment
(15) The student performs advanced equipment maintenance. The student is expected to:	(B) locate and perform manufacturers' maintenance procedures on selected tools, equipment, and machines	(vi) perform manufacturers' maintenance procedures on selected machines
(15) The student performs advanced equipment maintenance. The student is expected to:	(C) describe the results of negligent or improper maintenance	(i) describe the results of negligent or improper maintenance

Knowledge and Skill Statement	Student Expectation	Breakout
(16) The student suggests how the cost of a project, product, or service can be reduced. The student is expected to:	(A) identify the factors that influence the cost of a project, product, or service	(i) identify the factors that influence the cost of a project, product, or service
(16) The student suggests how the cost of a project, product, or service can be reduced. The student is expected to:	(B) select materials or processes that will reduce the cost of producing the product or delivering the service	(i) select materials or processes that will reduce the cost of producing the product or delivering the service
(17) The student applies knowledge and skills in mathematics, science, English language arts, and social studies as they relate to construction management. The student is expected to:	(A) develop a school-based learning activity that provides an in-depth study of at least one aspect of construction management	(i) develop a school-based learning activity that provides an in-depth study of at least one aspect of construction management
(17) The student applies knowledge and skills in mathematics, science, English language arts, and social studies as they relate to construction management. The student is expected to:	(B) establish at least one industry-related mentor for the school-based learning activity	(i) establish at least one industry-related mentor for the school-based learning activity
(17) The student applies knowledge and skills in mathematics, science, English language arts, and social studies as they relate to construction management. The student is expected to:	(C) present the product in at least two formats to a panel of students, teachers, and practitioners in construction management	(i) present the product in at least two formats to a panel of students, teachers, and practitioners in construction management
(17) The student applies knowledge and skills in mathematics, science, English language arts, and social studies as they relate to construction management. The student is expected to:	(D) deliver a final product that demonstrates the use of a variety of resources, technologies, and communication skills	(i) deliver a final product that demonstrates the use of a variety of resources

Knowledge and Skill Statement	Student Expectation	Breakout
(17) The student applies knowledge and skills in mathematics, science, English language arts, and social studies as they relate to construction management. The student is expected to:	(D) deliver a final product that demonstrates the use of a variety of resources, technologies, and communication skills	(ii) deliver a final product that demonstrates the use of a variety of technologies
(17) The student applies knowledge and skills in mathematics, science, English language arts, and social studies as they relate to construction management. The student is expected to:	(D) deliver a final product that demonstrates the use of a variety of resources, technologies, and communication skills	(iii) deliver a final product that demonstrates the use of a variety of communication skills
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(A) determine preparation requirements for various levels of employment in a variety of careers in construction management	(i) determine preparation requirements for various levels of employment in a variety of careers in construction management
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(B) analyze the future employment outlook of construction management	(i) analyze the future employment outlook of construction management
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(C) describe entrepreneurial opportunities in construction management	(i) describe entrepreneurial opportunities in construction management
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(i) determine how interests affect career choice

Knowledge and Skill Statement	Student Expectation	Breakout
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(ii) determine how abilities affect career choice
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(iii) determine how personal priorities affect career choice
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(iv) determine how family responsibilities affect career choice
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(E) compare rewards and demands for various levels of employment in a variety of careers	(i) compare rewards for various levels of employment in a variety of careers
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(E) compare rewards and demands for various levels of employment in a variety of careers	(ii) compare demands for various levels of employment in a variety of careers
(18) The student determines employment opportunities and preparation requirements for careers in the construction-management industries. The student is expected to:	(F) determine continuing education opportunities that enhance career advancement	(i) determine continuing education opportunities that enhance career advancement

Knowledge and Skill Statement	Student Expectation	Breakout
(19) The student demonstrates ethical and legal practices for careers in construction management. The student is expected to:	(A) summarize the rights and responsibilities of employers and employees	(i) summarize the rights of employers
(19) The student demonstrates ethical and legal practices for careers in construction management. The student is expected to:	(A) summarize the rights and responsibilities of employers and employees	(ii) summarize the rights of employees
(19) The student demonstrates ethical and legal practices for careers in construction management. The student is expected to:	(A) summarize the rights and responsibilities of employers and employees	(iii) summarize the responsibilities of employers
(19) The student demonstrates ethical and legal practices for careers in construction management. The student is expected to:	(A) summarize the rights and responsibilities of employers and employees	(iv) summarize the responsibilities of employees
(19) The student demonstrates ethical and legal practices for careers in construction management. The student is expected to:	(B) exhibit ethical practices as defined in construction management	(i) exhibit ethical practices as defined in construction management
(19) The student demonstrates ethical and legal practices for careers in construction management. The student is expected to:	(C) analyze legal aspects of construction management	(i) analyze legal aspects of construction management
(20) The student selects the appropriate technological resources to conduct research, design, and development activities. The student is expected to:	(A) apply technology to individual or community problems	(i) apply technology to individual or community problems

Knowledge and Skill Statement	Student Expectation	Breakout
(20) The student selects the appropriate technological resources to conduct research, design, and development activities. The student is expected to:	(B) describe the factors that affect the purchase and use of items	(i) describe the factors that affect the purchase of items
(20) The student selects the appropriate technological resources to conduct research, design, and development activities. The student is expected to:	(B) describe the factors that affect the purchase and use of items	(ii) describe the factors that affect the use of items
(20) The student selects the appropriate technological resources to conduct research, design, and development activities. The student is expected to:	(C) differentiate among research, design, and development	(i) differentiate among research, design, and development
(20) The student selects the appropriate technological resources to conduct research, design, and development activities. The student is expected to:	(D) distinguish among adaptation, imitation, innovation, and invention	(i) distinguish among adaptation, imitation, innovation, and invention
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(A) develop or improve a product or service that meets a specified need	(i) develop or improve a product or service that meets a specified need
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(B) identify how quality, reliability, and safety can be designed into a product	(i) identify how quality can be designed into a product
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(B) identify how quality, reliability, and safety can be designed into a product	(ii) identify how reliability can be designed into a product

Knowledge and Skill Statement	Student Expectation	Breakout
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(B) identify how quality, reliability, and safety can be designed into a product	(iii) identify how safety can be designed into a product
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(C) describe the functions and methodologies used in basic and applied research	(i) describe the functions used in basic research
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(C) describe the functions and methodologies used in basic and applied research	(ii) describe the functions used in applied research
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(C) describe the functions and methodologies used in basic and applied research	(iii) describe the methodologies used in basic research
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(C) describe the functions and methodologies used in basic and applied research	(iv) describe the methodologies used in applied research
(21) The student designs or improves a product using appropriate design processes and techniques. The student is expected to:	(D) develop a project portfolio that documents a research and development project	(i) develop a project portfolio that documents a research and development project

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.64. Practicum in Construction Technology (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. Prerequisite: Construction Technology II. Students shall be awarded two credits for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Practicum in Construction Technology, students will be challenged with the application of gained knowledge and skills from Construction Technology I and II. In many cases students will be allowed to work at a job (paid or unpaid) outside of school or be involved in local projects the school has approved for this class.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) explain the role of an employee in the construction industry	(i) explain the role of an employee in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate critical-thinking skills	(i) demonstrate critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate the ability to solve problems using critical-thinking skills	(i) demonstrate the ability to solve problems using critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate knowledge of basic computer systems	(i) demonstrate knowledge of basic computer systems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) explain common uses for computers in the construction industry	(i) explain common uses for computers in the construction industry

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) demonstrate effective relationship skills	(i) demonstrate effective relationship skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) recognize workplace issues such as sexual harassment, stress, and substance abuse	(i) recognize workplace issues
(2) The student develops a management plan for a project or an activity. The student is expected to:	(A) identify and describe the steps required to complete a project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project	(i) identify the steps required to complete a project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project
(2) The student develops a management plan for a project or an activity. The student is expected to:	(A) identify and describe the steps required to complete a project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project	(ii) describe the steps required to complete a project using project management processes, including initiating, planning, executing, monitoring and controlling, and closing a project
(2) The student develops a management plan for a project or an activity. The student is expected to:	(B) determine and acquire the resources needed to complete a project	(i) determine the resources needed to complete a project

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student develops a management plan for a project or an activity. The student is expected to:	(B) determine and acquire the resources needed to complete a project	(ii) acquire the resources needed to complete a project
(2) The student develops a management plan for a project or an activity. The student is expected to:	(C) develop a project schedule	(i) develop a project schedule
(3) The student applies the appropriate codes, laws, standards, or regulations related to a research and development project. The student is expected to:	(A) identify areas where codes, laws, standards, or regulations may be required	(i) identify areas where codes, laws, standards, or regulations may be required
(3) The student applies the appropriate codes, laws, standards, or regulations related to a research and development project. The student is expected to:	(B) locate the appropriate codes, laws, standards, or regulations	(i) locate the appropriate codes, laws, standards, or regulations
(3) The student applies the appropriate codes, laws, standards, or regulations related to a research and development project. The student is expected to:	(C) interpret and comply with the appropriate codes, laws, standards, or regulations	(i) interpret with the appropriate codes, laws, standards, or regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies the appropriate codes, laws, standards, or regulations related to a research and development project. The student is expected to:	(C) interpret and comply with the appropriate codes, laws, standards, or regulations	(ii) comply with the appropriate codes, laws, standards, or regulations
(4) The student describes the expectations for each project using a flowchart. The student is expected to:	(A) use an assessment strategy to determine the task's needs	(i) use an assessment strategy to determine the task's needs
(4) The student describes the expectations for each project using a flowchart. The student is expected to:	(B) describe why each task needs to be in the order it has been assigned	(i) describe why each task needs to be in the order it has been assigned
(4) The student describes the expectations for each project using a flowchart. The student is expected to:	(C) assess the time frame for each task	(i) assess the time frame for each task
(4) The student describes the expectations for each project using a flowchart. The student is expected to:	(D) plot a completed project flowchart expectation	(i) plot a completed project flowchart expectation
(5) The student solves problems, thinks critically, and makes decisions related to research, design, and development. The student is expected to:	(A) develop or improve the project by following a problem-solving strategy	(i) develop or improve the project by following a problem-solving strategy

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student solves problems, thinks critically, and makes decisions related to research, design, and development. The student is expected to:	(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(i) apply critical-thinking strategies to the analysis of proposed technological solutions
(5) The student solves problems, thinks critically, and makes decisions related to research, design, and development. The student is expected to:	(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(ii) apply critical-thinking strategies to the evaluation of proposed technological solutions
(5) The student solves problems, thinks critically, and makes decisions related to research, design, and development. The student is expected to:	(C) apply decision-making techniques to the selection of technological solutions	(i) apply decision-making techniques to the selection of technological solutions
(6) The student describes the costs associated with the project. The student is expected to:	(A) develop a bill of materials list for the complete project	(i) develop a bill of materials list for the complete project
(6) The student describes the costs associated with the project. The student is expected to:	(B) develop a budget, including a cost list, for the complete project	(i) develop a budget, including a cost list, for the complete project

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student describes the costs associated with the project. The student is expected to:	(C) determine the most effective way to minimize project costs	(i) determine the most effective way to minimize project costs
(7) The student applies communication, mathematics, and science knowledge and skills to the construction activities. The student is expected to:	(A) write technical reports	(i) write technical reports
(7) The student applies communication, mathematics, and science knowledge and skills to the construction activities. The student is expected to:	(B) deliver technical presentations to the instructor	(i) deliver technical presentations to the instructor
(7) The student applies communication, mathematics, and science knowledge and skills to the construction activities. The student is expected to:	(C) identify and describe the mathematical concepts used in projects	(i) identify the mathematical concepts used in projects
(7) The student applies communication, mathematics, and science knowledge and skills to the construction activities. The student is expected to:	(C) identify and describe the mathematical concepts used in projects	(ii) describe the mathematical concepts used in projects

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student applies communication, mathematics, and science knowledge and skills to the construction activities. The student is expected to:	(D) identify and describe the science concepts used in projects	(i) identify the science concepts used in projects
(7) The student applies communication, mathematics, and science knowledge and skills to the construction activities. The student is expected to:	(D) identify and describe the science concepts used in projects	(ii) describe the science concepts used in projects
(8) The student uses advanced tools, materials, processes, and procedures in the construction project. The student is expected to:	(A) determine and use the appropriate technology needed to solve a problem or complete a task	(i) determine the appropriate technology needed to solve a problem or complete a task
(8) The student uses advanced tools, materials, processes, and procedures in the construction project. The student is expected to:	(A) determine and use the appropriate technology needed to solve a problem or complete a task	(ii) use the appropriate technology needed to solve a problem or complete a task
(8) The student uses advanced tools, materials, processes, and procedures in the construction project. The student is expected to:	(B) evaluate the use of technology in a given situation	(i) evaluate the use of technology in a given situation

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student uses advanced tools, materials, processes, and procedures in the construction project. The student is expected to:	(C) describe the factors that influence the use of technology in a variety of situations	(i) describe the factors that influence the use of technology in a variety of situations

