

Colorado CTE Course – Scope and Sequence

Course Name	Welding for Jewelry Making		Course Details	Credit = 0.5	
			Course = 0.50 Carnegie Unit Credit	CTE Credential: CTE Manufacturing	
Course Description	This course covers the proper use and care of hand tools, safety, jewelry making fundamentals, soldering, oxy-acetylene cutting and welding, computer aided plasma cutting, and related metal theory. This course covers the hazards of welding on health and safety, locating essential safety and product information, and applying shop safety procedures.				
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 #	13208	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
Safety		Describe and apply appropriate safety and health practices as they apply to the jewelry/metalsmithing trade.	Describe and apply appropriate safety and health practices as they apply to the jewelry/metalsmithing trade. Student is expected to: (A) Describe and apply appropriate safety and health practices as they apply to the jewelry/ metalsmithing trade; and (B) Demonstrate proper care and safe use of tools used in the art of jewelry and metalsmithing.		
Overview of Metalsmithing		Demonstrate an understanding of the evolution and technological progression of, and the emerging trends in the	Demonstrate an understanding of the evolution and technological progression of, and the emerging trends in the jewelry/metalsmithing trade. Student is expected to:		

		jewelry/metalsmithing trade. Demonstrate awareness of the ethical and legal standards as they pertain to the jewelry trade. Demonstrate knowledge of the employability skills related to the jewelry trade.	(A) Understand the historical and cultural development of jewelry making and metalsmithing; (B) Recognize contemporary trends, materials, and approaches in jewelry and metalsmithing; (C) identify evolution and technological progression of, and the emerging trends in the jewelry/metalsmithing trade; (D) Identify basic jewelry making and metal working design vocabulary; (E) Demonstrate knowledge of the employability skills related to the jewelry trade; (F) Demonstrate knowledge of the creative design of jewelry; and (G) Discuss legal standards of hallmarking for metal content.		
Metals and Materials		Demonstrate knowledge of the identification, and the safe and appropriate operation, cleaning, maintenance, and management of equipment, tools, and materials. Demonstrate an understanding of metallurgy, gemology, and the characteristics of jewelry materials.	Apply knowledge of metals and other materials used in jewelry and metalsmithing. Student is expected to: (A) Identify the ferrous and non-ferrous metals and their subgroups used in jewelry/ metalsmithing; (B) Identify the terminology for descriptive characteristics and properties of metals as it pertains to the exploration of jewelry/ metalsmithing; (C) Identify the characteristics of metals as introduced;		

			(D) Identify the limitations of the materials used in jewelry making and metalsmithing; (E) Discuss the alloy chart as pertaining to jewelry metals; (F) Demonstrate an understanding of metal expansion and contraction as related to annealing, melting, and porosity of cast metal; (G) Discuss chemical hazards on the environment as they pertain to jewelry making and metal forging; and (H) Discuss the recycling process for materials related to the jewelry trade.		
Soldering		Understand soldering materials and applications for jewelry making and fine metal work fabrication.	Understand soldering materials and applications for jewelry making and fine metal work fabrication. Student is expected to: (A) Describe hand tools, power tools, equipment, and materials used in basic construction and soldering; (B) Demonstrate the safe and appropriate operation of hand tools and equipment used in the basic construction and soldering of jewelry; (C) Demonstrate the safe and appropriate operation of torch as it pertains to basic construction and soldering of jewelry; (D) Demonstrate the appropriate disposal and/or recycling of materials and supplies as it pertains to basic construction and soldering;		

			(E) Demonstrate the principles of material characteristics in construction processes as they pertain to basic construction and soldering; (F) Demonstrate the application of standard, nail head, and flush rivets; (G) Demonstrate tab and slot construction; (H) Demonstrate a variety of hard soldered joints using a variety of solders with sheet and wire; and (I) Demonstrate an understanding of oxides as they relate to basic construction and soldering.		
Metalwork and Fabrication		Demonstrate the construction techniques used in creating jewelry from sheet and wire.	Theory and application of traditional and contemporary techniques of metal work and fabrication. This may include but not limited to: cutting, sawing, riveting, annealing, soldering, drilling, forming, casting, hand finishing, and stone setting. Student is expected to: (A) Utilize jewelry/metalsmithing techniques to create jewelry and non-utilitarian metal objects as a form of creative expression; (B) Create jewelry and/or objects made from non-ferrous metals and mixed media; and (C) Analyze and evaluate the jewelry/objects utilizing the critique process.	Aluminum collage pins: Use colored papers to design brooches based upon international cultural masks. There will be brooches made from these designs, each using a new technique demonstrated in class. Techniques to be used: sawing, filing, stamping, engraving, sandblasting, riveting and anodizing titanium. Overlay brooch: Using a designing technique taught in class, translate a personal photograph into a design to be pieced and fabricated into a brooch. Techniques to be used: designing, sawing, filing, soldering, and hand-finishing.	

