



Multi-State Advanced Manufacturing Consortium

US DOL SPONSORED TAACCCT GRANT: TC23767

MSAMC Master Performance Based Objectives (PBO) Review Template

Instructions

The following tab lists PBOs for the topic areas *Welding*. Please review each of the PBOs, and rate each PBO with one of the following ratings:

- 1 = Skill or understanding is required for students.
- 2 = Skill is useful, but is not crucial for students to know.
- 3 = Skill is not useful for students, or isn't relevant for typical work assignments.
- 0 = PBO is unclear.

Additionally, for each PBO please

- * Note any comments or recommendations that you may have about how to improve the PBO.
- * Indicate whether each PBO is covered in your college's aligned courses, and how (written, lab demo, exercise).

If any PBOs or skill sets seem to be missing from the list, please add them in the space at the bottom of the list.

Please enter your information below

Name:	
Institution:	
Date:	
Email:	
Phone:	

20150626_pbo_review_acad_welding

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Welding

M-S AMC Academic Partner PBO Review

Please enter your information below

Name:	
Institution:	
Date:	
Email:	
Phone:	

Please indicate which course or courses delivered at your institution align with, or cover, the listed objective

Aligned Course(s)	1	Enter course code here
	2	Enter course code here
	3	Enter course code here

*** Note:** For each covered PBO, indicate in which of the aligned courses, documented at left, the PBO would be most extensively covered. If there is only one course listed to the left, then you do not have to complete the "Aligned Course" column.

Sub-Topic	Level	Topic	PBO ID	Performance Based Objective (PBO)	Importance, 1 = Need 2 = Nice to have 3 = N/A 0 = Don't understand	Covered - Written Assignment / Reading?	Covered - Exercise or Assessment?	Aligned Course *	Comments <i>Notes to improve the PBO, PBO is unclear, lacking equipment to cover, etc.</i>
						Y/N	Y/N		
Weld Joint Design and Prep		WD	1	Demonstrate proper welding safety in the lab environment.					
		WD	2	Interpret an industrial drawing with welding symbols.					
		WD	3	Identify welding joints and welding positions.					
		WD	4	Interpret welding terms.					
		WD	5	Identify the correct welding code for a given weldment.					
		WD	6	Demonstrate satisfactory knowledge of measuring tools used on weld and weldments.					
		WD	7	Demonstrate satisfactory knowledge of hand tool safety.					
		WD	8	Use hand tools properly.					
		WD	9	Identify welding flaws.					
		WD	10	Demonstrate proper set-up and use of an Oxy/Fuel cutting outfit.					
		WD	11	Demonstrate proper set-up and use of an Oxy/Fuel line cutter.					
		WD	12	Demonstrate proper set-up and use of a Plasma Arc Cutter.					
		WD	13	Demonstrate proper safety and use of power tools.					
		WD	14	Demonstrate fillet and groove joint assembly.					
Shielded Metal Arc Welding		WD	15	Demonstrate proper safety practices for Shielded Metal Arc Welding.					
		WD	16	Apply the proper welding machine settings for a given competency using the Shielded Metal Arc Welding process.					
		WD	17	Identify and explain various welding electrodes used in the Shielded Metal Arc Welding process.					
		WD	18	Demonstrate proper welding technique in flat position using the Shielded Metal Arc Welding process.					
		WD	19	Demonstrate proper welding technique in horizontal position using the Shielded Metal Arc Welding process.					
		WD	20	Perform multiple welds using proper welding technique for a given weldment.					
		WD	21	Demonstrate proper safety practices for Shielded Metal Arc Welding.					
		WD	22	Apply the proper welding machine settings for a given competency using the Shielded Metal Arc Welding process.					
		WD	23	Demonstrate proper welding technique in vertical position using the Shielded Metal Arc Welding process.					
		WD	24	Perform welds using proper preparation and welding technique for a given weldment.					
		WD	25	Demonstrate proper safety practices for Shielded Metal Arc Welding.					
		WD	26	Apply the proper welding machine settings for a given competency using the Shielded Metal Arc Welding process.					
		WD	27	Demonstrate proper welding technique in overhead position using the Shielded Metal Arc Welding process.					