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.65. Practicum in Masonry Technology (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. Prerequisite: Masonry Technology II. Students shall be awarded two credits for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Practicum in Masonry Technology is an occupationally specific course designed to provide classroom technical instruction or work-based learning experiences. Instruction may be delivered through laboratory training or through career preparation delivery arrangements. Safety and career opportunities are included, in addition to work ethics and job-related study in the classroom. Trade and industrial education provides the knowledge, skills, and technologies required for employment in masonry construction. Students will develop knowledge of the concepts and skills related to this trade in order to apply them to personal/career development. Trade and industrial education depends on and supports integration of academic, career, and technical knowledge and skills. To prepare for success, students must have opportunities to reinforce, apply, and transfer their knowledge and skills to a variety of settings and problems. Knowledge about career opportunities, requirements, and expectations and the development of workplace skills prepare students for success. For safety and liability considerations, including power tools usage during training, limiting course enrollment to 15 students is recommended.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) explain the role of an employee in the construction industry	(i) explain the role of an employee in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate critical-thinking skills	(i) demonstrate critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate the ability to solve problems using critical-thinking skills	(i) demonstrate the ability to solve problems using critical-thinking skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) demonstrate knowledge of basic computer systems	(i) demonstrate knowledge of basic computer systems
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) explain common uses for computers in the construction industry	(i) explain common uses for computers in the construction industry
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) demonstrate effective relationship skills	(i) demonstrate effective relationship skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) recognize workplace issues such as sexual harassment, stress, and substance abuse	(i) recognize workplace issues

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student demonstrates trowel proficiency. The student is expected to:	(A) demonstrate proficiency spreading mortar	(i) demonstrate proficiency spreading mortar
(2) The student demonstrates trowel proficiency. The student is expected to:	(B) demonstrate proficiency spreading mortar at various heights	(i) demonstrate proficiency spreading mortar at various heights
(2) The student demonstrates trowel proficiency. The student is expected to:	(C) demonstrate proficiency spreading mortar on different types and sizes of brick	(i) demonstrate proficiency spreading mortar on different types of brick
(2) The student demonstrates trowel proficiency. The student is expected to:	(C) demonstrate proficiency spreading mortar on different types and sizes of brick	(ii) demonstrate proficiency spreading mortar on different sizes of brick
(2) The student demonstrates trowel proficiency. The student is expected to:	(D) demonstrate proficiency spreading mortar on different types and sizes of concrete masonry units (CMU)	(i) demonstrate proficiency spreading mortar on different types of concrete masonry units (CMU)
(2) The student demonstrates trowel proficiency. The student is expected to:	(D) demonstrate proficiency spreading mortar on different types and sizes of concrete masonry units (CMU)	(ii) demonstrate proficiency spreading mortar on different sizes of concrete masonry units (CMU)
(2) The student demonstrates trowel proficiency. The student is expected to:	(E) demonstrate proficiency buttering masonry units laid in different positions in a masonry wall	(i) demonstrate proficiency buttering masonry units laid in different positions in a masonry wall
(3) The student constructs single wythe brick walls with level. The student is expected to:	(A) build a brick lead with a level	(i) build a brick lead with a level
(3) The student constructs single wythe brick walls with level. The student is expected to:	(B) build a brick wall with a level	(i) build a brick wall with a level

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student constructs single wythe brick walls with level. The student is expected to:	(C) build an outside corner with a level	(i) build an outside corner with a level
(3) The student constructs single wythe brick walls with level. The student is expected to:	(D) build an inside corner with a level	(i) build an inside corner with a level
(3) The student constructs single wythe brick walls with level. The student is expected to:	(E) build a double wythe brick wall with a level	(i) build a double wythe brick wall with a level
(4) The student constructs a brick wall demonstrating different brick positions in a wall. The student is expected to:	(A) lay a stretcher in a masonry wall	(i) lay a stretcher in a masonry wall
(4) The student constructs a brick wall demonstrating different brick positions in a wall. The student is expected to:	(B) lay a header in a masonry wall	(i) lay a header in a masonry wall
(4) The student constructs a brick wall demonstrating different brick positions in a wall. The student is expected to:	(C) lay a rowlock in a masonry wall	(i) lay a rowlock in a masonry wall
(4) The student constructs a brick wall demonstrating different brick positions in a wall. The student is expected to:	(D) lay a sailor in a masonry wall	(i) lay a sailor in a masonry wall
(4) The student constructs a brick wall demonstrating different brick positions in a wall. The student is expected to:	(E) lay a soldier in a masonry wall	(i) lay a soldier in a masonry wall

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student constructs a brick wall demonstrating different brick positions in a wall. The student is expected to:	(F) lay a shiner (rowlock stretcher) in a masonry wall	(i) lay a shiner (rowlock stretcher) in a masonry wall
(5) The student builds a brick column. The student is expected to:	(A) construct a four-brick column with a level	(i) construct a four-brick column with a level
(5) The student builds a brick column. The student is expected to:	(B) construct a six-brick column with a level	(i) construct a six-brick column with a level
(5) The student builds a brick column. The student is expected to:	(C) construct an eight-brick column with a level	(i) construct an eight-brick column with a level
(5) The student builds a brick column. The student is expected to:	(D) construct a ten-brick column with a level	(i) construct a ten-brick column with a level
(6) The student lays CMU. The student is expected to:	(A) build a block CMU lead with a level	(i) build a block CMU lead with a level
(6) The student lays CMU. The student is expected to:	(B) build a block CMU wall with a level	(i) build a block CMU wall with a level
(6) The student lays CMU. The student is expected to:	(C) build a block CMU corner with a level	(i) build a block CMU corner with a level
(7) The student builds a block CMU column. The student is expected to:	(A) build a four-block column of 8-inch block CMU	(i) build a four-block column of 8-inch block CMU

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student builds a block CMU column. The student is expected to:	(B) build a six-block column of 8-inch block CMU	(i) build a six-block column of 8-inch block CMU
(7) The student builds a block CMU column. The student is expected to:	(C) build a ten-block column of 8-inch block CMU	(i) build a ten-block column of 8-inch block CMU
(7) The student builds a block CMU column. The student is expected to:	(D) build a four-block column of 4-inch CMU	(i) build a four-block column of 4-inch CMU
(7) The student builds a block CMU column. The student is expected to:	(E) build a four-block column of 6-inch CMU	(i) build a four-block column of 6-inch CMU
(8) The student constructs a composite masonry wall of brick and block. The student is expected to:	(A) build a composite wall of brick and 8-inch block CMU	(i) build a composite wall of brick and 8-inch block CMU
(8) The student constructs a composite masonry wall of brick and block. The student is expected to:	(B) build a composite wall of brick and 4-inch block CMU	(i) build a composite wall of brick and 4-inch block CMU
(9) The student installs coping on a masonry wall. The student is expected to:	(A) lay single brick rowlock coping on a masonry wall	(i) lay single brick rowlock coping on a masonry wall
(9) The student installs coping on a masonry wall. The student is expected to:	(B) lay double brick rowlock coping on a masonry wall	(i) lay double brick rowlock coping on a masonry wall
(9) The student installs coping on a masonry wall. The student is expected to:	(C) lay 12-inch bonded brick rowlock coping on a masonry wall	(i) lay 12-inch bonded brick rowlock coping on a masonry wall

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student installs coping on a masonry wall. The student is expected to:	(D) lay 16-inch bonded brick rowlock coping on a masonry wall	(i) lay 16-inch bonded brick rowlock coping on a masonry wall
(9) The student installs coping on a masonry wall. The student is expected to:	(E) install limestone coping on a masonry wall	(i) install limestone coping on a masonry wall
(9) The student installs coping on a masonry wall. The student is expected to:	(F) install cast stone coping on a masonry wall	(i) install cast stone coping on a masonry wall
(9) The student installs coping on a masonry wall. The student is expected to:	(G) install prefab concrete coping on a masonry wall	(i) install prefab concrete coping on a masonry wall
(10) The student constructs a natural stone wall. The student is expected to:	(A) set natural stone in a random pattern in a masonry wall	(i) set natural stone in a random pattern in a masonry wall
(10) The student constructs a natural stone wall. The student is expected to:	(B) set natural stone in an ashlar pattern in a masonry wall	(i) set natural stone in an ashlar pattern in a masonry wall
(10) The student constructs a natural stone wall. The student is expected to:	(C) install flat work of natural stone in a random pattern	(i) install flat work of natural stone in a random pattern
(11) The student installs manufactured stone. The student is expected to:	(A) install manufactured stone on a wall in a random pattern	(i) install manufactured stone on a wall in a random pattern
(11) The student installs manufactured stone. The student is expected to:	(B) install manufactured stone on a wall in an ashlar pattern	(i) install manufactured stone on a wall in an ashlar pattern

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student lays brick to a line. The student is expected to:	(A) lay modular brick to a line	(i) lay modular brick to a line
(12) The student lays brick to a line. The student is expected to:	(B) lay king-size brick to a line	(i) lay king-size brick to a line
(12) The student lays brick to a line. The student is expected to:	(C) lay queen-size brick to a line	(i) lay queen-size brick to a line
(12) The student lays brick to a line. The student is expected to:	(D) lay utility brick to a line	(i) lay utility brick to a line
(13) The student lays CMU to a line. The student is expected to:	(A) lay 8-inch block CMU to a line	(i) lay 8-inch block CMU to a line
(13) The student lays CMU to a line. The student is expected to:	(B) lay 4-inch block CMU to a line	(i) lay 4-inch block CMU to a line
(13) The student lays CMU to a line. The student is expected to:	(C) lay 6-inch block CMU to a line	(i) lay 6-inch block CMU to a line
(13) The student lays CMU to a line. The student is expected to:	(D) lay 12-inch block CMU to a line	(i) lay 12-inch block CMU to a line

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.66. Practicum in Architectural Design (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. Prerequisite: Architectural Design II. Students shall be awarded two credits for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Practicum in Architectural Design is an occupationally specific course designed to provide technical instruction in architectural design. Safety and career opportunities are included in addition to work ethics and architectural design study.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship, and preparation requirements for the student's chosen field	(i) identify employment opportunities, including entrepreneurship, for the student's chosen field
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) identify employment opportunities, including entrepreneurship, and preparation requirements for the student's chosen field	(ii) identify employment preparation requirements for the student's chosen field
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(i) demonstrate an understanding of group participation related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(ii) demonstrate an understanding of group participation related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iii) demonstrate an understanding of leadership related to citizenship
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation	(iv) demonstrate an understanding of leadership related to career preparation
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate productive work habits and attitudes	(i) demonstrate productive work habits

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate productive work habits and attitudes	(ii) demonstrate productive work attitudes
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, interpersonal skills, systems, and technology in appropriate settings and situations	(i) apply the competencies related to resources in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, interpersonal skills, systems, and technology in appropriate settings and situations	(ii) apply the competencies related to information in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, interpersonal skills, systems, and technology in appropriate settings and situations	(iii) apply the competencies related to interpersonal skills in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, interpersonal skills, systems, and technology in appropriate settings and situations	(iv) apply the competencies related to systems in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) apply the competencies related to resources, information, interpersonal skills, systems, and technology in appropriate settings and situations	(v) apply the competencies related to technology in appropriate settings and situations
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate government regulations	(i) demonstrate knowledge of the concepts related to health and safety in the workplace, as specified by appropriate government regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate government regulations	(ii) demonstrate knowledge of the skills related to health and safety in the workplace, as specified by appropriate government regulations
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(i) demonstrate effective verbal communication skills with individuals from varied cultures, including fellow workers
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(ii) demonstrate effective verbal communication skills with individuals from varied cultures, including managers
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iii) demonstrate effective verbal communication skills with individuals from varied cultures, including customers
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(iv) demonstrate effective written communication skills with individuals from varied cultures, including fellow workers
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(v) demonstrate effective written communication skills with individuals from varied cultures, including managers

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(A) demonstrate effective verbal and written communication skills with individuals from varied cultures, including fellow workers, managers, and customers	(vi) demonstrate effective written communication skills with individuals from varied cultures, including customers
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(B) apply mathematics principles and practices	(i) apply mathematics principles
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(B) apply mathematics principles and practices	(ii) apply mathematics practices
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(C) apply and identify scientific principles used in projects	(i) apply scientific principles used in projects
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(C) apply and identify scientific principles used in projects	(ii) identify scientific principles used in projects
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(i) read appropriate schematics
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(ii) read appropriate charts

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(iii) read appropriate graphs
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(iv) read appropriate drawings
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(v) read appropriate construction documents
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(vi) read appropriate directions
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(vii) read appropriate manuals
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(viii) read appropriate bulletins
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(ix) read appropriate regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(x) interpret appropriate schematics
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xi) interpret appropriate charts
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xii) interpret appropriate graphs
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xiii) interpret appropriate drawings
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xiv) interpret appropriate construction documents
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xv) interpret appropriate directions
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xvi) interpret appropriate manuals

