

DESE Model Curriculum

GRADE LEVEL/UNIT TITLE: 11-12/ Agricultural Construction (Volume I), Unit I – Arc Welding

Course Code:

COURSE INTRODUCTION:

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

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: Students learn welding safety and proper welding procedures. Students demonstrate how to apply proper safety and welding procedures and their ability to properly weld.		SUGGESTED UNIT TIMELINE: 4 WEEKS CLASS PERIOD (min.): 50 MINUTES				
ESSENTIAL QUESTIONS: 1. What are the welding safety procedures and how do you apply them? 2. How do you know the difference between a proper and improper welding procedure and welds?						
ESSENTIAL MEASURABLE LEARNING OBJECTIVES	CCSS LEARNING GOALS (Anchor Standards/Clusters)	CROSSWALK TO STANDARDS				
		GLEs/CLEs	PS	CCSS	AFNR Standards	DOK
1. List and demonstrate the safety procedures for arc welding				RST 11-12.7 SL11-12.4	PST.02.02 PST.01.03 PST.02.01 CS.06.03 CS.07.01 CS.07.04 CS.08.01 CS.08.02 CS.08.03	4
2. Identify the various types of metals and their properties				RST 11-12.7	PST.02.02 PST.04.04.07.a PST.01.03 PST.02.01	3
3. Prepare metals for welding by cutting, grinding, and/or cleaning				RST11-12.3 RST 11-12.7	PST.02.02 PST.04.04.07.b	2

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				G-CO-1 G-CO-6 G-CO-7 G-CO – 12 G-GMD-4 G-MG-1 G-MG-3	PST.01.03 PST.02.01 CS.08.01 CS.08.02 CS.08.03	
4. Weld in all positions with stick welder [Shielded Metal Arc Welding]				G-CO-1 G-CO-6 G-CO-7 G-CO – 12 G-GMD-4 G-MG-1 G-MG-3 RST 11-12.3 RST 11-12.7	PST.02.02 PST.04.04.07.b PST.01.03 PST.02.01 CS.08.01 CS.08.02 CS.08.03	2
5. Weld in all positions with MIG welder [Gas Metal Arc Welding]				G-CO-1 G-CO-6 G-CO-7 G-CO – 12 G-GMD-4 G-MG-1 G-MG-3 RST 11-12.3 RST 11-12.7	PST.02.02 PST.04.04.07.b PST.01.03 PST.02.01 CS.08.01 CS.08.02 CS.08.03	2
6. Weld in all positions with TIG welder [Gas Tungsten Arc welding]				G-CO-1 G-CO-6 G-CO-7 G-CO – 12 G-GMD-4 G-MG-1 G-MG-3 RST 11-12.3 RST 11-12.7	PST.02.02 PST.04.04.07.b PST.01.03 PST.02.01 CS.08.01 CS.08.02 CS.08.03	2

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7. “Hardsurface” areas where extensive wear may occur				G-CO-1 G-CO-6 G-CO-7 G-CO – 12 G-GMD-4 G-MG-1 G-MG-3 RST 11-12.3 RST 11-12.7	PST.02.02 PST.01.03 PST.02.01 CS.08.01 CS.08.02 CS.08.03	2
8. Weld cast iron				G-CO-1 G-CO-6 G-CO-7 G-CO – 12 G-GMD-4 G-MG-1 G-MG-3 RST 11-12.3 RST 11-12.7	PST.02.02 PST.01.03 PST.02.01 CS.08.01 CS.08.02 CS.08.03	2
9. Weld pipe				G-CO-1 G-CO-6 G-CO-7 G-CO – 12 G-GMD-4 G-MG-1 G-MG-3 RST 11-12.3 RST 11-12.7	PST.02.02 PST.01.03 PST.02.01 CS.08.01 CS.08.02 CS.08.03	2
10. Apply principles of arc welding by performing common welds, identifying welding equipment, and answering welding-related questions				G-CO-1 G-CO-6 G-CO-7 G-CO – 12 G-GMD-4 G-MG-1 G-MG-3 RST 11-12.3 RST 11-12.7	PST.02.02 PST.04.04.07.c PST.01.03 PST.02.01 CS.06.03 CS.07.01 CS.07.04 CS.08.01	4

