Welding Technology Program Standards Criticality Survey 2014

	CONTENT STANDARD 1.0: IDENTIFY LAB ORGANIZATIONS AND SAFETY PROCEDURES				
	Performance Standard 1.1: Demonstrate General Lab Safety Rules and Procedures				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
1.1.1	Describe general shop safety rules and procedures (e.g., safety test).	0	5	19	2.79
1.1.2	Describe OSHA in workplace safety.	3	11	10	2.29
1.1.3	Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities (e.g., personal protection equipment – PPE).	0	2	22	2.92
1.1.4	Operate lab equipment according to safety guidelines.	0	7	17	2.71
1.1.5	Identify and use proper lifting procedures and proper use of support equipment (e.g., rigging, chains, straps, cables).	0	6	18	2.75
1.1.6	Utilize proper ventilation procedures for working within the lab/shop area.	0	10	14	2.58
1.1.7	Identify marked safety areas.	1	10	13	2.50
1.1.8	Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.	0	8	16	2.67
1.1.9	Identify the location and use of eye wash stations.	1	8	15	2.58
1.1.10	Identify the location of the posted evacuation routes.	1	10	13	2.50
1.1.11	Identify and wear appropriate clothing for lab/shop activities.	1	6	16	2.65
1.1.12	Secure hair and jewelry for lab/shop activities.	2	9	13	2.46
1.1.13	Demonstrate knowledge of the safety aspects of high voltage circuits.	2	5	17	2.63
1.1.14	Locate and interpret material safety data sheets (MSDS).	4	12	8	2.17
1.1.15	Perform housekeeping duties.	5	13	6	2.04
1.1.16	Follow verbal instructions to complete work assignments.	0	14	10	2.42

1.1.17	Follow written instructions to complete work assignments.	0	14	10	2.42
1.1.18	Identify requirements for Hot Work Permits.	5	9	10	2.21
1.1.19	Identify what constitutes a confined space.	5	7	12	2.29
				Answered	**24**
				Skipped	**0**

	Performance Standard 1.2: Identify and Utilize Proper Tools				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
1.2.1	Identify hand tools and their appropriate usage.	3	14	6	2.13
1.2.2	Identify standard and metric designation	9	12	2	1.70
1.2.3	Demonstrate safe handling and use of appropriate tools.	0	14	9	2.39
1.2.4	Demonstrate proper cleaning, storage, and maintenance of tools.	4	16	3	1.96
				Answered	**23**
				Skipped	**1**

	Performance Standard 1.3: Identify and Utilize Power Tools and Equipment				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
1.3.1	Identify power tools and equipment, and their appropriate usage.	0	18	6	2.25
1.3.2	Demonstrate safe handling and use of appropriate power tools and equipment.	0	12	11	2.48
1.3.3	Demonstrate proper cleaning, storage, and maintenance of power tools and equipment.	4	16	4	2.00
				Answered	**24**
				Skipped	**0**

	CONTENT STANDARD 2.0: APPLY FUNDAMENTAL PRINT READING, MEASUREMENT, AND LAYOUT/FIT-UP TECHNIQUES				
	Performance Standard 2.1: Demonstrate Print Reading and Sketching Practices				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
2.1.1	Interpret basic elements of a technical drawing (e.g., title block information, dimensions, line types).	3	14	7	2.17
2.1.2	Identify and explain industry standard welding symbols.	0	15	9	2.38
2.1.3	Prepare a materials list from a technical drawing (e.g., bill of material).	7	15	2	1.79
2.1.4	Describe various types of drawings (e.g., part, assembly, pictorial, orthographic, isometric, schematic).	13	11	0	1.46
2.1.5	Understand dimensioning, sectional drawings, fasteners, tables, charts, and assembly drawings.	5	16	3	1.92
2.1.6	Sketch or draw a basic welding drawing.	11	12	1	1.58
2.1.7	Fabricate parts from a drawing or sketch.	0	14	10	2.42
				Answered	**24**
				Skipped	**0**

	Performance Standard 2.2: Demonstrate Measuring and Scaling Techniques				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
2.2.1	Identify industry standard units of measure.	3	15	6	2.13
2.2.2	Convert between customary (e.g., SAE, Imperial) and metric systems.	11	11	2	1.63
2.2.3	Measure and calculate size, area, and volume.	8	14	2	1.75
2.2.4	Determine and apply the equivalence between fractions and decimals.	4	16	4	2.00
2.2.5	Identify measuring tools.	0	18	4	2.18
				Answered	**24**
				Skipped	**0**