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xvii) interpret appropriate bulletins
(2) The student relates communication, mathematics, and science to the requirements of the student's chosen field. The student is expected to:	(D) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xviii) interpret appropriate regulations
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(A) identify and select basic materials and processes used in the student's chosen field	(i) identify basic materials used in the student's chosen field
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(A) identify and select basic materials and processes used in the student's chosen field	(ii) identify basic processes used in the student's chosen field
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(A) identify and select basic materials and processes used in the student's chosen field	(iii) select basic materials used in the student's chosen field
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(A) identify and select basic materials and processes used in the student's chosen field	(iv) select basic processes used in the student's chosen field
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(B) use the tools and equipment commonly employed in the student's chosen field in a safe manner	(i) use the tools commonly employed in the student's chosen field in a safe manner

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(B) use the tools and equipment commonly employed in the student's chosen field in a safe manner	(ii) use the equipment commonly employed in the student's chosen field in a safe manner
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(C) handle and dispose of environmentally hazardous materials used in the student's chosen field in a proper manner	(i) handle environmentally hazardous materials used in the student's chosen field in a proper manner
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(C) handle and dispose of environmentally hazardous materials used in the student's chosen field in a proper manner	(ii) dispose of environmentally hazardous materials used in the student's chosen field in a proper manner
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(D) demonstrate knowledge of new and emerging technologies in the student's chosen field	(i) demonstrate knowledge of new technologies in the student's chosen field
(3) The student knows the function and application of the tools, equipment, technologies, and materials used in the student's chosen field. The student is expected to:	(D) demonstrate knowledge of new and emerging technologies in the student's chosen field	(ii) demonstrate knowledge of emerging technologies in the student's chosen field
(4) The student selects and uses multimedia communication and rendering technology to meet specific architectural design needs. The student is expected to:	(A) apply multimedia communication and rendering technology to individual or community problems	(i) apply multimedia communication technology to individual or community problems
(4) The student selects and uses multimedia communication and rendering technology to meet specific architectural design needs. The student is expected to:	(A) apply multimedia communication and rendering technology to individual or community problems	(ii) apply rendering technology to individual or community problems

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student selects and uses multimedia communication and rendering technology to meet specific architectural design needs. The student is expected to:	(B) describe the factors that affect the use and interpretation of communication products	(i) describe the factors that affect the use of communication products
(4) The student selects and uses multimedia communication and rendering technology to meet specific architectural design needs. The student is expected to:	(B) describe the factors that affect the use and interpretation of communication products	(ii) describe the factors that affect the interpretation of communication products
(4) The student selects and uses multimedia communication and rendering technology to meet specific architectural design needs. The student is expected to:	(C) identify and describe the roles of communication such as informing, persuading, and educating	(i) identify the roles of communication
(4) The student selects and uses multimedia communication and rendering technology to meet specific architectural design needs. The student is expected to:	(C) identify and describe the roles of communication such as informing, persuading, and educating	(ii) describe the roles of communication
(5) The student designs multimedia communication and rendering products using appropriate architectural design processes and techniques. The student is expected to:	(A) develop or improve communication products that meet specified needs	(i) develop or improve communication products that meet specified needs
(5) The student designs multimedia communication and rendering products using appropriate architectural design processes and techniques. The student is expected to:	(B) maintain a project portfolio that documents architectural projects using a variety of multimedia techniques	(i) maintain a project portfolio that documents architectural projects using a variety of multimedia techniques

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student produces multimedia communication and rendering products using the appropriate tools, equipment, machines, materials, and processes. The student is expected to:	(A) use a variety of tools, equipment, and machines	(i) use a variety of tools
(6) The student produces multimedia communication and rendering products using the appropriate tools, equipment, machines, materials, and processes. The student is expected to:	(A) use a variety of tools, equipment, and machines	(ii) use a variety of equipment
(6) The student produces multimedia communication and rendering products using the appropriate tools, equipment, machines, materials, and processes. The student is expected to:	(A) use a variety of tools, equipment, and machines	(iii) use a variety of machines
(6) The student produces multimedia communication and rendering products using the appropriate tools, equipment, machines, materials, and processes. The student is expected to:	(B) produce an architectural project using multimedia communication techniques	(i) produce an architectural project using multimedia communication techniques
(7) The student follows appropriate codes, laws, standards, or regulations. The student is expected to:	(A) identify areas where codes, laws, standards, or regulations may be required	(i) identify areas where codes, laws, standards, or regulations may be required
(7) The student follows appropriate codes, laws, standards, or regulations. The student is expected to:	(B) locate the appropriate codes, laws, standards, or regulations	(i) locate the appropriate codes, laws, standards, or regulations
(7) The student follows appropriate codes, laws, standards, or regulations. The student is expected to:	(C) comply with the appropriate codes, laws, standards, or regulations	(i) comply with the appropriate codes, laws, standards, or regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student demonstrates the ability to solve problems, think critically, and make decisions. The student is expected to:	(A) develop or improve a product by following a problem-solving strategy	(i) develop or improve a product by following a problem-solving strategy
(8) The student demonstrates the ability to solve problems, think critically, and make decisions. The student is expected to:	(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(i) apply critical-thinking strategies to the analysis of proposed technological solutions
(8) The student demonstrates the ability to solve problems, think critically, and make decisions. The student is expected to:	(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(ii) apply critical-thinking strategies to the evaluation of proposed technological solutions
(8) The student demonstrates the ability to solve problems, think critically, and make decisions. The student is expected to:	(C) apply decision-making techniques	(i) apply decision-making techniques
(9) The student applies communication, mathematics, and science knowledge and skills to job-related activities. The student is expected to:	(A) apply written, verbal, and visual communication techniques consistent with industry standards	(i) apply written communication techniques consistent with industry standards
(9) The student applies communication, mathematics, and science knowledge and skills to job-related activities. The student is expected to:	(A) apply written, verbal, and visual communication techniques consistent with industry standards	(ii) apply verbal communication techniques consistent with industry standards
(9) The student applies communication, mathematics, and science knowledge and skills to job-related activities. The student is expected to:	(A) apply written, verbal, and visual communication techniques consistent with industry standards	(iii) apply visual communication techniques consistent with industry standards

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student applies communication, mathematics, and science knowledge and skills to job-related activities. The student is expected to:	(B) use mathematics concepts in communication technology	(i) use mathematics concepts in communication technology
(9) The student applies communication, mathematics, and science knowledge and skills to job-related activities. The student is expected to:	(C) identify and apply scientific principles	(i) identify scientific principles
(9) The student applies communication, mathematics, and science knowledge and skills to job-related activities. The student is expected to:	(C) identify and apply scientific principles	(ii) apply scientific principles
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(A) determine preparation requirements for various levels of employment in a variety of careers	(i) determine preparation requirements for various levels of employment in a variety of careers
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(B) analyze the future employment outlook	(i) analyze the future employment outlook
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(C) describe entrepreneurial opportunities in architecture and related fields	(i) describe entrepreneurial opportunities in architecture
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(C) describe entrepreneurial opportunities in architecture and related fields	(ii) describe entrepreneurial opportunities in related fields

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(i) determine how interests affect career choice
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(ii) determine how abilities affect career choice
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(iii) determine how personal priorities affect career choice
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(iv) determine how family responsibilities affect career choice
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(E) compare rewards and demands for various levels of employment in a variety of careers	(i) compare rewards for various levels of employment in a variety of careers
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(E) compare rewards and demands for various levels of employment in a variety of careers	(ii) compare demands for various levels of employment in a variety of careers
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(F) determine continuing education opportunities that enhance career advancement and promote lifelong learning	(i) determine continuing education opportunities that enhance career advancement

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student determines employment opportunities and preparation requirements for careers in the field of architecture. The student is expected to:	(F) determine continuing education opportunities that enhance career advancement and promote lifelong learning	(ii) determine continuing education opportunities that promote lifelong learning
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(A) summarize the rights and responsibilities of employers and employees	(i) summarize the rights of employers
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(A) summarize the rights and responsibilities of employers and employees	(ii) summarize the responsibilities of employers
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(A) summarize the rights and responsibilities of employers and employees	(iii) summarize the rights of employees
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(A) summarize the rights and responsibilities of employers and employees	(iv) summarize the responsibilities of employees
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(B) exhibit ethical practices as defined by the architectural industry	(i) exhibit ethical practices as defined by the architectural industry
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(C) analyze legal aspects of the architectural-related workplace	(i) analyze legal aspects of the architectural-related workplace

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(D) develop a school-based learning activity in collaboration with the teacher and at least one related mentor that provides an in-depth study of at least one aspect of a selected business, industry, and labor independent study	(i) develop a school-based learning activity in collaboration with the teacher and at least one related mentor that provides an in-depth study of at least one aspect of a selected business, industry, and labor independent study
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(E) present the project in at least two formats such as model, graphic, verbal, or written to a panel of students, teachers, and practitioners in the career concentration	(i) present the project in at least two formats to a panel of students, teachers, and practitioners in the career concentration
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(F) maintain a project portfolio that documents experience by using graphic or written documentation of architectural-related projects	(i) maintain a project portfolio that documents experience by using graphic or written documentation of architectural-related projects
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(G) develop and update a professional resume that includes appropriate education history, work history, professional references, letters of recommendation, and all relevant information for any licenses, certifications, and credentials	(i) develop a professional resume that includes appropriate education history, work history, professional references, letters of recommendation, and all relevant information for any licenses, certifications, and credentials
(11) The student demonstrates ethical and legal practices for careers in the architectural-related workplace. The student is expected to:	(G) develop and update a professional resume that includes appropriate education history, work history, professional references, letters of recommendation, and all relevant information for any licenses, certifications, and credentials	(ii) update a professional resume that includes appropriate education history, work history, professional references, letters of recommendation, and all relevant information for any licenses, certifications, and credentials

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.67. Practicum in Interior Design (Two Credits), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. Prerequisite: Interior Design II. Students shall be awarded two credits for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Practicum in Interior Design is an occupationally specific course designed to provide job-specific skills through laboratory training, job shadowing, or work situations in areas compatible with identified career goals in interior design. In addition, students will be expected to develop knowledge and skills related to housing, furnishings, and equipment construction or equipment management and services.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(i) apply oral communication skills clearly, concisely, convincingly, and effectively to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(ii) apply oral communication skills clearly, concisely, convincingly, and effectively to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(iii) apply written communication skills clearly, concisely, convincingly, and effectively to explain actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) apply oral and written communication skills clearly, concisely, convincingly, and effectively to explain and justify actions in a socially acceptable manner that is easily understood by others	(iv) apply written communication skills clearly, concisely, convincingly, and effectively to justify actions in a socially acceptable manner that is easily understood by others
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) problem-solve using job-appropriate mathematical skills	(i) problem-solve using job-appropriate mathematical skills
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate an understanding of leadership skills	(i) demonstrate an understanding of leadership skills

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(i) cooperate as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(ii) contribute as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) cooperate, contribute, and collaborate as a member of a group	(iii) collaborate as a member of a group
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(i) exhibit professionalism through dress that [is] appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(ii) exhibit professionalism through speech that [is] appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(iii) exhibit professionalism through manners that are appropriate to the profession
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(iv) exhibit professionalism through dress that [is] appropriate to the worksite

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(v) exhibit professionalism through speech that [is] appropriate to the worksite
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) exhibit professionalism through dress, speech, and manners that are appropriate to the profession and worksite	(vi) exhibit professionalism through manners that are appropriate to the worksite
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review accurately both quantitative and qualitative work processes and end products	(i) review accurately quantitative work processes
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review accurately both quantitative and qualitative work processes and end products	(ii) review accurately quantitative work end products
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review accurately both quantitative and qualitative work processes and end products	(iii) review accurately qualitative work processes
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) review accurately both quantitative and qualitative work processes and end products	(iv) review accurately qualitative work end products
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(i) follow written instructions

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(ii) follow oral instructions
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(iii) adhere to established practices, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(iv) adhere to established policies, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(G) follow written and oral instructions and adhere to established practices, policies, and procedures, including health and safety rules	(v) adhere to established procedures, including health and safety rules
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(H) use and apply job-appropriate computer applications for the given task	(i) use job-appropriate computer applications for the given task
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(H) use and apply job-appropriate computer applications for the given task	(ii) apply job-appropriate computer applications for the given task
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(A) differentiate between the elements and principles of design	(i) differentiate between the elements and principles of design

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(B) exhibit how the elements of design can create various effects	(i) exhibit how the elements of design can create various effects
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(C) apply elements and principles of design for coordinating furnishings	(i) apply elements of design for coordinating furnishings
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(C) apply elements and principles of design for coordinating furnishings	(ii) apply principles of design for coordinating furnishings
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(D) analyze societal and cultural influences on the design of residential and nonresidential environments and their furnishings	(i) analyze societal influences on the design of residential environments
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(D) analyze societal and cultural influences on the design of residential and nonresidential environments and their furnishings	(ii) analyze societal influences on the design of nonresidential environments
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(D) analyze societal and cultural influences on the design of residential and nonresidential environments and their furnishings	(iii) analyze cultural influences on the design of residential environments