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				SL11-12.4	CS.08.02 CS.08.03	
<p>ASSESSMENT DESCRIPTIONS*: (Write a brief overview here. Identify Formative/Summative. Actual assessments will be accessed by a link to PDF file or Word doc.)</p> <p>Students will perform a series of welds determined by the instructor, identify arc-welding equipment, and answer questions about arc welding equipment and procedures. This activity is modeled on the arc-welding portion of the Agricultural Mechanics Career Development Event.</p> <p>Assessment will be based on the ability to safely and correctly perform the assigned welding procedures and on the accuracy of responses to the identification and written assessment portions of the activity.</p> <p>*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 #.)</p>						
Obj. #	INSTRUCTIONAL STRATEGIES (research-based): (Teacher Methods)					
1-2	1. Lecture on welding safety and types of metal.					
1-10	2. Demonstration on the parts of the welder, how to identify metals, welds, etc. Provide examples of improper welds.					
Obj. #	INSTRUCTIONAL ACTIVITIES: (What Students Do)					
1-2	1. Students will engage in study questions in lessons 1 through 8.					
1-10	<p>2. Students will complete “JS 4.1, Welds in the Flat Position”; “JS 4.2, Welds in the Horizontal Position”; “JS 4.3, Welds in the Vertical-Up Position”; “JS 4.4, Welds in the Vertical-Down Position”; “JS 4.5, Welds in the Overhead Position”; “JS 5.1, Prewelding and Postwelding Procedures for GMAW”; “JS 5.2, Welds in the Flat Position”; “JS 5.3, Welds in the Horizontal Position”; “JS 5.4, Welds in the Vertical Position”; “JS 5.5, Welds in the Overhead Position”; “JS 6.1, Hardsurfacing”; “JS 7.1, Welding Cast Iron”; “JS 8.1, Pipe Welding T-Joints”; “JS 8.2, Laying Out Angles”; “JS 8.3, Closing the End of Pipe — Orange-Peel Plug”; “JS 8.4, Butt Joint — Repositioned”; and “JS 8.5, Butt Joint — Not Repositioned.”</p>					
1-10	<p>3. Additional activities that relate to the unit objective can be found under the heading “Other Activities” in the following locations: pp. I-5–I-6 (1, 2, 3), p. I-17 (2), p. I-29 (1, 2, 3, 4), p. I-82 (3), p. I-119 (1), p. I-133 (3), and p. I-147 (3, 4).</p>					

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UNIT RESOURCES: (include internet addresses for linking)

- *Agricultural Construction Volume I*. University of Missouri-Columbia, Instructional Materials Laboratory, 1989. www.mcce.org
- American Welding Society. Accessed January 15, 2012, from <http://www.aws.org/>.
- ESAB Knowledge Centre. ESAB. Accessed January 15, 2012, from <http://www.esab.com/global/en/education/index.cfm>.
- Hobart Institute of Welding Technology. Accessed January 15, 2012, from <http://www.welding.org/>.
- Lincoln Electric. Accessed January 15, 2012, from <http://www.lincolnelectric.com/>.
- Machinery & Vehicle Safety: Welding. National Ag Safety Database. Accessed April 27, 2012, from <http://nasdonline.org/browse/229/welding.html>
- Miller Electric. Accessed January 15, 2012, from <http://www.millerwelds.com/>.
- *Missouri CDE Handbook*. Accessed January 15, 2012, from http://www.dese.mo.gov/divcareered/ag_cde_guidelines.htm.
- Missouri FFA Agricultural Mechanics Career Development Event. Accessed January 15, 2012, from <http://web.missouri.edu/~pavt0689/statecon.html>