	Performance Standard 2.3: Utilize Layout Principles and Practices				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
2.3.1	Interpret drawing, sketch, or specification information.	3	17	4	2.04
2.3.2	Prepare work area for layout.	2	19	3	2.04
2.3.3	Select appropriate materials to complete work assignment.	3	13	8	2.21
2.3.4	Use layout and marking tools as required.	2	18	4	2.08
2.3.5	Layout parts using measurement practices.	0	19	5	2.21
				Answered	**24**
				Skipped	**0**

	Performance Standard 2.4: Demonstrate Preparation and Fit-Up Practices				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
2.4.1	Identify and explain job specifications.	3	16	5	2.08
2.4.2	Use fit-up gauges and measuring devices to check joint fit-up.	4	15	5	2.04
2.4.3	Identify and explain distortion and how it is controlled.	4	17	3	1.96
2.4.4	Fit-up joints using plate and pipe fit-up tools.	4	17	3	1.96
2.4.5	Check for joint misalignment and poor fit-up before and after welding.	3	14	7	2.17
				Answered	**24**
				Skipped	**0**

	CONTENT STANDARD 3.0: IDENTIFY PROPERTIES OF MATERIALS				
	Performance Standard 3.1: Identify Material Properties and Science				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
3.1.1	Identify the difference between ferrous and non-ferrous metals.	1	17	6	2.21
3.1.2	Identify and explain forms and shapes of structural metals.	5	14	5	2.00
	Explain AWS filler metal classifications systems.	8	12	4	1.83
	Identify different types of filler metals.	4	18	2	1.92
	Explain the storage and control of filler metals.	4	18	2	1.92
				Answered	**24**
				Skipped	**0**

	Performance Standard 3.2: Identify Filler Materials				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
3.2.1	Explain AWS filler metal classifications systems	11	10	3	1.67
3.2.2	Identify different types of filler metals.	5	17	2	1.88
3.2.3	Explain the storage and control of filler metals.	4	19	1	1.88
				Answered	**24**
				Skipped	**0**

	CONTENT STANDARD 4.0: APPLY SHIELDED METAL ARC WELDING (SMAW) TECHNIQUES				
	Performance Standard 4.1: Safety Procedures				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
4.1.1	Identify and explain different types of welding current and polarity.	2	15	6	2.17
4.1.2	Perform safety inspections of SMAW equipment and accessories.	3	16	4	2.04
4.1.3	Maintain SMAW equipment and accessories.	3	19	1	1.91
				Answered	**23**
				Skipped	**1**

	Performance Standard 4.2: Produce Welds Using SMAW on Carbon Steel				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
4.2.1	Set up for SMAW operations.	5	15	3	1.91
4.2.2	Operate SMAW equipment.	4	16	3	1.96
4.2.3	Perform welds in the 1F position.	5	14	4	1.96
4.2.4	Perform welds in the 2F position.	4	15	4	2.00
4.2.5	Perform welds in the 3F position.	5	15	3	1.91
4.2.6	Perform welds in the 4F position.	6	14	3	1.87
4.2.7	Perform welds in the 1G position.	5	14	4	1.96
4.2.8	Perform welds in the 2G position.	4	15	4	2.00
4.2.9	Perform welds in the 3G position.	5	15	3	1.91
4.2.10	Perform welds in the 4G position.	6	14	3	1.87
4.2.11	Describe 2G, 5G and 6G welding positions.	6	14	3	1.87
				Answered	**23**
				Skipped	**1**

	CONTENT STANDARD 5.0: APPLY GAS METAL ARC WELDING (GMAW-S, GMAW) TECHNIQUES				
	Performance Standard 5.1: Utilize Safety Procedures				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
5.1.1	Identify and explain the use of GMAW equipment (e.g., spray transfer, globular, short circuit, pulse).	5	13	5	2.00
5.1.2	Perform safety inspections of GMAW equipment and accessories.	5	14	4	1.96
5.1.3	Maintain GMAW equipment and accessories.	2	18	3	2.04
5.1.4	Demonstrate safe startup, shutdown, disassembly, and cylinder exchange procedures of GMAW equipment.	1	15	7	2.26
				Answered	**23**
				Skipped	**1**