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(D) analyze societal and cultural influences on the design of residential and nonresidential environments and their furnishings	(iv) analyze cultural influences on the design of nonresidential environments
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(D) analyze societal and cultural influences on the design of residential and nonresidential environments and their furnishings	(v) analyze societal influences on the design of [residential environments'] furnishings
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(D) analyze societal and cultural influences on the design of residential and nonresidential environments and their furnishings	(vi) analyze societal influences on the design of [nonresidential environments'] furnishings
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(D) analyze societal and cultural influences on the design of residential and nonresidential environments and their furnishings	(vii) analyze cultural influences on the design of [residential environments'] furnishings
(2) The student determines the use of elements and principles of design in residential and nonresidential environments and furnishings. The student is expected to:	(D) analyze societal and cultural influences on the design of residential and nonresidential environments and their furnishings	(viii) analyze cultural influences on the design of [nonresidential environments'] furnishings
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(A) analyze characteristics of materials and workmanship in relationship to durability and use	(i) analyze characteristics of materials in relationship to durability

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(A) analyze characteristics of materials and workmanship in relationship to durability and use	(ii) analyze characteristics of materials in relationship to use
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(A) analyze characteristics of materials and workmanship in relationship to durability and use	(iii) analyze characteristics of workmanship in relationship to durability
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(A) analyze characteristics of materials and workmanship in relationship to durability and use	(iv) analyze characteristics of workmanship in relationship to use
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(B) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(i) identify characteristics of materials in relationship to appearance
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(B) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(ii) identify characteristics of materials in relationship to performance

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(B) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(iii) identify characteristics of materials in relationship to use
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(B) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(iv) identify characteristics of materials in relationship to care of furnishings
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(B) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(v) identify characteristics of workmanship in relationship to appearance
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(B) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(vi) identify characteristics of workmanship in relationship to performance
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(B) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(vii) identify characteristics of workmanship in relationship to use

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(B) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(viii) identify characteristics of workmanship in relationship to care of furnishings
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(C) explain labeling requirements and appropriate procedures for the care of various furnishings	(i) explain labeling requirements for the care of various furnishings
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(C) explain labeling requirements and appropriate procedures for the care of various furnishings	(ii) explain appropriate procedures for the care of various furnishings
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(D) interpret information provided in equipment use and care manuals	(i) interpret information provided in equipment use and care manuals
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(E) demonstrate procedures for the care and maintenance of different types of furnishings and equipment	(i) demonstrate procedures for the care of different types of furnishings

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(E) demonstrate procedures for the care and maintenance of different types of furnishings and equipment	(ii) demonstrate procedures for the care of different types of equipment
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(E) demonstrate procedures for the care and maintenance of different types of furnishings and equipment	(iii) demonstrate procedures for the maintenance of different types of furnishings
(3) The student analyzes the workmanship, characteristics, use, and care of materials used in the design and construction of residential and nonresidential furnishings and equipment. The student is expected to:	(E) demonstrate procedures for the care and maintenance of different types of furnishings and equipment	(iv) demonstrate procedures for the maintenance of different types of equipment
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(A) analyze products to determine the appropriate style of design	(i) analyze products to determine the appropriate style of design
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(B) determine appropriate use of accessories, lighting, materials, and space in various environments, including environments designed to meet special needs	(i) determine appropriate use of accessories in various environments, including environments designed to meet special needs
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(B) determine appropriate use of accessories, lighting, materials, and space in various environments, including environments designed to meet special needs	(ii) determine appropriate use of lighting in various environments, including environments designed to meet special needs

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(B) determine appropriate use of accessories, lighting, materials, and space in various environments, including environments designed to meet special needs	(iii) determine appropriate use of materials in various environments, including environments designed to meet special needs
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(B) determine appropriate use of accessories, lighting, materials, and space in various environments, including environments designed to meet special needs	(iv) determine appropriate use of space in various environments, including environments designed to meet special needs
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(C) describe trends in materials, including eco-friendly and sustainable materials, accessories, lighting, and use of space	(i) describe trends in materials, including eco-friendly materials
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(C) describe trends in materials, including eco-friendly and sustainable materials, accessories, lighting, and use of space	(ii) describe trends in materials, including sustainable materials
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(C) describe trends in materials, including eco-friendly and sustainable materials, accessories, lighting, and use of space	(iii) describe trends in accessories
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(C) describe trends in materials, including eco-friendly and sustainable materials, accessories, lighting, and use of space	(iv) describe trends in lighting
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(C) describe trends in materials, including eco-friendly and sustainable materials, accessories, lighting, and use of space	(v) describe trends in use of space

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(D) illustrate appropriate window treatments for specific windows	(i) illustrate appropriate window treatments for specific windows
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(E) evaluate cost considerations and budgets in accessorizing for various settings	(i) evaluate cost considerations in accessorizing for various settings
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(E) evaluate cost considerations and budgets in accessorizing for various settings	(ii) evaluate budgets in accessorizing for various settings
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(F) describe characteristics, use, and care of wall treatments	(i) describe characteristics of wall treatments
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(F) describe characteristics, use, and care of wall treatments	(ii) describe use of wall treatments
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(F) describe characteristics, use, and care of wall treatments	(iii) describe care of wall treatments
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(G) identify characteristics of types of flooring in relationship to design and construction	(i) identify characteristics of types of flooring in relationship to design

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student determines treatments and accessories suitable for residential and nonresidential applications. The student is expected to:	(G) identify characteristics of types of flooring in relationship to design and construction	(ii) identify characteristics of types of flooring in relationship to construction
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(A) describe furniture and equipment used in residential and nonresidential applications	(i) describe furniture used in residential applications
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(A) describe furniture and equipment used in residential and nonresidential applications	(ii) describe furniture used in nonresidential applications
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(A) describe furniture and equipment used in residential and nonresidential applications	(iii) describe equipment used in residential applications
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(A) describe furniture and equipment used in residential and nonresidential applications	(iv) describe equipment used in nonresidential applications
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(B) compare furniture and equipment needs of families in different stages of the life cycle	(i) compare furniture needs of families in different stages of the life cycle
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(B) compare furniture and equipment needs of families in different stages of the life cycle	(ii) compare equipment needs of families in different stages of the life cycle

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(C) evaluate economic considerations when selecting furniture and equipment	(i) evaluate economic considerations when selecting furniture
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(C) evaluate economic considerations when selecting furniture and equipment	(ii) evaluate economic considerations when selecting equipment
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(D) arrange furniture and equipment to accommodate floor plans to meet needs and wants	(i) arrange furniture to accommodate floor plans to meet needs
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(D) arrange furniture and equipment to accommodate floor plans to meet needs and wants	(ii) arrange furniture to accommodate floor plans to meet wants
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(D) arrange furniture and equipment to accommodate floor plans to meet needs and wants	(iii) arrange equipment to accommodate floor plans to meet needs
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(D) arrange furniture and equipment to accommodate floor plans to meet needs and wants	(iv) arrange equipment to accommodate floor plans to meet wants
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(E) describe considerations for selecting furniture and equipment to accommodate persons with special needs	(i) describe considerations for selecting furniture to accommodate persons with special needs

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(E) describe considerations for selecting furniture and equipment to accommodate persons with special needs	(ii) describe considerations for selecting equipment to accommodate persons with special needs
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(F) research trends and technology related to furnishings and equipment	(i) research trends related to furnishings
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(F) research trends and technology related to furnishings and equipment	(ii) research trends related to equipment
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(F) research trends and technology related to furnishings and equipment	(iii) research technology related to furnishings
(5) The student assesses factors influencing the selection of furniture and equipment for residential and nonresidential applications. The student is expected to:	(F) research trends and technology related to furnishings and equipment	(iv) research technology related to equipment
(6) The student applies safety and sanitation practices. The student is expected to:	(A) apply safety rules in performing various workplace procedures according to industry standards	(i) apply safety rules in performing various workplace procedures according to industry standards
(6) The student applies safety and sanitation practices. The student is expected to:	(B) identify potential hazards	(i) identify potential hazards
(6) The student applies safety and sanitation practices. The student is expected to:	(C) promote prevention practices	(i) promote prevention practices

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student applies safety and sanitation practices. The student is expected to:	(D) summarize laws pertaining to safety and sanitation practices	(i) summarize laws pertaining to safety practices
(6) The student applies safety and sanitation practices. The student is expected to:	(D) summarize laws pertaining to safety and sanitation practices	(ii) summarize laws pertaining to sanitation practices
(6) The student applies safety and sanitation practices. The student is expected to:	(E) demonstrate appropriate responses to emergency situations	(i) demonstrate appropriate responses to emergency situations
(6) The student applies safety and sanitation practices. The student is expected to:	(F) determine workplace procedures that protect the environment	(i) determine workplace procedures that protect the environment
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(A) identify tools and equipment used in construction of furnishings	(i) identify tools used in construction of furnishings
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(A) identify tools and equipment used in construction of furnishings	(ii) identify equipment used in construction of furnishings
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(B) demonstrate safe and skillful tool care and use	(i) demonstrate safe tool care
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(B) demonstrate safe and skillful tool care and use	(ii) demonstrate safe tool use

Knowledge and Skill Statement	Student Expectation	Breakout
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(B) demonstrate safe and skillful tool care and use	(iii) demonstrate skillful tool care
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(B) demonstrate safe and skillful tool care and use	(iv) demonstrate skillful tool use
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(C) describe the impact of technology on tools, equipment, and construction	(i) describe the impact of technology on tools
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(C) describe the impact of technology on tools, equipment, and construction	(ii) describe the impact of technology on equipment
(7) The student determines appropriate use and care of tools and equipment used in construction of furnishings. The student is expected to:	(C) describe the impact of technology on tools, equipment, and construction	(iii) describe the impact of technology on construction
(8) The student demonstrates skills in selected product design and construction. The student is expected to:	(A) evaluate characteristics of good workmanship in furnishings products	(i) evaluate characteristics of good workmanship in furnishings products
(8) The student demonstrates skills in selected product design and construction. The student is expected to:	(B) apply knowledge of design application, selection, and construction to complete furnishings projects	(i) apply knowledge of design application to complete furnishings projects
(8) The student demonstrates skills in selected product design and construction. The student is expected to:	(B) apply knowledge of design application, selection, and construction to complete furnishings projects	(ii) apply knowledge of design selection to complete furnishings projects

Knowledge and Skill Statement	Student Expectation	Breakout
(8) The student demonstrates skills in selected product design and construction. The student is expected to:	(B) apply knowledge of design application, selection, and construction to complete furnishings projects	(iii) apply knowledge of design construction to complete furnishings projects
(8) The student demonstrates skills in selected product design and construction. The student is expected to:	(C) analyze uses of technology in furnishings, design, and construction	(i) analyze uses of technology in furnishings
(8) The student demonstrates skills in selected product design and construction. The student is expected to:	(C) analyze uses of technology in furnishings, design, and construction	(ii) analyze uses of technology in design
(8) The student demonstrates skills in selected product design and construction. The student is expected to:	(C) analyze uses of technology in furnishings, design, and construction	(iii) analyze uses of technology in construction
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(A) discuss business promotion objectives in the retail housing and furnishings industry	(i) discuss business promotion objectives in the retail housing and furnishing industry
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(B) analyze techniques using sales promotion, advertising, and displays	(i) analyze techniques using sales promotion
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(B) analyze techniques using sales promotion, advertising, and displays	(ii) analyze techniques using advertising
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(B) analyze techniques using sales promotion, advertising, and displays	(iii) analyze techniques using displays

Knowledge and Skill Statement	Student Expectation	Breakout
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(C) describe the use of technology and other forms of advertising media in housing and furnishings business promotions	(i) describe the use of technology in housing and furnishing business promotions
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(C) describe the use of technology and other forms of advertising media in housing and furnishings business promotions	(ii) describe the use of other forms of advertising media in housing and furnishing business promotions
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(D) analyze how business promotion reflects the environment in which a person lives	(i) analyze how business promotion reflects the environment in which a person lives
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(E) predict how societal trends and changing demographics influence housing and furnishings business promotions	(i) predict how societal trends influence housing and furnishing business promotions
(9) The student identifies types of business promotion practices and their benefit to the housing and furnishings retailer. The student is expected to:	(E) predict how societal trends and changing demographics influence housing and furnishings business promotions	(ii) predict how changing demographics influence housing and furnishing business promotions
(10) The student evaluates customer relations as a tool for successful business operations. The student is expected to:	(A) analyze the importance of good customer relations in building and maintaining a business	(i) analyze the importance of good customer relations in building a business
(10) The student evaluates customer relations as a tool for successful business operations. The student is expected to:	(A) analyze the importance of good customer relations in building and maintaining a business	(ii) analyze the importance of good customer relations in maintaining a business

