

DESE Model Curriculum

GRADE LEVEL/UNIT TITLE: 11-12/Metals

Course Code:

COURSE INTRODUCTION:

This course utilizes welding in the development and construction of major metal and wood projects. (CD 016770, CIP 01.0201).

Course Rationale – Agriculture encompasses the food, fiber, conservation and natural resource systems, employing over 20% of the nation's workforce. Advanced skills in welding, woodworking, and project construction provide students with entry-level agricultural construction skills.

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UNIT DESCRIPTION:		SUGGESTED UNIT TIMELINE: 2 WEEKS					
Students learn to select metals and fasteners for agricultural applications.		CLASS PERIOD (min.): 50 MINUTES					
ESSENTIAL QUESTIONS:							
1. How are metals and fasteners appropriately selected for agricultural applications?							
ESSENTIAL MEASURABLE LEARNING OBJECTIVES		CCSS LEARNING GOALS (Anchor Standards/Clusters)	CROSSWALK TO STANDARDS				
			GLEs/CLEs	PS	CCSS	AFNR Standards	DOK
1. Select metals by design and strength.					N-Q-1 N-Q-2 N-Q-3 RST11-12.3 RST11-12.4 RST11-12.9 L11-12.6	CS.08.01 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	3
2. Explain how construction metal is dimensioned.					N-Q-1 N-Q-2 N-Q-3 G-CO-6 G-CO-7 G-CO-12 G-MG-1 G-MG-3 G-GMD-4 RST11-12.4 RST11-12.9	CS.08.01 CS.08.02 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	2

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				L11-12.6 SL11-12.4		
3. Remove stress risers.				N-Q-1 N-Q-2 N-Q-3 G-CO-6 G-CO-7 G-CO-12 G-MG-1 G-MG-3 G-GMD-4 RST11-12.3 RST11-12.4 L11-12.6	CS.06.03 CS.07.01 CS.07.04 CS.08.01 CS.08.02 CS.08.03 PST.01.03 PST.02.01 PST.02.02 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	2
4. Identify common metal fasteners.				RST11-12.4 RST11-12.9 L11-12.6	CS.08.01 CS.08.02 CS.08.03 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	1
5. Identify the hardness grade of a bolt.				N-Q-1 N-Q-2 N-Q-3 RST11-12.4 RST11-12.9 L11-12.6	CS.08.01 CS.08.02 CS.08.03 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	1
6. Control heat distortion of metals.				L11-12.6	CS.06.03 CS.07.01 CS.07.04 CS.08.01	2

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					CS.08.02 CS.08.03 PST.01.03 PST.02.01 PST.02.02 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	
7. Assemble work using proper locks and fasteners.				N-Q-1 N-Q-2 N-Q-3 G-CO-6 G-CO-7 G-CO-12 G-MG-1 G-MG-3 G-GMD-4 RST11-12.3 RST11-12.4 RST11-12.9 L11-12.6	CS.06.03 CS.07.01 CS.07.04 CS.08.01 CS.08.02 CS.08.03 PST.01.03 PST.02.01 PST.02.02 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	2
8. Use heat to shape metals.				N-Q-1 N-Q-2 N-Q-3 G-CO-6 G-CO-7 G-CO-12 G-MG-1 G-MG-3 G-GMD-4 RST11-12.3 RST11-12.4	CS.06.03 CS.07.01 CS.07.04 CS.08.01 CS.08.02 CS.08.03 PST.01.03 PST.02.01 PST.02.02 PST.04.04.07.a PST.04.04.07.b	2

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				RST11-12.9 L11-12.6	PST.04.04.07.c	
9. Use tap and die set to do threading.				N-Q-1 N-Q-2 N-Q-3 G-CO-6 G-CO-7 G-CO-12 G-MG-1 G-MG-3 G-GMD-4 RST11-12.3 RST11-12.4 RST11-12.9 L11-12.6	CS.06.03 CS.07.01 CS.07.04 CS.08.01 CS.08.02 CS.08.03 PST.01.03 PST.02.01 PST.02.02 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	2
10. List steps used to control crystallization in tempering, annealing, hardening, wrinkle bending, normalizing, and welding				N-Q-1 N-Q-2 N-Q-3 G-CO-6 G-CO-7 G-CO-12 G-MG-1 G-MG-3 G-GMD-4 RST11-12.4 RST11-12.9 L11-12.6 WHST11-12.2	CS.06.03 CS.07.01 CS.07.04 CS.08.01 CS.08.02 CS.08.03 PST.01.03 PST.02.01 PST.02.02 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	1
11. Apply basic metalworking skills by constructing an appropriate metalworking project.				N-Q-1 N-Q-2 N-Q-3 G-CO-6 G-CO-7	CS.06.03 CS.07.01 CS.07.04 CS.08.01 CS.08.02	4

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Course Code:

				G-CO-12 G-MG-1 G-MG-3 G-GMD-4 RST11-12.3 RST11-12.4 RST11-12.9 L11-12.6	CS.08.03 PST.01.03 PST.02.01 PST.02.02 PST.04.04.07.a PST.04.04.07.b PST.04.04.07.c	
ASSESSMENT DESCRIPTIONS*: (Write a brief overview here. Identify Formative/Summative. Actual assessments will be accessed by a link to PDF file or Word doc.) Students will use common equipment, materials, and procedures discussed in class to lay out and construct an appropriate metalworking project. Assessment will be based on the overall quality of the work and the ability to safely and correctly complete the project within the available time. *Attach Unit Summative Assessment, including Scoring Guides/Scoring Keys/Alignment Codes and DOK Levels for all items. Label each assessment according to the unit descriptions above (i.e., Grade Level/Course Title/Course Code, Unit #.)						
Obj. #	INSTRUCTIONAL STRATEGIES (research-based): (Teacher Methods)					
1-11	1. Lecture and demonstration.					
Obj. #	INSTRUCTIONAL ACTIVITIES: (What Students Do)					
1 2 4 5 10	1. Students will engage in study questions in lessons 1 through 10.					
3 6 7 8	2. Students will complete “JS 9.3, Using the Drill Press as a Precision Guide for Tapping”; “JS 9.4, Tapping a Hole With a Drill Press”; and “JS 10.1, Making a Cold Chisel.”					

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9 11	
	3. Additional activities that relate to the unit objective can be found under the heading “Other Activities” in the following locations: p. IV-4 (1, 2), p. IV-17, p. IV-32 (2), p. IV-64, p. IV-72 (1, 2), p. IV-80 (1, 3), and p. IV-125 (2).
UNIT RESOURCES: (include internet addresses for linking) <ul style="list-style-type: none">• <i>Agricultural Construction Volume I.</i> University of Missouri-Columbia, Instructional Materials Laboratory, 1989.• <i>Agricultural Construction Volume II.</i> University of Missouri-Columbia, Instructional Materials Laboratory, 1989.• Machinery & Vehicle Safety: Welding. National Ag Safety Database. Accessed April 27, 2012, from http://nasdonline.org/browse/229/welding.html	