RESEARCH & CURRICULUM UNIT
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SEC – Welding Blueprints

This document contains the blueprints for the concentration areas in secondary Welding.

Course Code(s)	Test Code	Program Name	Supplemental Materials/Notes
993300, 993302, 993303	11352Y1-2014	Welding	
993301, 993304, 993306	11352Y2-2014	Welding	

	Perkins Assessment 2016-17		Teacher Evaluation Pilot 2016-17			
Curriculum	**Y1 Post-Test**	**Y2 Post-Test**	**Y1 Baseline**	**Y1 Post-Test**	**Y2 Baseline**	**Y2 Post-Test**
Welding	MS-CPAS2*	MS-CPAS2*	NA*	NA*	NA*	NA*

* These assessments are subject to change based on funding and policy changes/updates.
Information for test coordinators will be disseminated on the ordering process for the national certification by the Research and Curriculum Unit at Mississippi State University.

MS-CPAS2 Blueprint Summary

Assessment: Welding
Test Code: 11352Y1-2014
CIP Code: 480508
Course Codes: 993300, 993302, 993303
Type: CP

The MS-CPAS2 Blueprint Summary indicates the number of assessment questions related to each unit on the assessment and indicates the relative emphasis placed on each unit. All of the listed competencies will appear on the assessment, but because of the length of the assessment, not every competency will be equally represented in the assessment.

The MS-CPAS2 Blueprint Summary includes a variety of information, which is explained below:

Terms and Definitions	
Assessment:	This signifies the name of the assessment, which corresponds with the name of the pathway or program.
CIP Code:	Developed by the U.S. Department of Education's National Center for Education Statistics (NCES), CIP codes are a federal coding system utilized for assessment and reporting of fields of study and program completions activity tracking.
Test Code:	A unique code that serves to numerically identify a specific assessment
DOK Levels:	Based on Webb's Depth of Knowledge (DOK), this signifies the assessment item difficulty factor to be expected in each unit. The three levels are as follows: *1 = Recall and Reproduction, 2 = Skills and Concepts, 3 = Short-term Strategic Thinking* **Some postsecondary programs will not use DOK levels until the next revision.**
Instructional	The total number of hours assigned to a unit per the pathway's curriculum
Total Items:	The total number of items assigned to each unit on the assessment. It is calculated as follows: *(Unit Instructional Hours / Total Instructional Hours) * Total Active Items*
Active Items:	The number of items on the assessment that will be graded
Field-test Items:	The number of items that are being field-tested, or piloted, to determine their eligibility for inclusion as an Active Item on future assessments. These items are not graded and, thus, will not impact the student's final score.
Total Assessed Items:	The total number of items on the given assessment. It is calculated as follows: *Active Items + Field-test Items*

For more information regarding this MS-CPAS2 Blueprint Summary, please contact the Mississippi Assessment Center by phone at 1.866.901.7433 or by e-mail at helpdesk@rcu.msstate.edu.

Assessment: Welding **Test Code:** 11352Y1-2014 **CIP Code:** 480508 **Total Hours:** 185	**DOK Level(s)**			**Instructional Hours**	**Total Items**
Unit 1: Not on CPAS					
Unit 2: Basic Safety	**1**	**2**		**15**	**8**
1. Describe, define, and illustrate general safety rules for working in a shop or lab and how they relate to the construction industry. 2. Identify and apply safety around welding operations. 3. Display appropriate safety precautions to take around common job site hazards. 4. Demonstrate the appropriate use and care of personal protective equipment (PPE). 5. Explain fall protection, ladder, stair, and scaffold procedures and requirements. 6. Explain the material safety data sheet (MSDS). 7. Display appropriate safety procedures related to fires. 8. Explain safety in and around electrical situations.					
Unit 3: Introduction to Construction Math	**1**	**2**		**15**	**6**
1. Apply the four basic math skills using whole numbers, fractions, decimals, and percentages, both with and without a calculator.					
Unit 4: Hand and Power Tools	**1**	**2**		**15**	**6**
1. Demonstrate the use and maintenance of hand and power tools.					
Unit 5: Introduction to Blueprints and Basic Rigging	**1**	**2**	**3**	**15**	**6**
1. Read, analyze, and understand basic components of a basic blueprint. 2. Identify and use basic rigging tools found in the welding trade, describe how each is used, and discuss proper care and maintenance of the tools.					
Unit 6: Introduction to Materials Handling	**1**	**2**		**8**	**3**
1. Safely handle and store materials.					
Unit 7: Base Metal Preparation and Weld Quality, Joint Fit-up and Alignment, and Oxyfuel Cutting	**1**	**2**		**62**	**27**
1. Explore regulations and job code specifications for welding, base metal cleaning, joint designs and their purpose. 2. Identify fit-up gauges and measuring devices to check joint fit-up. 3. Demonstrate the use of fit-up gauges and measuring devices to check joint fit-up. 4. Discuss the various fit-up tools. 5. Demonstrate the proper way to fit-up joints using the various fit-up tools. 6. Explain distortion. 7. Identify joint misalignment and poor fit-up before and after welding. 8. Identify and describe the basic equipment, setup, and safety rules for proper use of equipment, and prepare base metal for oxyfuel cutting.					

