

Colorado CTE Course – Scope and Sequence

Course Name	Construction Management II		Course Details	Credit = 1.0	
			Course = 0.50 Carnegie Unit Credit	Prerequisite: Construction Management I	
				CTE Credential: CTE Architecture and Construction	
Course Description	This course provides an introduction to basic project management techniques and tools used in the construction industry to oversee the planning, design, and construction of a project, from its beginning to its end.				
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 #	17016	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
Employability skills		Apply communication, mathematical, and scientific knowledge and skills to construction activities. Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.	The student applies communication, mathematical, and scientific knowledge and skills to construction activities. The student is expected to: (A) write technical reports; (B) make technical presentations to groups of individuals;	Participate in interactive teamwork to solve real Building and Construction Trades sector issues and problems. Serve as team lead or project supervisor with responsibilities for reporting technical information to project manager. Demonstrate ethical and legal practices consistent with Building and Construction Trades sector workplace standards. Review construction case studies or best practices. Discuss the	Updates to student ICAP and portfolio. Investigate and complete SkillsUSA PDP.

			<p>(C) use mathematical concepts in construction technology; and</p> <p>(D) apply scientific principles used in construction technology.</p> <p>The student investigates career opportunities, requirements, and expectations in construction technology. The student is expected to:</p> <p>(A) identify an area of interest in construction and investigate its entry-level and advancement requirements and its growth potential; and</p> <p>(B) describe the careers available in construction.</p>	<p>ethical and legal implications of business decisions. Use multiple sources to research and outreach to local construction companies. Investigate internship and hiring opportunities and demonstrate practical knowledge of career readiness skills (refer to CDE career ready practice standards.)</p> <p>Accurately read, interpret, and demonstrate adherence to safety rules, including but not limited to rules published by the Occupational Safety and Health Administration (OSHA), and state and national code requirements. Be able to distinguish between the rules and explain why certain rules apply.</p>	
Design Process		<p>Understand the application of the building design process.</p> <p>Interpret architectural and engineering working drawings and specifications.</p>	<p>The student designs or modifies a structure using designated design processes and techniques. The student is expected to:</p> <p>(A) develop or improve a building design that meets a specified need; and</p>	<p>Interpret civil drawings used to describe a site, including recognizing symbols used to describe topography. For example, in teams, interpret a topographic survey drawing to construct a model (physical or virtual) of a building site. Use the model to influence the design of the building and the building's placement on the site.</p>	

			<p>(B) develop and communicate ideas using specified design processes.</p>	<p>Perform a site analysis to make design decisions for a building plan, including interpreting existing site conditions and evaluating site surroundings. Determine the impact environmental factors such as climate, wind patterns, and the movement of the sun have on the design and site placement of the building. Summarize site analysis findings with drawings and supporting text.</p> <p>Synthesize the various constraints affecting a building's design to make and justify design decisions. Items to consider should include: a. Evaluating the building's program based on client need. For example, appraise the requirements of the client such as total square footage and list of desired features (number of bedrooms, bathrooms, etc.). b. Accommodating the needs of people of all ages and physical abilities in compliance with the Americans with Disabilities Act (ADA). c. Interpreting applicable building codes based on the project type. For example, determine the minimum number and spacing</p>	
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				of exit doors for a given building occupancy size	
Construction Technologies		Understand the role of technology for management of construction projects.	<p>The student investigates emerging construction technologies. The student is expected to:</p> <p>(A) report on emerging construction technologies; and</p> <p>(B) conduct research in construction technology to determine its effectiveness.</p> <p>The student solves problems, thinks critically, and makes decisions related to architectural construction. The student is expected to:</p> <p>(A) develop or improve a building or structure by following a problem-solving strategy;</p> <p>(B) apply critical-thinking strategies to the analysis and evaluation of proposed technological solutions; and</p> <p>(C) apply decision-making techniques to the</p>	<p>Investigate BIM principles from AGC. Discuss how project managers are able to leverage BIM practices to increase profitability of their projects.</p> <p>Research planning and diagramming techniques used by designers. Implement planning and diagramming techniques such as bubble diagrams and traffic flow patterns to design a schematic site plan and floor plan for a given building program.</p>	

