CareerClusters™ PATHWAYS TO COLLEGE & CAREER READINESS
Science, Technology, Engineering & Mathematics

Learning that works for Colorado CTE®

Colorado CTE Course – Scope and Sequence

Course Name	Architectural Drafting	Course Details Course = 0.50 Carnegie Unit Credit	Credit = 1.0
Course Description	Architecture is designed for advanced drafters to develop skills in the field of architectural engineering. This class will offer the experience in the development and design of structures using architectural design software. Students will develop drafting skills through reading architectural blue prints and generating floor plans for real world applications. This course is designed to allow students to use their knowledge of CAD to create a set of house plans that meet city code requirements for the city. Students will use CAD software and draw a floor plan, plot plan, electrical plan, foundation plan, and elevation for their house as well as construct a model frame house.		
Note:	This is a suggested scope and sequence for the course content. The content will work with any textbook or instructional resource. If locally adapted, make sure all essential knowledge and skills are covered.		
SCED Identification #	21103	Schedule calculation based on 60 calendar days of a 90-day semester. Scope and sequence allows for additional time for guest speakers, student presentations, field trips, remediation, or other content topics.	

All courses taught in an approved CTE program must include Essential Skills embedded into the course content. The Essential Skills Framework for this course can be found at https://www.cde.state.co.us/standardsandinstruction/essentialskills

Instructional Unit Topic	Suggested Length of Instruction	CTE or Academic Standard Alignment	Competency / Performance Indicator	Outcome / Measurement	CTSO Integration
Career Development		Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans. Identify career paths available in the architectural drafting and design trade. Understand employers' expectations and develop appropriate work habits.	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;	Continually reflect on coursework experiences and revise and refine the career plan generated in prior courses. Create a portfolio of work accomplished. Include photographs or illustrations and written descriptions of sequential progress in construction projects. Research local job and internship opportunities and requirements. Update	Updates to ICAP SkillsUSA Personal and Employability Skills Framework SkillsUSA Architectural Drafting Competition

			B) demonstrate an understanding of group participation and leadership related to citizenship and career preparation; C) identify employers' expectations and appropriate work habits; D) apply the competencies related to resources, information, systems, and technology in appropriate settings and situations; and E) demonstrate knowledge of the concepts and skills related to health and safety in the workplace, as specified by appropriate governmental regulations; F) propose short-term and long-term career goals; G) describe technology used in architectural careers; H) maintain a project portfolio that documents experience by using	resume and practice job interview skills.	

			graphic or written documentation of architectural-related projects; and I) develop a professional resume.		
Architecture Design Principles			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; (B) determine building code and zoning requirements for building types in a selected area; and (C) demonstrate knowledge of the various grades and types of construction materials; (D) understand purpose of foundation systems and identify terms; (E) understand basic principles of load and bearing; (F) read and interpret appropriate	Describe historical influences that contributed to current home styles. Describe design elements of contemporary dwellings. Discuss current trends in Architecture. Compare the different methods of frame wall construction. Interpret the information shown on a ceiling joist span data chart and trusses. Draw a typical wall section and full cross sections. Apply the Uniform Building Code (UBC) to a residential design List and describe the purposes of and regulations from architectural governing bodies and their building codes. Create a list of building materials and their uses and describe how they will affect the design of a residence.	

			architectural symbols, schematics, blueprints, work drawings, manuals, and bulletins; and (G) research the Green Building Rating System as defined by the U.S. Green Building Council.	Draw a plot/site plan for a residence showing grade elevations against the home, lot contours and corners of the lot for drainage purposes Show water, power, gas and sewer lines or septic system in plan. Show walks, driveways, patios, and other onsite improvements in plan. Show the relationship of the finished floor elevation and the finished grade around the home. Analyze list major considerations when designing a footing for a residential foundation. Describe the procedure for staking out a house location. Analyze a typical floor plan. Discuss how to determine the appropriate foundation. Analyze design considerations for wood, concrete, and masonry foundation walls. Calculate the load to be supported by a beam. Research the Green Building Rating System as defined by the U.S. Green Building Council .Create a project demonstrating sustainable design as it relates to	

