

Colorado CTE Course – Scope and Sequence

Course Name	Work-based Learning Experience		Course Details	Credit= Variable		
			Course = 0.50 Carnegie Unit Credit			
				<p>Prerequisite: Completion of Level 3 coursework in pathway area or with permission of the instructor.</p> <p>CTE Credential: Appropriate CTE credential for the pathway or CTE Work-based Learning Coordinator Credential</p>		
Course Description	<p>This course is designed to prepare students to enter the workforce through on-the-job training in the form of a work-based learning experience and may be combined with class instruction. Students will build on prior knowledge and skills in the program of study aligned to their career and academic plan to further develop and apply employability and technical skills that prepare them for success in future career and postsecondary education. Students will have the opportunity to develop skills in supervised practical experience on the job or in a classroom-based job environment. A personalized learning plan is a requirement of this course.</p> <p>**Significant industry engagement is required for this course and includes, but is not limited to, setting professional expectations for quality of work, mentoring students through a project and providing feedback, and evaluating employability skill development. Students should have a minimum contact of 30 hours with employers or in the job setting. A dedicated workplace mentor will supervise each student in workplace-based experiences such as internships, co-op, and apprenticeships.</p>					
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 #	17009	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	
Personalized Learning Plan		Develop a personalized career plan that includes application of academic standards, technical	A student will have a Personalized Learning Plan that identifies their long-term goals, demonstrates how the	Personalized learning plan is updated and documents metrics for student achievement of :		

		standards, and personal and workplace skills.	<p>Work-Based Learning (WBL) experience aligns with their elective focus and/or high school plan of study, addresses how the student plans to meet and demonstrate the course standards, and addresses employability skill attainment in the following areas:</p> <ol style="list-style-type: none"> a. Application of academic and technical knowledge and skills (embedded in course standards) b. Career knowledge and navigation skills c. 21st Century learning and innovation skills d. Personal and social skills 	<ul style="list-style-type: none"> • Technical skills attainment • Career Knowledge and Development • Development of Personal and Social Skills • Development of Employment Skills/21st Century Learning and Innovation Skills. 	
Career Development		Demonstrate active career development through participation in work-based learning activities and personal reflection and career planning.	<p>Student demonstrates active career development through participation in work-based learning activities and personal reflection and career planning. Student is expected to:</p> <ol style="list-style-type: none"> (A) Document work from the personalized 	Update materials from coursework to add to the portfolio or other ICAP documentation repository started in previous courses to illustrate mastery of skills and knowledge outlined in the previous courses and applied in the practicum. The portfolio/ICAP should reflect thoughtful assessment and evaluation of the progression of work involving the	

			<p>learning plan; and (B) Analyze work experiences and career goals.</p>	<p>application of project management skills specific to the students' career and academic goals. The following documents will reside in the career portfolio/ICAP:</p> <ul style="list-style-type: none"> a. The career plan developed and revised in prior courses b. Resume c. List of responsibilities undertaken through the course d. Examples of visual materials used during the course (such as diagrams, schematics, and site plans) and artifacts of project outcomes (such as photographs of various stages of a project) e. Periodic journal entries reflecting on tasks and activities f. Feedback from instructor and/or supervisor based on observations <p>Create and continually update a personal journal to document skills learned during the practicum and draw connections between the experience and previous course content by reflecting on:</p> <ul style="list-style-type: none"> a. Tasks accomplished and activities implemented 	
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				<ul style="list-style-type: none"> b. Positive and negative aspects of the experience c. How challenges were addressed d. Team participation in a learning environment e. Comparisons and contrasts between classroom and work environments f. Interactions with colleagues and supervisors g. Personal career development h. Personal satisfaction 	
<p>Sample WBL Experiences and Projects</p>		<p>Advanced Process Management:</p> <p>In teams, research an industry need that can be met with a manufacturing product. If possible, meet with a potential client who could use such a product, and discuss the client's wants and needs. Research what materials, labor, equipment, and other inputs are necessary to complete production, then work as a team to develop a production plan, delegate responsibilities, and determine deadlines to meet the client's specifications. Present the plan with supporting graphics and data compiled from the research.</p> <p>Simulate the work of a plant operations manager or related position by formulating a detailed production schedule. Use diagrams, schematics, and floor plans to lay out production processes and assign sample shifts. Determine how each team member will contribute to the designated production project.</p> <p>Develop a logical decision tree to guide manufacturing processes for a range of products. Given a set of defined criteria and constraints, conduct if/then analyses to answer a variety of process-oriented questions. For example, follow a logical decision tree to determine when to employ serial, batch, or continuous manufacturing processes.</p> <p>Demonstrate the ability to apply statistical analysis to the evaluation of process outputs. For a given set of constraints, calculate the ideal production rate for a simulated product, then apply learnings toward original projects undertaken in this course. Using quality control methods learned in previous courses, determine criteria to maximize output and minimize product defects.</p>			

Work together to assemble adequate documentation of production activities in the form of a team log, manual, or executive summary of production processes. Be able to explain to both lay and technical audiences how various aspects of the process work, including how the end product is created. Document constraints and criteria using domain-specific vocabulary and industry terminology.

Execute all production plans undertaken in this course in line with resource constraints, deadlines, and all other specifications in order to meet the vision of a client or the expectations of a classroom-based project. Critique the quality of final products for their compliance with client or classroom specifications. Document product evaluations in a written format that can be easily interpreted by others.

Troubleshooting, Problem-solving, and Quality Control:

Work in teams to identify, diagnose, and troubleshoot malfunctions in advanced manufacturing equipment. Apply problem solving skills learned in previous courses to determine the source of the problem(s), assess the maintenance that will be required, and develop a multistep procedure for making corrections. Conduct the required maintenance according to outlined procedures, and critique the effectiveness of the corrective action.

Apply quality control methods learned in previous courses to regularly test and evaluate the quality of manufactured products created in this course. Drawing on associated industry standards, develop quality benchmarks for measuring the acceptability of the end product. Formulate criteria for identifying defects, and make recommendations for reducing the number of defects based on observations.

Record accurate and repeatable measurements to specified degrees of precision, attending to appropriate units as directed. When measurements misalign, make the necessary adjustments in order to eliminate the problem. For example, if a machining part is specified to be sized within an acceptable range of nanometers, adjust the CNC code to cut the part within a more accurate margin of error.

Independent Project Reporting and Summary:

Produce technical reports highlighting the purpose, content, and use for all advanced manufacturing and production projects undertaken in this course. Cite evidence from multiple authoritative sources in order to justify design and production decisions and maximize client satisfaction (when applicable). Incorporate supporting graphics, sketches, and data as needed to summarize the technical specifications of products generated for each project.

Upon completion of the practicum, develop a technology-enhanced presentation showcasing highlights, challenges, and lessons learned from the experience. The presentation should be delivered orally, but supported by relevant graphic illustrations, such