		WD	28	Perform welds using proper preparation and welding technique for a given weldment.					
Gas Tungsten Arc Welding		WD	29	Demonstrate proper safety practices for the Gas Tungsten Arc Welding process.					
		WD	30	Prepare the Gas Tungsten Arc Welding machine for a given metal type and thickness.					
		WD	31	Select the proper filler metal for a given weldment using the Gas Tungsten Arc Welding process.					
		WD	32	Demonstrate the proper welding technique in flat position with steel.					
		WD	33	Demonstrate the proper welding technique in horizontal position with steel.					
		WD	34	Demonstrate the proper welding technique in flat position with stainless steel.					
		WD	35	Demonstrate the proper welding technique in horizontal position with stainless steel.					
		WD	36	Perform welds using proper preparation and welding technique for a given weldment.					
		WD	37	Demonstrate the proper welding technique in vertical position with steel.					
		WD	38	Demonstrate the proper welding technique in vertical position with stainless steel.					
		WD	39	Perform welds using proper preparation and welding technique for a given weldment.					
		WD	40	Demonstrate the proper welding technique in flat position with aluminum.					
		WD	41	Demonstrate the proper welding technique in horizontal position with aluminum.					
		WD	42	Demonstrate the proper welding technique in vertical position with aluminum.					
	Gas Metal Arc Welding		WD	43	Perform welds using proper preparation and welding technique for a given weldment.				
		WD	44	Demonstrate proper safety practices for the Gas Metal Arc Welding process.					
		WD	45	Prepare the Gas Metal Arc Welding machine for a given metal type and thickness.					
		WD	46	Select the proper filler metal for a given weldment using the Gas Metal Arc Welding process.					
		WD	47	Demonstrate the proper welding technique in flat position.					
		WD	48	Demonstrate the proper welding technique in horizontal position.					
		WD	49	Perform welds using proper preparation and welding technique for a given weldment.					
		WD	50	Demonstrate the proper welding technique in vertical position.					
Weld Metallurgy		WD	51	Demonstrate the proper welding technique in overhead position.					
		WD	52	Perform welds using proper preparation and welding technique for a given weldment.					
		WD	53	Describe different types of ferrous metal.					
		WD	54	Describe the crystal structure of carbon steels.					
		WD	55	Describe the effects of heat treating on carbon steel.					
		WD	56	Explain the effects of heating and cooling of steel using the Iron/Carbon phase diagram.					
		WD	57	Describe different types of non ferrous metals.					
		WD	58	Identify and explain phase diagrams.					
		WD	59	Explain the effects of alloying on non ferrous metals.					
		WD	60	Explain the effects of heat treating of non ferrous metals.					
		WD	61	Identify and explain bend and break tests as destructive weld tests.					
		WD	62	Identify and explain various non destructive weld tests.					
		WD	63	Demonstrate destructive weld test procedures.					
		WD	64	Demonstrate non destructive weld test procedures.					
	WD	65	Evaluate destructive and non destructive weld test results.						
	WD	66	Explain the heat affected zone in a welded joint.						
	WD	67	Demonstrate proper safety practices for pipe welding.						