Knowledge and Skill Statement	Student Expectation	Breakout
(10) The student evaluates customer relations as a tool for successful business operations. The student is expected to:	(B) demonstrate techniques for maintaining good client relationships	(i) demonstrate techniques for maintaining good client relationships
(10) The student evaluates customer relations as a tool for successful business operations. The student is expected to:	(C) describe conflict-resolution techniques when dealing with customer complaints	(i) describe conflict-resolution techniques when dealing with customer complaints
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(i) demonstrate effective verbal communication skills
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(ii) demonstrate effective nonverbal communication skills
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(iii) demonstrate effective written communication skills
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(A) demonstrate effective verbal, nonverbal, written, and electronic communication skills	(iv) demonstrate effective electronic communication skills
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(i) demonstrate effective methods to secure employment

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(ii) demonstrate effective methods to maintain employment
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(B) demonstrate effective methods to secure, maintain, and terminate employment	(iii) demonstrate effective methods to terminate employment
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(i) demonstrate positive interpersonal skills, including conflict resolution
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(ii) demonstrate positive interpersonal skills, including negotiation
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(iii) demonstrate positive interpersonal skills, including teamwork
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(C) demonstrate positive interpersonal skills, including conflict resolution, negotiation, teamwork, and leadership	(iv) demonstrate positive interpersonal skills, including leadership
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(i) evaluate the relationship of good physical health to job success

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(ii) evaluate the relationship of good physical health to job achievement
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(iii) evaluate the relationship of good mental health to job success
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(D) evaluate the relationship of good physical and mental health to job success and achievement	(iv) evaluate the relationship of good mental health to job achievement
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(E) demonstrate appropriate grooming and appearance for the workplace	(i) demonstrate appropriate grooming for the workplace
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(E) demonstrate appropriate grooming and appearance for the workplace	(ii) demonstrate appropriate appearance for the workplace
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(F) demonstrate appropriate business and personal etiquette in the workplace	(i) demonstrate appropriate business etiquette in the workplace
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(F) demonstrate appropriate business and personal etiquette in the workplace	(ii) demonstrate appropriate personal etiquette in the workplace

Knowledge and Skill Statement	Student Expectation	Breakout
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(G) exhibit productive work habits and attitudes	(i) exhibit productive work habits
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(G) exhibit productive work habits and attitudes	(ii) exhibit productive work attitudes
(11) The student exhibits employability skills that lead to job success in the housing, furnishings, and equipment industries. The student is expected to:	(H) maintain a project portfolio that documents interior design projects using a variety of multimedia techniques with a professional resume	(i) maintain a project portfolio that documents interior design projects using a variety of multimedia techniques with a professional resume
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) determine preparation requirements for various levels of employment in a variety of careers in the housing, furnishings, and equipment industries	(i) determine preparation requirements for various levels of employment in a variety of careers in the housing industr[y]
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) determine preparation requirements for various levels of employment in a variety of careers in the housing, furnishings, and equipment industries	(ii) determine preparation requirements for various levels of employment in a variety of careers in the furnishings industr[y]
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) determine preparation requirements for various levels of employment in a variety of careers in the housing, furnishings, and equipment industries	(iii) determine preparation requirements for various levels of employment in a variety of careers in the equipment industr[y]

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(B) analyze the future employment outlook in the housing, furnishings, and equipment industries	(i) analyze the future employment outlook in the housing industr[y]
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(B) analyze the future employment outlook in the housing, furnishings, and equipment industries	(ii) analyze the future employment outlook in the furnishings industr[y]
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(B) analyze the future employment outlook in the housing, furnishings, and equipment industries	(iii) analyze the future employment outlook in the equipment industr[y]
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(C) describe entrepreneurial opportunities in the housing, furnishings, and equipment industries	(i) describe entrepreneurial opportunities in the housing industr[y]
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(C) describe entrepreneurial opportunities in the housing, furnishings, and equipment industries	(ii) describe entrepreneurial opportunities in the furnishings industr[y]
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(C) describe entrepreneurial opportunities in the housing, furnishings, and equipment industries	(iii) describe entrepreneurial opportunities in the equipment industr[y]

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(i) determine how interests affect career choice
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(ii) determine how abilities affect career choice
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(iii) determine how personal priorities affect career choice
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(D) determine how interests, abilities, personal priorities, and family responsibilities affect career choice	(iv) determine how family responsibilities affect career choice
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(E) analyze rewards and demands for various levels of employment in a variety of careers	(i) analyze rewards for various levels of employment in a variety of careers
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(E) analyze rewards and demands for various levels of employment in a variety of careers	(ii) analyze demands for various levels of employment in a variety of careers

Knowledge and Skill Statement	Student Expectation	Breakout
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(F) research continuing education opportunities that enhance career advancement and promote lifelong learning	(i) research continuing education opportunities that enhance career advancement
(12) The student determines employment opportunities and preparation requirements for careers in the housing, furnishings, and equipment industries. The student is expected to:	(F) research continuing education opportunities that enhance career advancement and promote lifelong learning	(ii) research continuing education opportunities that promote lifelong learning
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) research and summarize the rights and responsibilities of employers and employees	(i) research the rights of employers
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) research and summarize the rights and responsibilities of employers and employees	(ii) research the rights of employees
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) research and summarize the rights and responsibilities of employers and employees	(iii) research the responsibilities of employers
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) research and summarize the rights and responsibilities of employers and employees	(iv) research the responsibilities of employees
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) research and summarize the rights and responsibilities of employers and employees	(v) summarize the rights of employers

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) research and summarize the rights and responsibilities of employers and employees	(vi) summarize the rights of employees
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) research and summarize the rights and responsibilities of employers and employees	(vii) summarize the responsibilities of employers
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(A) research and summarize the rights and responsibilities of employers and employees	(viii) summarize the responsibilities of employees
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(B) exhibit ethical practices as defined by the housing, furnishings, and equipment industries	(i) exhibit ethical practices as defined by the housing industr[y]
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(B) exhibit ethical practices as defined by the housing, furnishings, and equipment industries	(ii) exhibit ethical practices as defined by the furnishings industr[y]
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(B) exhibit ethical practices as defined by the housing, furnishings, and equipment industries	(iii) exhibit ethical practices as defined by the equipment industr[y]
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(C) analyze legal aspects of the housing, furnishings, and equipment industries	(i) analyze legal aspects of the housing industr[y]

Knowledge and Skill Statement	Student Expectation	Breakout
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(C) analyze legal aspects of the housing, furnishings, and equipment industries	(ii) analyze legal aspects of the furnishings industr[y]
(13) The student demonstrates ethical and legal practices for careers in the housing, furnishings, and equipment industries. The student is expected to:	(C) analyze legal aspects of the housing, furnishings, and equipment industries	(iii) analyze legal aspects of the equipment industr[y]

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.68. Extended Practicum in Construction Management (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Architecture and Construction Career Cluster. Prerequisite: Construction Management II. Corequisite: Practicum in Construction Management. This course must be taken concurrently with Practicum in Construction Management and may not be taken as a stand-alone course. Students shall be awarded one credit for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Extended Practicum in Construction Management is an occupationally specific course designed to provide classroom technical instruction or on-the-job training experiences. Safety and career opportunities are included in addition to work ethics and job-related study in the classroom.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to construction management	(i) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge related to construction management
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to construction management	(ii) participate in a paid or unpaid, laboratory- or work-based application of previously studied skills related to construction management
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment	(i) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as punctuality, time management, initiative, and cooperation with increased fluency	(i) demonstrate professional standards needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as punctuality, time management, initiative, and cooperation with increased fluency	(ii) demonstrate personal qualities needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) complete tasks with high standards to ensure quality products and services	(i) complete tasks with high standards to ensure quality products

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) complete tasks with high standards to ensure quality products and services	(ii) complete tasks with high standards to ensure quality services
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(i) employ teamwork with increased fluency to achieve collective goals
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(ii) employ conflict-management skills with increased fluency to achieve collective goals
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(i) employ planning skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(ii) employ planning skills with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iii) employ planning tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iv) employ planning tools with increased fluency to complete work tasks

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(v) employ time-management skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vi) employ time-management skills with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vii) employ time-management tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(viii) employ time-management tools with increased fluency to complete work tasks
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary when analyzing information and following directions	(i) apply appropriate content knowledge when analyzing information
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary when analyzing information and following directions	(ii) apply appropriate content knowledge when following directions
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary when analyzing information and following directions	(iii) apply appropriate technical concepts when analyzing information

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary when analyzing information and following directions	(iv) apply appropriate technical concepts when following directions
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary when analyzing information and following directions	(v) apply appropriate vocabulary when analyzing information
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary when analyzing information and following directions	(vi) apply appropriate vocabulary when following directions
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(i) demonstrate verbal communication consistently in a clear, concise, and effective manner
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication consistently in a clear, concise, and effective manner
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(i) analyze information
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(ii) analyze data
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(iii) analyze observations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(iv) interpret information
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(v) interpret data
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(vi) interpret observations
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(vii) effectively communicate information
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(viii) effectively communicate data
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(ix) effectively communicate observations
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(i) observe verbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(ii) observe nonverbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iii) observe behaviors to enhance communication

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iv) interpret verbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(v) interpret nonverbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(vi) interpret behaviors to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(E) apply active listening skills to obtain and clarify information	(i) apply active listening skills to obtain information
(2) The student implements advanced professional communications strategies. The student is expected to:	(E) apply active listening skills to obtain and clarify information	(ii) apply active listening skills to clarify information
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(i) employ critical-thinking skills with increased fluency independently to solve problems
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(ii) employ critical-thinking skills with increased fluency in groups to solve problems
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iii) employ critical-thinking skills with increased fluency independently to make decisions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iv) employ critical-thinking skills with increased fluency in groups to make decisions
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(B) analyze elements of a problem to develop creative and innovative solutions	(i) analyze elements of a problem to develop creative solutions
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(B) analyze elements of a problem to develop creative and innovative solutions	(ii) analyze elements of a problem to develop innovative solutions
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(i) demonstrate understanding of workplace safety rules and regulations
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(ii) consistently follow workplace safety rules and regulations
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate safe operation of tools and equipment	(i) demonstrate safe operation of tools
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate safe operation of tools and equipment	(ii) demonstrate safe operation of equipment
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(C) describe and perform hazard analysis	(i) describe hazard analysis

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(C) describe and perform hazard analysis	(ii) perform hazard analysis
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(D) specify safety devices that allow for the safe completion of a task	(i) specify safety devices that allow for the safe completion of a task
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(E) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(i) demonstrate knowledge of procedures for reporting accidents
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(E) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(ii) demonstrate knowledge of procedures for reporting safety incidents
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(E) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(iii) demonstrate knowledge of procedures for handling accidents
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(E) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(iv) demonstrate knowledge of procedures for handling safety incidents
(5) The student understands the professional, ethical, and legal responsibilities in construction management. The student is expected to:	(A) demonstrate a positive, productive work ethic by performing assigned tasks as directed	(i) demonstrate a positive, productive work ethic by performing assigned tasks as directed

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student understands the professional, ethical, and legal responsibilities in construction management. The student is expected to:	(B) apply ethical reasoning to a variety of situations in order to make ethical decisions	(i) apply ethical reasoning to a variety of situations in order to make ethical decisions
(5) The student understands the professional, ethical, and legal responsibilities in construction management. The student is expected to:	(C) exhibit ethical practices as defined in construction management	(i) exhibit ethical practices as defined in construction management
(5) The student understands the professional, ethical, and legal responsibilities in construction management. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(i) comply with all applicable rules in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in construction management. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(ii) comply with all applicable laws in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in construction management. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(iii) comply with all applicable regulations in a consistent manner
(6) The student participates in a construction management experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised construction management experience	(i) conduct learning activities in a supervised construction management experience
(6) The student participates in a construction management experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised construction management experience	(ii) document learning activities in a supervised construction management experience
(6) The student participates in a construction management experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised construction management experience	(iii) evaluate learning activities in a supervised construction management experience

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a construction management experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(i) develop advanced technical knowledge related to the student's occupational objective
(6) The student participates in a construction management experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(ii) develop advanced technical skills related to the student's occupational objective
(6) The student participates in a construction management experience. The student is expected to:	(C) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(i) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of tools
(6) The student participates in a construction management experience. The student is expected to:	(C) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(ii) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of equipment
(6) The student participates in a construction management experience. The student is expected to:	(C) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(iii) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of machines
(6) The student participates in a construction management experience. The student is expected to:	(C) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(iv) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of materials
(6) The student participates in a construction management experience. The student is expected to:	(C) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of tools, equipment, machines, materials, and processes	(v) demonstrate advanced construction-management skills by building products in a more efficient manner using a variety of processes

