TRACK Welding Standards and Blueprint

STD. CODE	STANDARDS	COURSE 1	COURSE 2	COURSE 3	COURSE 4	TEST BLUEPRINT	75 QUESTIONS
OA	IDENTIFY LAB ORGANIZATION AND SAFETY PROCEDURES	Cutting Processes and Lab 480501	Gas Metal Arc Welding and Lab 480522	Shielded Metal Arc Welding (SMAW) and Lab 480521	SMAW Groove Welds with Backing Lab 480528	20%	15
OA1	**Demonstrate general lab safety rules and procedures (Many may be fulfilled with OSHA 10 modules)**						
	OA1.1 Describe general shop safety rules and procedures (i.e., safety test)						
	OA1.2 Describe OSHA in workplace safety						
	OA1.3 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities (i.e., personal protection equipment (PPE))						
	OA1.4 Operate lab equipment according to safety guidelines						
	OA1.5 Identify and use proper lifting procedures and proper use of support equipment (i.e., rigging, chains, straps, cables)						
	OA1.6 Utilize proper ventilation procedures for working within the lab/shop area						
	OA1.7 Identify marked safety areas						
	OA1.8 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						
	OA1.9 Identify the location and use of eye wash stations						
	OA1.10 Identify the location of the posted evacuation routes						
	OA1.11 Identify and wear appropriate clothing for lab/shop activities						
	OA1.12 Secure hair and jewelry for lab/shop activities						
	OA1.13 Demonstrate knowledge of the safety aspects of high voltage circuits						
	OA1.14 Locate and interpret material safety data sheets (MSDS)						
	OA1.15 Perform housekeeping duties						
	OA1.16 Follow verbal instructions to complete work assignments						
	OA1.17 Follow written instructions to complete work assignments						
	OA1.18 Identify requirements for Hot Work Permits						
	OA1.19 Identify what constitutes a confined space						

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OA2	**Identify and utilize proper tools**						
	OA2.1 Identify hand tools and their appropriate usage						
	OA2.2 Identify standard and metric designation						
	OA2.3 Demonstrate safe handling and use of appropriate tools						
	OA2.4 Demonstrate proper cleaning, storage, and maintenance of tools						
OA3	**Identify and utilize power tools and equipment**						
	OA3.1 Identify power tools and equipment, and their appropriate usage						
	OA3.2 Demonstrate safe handling and use of appropriate power tools and equipment						
	OA3.3 Demonstrate proper cleaning, storage, and maintenance of power tools and equipment						
OB	**APPLY FUNDAMENTAL MEASUREMENT AND LAYOUT/FIT-UP TECHNIQUES**	**Cutting Processes and Lab 480501**	**Gas Metal Arc Welding and Lab 480522**	**Shielded Metal Arc Welding (SMAW) and Lab 480521**	**SMAW Groove Welds with Backing Lab 480528**	**21%**	**16**
OB1	**Demonstrate measuring and scaling techniques**						
	OB1.1 Identify industry standard units of measure						
	OB1.2 Convert between customary (i.e., SAE, Imperial) and metric systems						
	OB1.3 Measure and calculate size, area, and volume						
	OB1.4 Determine and apply the equivalence between fractions and decimals						
	OB1.5 Identify measuring tools						
OB2	**Utilize layout principles and practices**						
	OB2.1 Interpret drawing, sketch or specification information						
	OB2.2 Prepare work area for layout						
	OB2.3 Select appropriate materials to complete work assignment						
	OB2.4 Use layout and marking tools as required						
	OB2.5 Layout parts using measurement practices						

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OB3	**Demonstrate preparation and fit-up practices**						
	OB3.1 Identify and explain job specifications						
	OB3.2 Use fit-up gauges and measuring devices to check joint fit-up						
	OB3.3 Identify and explain distortion and how it is controlled						
	OB3.4 Fit-up joints using plate and pipe fit-up tools						
	OB3.5 Check for joint misalignment and poor fit-up before and after welding						
OC	**IDENTIFY PROPERTIES OF METALS**	**Cutting Processes and Lab 480501**	**Gas Metal Arc Welding and Lab 480522**	**Shielded Metal Arc Welding (SMAW) and Lab 480521**	**SMAW Groove Welds with Backing Lab 480528**	**6.5%**	**5**
OC1	**Identify material properties and science**						
	OC1.1 Identify the difference between ferrous and non-ferrous metals						
	OC1.2 Identify and explain forms and shapes of structural metals						
	OC1.3 Explain AWS filler metal classifications systems						
	OC1.4 Identify different types of filler metals						
	OC1.5 Explain the storage and control of filler metals						
OC2	**Identify filler metals**						
	OC2.1 Explain AWS filler metal classifications systems						
	OC2.2 Identify different types of filler metals						
	OC2.3 Explain the storage and control of filler metals						
OD	**APPLY SHIELDED METAL ARC WELDING (SMAW) TECHNIQUES**			**Shielded Metal Arc Welding (SMAW) and Lab 480521**	**SMAW Groove Welds with Backing Lab 480528**	**12%**	**9**
OD1	**Utilize safety procedures**						
	OD1.1 Identify and explain different types of welding current and polarity						
	OD1.2 Perform safety inspections of SMAW equipment and accessories						
	OD1.3 Maintain SMAW equipment and accessories						