			selection of technological solutions.		
Building Quality		Understand how quality control is used in the project quality management process.	<p>The student describes quality and how it is measured in construction. The student is expected to:</p> <p>(A) construct items that meet a specified level of quality;</p> <p>(B) recommend how the quality of a building can be improved; and</p> <p>(C) explain the factors that affect the quality of buildings.</p>	<p>Research sustainable design solutions and practices; then provide recommendations for a given design. Calculate a rating for energy responsiveness using a sustainable building guideline.</p> <p>Examine a wall section drawing for a specific building. Identify, define, and explain the function of each component, including wall insulation, flashing, and the structure of the cornice. Draw from textbooks and other resources to annotate the wall section drawing with notes explaining the purpose of each component.</p>	
Building Modeling		Apply construction building modeling practices, tools, and techniques.	<p>The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:</p> <p>(A) describe the chemical, mechanical, and physical properties and standard units of measure of architectural</p>	<p>Create a properly scaled model of a building (physical or virtual) and study the model in the context of the site layout. Present the model along with supporting sketches and diagrams to an audience (such as the instructor and peers), explaining and justifying design ideas in a logical, coherent narrative. Gather feedback and use it to refine the design.</p>	

			<p>construction materials such as concrete, masonry, and metals;</p> <p>(B) describe the processes used in construction; and</p> <p>(C) construct a building or a model of a building using a variety of tools, equipment, and machines.</p>	<p>Incorporate schematic design sketches, models, and peer feedback to further develop a building's design. Communicate details of the design through appropriate drawing types, utilizing industry-standard drawing conventions and software. Create a comprehensive set of drawings including the following drawing types: a. Site plan b. Floor plan c. Interior and exterior building elevations d. Foundation plan e. Roof plan f. Building system plans (such as an electrical plan) g. Door and window schedules h. Three-dimensional renderings (interior and exterior)</p>	
<p>Project Management Processes</p>		<p>Understand and apply construction project management skills.</p>	<p>The student manages construction technology projects. The student is expected to:</p> <p>(A) initiate a construction technology project;</p> <p>(B) plan a construction technology project, including developing a project schedule and describing use of resources needed;</p>	<p>Examine how architects and engineers conduct project management processes, including but not limited to setting interim goals, tracking progress, and coordinating with construction professionals and clients. Compare and contrast components of project management models gathered from textbooks, online resources, and actual case studies of major or local design professionals.</p>	

			<p>(C) execute a construction technology project;</p> <p>(D) monitor and control a construction technology project; and</p> <p>(E) close a construction technology project.</p>	<p>Utilize project management strategies to create and implement a work plan to complete projects according to schedule. Use technology to periodically document project status and progress in written reports.</p> <p>Create a written report or infographic describing the basic steps of traditional project delivery, outlining who and what is involved in each step. Compare texts to describe alternatives to traditional project delivery methods, such as the design-build method used in construction.</p>	
<p>Building Standards and Codes</p>		<p>Understand and apply building codes to construction projects.</p>	<p>The student follows the appropriate codes, laws, standards, or regulations related to architectural construction technology. The student is expected to:</p> <p>(A) identify areas where codes, laws, standards, or regulations may be required;</p> <p>(B) locate the appropriate codes, laws, standards, or regulations; and</p>		