Lost Wax Casting		Demonstrate an understanding of the construction, casting, incorporation of components and gemstones, and production techniques of jewelry creations.	Demonstrate the safe and appropriate operation of hand tools and equipment used in lost wax casting. Student is expected to: (A) Demonstrate the safe and appropriate use of the flex-shaft ; (B) Demonstrate the principles of material characteristics in construction processes as they pertain to lost wax castings; (C) Identify the design problems related to lost wax casting; (D) Demonstrate the application of integral rivets; (E) Demonstrate the safe and appropriate use of the pickle pot; (F) Discuss investing and using a vacuum machine; and (G) Define the production and benefits to trade as they pertain to lost wax casting.	Make a wax pattern using carved wax techniques demonstrated in class.	
Forging Techniques		Understand the principles of forging and forming.	Demonstrate the principles of material characteristics in construction processes as they pertain to forging and forming. Student is expected to: (A) Demonstrate the forming of hollow ring constructions using patterns; (B) Demonstrate the production of sheet from ingots using a rolling mill; (C) Demonstrate the production of wire from ingots using a rolling mill and drawplates;		

			(D) Demonstrate die forming with a hydraulic press; and (E) Demonstrate the use of patinas as it pertains to forging and forming.		
Ring Construction		Identify common ring construction practices for jewelry making.	Identify common ring construction practices for jewelry making. Student is expected to: (A) Demonstrate fabrication of a butt joint; (B) Demonstrate fabrication of a tee joint; (C) Demonstrate lamination and post creation; (D) Demonstrate forged practices; (E) Demonstrate fabrication of a bezel; (F) Demonstrate fabrication of a raindrop style jewelry; (G) Demonstrate fabrication of an osculating joint; (H) Fabricate a jump Ring; (I) Demonstrate fabricate of wire tees and parallel joint; (J) Create a wire appliqué; and (K) Demonstrate overall assembly techniques.	Roller-print ring: Design a pattern from paper to be printed on to a sterling sheet metal and fabricated into a ring. Techniques to be used: roller-printing, soldering, depletion gilding, tumble finishing.	
Bezel Setting		Understand and apply concepts of bezel setting for jewelry construction.	Understand and apply concepts of bezel setting for jewelry construction. Student is expected to: (A) Discuss the styles of stone cuts as well as cabochon stone style; and (B) Understand techniques for setting a bezel cup.		

Finishing		Demonstrate an understanding of the finishing, polishing, and textural techniques of jewelry creation.	Demonstrate an understanding of the finishing, polishing, and textural techniques of jewelry creation. Student is expected to: (A) Demonstrate the sequence of finishing steps as they pertain to metal type, technique, and jewelry design (B) Demonstrate precautions and the appropriate care of gem materials. (C) Demonstrate textural finishing techniques with hammers and chasing tools	Stone setting: Make a simple setting for a cabochon stone. This can be incorporated into another assignment or be done separately.	
Equipment Set Up & Oxy-fuel		Explore and understand various welding systems that require standard hand and machine tools.	Use standard and new emerging welding tools and equipment for the purpose of completing a finished jewelry or fine metal worked product. Student is expected to: (A) identify and explain the equipment, equipment setup, and techniques that apply to the following thermal cutting operations: a. Oxyfuel cutting b. Plasma-arc cutting c. Air carbon arc cutting d. Sawing e. Shearing f. Punching (B) select and use appropriate welding tools, equipment, and inspection devices to manufacture parts or products; and (C) introduce joint preparation methods and explain how to identify joint specifications.	Perform straight, shaped, and beveled cutting operations using both manual and machine-guided techniques. Properly use weld-washing techniques and visually examine cut surfaces for meeting the given specifications.	

Academic Standards Alignment

Colorado CTE courses are required to integrate academic and essential skills into course content. The following academic standards have been identified as aligned to this course and should be integrated throughout instruction.

[CO CTE Academic Standards Resources](#) (Rubrics, integration strategies, etc) [CDE Colorado Academic Standards Online](#) (Online standards lookup tool)

Reading, Writing, & Communicating

Standard 1: Oral Expression and Listening

- **Prepared Graduate 1:** Collaborate effectively as group members or leaders who listen actively and respectfully; pose thoughtful questions, acknowledge the ideas of others; and contribute ideas to further the group's attainment of an objective.

Standard 2: Reading for All Purposes .

- **Prepared Graduate 4:** Read a wide range of informational texts to build knowledge and to better understand the human experience.
- **Prepared Graduate 5:** Understand how language functions in different contexts, command a variety of word-learning strategies to assist comprehension, and make effective choices for meaning or style when writing and speaking.

Standard 3: Writing and Composition

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- **Prepared Graduate 9:** Demonstrate mastery of their own writing process with clear, coherent, and error-free polished products.

Standard 4: Research Inquiry and Design

- **Prepared Graduate 10:** Gather information from a variety of sources; analyze and evaluate its quality and relevance; and use it ethically to answer complex questions.

Note: Mathematics and Science standards will be added in the future. Visit the [Colorado Academic Standards](#) page for the most current version.