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a construction management experience. The student is expected to:	(D) design or improve a product using appropriate design processes and techniques	(i) design or improve a product using appropriate design processes
(6) The student participates in a construction management experience. The student is expected to:	(D) design or improve a product using appropriate design processes and techniques	(ii) design or improve a product using appropriate techniques
(6) The student participates in a construction management experience. The student is expected to:	(E) maintain tools and materials correctly	(i) maintain tools correctly
(6) The student participates in a construction management experience. The student is expected to:	(E) maintain tools and materials correctly	(ii) maintain materials correctly
(6) The student participates in a construction management experience. The student is expected to:	(F) design an object or a service using an accepted design process	(i) design an object or a service using an accepted design process
(6) The student participates in a construction management experience. The student is expected to:	(G) demonstrate growth of technical skill competencies	(i) demonstrate growth of technical skill competencies
(6) The student participates in a construction management experience. The student is expected to:	(H) evaluate strengths and weaknesses in technical skill proficiency	(i) evaluate strengths in technical skill proficiency
(6) The student participates in a construction management experience. The student is expected to:	(H) evaluate strengths and weaknesses in technical skill proficiency	(ii) evaluate weaknesses in technical skill proficiency
(6) The student participates in a construction management experience. The student is expected to:	(I) collect representative work samples	(i) collect representative work samples

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.69. Extended Practicum in Construction Technology (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Architecture and Construction Career Cluster. Prerequisite: Construction Technology II. Corequisite: Practicum in Construction Technology. This course must be taken concurrently with Practicum in Construction Technology and may not be taken as a stand-alone course. Students shall be awarded one credit for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) In Extended Practicum in Construction Technology, students will be challenged with the application of gained knowledge and skills from Construction Technology I and II. In many cases students will be allowed to work at a job (paid or unpaid) outside of school or be involved in local projects the school has approved for this class.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to construction technology	(i) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge related to construction technology
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to construction technology	(ii) participate in a paid or unpaid, laboratory- or work-based application of previously studied skills related to construction technology
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment	(i) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as punctuality, time management, initiative, and cooperation with increased fluency	(i) demonstrate professional standards needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as punctuality, time management, initiative, and cooperation with increased fluency	(ii) demonstrate personal qualities needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) complete tasks with high standards to ensure quality products and services	(i) complete tasks with high standards to ensure quality products

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) complete tasks with high standards to ensure quality products and services	(ii) complete tasks with high standards to ensure quality services
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(i) employ teamwork with increased fluency to achieve collective goals
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(ii) employ conflict-management skills with increased fluency to achieve collective goals
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(i) employ planning skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(ii) employ planning skills with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iii) employ planning tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iv) employ planning tools with increased fluency to complete work tasks

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(v) employ time-management skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vi) employ time-management skills with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vii) employ time-management tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(F) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(viii) employ time-management tools with increased fluency to complete work tasks
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary with increased fluency when analyzing information and following directions	(i) apply appropriate content knowledge with increased fluency when analyzing information
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary with increased fluency when analyzing information and following directions	(ii) apply appropriate content knowledge with increased fluency when following directions
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary with increased fluency when analyzing information and following directions	(iii) apply appropriate technical concepts with increased fluency when analyzing information

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary with increased fluency when analyzing information and following directions	(iv) apply appropriate technical concepts with increased fluency when following directions
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary with increased fluency when analyzing information and following directions	(v) apply appropriate vocabulary with increased fluency when analyzing information
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) apply appropriate content knowledge, technical concepts, and vocabulary with increased fluency when analyzing information and following directions	(vi) apply appropriate vocabulary with increased fluency when following directions
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(i) demonstrate verbal communication consistently in a clear, concise, and effective manner
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication consistently in a clear, concise, and effective manner
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(i) analyze information
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(ii) analyze data
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(iii) analyze observations

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(iv) interpret information
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(v) interpret data
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(vi) interpret observations
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(vii) effectively communicate information
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(viii) effectively communicate data
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) analyze, interpret, and effectively communicate information, data, and observations	(ix) effectively communicate observations
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(i) observe verbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(ii) observe nonverbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iii) observe behaviors to enhance communication

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iv) interpret verbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(v) interpret nonverbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(D) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(vi) interpret behaviors to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(E) apply active listening skills to obtain and clarify information	(i) apply active listening skills to obtain information
(2) The student implements advanced professional communications strategies. The student is expected to:	(E) apply active listening skills to obtain and clarify information	(ii) apply active listening skills to clarify information
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(i) employ critical-thinking skills with increased fluency independently to solve problems
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(ii) employ critical-thinking skills with increased fluency in groups to solve problems
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iii) employ critical-thinking skills with increased fluency independently to make decisions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iv) employ critical-thinking skills with increased fluency in groups to make decisions
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(B) analyze elements of a problem to develop creative and innovative solutions	(i) analyze elements of a problem to develop creative solutions
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(B) analyze elements of a problem to develop creative and innovative solutions	(ii) analyze elements of a problem to develop innovative solutions
(3) The student applies concepts of critical thinking and problem solving. The student is expected to:	(C) develop or improve a project by following a problem-solving strategy	(i) develop or improve a project by following a problem-solving strategy
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(i) demonstrate understanding of workplace safety rules and regulations
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(ii) consistently follow workplace safety rules and regulations
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(i) demonstrate knowledge of procedures for reporting accidents
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(ii) demonstrate knowledge of procedures for reporting safety incidents

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(iii) demonstrate knowledge of procedures for handling accidents
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(iv) demonstrate knowledge of procedures for handling safety incidents
(5) The student understands the professional, ethical, and legal responsibilities in construction technology. The student is expected to:	(A) demonstrate a positive, productive work ethic by performing assigned tasks as directed	(i) demonstrate a positive, productive work ethic by performing assigned tasks as directed
(5) The student understands the professional, ethical, and legal responsibilities in construction technology. The student is expected to:	(B) apply ethical reasoning to a variety of situations in order to make ethical decisions	(i) apply ethical reasoning to a variety of situations in order to make ethical decisions
(5) The student understands the professional, ethical, and legal responsibilities in construction technology. The student is expected to:	(C) comply with all applicable rules, laws, and regulations in a consistent manner	(i) comply with all applicable rules in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in construction technology. The student is expected to:	(C) comply with all applicable rules, laws, and regulations in a consistent manner	(ii) comply with all applicable laws in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in construction technology. The student is expected to:	(C) comply with all applicable rules, laws, and regulations in a consistent manner	(iii) comply with all applicable regulations in a consistent manner

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a construction technology experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised construction technology experience	(i) conduct learning activities in a supervised construction technology experience
(6) The student participates in a construction technology experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised construction technology experience	(ii) document learning activities in a supervised construction technology experience
(6) The student participates in a construction technology experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised construction technology experience	(iii) evaluate learning activities in a supervised construction technology experience
(6) The student participates in a construction technology experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(i) develop advanced technical knowledge related to the student's occupational objective
(6) The student participates in a construction technology experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(ii) develop advanced technical skills related to the student's occupational objective
(6) The student participates in a construction technology experience. The student is expected to:	(C) develop a management plan for a project or an activity	(i) develop a management plan for a project or an activity
(6) The student participates in a construction technology experience. The student is expected to:	(D) apply the appropriate codes, laws, standards, or regulations related to a research and development project	(i) apply the appropriate codes, laws, standards, or regulations related to a research and development project
(6) The student participates in a construction technology experience. The student is expected to:	(E) develop a flowchart to plan a project	(i) develop a flowchart to plan a project
(6) The student participates in a construction technology experience. The student is expected to:	(F) determine and use the appropriate technology to solve a problem or complete a task	(i) determine the appropriate technology to solve a problem or complete a task

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a construction technology experience. The student is expected to:	(F) determine and use the appropriate technology to solve a problem or complete a task	(ii) use the appropriate technology to solve a problem or complete a task
(6) The student participates in a construction technology experience. The student is expected to:	(G) demonstrate growth of technical skill competencies	(i) demonstrate growth of technical skill competencies
(6) The student participates in a construction technology experience. The student is expected to:	(H) evaluate strengths and weaknesses in technical skill proficiency	(i) evaluate strengths in technical skill proficiency
(6) The student participates in a construction technology experience. The student is expected to:	(H) evaluate strengths and weaknesses in technical skill proficiency	(ii) evaluate weaknesses in technical skill proficiency
(6) The student participates in a construction technology experience. The student is expected to:	(I) collect representative work samples	(i) collect representative work samples

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.70. Extended Practicum in Masonry Technology (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Architecture and Construction Career Cluster. Prerequisite: Masonry Technology II. Corequisite: Practicum in Masonry Technology. This course must be taken concurrently with Practicum in Masonry Technology and may not be taken as a stand-alone course. Students shall be awarded one credit for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Extended Practicum in Masonry Technology is an occupationally specific course designed to provide classroom technical instruction or work-based learning experiences. Instruction may be delivered through laboratory training or through career preparation delivery arrangements. Safety and career opportunities are included, in addition to work ethics and job-related study in the classroom. Trade and industrial education provides the knowledge, skills, and technologies required for employment in masonry construction. Students will develop knowledge of the concepts and skills related to this trade in order to apply them to personal/career development. Trade and industrial education depends on and supports integration of academic, career, and technical knowledge and skills. To prepare for success, students must have opportunities to reinforce, apply, and transfer their knowledge and skills to a variety of settings and problems. Knowledge about career opportunities, requirements, and expectations and the development of workplace skills prepare students for success. For safety and liability considerations, including power tools usage during training, limiting course enrollment to 15 students is recommended.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to masonry technology	(i) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge related to masonry technology
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to masonry technology	(ii) participate in a paid or unpaid, laboratory- or work-based application of previously studied skills related to masonry technology
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment	(i) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as punctuality, time management, initiative, and cooperation with increased fluency	(i) demonstrate professional standards needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as punctuality, time management, initiative, and cooperation with increased fluency	(ii) demonstrate personal qualities needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(i) employ teamwork with increased fluency to achieve collective goals

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(ii) employ conflict-management skills with increased fluency to achieve collective goals
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(i) employ planning skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(ii) employ planning skills with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iii) employ planning tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iv) employ planning tools with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(v) employ time-management skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vi) employ time-management skills with increased fluency to complete work tasks

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vii) employ time-management tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(viii) employ time-management tools with increased fluency to complete work tasks
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(i) demonstrate verbal communication consistently in a clear, concise, and effective manner
(2) The student implements advanced professional communications strategies. The student is expected to:	(A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication consistently in a clear, concise, and effective manner
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(i) observe verbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(ii) observe nonverbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iii) observe behaviors to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iv) interpret verbal cues to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(v) interpret nonverbal cues to enhance communication

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student implements advanced professional communications strategies. The student is expected to:	(B) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(vi) interpret behaviors to enhance communication
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) apply active listening skills to obtain and clarify information	(i) apply active listening skills to obtain information
(2) The student implements advanced professional communications strategies. The student is expected to:	(C) apply active listening skills to obtain and clarify information	(ii) apply active listening skills to clarify information
(3) The student applies concepts of critical thinking and problem solving. The student is expected to employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions.	[A] employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(i) employ critical-thinking skills with increased fluency independently to solve problems
(3) The student applies concepts of critical thinking and problem solving. The student is expected to employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions.	[A] employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(ii) employ critical-thinking skills with increased fluency in groups to solve problems
(3) The student applies concepts of critical thinking and problem solving. The student is expected to employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions.	[A] employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iii) employ critical-thinking skills with increased fluency independently to make decisions

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student applies concepts of critical thinking and problem solving. The student is expected to employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions.	[A] employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iv) employ critical-thinking skills with increased fluency in groups to make decisions
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(i) demonstrate understanding of workplace safety rules and regulations
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(ii) consistently follow workplace safety rules and regulations
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(i) demonstrate knowledge of procedures for reporting accidents
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(ii) demonstrate knowledge of procedures for reporting safety incidents
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(iii) demonstrate knowledge of procedures for handling accidents
(4) The student understands and applies proper safety techniques in the workplace. The student is expected to:	(B) demonstrate knowledge of procedures for reporting and handling accidents and safety incidents	(iv) demonstrate knowledge of procedures for handling safety incidents

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student understands the professional, ethical, and legal responsibilities in masonry technology. The student is expected to:	(A) demonstrate a positive, productive work ethic by performing assigned tasks as directed	(i) demonstrate a positive, productive work ethic by performing assigned tasks as directed
(5) The student understands the professional, ethical, and legal responsibilities in masonry technology. The student is expected to:	(B) apply ethical reasoning to a variety of situations in order to make ethical decisions	(i) apply ethical reasoning to a variety of situations in order to make ethical decisions
(5) The student understands the professional, ethical, and legal responsibilities in masonry technology. The student is expected to:	(C) comply with all applicable rules, laws, and regulations in a consistent manner	(i) comply with all applicable rules in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in masonry technology. The student is expected to:	(C) comply with all applicable rules, laws, and regulations in a consistent manner	(ii) comply with all applicable laws in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in masonry technology. The student is expected to:	(C) comply with all applicable rules, laws, and regulations in a consistent manner	(iii) comply with all applicable regulations in a consistent manner
(6) The student participates in a masonry technology experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised masonry technology experience	(i) conduct learning activities in a supervised masonry technology experience
(6) The student participates in a masonry technology experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised masonry technology experience	(ii) document learning activities in a supervised masonry technology experience
(6) The student participates in a masonry technology experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised masonry technology experience	(iii) evaluate learning activities in a supervised masonry technology experience