				architectural design as defined by the U.S. Green Building Council.	
Modeling Tools		The student begins expressing ideas through original architectural projects using a variety of media with appropriate skill. The student is expected to:	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; (B) handle and dispose of environmentally hazardous materials; (C) demonstrate knowledge of new and emerging technologies that may affect the field of architecture. (D) create beginning visual solutions by elaborating on direct observation, experiences, and imagination;	Investigate modeling techniques and practices used by architects and drafters. Explain how these techniques are used in drafting and design work. Discuss the advantages and disadvantages of simulations and actual models used in drafting and design. Identify common modeling materials. Create a simple model for a project.	

			(E) create beginning designs for practical applications; and (F) demonstrate beginning effective use of architectural media and tools in design, drawing, painting, printmaking, and sculpture such as model building.		
Architectural Drawings		Examine drawing identification and management techniques used in architectural drafting. Illustrate proper dimensioning and notation practices used in architectural drafting. Properly lay out drawings with the correct information to design a residence. Analyze and compute various aspects of blue prints.	The student applies the concepts and skills of the architectural drafting trade to simulated and actual work situations. The student is expected to: A) apply architectural lettering techniques; B) develop preliminary sketches of a nonresidential or residential architectural design; C) use traditional technical architectural drafting techniques to create drawings; D) demonstrate through drawings the development of maximum efficiency	Analyze types and uses of architectural drawings. Explain their function and key information presented. Demonstrate knowledge of how to illustrate proper dimensioning and notation used in architectural drafting. Discuss how to: • Choose best location for dimensions. • Apply uniform spacing between dimension lines. • Fully dimension an object. • Correctly use leaders and notes. • Use appropriate angles for leaders. • Use correct text height.	

			of circulation within areas or rooms; E) develop a site plan using maximum orientation of the building relative to views, sun, and wind direction; F) draw schematic site plans, floor plans, building elevations, sections, perspectives, and character sketches from bubble diagrams; G) draw scaled wall thickness plans, elevations, and sections; H) develop details of floor and wall sections as required; I) demonstrate knowledge of the Americans with Disabilities Act; J) assemble an architectural design in three dimensions; K) customize screen menus to fit specific problems or needs; L) construct points, lines, and other geometric forms using accepted	• Use architectural style letters and numerals. Represent typical materials using standard architectural symbols Draw to scale a residential floor plan using accepted symbols and techniques. Draw dimensions of a floor plan in a clear and precise manner which complies with architectural standards. Discuss the difference between a good and poor drawing of a floor plan. Discuss accessibility requirements for functional utility. Research the requirements for a residential housing system (plumbing, HVAC, electrical). Identify the code requirements (i.e. National Electrical Code) and identify code symbols used in architectural drawings. Present the findings or create an infographic. Design a residential roof plan. Identify issues associated with roof framing plans. Calculate the dimensions of the roof, elevations, and other aspects of a project to determine if	

			computer-aided design methods; M) create a freehand simple one-point perspective; N) use a computer system to create a bill of materials; O) construct architectural drawings using advanced computer-aided design drafting skills; P) draw schematic site plans, floor plans, roof plans, building elevations, sections, perspectives, and character sketches using design development techniques; Q) develop details, sections, floor and wall sections, ceiling and roof sections, door and window sections, and other sections as required; R) assemble an architectural design in three dimensions; S) research an architectural project; T) design and present an effective	the measurements are correct. Illustrate symbols that are often found on elevations. Draw a typical exterior elevation which demonstrates proper techniques.	

			architectural product; and U) present a final architectural product for critique.		
Incorporating Design Elements			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; (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; (C) explore drawing and design techniques for	Draw millwork elevations and special details for kitchen cabinets, bathroom cabinets, wardrobe & utility closet and cabinets. Draw interior and exterior stair details appropriate to those found in a home that comply with applicable building codes. Show hand rails, guardrails and other safety features in a drawing. Draw a finish schedule that would include different types of wall & ceiling finishes, types of floor coverings, special wainscot wall finishes, etc.	

			interior spaces including kitchens and baths.		