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OD2	**Produce welds using SMAW on carbon steel**						
	OD2.1 Set up for SMAW operations						
	OD2.2 Operate SMAW equipment						
	OD2.3 Perform welds in the 1F position						
	OD2.4 Perform welds in the 2F position						
	OD2.5 Perform welds in the 3F position						
	OD2.6 Perform welds in the 4F position						
	OD2.7 Perform welds in the 1G position						
	OD2.8 Perform welds in the 2G position						
	OD2.9 Perform welds in the 3G position						
	OD2.10 Perform welds in the 4G position						
	OD2.11 Describe 2G, 5G and 6G welding positions						
OE	**APPLY GAS METAL ARC WELDING (GMAW-S, GMAW) TECHNIQUES**		**Gas Metal Arc Welding and Lab 480522**			**8%**	**6**
OE1	**Utilize safety procedures**						
	OE1.1 Identify and explain the use of GMAW equipment (i.e., spray transfer, globular, short circuit, pulse)						
	OE1.2 Perform safety inspections of GMAW equipment and accessories						
	OE1.3 Maintain GMAW equipment and accessories						
	OE1.4 Demonstrate safe startup, shutdown, disassembly, and cylinder exchange procedures of GMAW equipment						
OE2	**Produce welds using GMAW-S on carbon steel**						
	OE2.1 Set up for GMAW-S operations						
	OE2.2 Operate GMAW-S equipment						
	OE2.3 Perform welds in the 1F position						
	OE2.4 Perform welds in the 2F position						
	OE2.5 Perform welds in the 3F position						
	OE2.6 Perform welds in the 4F position						

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	OE2.7 Perform welds in the 1G position						
	OE2.8 Perform welds in the 2G position						
	OE2.9 Perform welds in the 3G position						
OF	**APPLY THERMAL CUTTING PROCESSES**	**Cutting Processes and Lab 480501**				**15%**	**11**
OF1	**Demonstrate oxy-fuel gas cutting (OFC)**						
	OF1.1 Perform safety inspections of OFC equipment and accessories						
	OF1.2 Maintain OFC equipment and accessories						
	OF1.3 Demonstrate safe startup, shutdown, disassembly, and cylinder exchange procedures of OFC equipment						
	OF1.4 Set up for OFC operations						
	OF1.5 Operate OFC equipment						
	OF1.6 Perform straight, square edge cutting operations in the flat position						
	OF1.7 Perform shape, square edge cutting operations in the flat position						
	OF1.8 Perform straight, bevel edge cutting operations in the flat position						
	OF1.9 Perform scarfing and gouging operations to remove base and weld metal, in flat and horizontal positions						
OF2	**Demonstrate plasma arc cutting (PAC) on carbon steel and aluminum**						
	OF2.1 Explain the PAC process						
	OF2.2 Determine the appropriate PAC settings for the various types of metals						
	OF2.3 Perform safety inspections of PAC equipment and accessories						
	OF2.4 Maintain PAC equipment and accessories						
	OF2.5 Set up for PAC operations						
	OF2.6 Operate PAC equipment						
	OF2.7 Perform straight, square edge cutting operations in the flat position						
	OF2.8 Perform shape, square edge cutting operations in the flat position						

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OG	**IDENTIFY WELDING CODES, INSPECTIONS, AND TESTING PRINCIPLES**		**Gas Metal Arc Welding and Lab 480522**	**Shielded Metal Arc Welding (SMAW) and Lab 480521**	**SMAW Groove Welds with Backing Lab 480528**	**11%**	**8**
OG1	**Identify welding codes, qualifications and certifications**						
	OG1.1 Identify and explain weld imperfections and their causes						
	OG1.2 Identify and explain welder qualification tests						
	OG1.3 Explain the importance of quality workmanship						
	OG1.4 Identify common destructive testing methods						
	OG1.5 Perform a visual inspection of fillet welds						
OG2	**Demonstrate welding inspection and testing principles**						
	OG2.1 Define the role of welding inspection/inspector and testing in industry						
	OG2.2 Examine cut surfaces and edges of prepared base metal parts						
	OG2.3 Examine tack, root passes, intermediate layers, and completed welds						
OH	**APPLY FABRICATION FUNDAMENTALS**	**Cutting Processes and Lab 480501**	**Gas Metal Arc Welding and Lab 480522**	**Shielded Metal Arc Welding (SMAW) and Lab 480521**	**SMAW Groove Welds with Backing Lab 480528**	**6.5%**	**5**
OH1	**Utilize base metal preparation fundamentals**						
	OH1.1 Clean base metal for welding or cutting						
	OH1.2 Identify and explain joint design						
	OH1.3 Select the proper joint design based on a welding procedure specification (WPS) or instructors direction						
	OH1.4 Mechanically bevel the edge of a mild steel plate (i.e., hand beveller, grinder)						
	OH1.5 Thermally bevel the end of a mild steel plate						
OH2	**Demonstrate fabrication techniques**						
	OH2.1 Demonstrate proper setup of fabrication area, equipment, and materials						
	OH2.2 Construct projects in the proper sequence						
	OH2.3 Properly layout projects from welding prints						

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	OH2.4 Check work for accuracy						
	Total					**100%**	**75**

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