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a masonry technology experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(i) develop advanced technical knowledge related to the student's occupational objective
(6) The student participates in a masonry technology experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(ii) develop advanced technical skills related to the student's occupational objective
(6) The student participates in a masonry technology experience. The student is expected to:	(C) demonstrate proficiency spreading mortar	(i) demonstrate proficiency spreading mortar
(6) The student participates in a masonry technology experience. The student is expected to:	(D) construct single wythe brick walls with level	(i) construct single wythe brick walls with level
(6) The student participates in a masonry technology experience. The student is expected to:	(E) construct a brick wall demonstrating different brick positions in a wall	(i) construct a brick wall demonstrating different brick positions in a wall
(6) The student participates in a masonry technology experience. The student is expected to:	(F) build a brick column with advanced proficiency	(i) build a brick column with advanced proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(G) lay concrete masonry unit (CMU) with advanced proficiency	(i) lay concrete masonry unit (CMU) with advanced proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(H) build a block CMU column with advanced proficiency	(i) build a block CMU column with advanced proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(I) construct a composite masonry wall of brick and block	(i) construct a composite masonry wall of brick and block

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a masonry technology experience. The student is expected to:	(J) install coping on a masonry wall with advanced proficiency	(i) install coping on a masonry wall with advanced proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(K) construct a natural stone wall with advanced proficiency	(i) construct a natural stone wall with advanced proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(L) install manufactured stone with advanced proficiency	(i) install manufactured stone with advanced proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(M) lay brick and CMU to a line with advanced proficiency	(i) lay brick and CMU to a line with advanced proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(N) demonstrate growth of technical skill competencies	(i) demonstrate growth of technical skill competencies
(6) The student participates in a masonry technology experience. The student is expected to:	(O) evaluate strengths and weaknesses in technical skill proficiency	(i) evaluate strengths in technical skill proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(O) evaluate strengths and weaknesses in technical skill proficiency	(ii) evaluate weaknesses in technical skill proficiency
(6) The student participates in a masonry technology experience. The student is expected to:	(P) collect representative work samples	(i) collect representative work samples

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.71. Extended Practicum in Architectural Design (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Architecture and Construction Career Cluster. Prerequisite: Architectural Design II. Corequisite: Practicum in Architectural Design. This course must be taken concurrently with Practicum in Architectural Design and may not be taken as a stand-alone course. Students shall be awarded one credit for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Extended Practicum in Architectural Design is an occupationally specific course designed to provide technical instruction in architectural design. Safety and career opportunities are included in addition to work ethics and architectural design study.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to architectural design	(i) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge related to architectural design
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to architectural design	(ii) participate in a paid or unpaid, laboratory- or work-based application of previously studied skills related to architectural design
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment	(i) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as self-discipline, positive attitude, integrity, leadership, appreciation for diversity, customer service, work ethic, and adaptability with increased fluency	(i) demonstrate professional standards needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as self-discipline, positive attitude, integrity, leadership, appreciation for diversity, customer service, work ethic, and adaptability with increased fluency	(ii) demonstrate personal qualities needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(i) employ teamwork with increased fluency to achieve collective goals

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(ii) employ conflict-management skills with increased fluency to achieve collective goals
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(i) employ planning skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(ii) employ planning skills with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iii) employ planning tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iv) employ planning tools with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(v) employ time-management skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vi) employ time-management skills with increased fluency to complete work tasks

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vii) employ time-management tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(viii) employ time-management tools with increased fluency to complete work tasks
(2) The student applies professional communications strategies. The student is expected to:	(A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(i) demonstrate verbal communication consistently in a clear, concise, and effective manner
(2) The student applies professional communications strategies. The student is expected to:	(A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication consistently in a clear, concise, and effective manner
(2) The student applies professional communications strategies. The student is expected to:	(B) apply active listening skills to obtain and clarify information	(i) apply active listening skills to obtain information
(2) The student applies professional communications strategies. The student is expected to:	(B) apply active listening skills to obtain and clarify information	(ii) apply active listening skills to clarify information
(2) The student applies professional communications strategies. The student is expected to:	(C) create and deliver formal and informal presentations effectively	(i) create formal presentations effectively
(2) The student applies professional communications strategies. The student is expected to:	(C) create and deliver formal and informal presentations effectively	(ii) create informal presentations effectively
(2) The student applies professional communications strategies. The student is expected to:	(C) create and deliver formal and informal presentations effectively	(iii) deliver formal presentations effectively

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies professional communications strategies. The student is expected to:	(C) create and deliver formal and informal presentations effectively	(iv) deliver informal presentations effectively
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(i) analyze information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(ii) analyze data
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(iii) analyze observations
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(iv) interpret information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(v) interpret data
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(vi) interpret observations
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(vii) effectively communicate information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(viii) effectively communicate data

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(ix) effectively communicate observations
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(i) observe verbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(ii) observe nonverbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iii) observe behaviors to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iv) interpret verbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(v) interpret nonverbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(vi) interpret behaviors to enhance communication
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(i) employ critical-thinking skills with increased fluency independently to solve problems
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(ii) employ critical-thinking skills with increased fluency in groups to solve problems

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iii) employ critical-thinking skills with increased fluency independently to make decisions
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iv) employ critical-thinking skills with increased fluency in groups to make decisions
(3) The student implements advanced problem-solving methods. The student is expected to:	(B) analyze elements of problems to develop creative and innovative solutions	(i) analyze elements of problems to develop creative solutions
(3) The student implements advanced problem-solving methods. The student is expected to:	(B) analyze elements of problems to develop creative and innovative solutions	(ii) analyze elements of problems to develop innovative solutions
(3) The student implements advanced problem-solving methods. The student is expected to:	(C) apply decision-making techniques with increased fluency to the selection of technological solutions	(i) apply decision-making techniques with increased fluency to the selection of technological solutions
(3) The student implements advanced problem-solving methods. The student is expected to:	(D) develop or improve a product by following a problem-solving strategy	(i) develop or improve a product by following a problem-solving strategy
(3) The student implements advanced problem-solving methods. The student is expected to:	(E) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(i) apply critical-thinking strategies to the analysis of proposed technological solutions
(3) The student implements advanced problem-solving methods. The student is expected to:	(E) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions	(ii) apply critical-thinking strategies to the evaluation of proposed technological solutions
(3) The student implements advanced problem-solving methods. The student is expected to:	(F) conduct technical research to gather information necessary for decision making	(i) conduct technical research to gather information necessary for decision making

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(i) demonstrate understanding of workplace safety rules and regulations
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(ii) consistently follow workplace safety rules and regulations
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in the student's chosen field in a proper manner	(i) handle environmentally hazardous materials used in the student's chosen field in a proper manner
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(B) handle and dispose of environmentally hazardous materials used in the student's chosen field in a proper manner	(ii) dispose of environmentally hazardous materials used in the student's chosen field in a proper manner
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(C) demonstrate use of tools and equipment commonly employed in the architectural design field in a safe manner	(i) demonstrate use of tools commonly employed in the architectural design field in a safe manner
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(C) demonstrate use of tools and equipment commonly employed in the architectural design field in a safe manner	(ii) demonstrate use of equipment commonly employed in the architectural design field in a safe manner
(5) The student understands the professional, ethical, and legal responsibilities in architectural design. The student is expected to:	(A) demonstrate a positive, productive work ethic by performing assigned tasks as directed	(i) demonstrate a positive, productive work ethic by performing assigned tasks as directed

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student understands the professional, ethical, and legal responsibilities in architectural design. The student is expected to:	(B) apply ethical reasoning to a variety of situations in order to make ethical decisions	(i) apply ethical reasoning to a variety of situations in order to make ethical decisions
(5) The student understands the professional, ethical, and legal responsibilities in architectural design. The student is expected to:	(C) exhibit ethical practices as defined by the architectural industry	(i) exhibit ethical practices as defined by the architectural industry
(5) The student understands the professional, ethical, and legal responsibilities in architectural design. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(i) comply with all applicable rules in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in architectural design. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(ii) comply with all applicable laws in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in architectural design. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(iii) comply with all applicable regulations in a consistent manner
(6) The student participates in a supervised architectural design experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised architectural design experience	(i) conduct learning activities in a supervised architectural design experience
(6) The student participates in a supervised architectural design experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised architectural design experience	(ii) document learning activities in a supervised architectural design experience

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised architectural design experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised architectural design experience	(iii) evaluate learning activities in a supervised architectural design experience
(6) The student participates in a supervised architectural design experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(i) develop advanced technical knowledge related to the student's occupational objective
(6) The student participates in a supervised architectural design experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(ii) develop advanced technical skills related to the student's occupational objective
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(i) read appropriate schematics
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(ii) read appropriate charts
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(iii) read appropriate graphs
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(iv) read appropriate drawings

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(v) read appropriate construction documents
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(vi) read appropriate directions
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(vii) read appropriate manuals
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(viii) read appropriate bulletins
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(ix) read appropriate regulations
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(x) interpret appropriate schematics
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xi) interpret appropriate charts

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xii) interpret appropriate graphs
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xiii) interpret appropriate drawings
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xiv) interpret appropriate construction documents
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xv) interpret appropriate directions
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xvi) interpret appropriate manuals
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xvii) interpret appropriate bulletins
(6) The student participates in a supervised architectural design experience. The student is expected to:	(C) read and interpret appropriate schematics, charts, graphs, drawings, construction documents, directions, manuals, bulletins, and regulations	(xviii) interpret appropriate regulations

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised architectural design experience. The student is expected to:	(D) design multimedia communication and rendering products using appropriate architectural design processes and techniques	(i) design multimedia communication products using appropriate architectural design processes
(6) The student participates in a supervised architectural design experience. The student is expected to:	(D) design multimedia communication and rendering products using appropriate architectural design processes and techniques	(ii) design multimedia communication products using appropriate architectural design techniques
(6) The student participates in a supervised architectural design experience. The student is expected to:	(D) design multimedia communication and rendering products using appropriate architectural design processes and techniques	(iii) design multimedia rendering products using appropriate architectural design processes
(6) The student participates in a supervised architectural design experience. The student is expected to:	(D) design multimedia communication and rendering products using appropriate architectural design processes and techniques	(iv) design multimedia rendering products using appropriate architectural design techniques
(6) The student participates in a supervised architectural design experience. The student is expected to:	(E) produce multimedia communication and rendering products using the appropriate tools, equipment, machines, and materials	(i) produce multimedia communication products using the appropriate tools
(6) The student participates in a supervised architectural design experience. The student is expected to:	(E) produce multimedia communication and rendering products using the appropriate tools, equipment, machines, and materials	(ii) produce multimedia communication products using the appropriate equipment
(6) The student participates in a supervised architectural design experience. The student is expected to:	(E) produce multimedia communication and rendering products using the appropriate tools, equipment, machines, and materials	(iii) produce multimedia communication products using the appropriate machines

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised architectural design experience. The student is expected to:	(E) produce multimedia communication and rendering products using the appropriate tools, equipment, machines, and materials	(iv) produce multimedia communication products using the appropriate materials
(6) The student participates in a supervised architectural design experience. The student is expected to:	(E) produce multimedia communication and rendering products using the appropriate tools, equipment, machines, and materials	(v) produce multimedia rendering products using the appropriate tools
(6) The student participates in a supervised architectural design experience. The student is expected to:	(E) produce multimedia communication and rendering products using the appropriate tools, equipment, machines, and materials	(vi) produce multimedia rendering products using the appropriate equipment
(6) The student participates in a supervised architectural design experience. The student is expected to:	(E) produce multimedia communication and rendering products using the appropriate tools, equipment, machines, and materials	(vii) produce multimedia rendering products using the appropriate machines
(6) The student participates in a supervised architectural design experience. The student is expected to:	(E) produce multimedia communication and rendering products using the appropriate tools, equipment, machines, and materials	(viii) produce multimedia rendering products using the appropriate materials
(6) The student participates in a supervised architectural design experience. The student is expected to:	(F) evaluate strengths and weaknesses in technical skill proficiency	(i) evaluate strengths in technical skill proficiency
(6) The student participates in a supervised architectural design experience. The student is expected to:	(F) evaluate strengths and weaknesses in technical skill proficiency	(ii) evaluate weaknesses in technical skill proficiency

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised architectural design experience. The student is expected to:	(G) collect representative work samples	(i) collect representative work samples