Unit 8: Shielded Metal Arc Welding (SMAW)	**1**	**2**		**55**	**24**
1. Explain safety hazards, protective devices used, and how to avoid accidents that commonly occur in the welding trade. 2. Identify types of shielded metal arc welding machines and their accessories. 3. Select shielded metal arc electrodes for welding applications. 4. Setup and make beads and fillet welds.					
				Active Items	**80**
				Field-Test Items	**20**
				TOTAL ASSESSED ITEMS	**100**

MS-CPAS2 Blueprint Summary

Assessment: Welding
Test Code: 11352Y2-2014
CIP Code: 480508
Course Codes: 993301, 993304, 993306
Type: CP

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Terms and Definitions	
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Instructional Hours:	The total number of hours assigned to a unit per the pathway's curriculum
Total Items:	The total number of items assigned to each unit on the assessment. It is calculated as follows: *(Unit Instructional Hours / Total Instructional Hours) * Total Active Items*
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Total Assessed Items:	The total number of items on the given assessment. It is calculated as follows: *Active Items + Field-test Items*

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Center by phone at 1.866.901.7433 or by e-mail at helpdesk@rcu.msstate.edu.

Assessment: Welding **Test Code:** 11352Y2-2014 **CIP Code:** 480508 **Total Hours:** 212	**DOK Level(s)**			**Instructional Hours**	**Total Items**
Unit 9: Not on CPAS					
Unit 10: Welding Symbols and Reading Welding Detail Drawings	**1**	**2**		**15**	**6**
1. Examine the various parts of a welding symbol. 2. Discuss fillet and groove weld symbols. 3. Identify the various welding symbols on drawings, specifications, and welding procedure specifications. 4. Interpret welding symbols from a blueprint. 5. Examine a welding detail drawing. 6. Discuss notes and bill of materials. 7. Interpret basic elements of a welding detail drawing. 8. Demonstrate how to sketch or draw basic welding drawings.					
Unit 11: Plasma Arc Cutting (PAC) and Carbon Arc Cutting and Gouging (CAC-A)	**1**	**2**		**15**	**6**
1. Explain the plasma arc cutting (PAC) process. 2. Identify PAC equipment and accessories. 3. Set up and perform various types of cuts using PAC equipment. 4. Properly store equipment and clean the work area after use. 5. Explain the air carbon arc cutting (CAC-A) process. 6. Identify the various CAC-A electrodes. 7. Perform washing and gouging activities using CAC-A equipment.					
Unit 12: Advanced Shielded Metal Arc Welding (SMAW)	**1**	**2**		**102**	**38**
1. Review safety hazards, protective devices used, and basic operation of SMAW equipment. 2. Discuss the various groove welds with and without backing. 3. Discuss and demonstrate proper SMAW equipment setup for making V-groove welds. 4. Prepare materials to perform SMAW V-groove welds with and without backing. 5. Setup and perform SMAW V-groove welds with and without backing in the 1G, 2G, 3G and 4G positions.					

Unit 13: Gas Metal Arc Welding and Flux-core Arc Welding	1	2		80	30
1. Explain the GMAW and FCAW welding processes. 2. Explain the use of GMAW and FCAW equipment parts and modes. 3. Demonstrate proper setup of GMAW and FCAW equipment. 4. Setup and perform GMAW-S (short-circuit) multiple-pass fillet welds on carbon steel plate coupons in multiple positions, using solid or composite wire and shielding gas. 5. Setup and perform GMAW-S (short-circuit) multiple-pass V-groove welds on carbon steel plate coupons in multiple positions (with or without backing), using solid or composite wire and shielding gas. 6. Setup and perform FCAW multiple-pass fillet welds on carbon steel plate coupons in multiple positions, using flux-cored wire and, if required, shielding gas. 7. Setup and perform FCAW multiple-pass V-groove welds on carbon steel plate coupons in multiple positions (with or without backing) using flux-cored wire and, if required, shielding gas.					
				Active Items	**80**
				Field-Test Items	**20**
				TOTAL ASSESSED ITEMS	**100**