Pipe Welding	WD	68	Identify and explain the 2G and 5G pipe welding positions.					
	WD	69	Demonstrate the proper alignment techniques for welded pipe joints.					
	WD	70	Demonstrate proper welding technique for an open root pass on plate.					
	WD	71	Perform a weld using the proper techniques for the 2G and 5G positions using the Shielded Metal Arc Welding process.					
	WD	72	Perform a weld using the proper techniques for the 2G and 5G positions using the Gas Tungsten Arc Welding process.					
	WD	73	Demonstrate proper safety practices for pipe welding.					
	WD	74	Identify and explain the 6G pipe welding positions.					
	WD	75	Demonstrate the proper alignment techniques for welded pipe joints.					
	WD	76	Perform a weld using the proper techniques for the 6G positions using the Shielded Metal Arc Welding process.					
	WD	77	Perform a weld using the proper techniques for the 6G positions using the Gas Tungsten Arc Welding process.					
	WD	78	Demonstrate proper safety practices for pipe welding.					
	WD	79	Identify and explain a socket pipe joint.					
	WD	80	Identify and explain a flanged pipe joint.					
	WD	81	Demonstrate the proper alignment techniques for the socket and flanged pipe joints.					
Tool and Die Welding	WD	82	Perform a weld using the proper techniques for the socket and flanged pipe joint using the Shielded Metal Arc Welding process.					
	WD	83	Demonstrate proper safety practices for tool and die welding.					
	WD	84	Identify and explain tool steels.					
	WD	85	Identify the proper filler metals used in the repair of tools and dies.					
	WD	86	Explain the proper preparation techniques for the repair of a tool or a die.					
	WD	87	Explain the proper welding procedures for the repair of a tool or die.					
	WD	88	Demonstrate proper preparation techniques for the repair of a tool or die.					
	WD	89	Perform a weld using the proper techniques for the repair of a tool or die using the Gas Tungsten Arc Welding process.					
	WD	90	Demonstrate the proper preparation techniques for the repair of a tool or die.					
	WD	91	Perform a weld using the proper techniques for the repair of a tool or die using the Shielded Metal Arc Welding process.					
Shielded Metal Arc Welding - AWS Cert	WD	92	Demonstrate the proper technique for removing a broken bolt.					
	WD	93	Demonstrate assembly of a test weld following the American Welding Society D1.1 code.					
	WD	94	Perform a weld using the proper technique to successfully complete a weld following the American Welding Society D1.1 code.					
	WD	95	Perform the proper testing method to successfully complete a weld following the American Welding Society D1.1 code.					
	WD	96	Demonstrate assembly of a test weld following the American Welding Society D1.1 code.					
	WD	97	Perform a weld using the proper technique to successfully complete a weld following the American Welding Society D1.1 code.					
Gas Tungsten Arc Welding - AWS Cert	WD	98	Perform the proper testing method to successfully complete a weld following the American Welding Society D1.1 code.					
	WD	99	Demonstrate assembly of a test weld following the American Welding Society D1.1 code.					
	WD	100	Perform a weld using the proper technique to successfully complete a weld following the American Welding Society D1.1 code.					
	WD	101	Perform the proper testing method to successfully complete a weld following the American Welding Society D1.1 code.					

Welding AWS Cert	WD	102	Demonstrate assembly of a test weld following the American Welding Society D1.1 code.					
	WD	103	Perform a weld using the proper technique to successfully complete a weld following the American Welding Society D1.1 code.					
	WD	104	Perform the proper testing method to successfully complete a weld following the American Welding Society D1.1 code.					
Gas Metal Arc Welding AWS Cert	WD	105	Demonstrate assembly of a test weld following the American Welding Society D1.1 code.					
	WD	106	Perform a weld using the proper technique to successfully complete a weld following the American Welding Society D1.1 code.					
	WD	107	Perform the proper testing method to successfully complete a weld following the American Welding Society D1.1 code.					
	WD	108	Demonstrate assembly of a test weld following the American Welding Society D1.1 code.					
	WD	109	Perform a weld using the proper technique to successfully complete a weld following the American Welding Society D1.1 code.					
Welding Fabrication Project	WD	110	Perform the proper testing method to successfully complete a weld following the American Welding Society D1.1 code.					
	WD	111	Devise a product to be produced in the welding lab.					
	WD	112	Design the product to be made.					
	WD	113	Formulate a plan to be used to move this product to the fabrication stage.					
	WD	114	Determine materials used and material costs for the project.					
	WD	115	Prepare materials for the project.					
	WD	116	Perform the needed joining methods for the project.					
	WD	117	Prepare components to be used on the final project.					
WD	118	Examine and assess any flaws that need to be addressed before final assembly.						
WD	119	Construct the fabricated parts and components to produce a final product.						

Additions: Please add any additional objectives that we may have overlooked.



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