Subject	Chapter 130. Career and Technical Education, Subchapter B. Architecture and Construction
Course Title	§130.72. Extended Practicum in Interior Design (One Credit), Adopted 2015.
<p>(a) General Requirements. This course is recommended for students in Grade 12. The practicum course is a paid or unpaid capstone experience for students participating in a coherent sequence of career and technical education courses in the Architecture and Construction Career Cluster. Prerequisite: Interior Design II. Corequisite: Practicum in Interior Design. This course must be taken concurrently with Practicum in Interior Design and may not be taken as a stand-alone course. Students shall be awarded one credit for successful completion of this course. A student may repeat this course once for credit provided that the student is experiencing different aspects of the industry and demonstrating proficiency in additional and more advanced knowledge and skills.</p>	
<p>(b) Introduction.</p>	
<p>(1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.</p> <p>(2) The Architecture and Construction Career Cluster focuses on designing, planning, managing, building, and maintaining the built environment.</p> <p>(3) Extended Practicum in Interior Design is an occupationally specific course designed to provide job-specific skills through laboratory training, job shadowing, or work situations in areas compatible with identified career goals in interior design. In addition, students will be expected to develop knowledge and skills related to housing, furnishings, and equipment construction or equipment management and services.</p> <p>(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.</p> <p>(5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>	

(c) Knowledge and Skills.		
Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to interior design	(i) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge related to interior design
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(A) participate in a paid or unpaid, laboratory- or work-based application of previously studied knowledge and skills related to interior design	(ii) participate in a paid or unpaid, laboratory- or work-based application of previously studied skills related to interior design
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(B) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment	(i) participate in training, education, or preparation for licensure, certification, or other relevant credentials to prepare for employment
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as self-discipline, positive attitude, integrity, leadership, appreciation for diversity, customer service, work ethic, and adaptability with increased fluency	(i) demonstrate professional standards needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(C) demonstrate professional standards and personal qualities needed to be employable such as self-discipline, positive attitude, integrity, leadership, appreciation for diversity, customer service, work ethic, and adaptability with increased fluency	(ii) demonstrate personal qualities needed to be employable
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(i) employ teamwork with increased fluency to achieve collective goals

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(D) employ teamwork and conflict-management skills with increased fluency to achieve collective goals	(ii) employ conflict-management skills with increased fluency to achieve collective goals
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(i) employ planning skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(ii) employ planning skills with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iii) employ planning tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(iv) employ planning tools with increased fluency to complete work tasks
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(v) employ time-management skills with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vi) employ time-management skills with increased fluency to complete work tasks

Knowledge and Skill Statement	Student Expectation	Breakout
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(vii) employ time-management tools with increased fluency to enhance results
(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:	(E) employ planning and time-management skills and tools with increased fluency to enhance results and complete work tasks	(viii) employ time-management tools with increased fluency to complete work tasks
(2) The student applies professional communications strategies. The student is expected to:	(A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(i) demonstrate verbal communication consistently in a clear, concise, and effective manner
(2) The student applies professional communications strategies. The student is expected to:	(A) demonstrate verbal and non-verbal communication consistently in a clear, concise, and effective manner	(ii) demonstrate non-verbal communication consistently in a clear, concise, and effective manner
(2) The student applies professional communications strategies. The student is expected to:	(B) apply active listening skills to obtain and clarify information	(i) apply active listening skills to obtain information
(2) The student applies professional communications strategies. The student is expected to:	(B) apply active listening skills to obtain and clarify information	(ii) apply active listening skills to clarify information
(2) The student applies professional communications strategies. The student is expected to:	(C) create and deliver formal and informal presentations effectively	(i) create formal presentations effectively
(2) The student applies professional communications strategies. The student is expected to:	(C) create and deliver formal and informal presentations effectively	(ii) create informal presentations effectively
(2) The student applies professional communications strategies. The student is expected to:	(C) create and deliver formal and informal presentations effectively	(iii) deliver formal presentations effectively

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies professional communications strategies. The student is expected to:	(C) create and deliver formal and informal presentations effectively	(iv) deliver informal presentations effectively
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(i) analyze information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(ii) analyze data
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(iii) analyze observations
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(iv) interpret information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(v) interpret data
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(vi) interpret observations
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(vii) effectively communicate information
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(viii) effectively communicate data

Knowledge and Skill Statement	Student Expectation	Breakout
(2) The student applies professional communications strategies. The student is expected to:	(D) analyze, interpret, and effectively communicate information, data, and observations	(ix) effectively communicate observations
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(i) observe verbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(ii) observe nonverbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iii) observe behaviors to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(iv) interpret verbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(v) interpret nonverbal cues to enhance communication
(2) The student applies professional communications strategies. The student is expected to:	(E) observe and interpret verbal and nonverbal cues and behaviors to enhance communication	(vi) interpret behaviors to enhance communication
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(i) employ critical-thinking skills with increased fluency independently to solve problems
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(ii) employ critical-thinking skills with increased fluency in groups to solve problems

Knowledge and Skill Statement	Student Expectation	Breakout
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iii) employ critical-thinking skills with increased fluency independently to make decisions
(3) The student implements advanced problem-solving methods. The student is expected to:	(A) employ critical-thinking skills with increased fluency both independently and in groups to solve problems and make decisions	(iv) employ critical-thinking skills with increased fluency in groups to make decisions
(3) The student implements advanced problem-solving methods. The student is expected to:	(B) analyze elements of problems to develop creative and innovative solutions	(i) analyze elements of problems to develop creative solutions
(3) The student implements advanced problem-solving methods. The student is expected to:	(B) analyze elements of problems to develop creative and innovative solutions	(ii) analyze elements of problems to develop innovative solutions
(3) The student implements advanced problem-solving methods. The student is expected to:	(C) conduct technical research to gather information necessary for decision making	(i) conduct technical research to gather information necessary for decision making
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(i) demonstrate understanding of workplace safety rules and regulations
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(A) demonstrate understanding of and consistently follow workplace safety rules and regulations	(ii) consistently follow workplace safety rules and regulations
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(B) apply safety rules in performing various workplace procedures according to industry standards	(i) apply safety rules in performing various workplace procedures according to industry standards

Knowledge and Skill Statement	Student Expectation	Breakout
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(C) demonstrate safe and skillful tool care and use	(i) demonstrate safe tool care
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(C) demonstrate safe and skillful tool care and use	(ii) demonstrate safe tool use
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(C) demonstrate safe and skillful tool care and use	(iii) demonstrate skillful tool care
(4) The student understands and applies proper safety and security techniques in the workplace. The student is expected to:	(C) demonstrate safe and skillful tool care and use	(iv) demonstrate skillful tool use
(5) The student understands the professional, ethical, and legal responsibilities in interior design. The student is expected to:	(A) demonstrate a positive, productive work ethic by performing assigned tasks as directed	(i) demonstrate a positive, productive work ethic by performing assigned tasks as directed
(5) The student understands the professional, ethical, and legal responsibilities in interior design. The student is expected to:	(B) apply ethical reasoning to a variety of situations in order to make ethical decisions	(i) apply ethical reasoning to a variety of situations in order to make ethical decisions
(5) The student understands the professional, ethical, and legal responsibilities in interior design. The student is expected to:	(C) exhibit ethical practices as defined by the housing, furnishings, and equipment industries	(i) exhibit ethical practices as defined by the housing industry

Knowledge and Skill Statement	Student Expectation	Breakout
(5) The student understands the professional, ethical, and legal responsibilities in interior design. The student is expected to:	(C) exhibit ethical practices as defined by the housing, furnishings, and equipment industries	(ii) exhibit ethical practices as defined by the furnishings industry
(5) The student understands the professional, ethical, and legal responsibilities in interior design. The student is expected to:	(C) exhibit ethical practices as defined by the housing, furnishings, and equipment industries	(iii) exhibit ethical practices as defined by the equipment industry
(5) The student understands the professional, ethical, and legal responsibilities in interior design. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(i) comply with all applicable rules in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in interior design. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(ii) comply with all applicable laws in a consistent manner
(5) The student understands the professional, ethical, and legal responsibilities in interior design. The student is expected to:	(D) comply with all applicable rules, laws, and regulations in a consistent manner	(iii) comply with all applicable regulations in a consistent manner
(6) The student participates in a supervised interior design experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised interior design experience	(i) conduct learning activities in a supervised interior design experience
(6) The student participates in a supervised interior design experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised interior design experience	(ii) document learning activities in a supervised interior design experience
(6) The student participates in a supervised interior design experience. The student is expected to:	(A) conduct, document, and evaluate learning activities in a supervised interior design experience	(iii) evaluate learning activities in a supervised interior design experience

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised interior design experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(i) develop advanced technical knowledge related to the student's occupational objective
(6) The student participates in a supervised interior design experience. The student is expected to:	(B) develop advanced technical knowledge and skills related to the student's occupational objective	(ii) develop advanced technical skills related to the student's occupational objective
(6) The student participates in a supervised interior design experience. The student is expected to:	(C) apply elements and principles of design for coordinating furnishings with advanced proficiency	(i) apply elements of design for coordinating furnishings with advanced proficiency
(6) The student participates in a supervised interior design experience. The student is expected to:	(C) apply elements and principles of design for coordinating furnishings with advanced proficiency	(ii) apply principles of design for coordinating furnishings with advanced proficiency
(6) The student participates in a supervised interior design experience. The student is expected to:	(D) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(i) identify characteristics of materials in relationship to appearance of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(D) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(ii) identify characteristics of materials in relationship to performance of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(D) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(iii) identify characteristics of materials in relationship to use of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(D) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(iv) identify characteristics of materials in relationship to care of furnishings

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised interior design experience. The student is expected to:	(D) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(v) identify characteristics of workmanship in relationship to appearance of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(D) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(vi) identify characteristics of workmanship in relationship to performance of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(D) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(vii) identify characteristics of workmanship in relationship to use of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(D) identify characteristics of materials and workmanship in relationship to appearance, performance, use, and care of furnishings	(viii) identify characteristics of workmanship in relationship to care of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(E) demonstrate advanced procedures for the care and maintenance of different types of furnishings and equipment	(i) demonstrate advanced procedures for the care of different types of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(E) demonstrate advanced procedures for the care and maintenance of different types of furnishings and equipment	(ii) demonstrate advanced procedures for the maintenance of different types of furnishings
(6) The student participates in a supervised interior design experience. The student is expected to:	(E) demonstrate advanced procedures for the care and maintenance of different types of furnishings and equipment	(iii) demonstrate advanced procedures for the care of different types of equipment

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised interior design experience. The student is expected to:	(E) demonstrate advanced procedures for the care and maintenance of different types of furnishings and equipment	(iv) demonstrate advanced procedures for the care of different types of equipment
(6) The student participates in a supervised interior design experience. The student is expected to:	(F) determine appropriate use of accessories, lighting, materials, and space in various environments	(i) determine appropriate use of accessories in various environments
(6) The student participates in a supervised interior design experience. The student is expected to:	(F) determine appropriate use of accessories, lighting, materials, and space in various environments	(ii) determine appropriate use of lighting in various environments
(6) The student participates in a supervised interior design experience. The student is expected to:	(F) determine appropriate use of accessories, lighting, materials, and space in various environments	(iii) determine appropriate use of materials in various environments
(6) The student participates in a supervised interior design experience. The student is expected to:	(F) determine appropriate use of accessories, lighting, materials, and space in various environments	(iv) determine appropriate use of space in various environments
(6) The student participates in a supervised interior design experience. The student is expected to:	(G) arrange furniture and equipment to accommodate floor plans to meet needs and wants	(i) arrange furniture to accommodate floor plans to meet needs
(6) The student participates in a supervised interior design experience. The student is expected to:	(G) arrange furniture and equipment to accommodate floor plans to meet needs and wants	(ii) arrange furniture to accommodate floor plans to meet wants
(6) The student participates in a supervised interior design experience. The student is expected to:	(G) arrange furniture and equipment to accommodate floor plans to meet needs and wants	(iii) arrange equipment to accommodate floor plans to meet needs
(6) The student participates in a supervised interior design experience. The student is expected to:	(G) arrange furniture and equipment to accommodate floor plans to meet needs and wants	(iv) arrange equipment to accommodate floor plans to meet wants

Knowledge and Skill Statement	Student Expectation	Breakout
(6) The student participates in a supervised interior design experience. The student is expected to:	(H) apply knowledge of design application, selection, and construction to complete furnishings projects	(i) apply knowledge of design application to complete furnishings projects
(6) The student participates in a supervised interior design experience. The student is expected to:	(H) apply knowledge of design application, selection, and construction to complete furnishings projects	(ii) apply knowledge of design selection to complete furnishings projects
(6) The student participates in a supervised interior design experience. The student is expected to:	(H) apply knowledge of design application, selection, and construction to complete furnishings projects	(iii) apply knowledge of design construction to complete furnishings projects
(6) The student participates in a supervised interior design experience. The student is expected to:	(I) evaluate strengths and weaknesses in technical skill proficiency	(i) evaluate strengths in technical skill proficiency
(6) The student participates in a supervised interior design experience. The student is expected to:	(I) evaluate strengths and weaknesses in technical skill proficiency	(ii) evaluate weaknesses in technical skill proficiency
(6) The student participates in a supervised interior design experience. The student is expected to:	(J) collect representative work samples	(i) collect representative work samples