	Performance Standard 5.2: Produce Welds Using GMAW-S on Carbon Steel				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
5.2.1	Set up for GMAW-S operations.	4	11	8	2.17
5.2.2	Operate GMAW-S equipment.	2	13	8	2.26
5.2.3	Perform welds in the 1F position.	4	10	9	2.22
5.2.4	Perform welds in the 2F position.	3	11	9	2.26
5.2.5	Perform welds in the 3F position.	4	11	8	2.17
5.2.6	Perform welds in the 4F position.	4	12	7	2.13
5.2.7	Perform welds in the 1G position.	4	10	9	2.22
5.2.8	Perform welds in the 2G position.	3	11	9	2.26
5.2.9	Perform welds in the 3G position.	4	11	8	2.17
				Answered	**23**
				Skipped	**1**

	CONTENT STANDARD 6.0: APPLY FLUX CORED ARC WELDING (FCAW-G) TECHNIQUES				
	Performance Standard 6.1: Utilize Safety Procedures				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
6.1.1	Identify and explain the use of FCAW-G equipment.	3	17	2	1.95
6.1.2	Perform safety inspections of FCAW-G equipment and accessories.	3	17	2	1.95
6.1.3	Maintain FCAW-G equipment and accessories.	2	18	2	2.00
6.1.4	Demonstrate safe startup, shutdown, disassembly, and cylinder exchange procedures of FCAW-G equipment.	1	15	5	2.19
				Answered	**22**
				Skipped	**2**

	Performance Standard 6.2: Produce Welds Using FCAW-G on Carbon Steel				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
6.2.1	Set up for FCAW-G operations.	4	11	7	2.14
6.2.2	Operate FCAW-G equipment.	2	13	7	2.23
6.2.3	Perform welds in the 1F position.	4	11	7	2.14
6.2.4	Perform welds in the 2F position.	3	12	7	2.18
6.2.5	Perform welds in the 3F position.	4	11	7	2.14
6.2.6	Perform welds in the 4F position.	5	11	6	2.05
6.2.7	Perform welds in the 1G position.	5	10	7	2.09
6.2.8	Perform welds in the 2G position.	4	11	7	2.14
6.2.9	Perform welds in the 3G position.	5	11	6	2.05
				Answered	**22**
				Skipped	**2**

	CONTENT STANDARD 7.0: APPLY GAS TUNGSTEN ARC WELDING (GTAW) TECHNIQUES				
	Performance Standard 7.1: Utilize Safety Procedures				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
7.1.1	Perform safety inspections of GTAW equipment and accessories.	4	14	4	2.00
7.1.2	Maintain GTAW equipment and accessories.	3	16	3	2.00
7.1.3	Demonstrate safe startup, shutdown, disassembly, and cylinder exchange procedures of GTAW equipment.	2	16	4	2.09
				Answered	**22**
				Skipped	**2**

	Performance Standard 7.2: Produce Welds Using GTAW on Carbon Steel				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
7.2.1	Set up for GTAW operations.	5	14	3	1.91
7.2.2	Operate GTAW equipment.	3	16	3	2.00
7.2.3	Perform welds in the 1F position.	4	15	3	1.95
7.2.4	Perform welds in the 2F position.	4	15	3	1.95
7.2.5	Perform welds in the 3F position.	5	14	3	1.91
7.2.6	Perform welds in the 1G position.	4	15	3	1.95
7.2.7	Perform welds in the 2G position.	4	15	3	1.95
7.2.8	Perform welds in the 3G position.	5	14	3	1.91
				Answered	**22**
				Skipped	**2**

	Performance Standard 7.3: Produce Welds Using GTAW on Aluminum				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
7.3.1	Set up for GTAW operations.	9	10	3	1.73
7.3.2	Operate GTAW equipment.	7	12	3	1.82
7.3.3	Perform welds in the 1F position.	9	10	3	1.73
7.3.4	Perform welds in the 2F position.	10	9	3	1.68
				Answered	**22**
				Skipped	**2**

	CONTENT STANDARD 8.0: APPLY THERMAL CUTTING PROCESS				
	Performance Standard 8.1: Demonstrate Oxy-Fuel Gas Cutting (OFC)				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
8.1.1	Perform safety inspections of OFC equipment and accessories.	2	9	11	2.41
8.1.2	Maintain OFC equipment and accessories.	2	16	4	2.09
8.1.3	Demonstrate safe startup, shutdown, disassembly, and cylinder exchange procedures of OFC equipment.	2	10	10	2.36
8.1.4	Set up for OFC operations.	4	14	4	2.00
8.1.5	Operate OFC equipment.	2	14	6	2.18
8.1.6	Perform straight, square edge cutting operations in the flat position.	3	12	7	2.18
8.1.7	Perform shape, square edge cutting operations in the flat position.	3	13	6	2.14
8.1.8	Perform straight, bevel edge cutting operations in the flat position.	4	13	5	2.05
8.1.9	Perform scarfing and gouging operations to remove base and weld metal, in flat and horizontal positions.	10	7	5	1.77
				Answered	**22**
				Skipped	**2**