			(C) comply with the appropriate codes, laws, standards, or regulations.		
Budgeting and Controlling Costs		<p>Understand basic budgeting techniques used in project management.</p> <p>Understand cost control mechanisms for managing projects.</p>	<p>The student determines the cost of constructing a building. The student is expected to:</p> <p>(A) develop a budget for a construction project; and</p> <p>(B) determine the most effective strategies to minimize costs.</p>		
Supervision and Leadership		<p>Understand the characteristics and benefits of teamwork, leadership, and citizenship in the school, community, and workplace setting.</p> <p>Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution.</p>	<p>The student describes the importance of teamwork, leadership, integrity, honesty, work habits, and organizational skills. The student is expected to:</p> <p>(A) describe how teams function;</p> <p>(B) use teamwork to solve problems;</p> <p>(C) distinguish between the roles of team leaders and team members;</p>	<p>Differentiate between verbal and nonverbal communications when interacting with peers, subordinates, superiors, and customers. List specific techniques for effective communications and evaluate how different cultures and generations attach different meanings to various gestures, intonations, and other communications techniques.</p> <p>Practice and implement proven communication techniques to foster positive interpersonal relationships in the business atmosphere,</p>	

			<p>(D) identify characteristics of good leaders;</p> <p>(E) identify employers' expectations for appropriate work habits;</p> <p>(F) define discrimination, harassment, and inequality;</p> <p>(G) use time-management techniques to develop work schedules, maintain work schedules, and meet work schedule deadlines; and</p> <p>(H) complete work according to established criteria.</p>	<p>such as: a. Establishing and maintaining positive relationships with coworkers and customers (e.g., being fair, helpful, tactful, gracious, and appreciative). b. Recognize manifestations of tension, and employ recommended strategies to resolve the situation in the most favorable ways (e.g., collaborating, compromising, accommodating). c. Practice various interactions and conflict resolution strategies by participating in role-play exercises and structured controversies, allowing students to model positive/supportive behaviors that respect varying perspectives and viewpoints of others and yield consensus decision-making.</p>	
<p>Business Skill Development</p>		<p>Understand and employ business practices and behaviors appropriate to Building and Construction Trades sector opportunities.</p>	<p>The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:</p> <p>(A) apply construction technology to individual or local problems;</p>	<p>Design, write, modify and evaluate a business plan for the identified existing business. The business plan should include, but may not be limited to, detailed descriptions of products and/or services offered, risk analysis, short and long term profits, marketing plan, investment needed to start and maintain the business, plans to obtain working</p>	

			<p>(B) identify the appropriate resources needed to solve problems; and</p> <p>(C) describe the factors that affect the purchase and use of buildings.</p> <p>The student describes basic product marketing processes and techniques used in construction. The student is expected to:</p> <p>(A) prepare a marketing plan for an idea, product, or service; and</p> <p>(B) discuss the effect of customer satisfaction on the image of a product or company.</p>	<p>capital, legal licenses, and vendor contracts. Include a company organization chart, job description and skills needed of main employees, physical equipment and facilities required, and any future expansion plans.</p> <p>Investigate and choose an existing business to research (individually or in teams) throughout the duration of the course. Describe the business' current target market, primary products or services offered, unique characteristics, current market position, and customer volume by summarizing available public documents about the business.</p>	
<p>Advancing Technical Skills</p>		<p>Apply essential technical knowledge and skills common to all pathways in the Building and Construction Trades sector, following procedures when carrying out experiments or performing technical tasks.</p>	<p>The student constructs buildings or scaled models using the appropriate tools, equipment, machines, materials, and technical processes. The student is expected to:</p> <p>(A) describe the chemical, mechanical, and physical properties and standard units of</p>	<p>Students will continue to perform increasingly advanced technical skills depending on the construction project(s) applied within this course.</p> <p>Refer to specific competencies and measurements of advanced trades courses for examples.</p>	

			<p>measure of architectural construction materials such as concrete, masonry, and metals;</p> <p>(B) describe the processes used in construction; and</p> <p>(C) construct a building or a model of a building using a variety of tools, equipment, and machines.</p> <p>(6) The student works safely with construction technology. The student is expected to:</p> <p>(A) master relevant safety tests;</p> <p>(B) follow safety manuals, instructions, and requirements;</p> <p>(C) identify and classify hazardous materials and wastes correctly;</p> <p>(D) dispose of hazardous materials and waste appropriately; and</p>		
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