	Performance Standard 8.2: Demonstrate Plasma Arc Cutting (PAC) on Carbon Steel and Aluminum				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
8.2.1	Explain the PAC process.	3	17	2	1.95
8.2.2	Determine the appropriate PAC settings for the various types of metals.	3	15	4	2.05
8.2.3	Perform safety inspections of PAC equipment and accessories.	2	15	5	2.14
8.2.4	Maintain PAC equipment and accessories.	2	17	3	2.05
8.2.5	Set up for PAC operations.	2	15	5	2.14
8.2.6	Operate PAC equipment.	1	16	5	2.18
8.2.7	Perform straight, square edge cutting operations in the flat position.	3	14	5	2.09
8.2.8	Perform shape, square edge cutting operations in the flat position.	3	14	5	2.09
				Answered	**22**
				Skipped	**2**

	Performance Standard 8.3: Demonstrate Manual Air Carbon Arc Cutting (CAC-A)				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
8.3.1	Performs safety inspections of manual CAC-A equipment and accessories.	7	12	3	1.82
8.3.2	Maintain CAC-A equipment and accessories.	7	14	1	1.73
8.3.3	Set up manual CAC-A scarfing and gouging operation on carbon steel.	7	14	1	1.73
8.3.4	Operate manual CAC-A equipment on carbon steel.	7	14	1	1.73
8.3.5	Perform scarfing and gouging operations to remove base and weld metal in the flat and horizontal positions on carbon steel.	8	13	1	1.68
				Answered	**22**
				Skipped	**2**

	CONTENT STANDARD 9.0: IDENTIFY WELDING CODES, INSPECTIONS, AND TESTING PRINCIPLES				
	Performance Standard 9.1: Identify Welding Codes, Qualifications, and Certifications				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
9.1.1	Identify and explain weld imperfections and their causes.	3	15	4	2.05
9.1.2	Identify and explain welder qualification tests.	7	12	3	1.82
9.1.3	Explain the importance of quality workmanship.	0	13	9	2.41
9.1.4	Identify common destructive testing methods.	9	10	3	1.73
9.1.5	Perform a visual inspection of fillet welds.	1	15	6	2.23
				Answered	**22**
				Skipped	**2**

	Performance Standard 9.2: Demonstrate Welding Inspection and Testing Principles				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
9.2.1	Define the role of welding inspection/inspector and testing in industry.	10	9	3	1.68
9.2.2	Examine cut surfaces and edges of prepared base metal parts.	6	12	4	1.91
9.2.3	Examine tack, root passes, intermediate layers, and completed welds.	4	12	6	2.09
				Answered	**22**
				Skipped	**2**

	CONTENT STANDARD 10.0: APPLY FABIRACTION FUNDAMENTALS				
	Performance Standard 10.1: Utilize Base Metal Preperation Fundamentals				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
10.1.1	Clean base metal for welding or cutting.	0	13	9	2.41
10.1.2	Identify and explain joint design.	3	12	7	2.18
10.1.3	Select the proper joint design based on a welding procedure specification (WPS) or instructor's direction.	2	12	8	2.27
10.1.4	Mechanically bevel the edge of a mild steel plate (e.g., hand beveller, grinder).	1	13	8	2.32
10.1.5	Thermally bevel the end of a mild steel plate.	2	15	5	2.14
				Answered	**22**
				Skipped	**2**

	Performance Standard 10.2: Demonstrate Fabrication Techniques				
	Answer Choices	**Nice to Know**	**Need to Know**	**Critical to Know**	**Rating Average**
10.2.1	Demonstrate proper setup of fabrication area, equipment, and materials.	2	11	9	2.32
10.2.2	Construct projects in the proper sequence.	2	10	10	2.36
10.2.3	Properly layout projects from welding prints.	1	11	9	2.38
10.2.4	Check work for accuracy.	0	13	9	2.41
				Answered	**22**
				Skipped	**2**