Imperial Valley Regional Occupational Program
687 State Street, El Centro, CA 92243
(760) 482-2600 • Fax (760) 482-2751 ▪ Website: www.ivrop.org • Email: info@ivrop.org
Course Title: Welding Instructor: Cervantes Hours: 300

Major Units of Instruction Foundation and Pathway Standards Aligned Welding Manufacturing/Product Dev: Welding Pathway (C)	Key Assignments/ Common Assessments	Standards Anchor / Pathway(C)	Academic / Common Core Standards	Class Hours
1. Essential Employability / Career Preparation Skills	IVROP Common Assessments: Oral Presentation Assignment, Application and Resume Assignment(s)	2,3	LS 9-10, 11-12.6 SLS 11 – 12.2	20
2. ORIENTATION AND SHOP SAFETY a. Shop rules b. Use of safety glasses c. Physical orientation d. Basic equipment needs and uses e. Safety tests	Students will use workplace scenarios to identify safety issues. Students will take a general shop safety quiz	6,7,8/B1.0	SLS 9-10 11-12.1 SLS 11-12.1d	25
3. MEASUREMENT/DRAWING a. Basic math skills review and practice b. Math concept related to computing materials needs, estimating costs, etc. c. Feet and inches, scales, areas, volume d. Sketches and sketching e. Scale drawings f. Complicated and simple plans g. Blue print reading using scale-interpret	Students will use industry specific mesuring tools to layout and design welding joints	2,5, /C1.1,C1.2	A-CED-1 G-CO-12 SLS 9-10 11-12.1 SLS 11-12.1d	20
4. THE ARC WELDING PROCESS (SMAW) a. Fundamental steps and principles i. Heat control (amperage) ii. Speed of travel iii. Angle of electrode iv. Length of arc b. Types of welders, equipment and selection v. AC vi. DC vii. Accessories c. Rod selection (AWS classification) d. Running welds in all positions	Students will complete a padding exercise on a 4x4 inch plate. Students will perform BUTT, TEE, CORNER, LAP, EDGE joints in the flat position. Students will perform BUTT, TEE, LAP, joints in the vertical position. Students will perform BUTT, TEE, LAP, joints in the overhead position	6,10,11/C2.0,C4.0,C6.0,C8.0	PS 1.A RLST 11-12.4 RSLT 11-12.3	80
5. THE OXY-ACETYLENE PROCESS a. Safety	Student will successfully complete OAF weld tests in the flat position.	6,10,11/ C2.0,C 3.0,C5	RLST 11.12.3 RLST11-12.4	40

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b. Equipment and accessories i. Acetylene tanks, regulators ii. Oxygen tanks, regulators iii. Hoses, torches, tips iv. Track burners c. Setting up and adjusting equipment i. Setting up and safety check ii. Lighting and adjusting torch iii. Shut down and secure equipment	Students will complete corner joint without filler material on 1/8 plate. Students will perform BUTT, LAP, TEE JOINT on 1/8 plate with filler material.			
6. OXY-ACETYLENE CUTTING a. Oxyfuel cutting principals b. Oxyfuel cutting equipment c. Preparing to cut d. Manual cutting	Students will perform straight and round OAF cuts on ¼ inch plate.	5,6,10,11/C1.0,C2.0,C5,C6.0,C8.0	A-CED-1 G-CO-12 RLST11-12.4 SEP 4	20
7. PLASMA-ARC CUTTING a. Plasma Arc principles b. Plama Arc cutting equipment and supplies c. Safety equipment d. Preparing to cut e. Cutting procedure	Students will perform straight and round PAC cuts on ¼ inch plate.	5,6,10,11/C1.0 , C2.0	A-CED-1 G-CO-12 RLST11-12.4 SEP 4	15
8. GMAW (MIG) a. Equipment and supplies 1.Gas metal arc welding principals 2. Metal transfer 3. Equipment and protective clothing b. Equipment assembly and adjustment 1. Assembly and set up 2. Shielding gasses 3. selecting electrode 4. machine settings 5. preparing base metal 6. shutting down station c. Welding Positions and joints 1. Flat	Students will complete GMAW padding exercise on a 4x4 inch plate. Students will perform GMAW BUTT, TEE, CORNER, LAP, joints in the flat position. Students will perform GMAW BUTT, TEE, LAP, joints in the vertical position. Students will perform GMAW BUTT, TEE, LAP, joints in the overhead position	6,7,8,10,11/C2.0,C4.0,C5,C8.0 6,7,8,10,11/C2.0,C4.0,C8.0	PS 1.A RLST 11-12.4 RSLT 11-12.3 PS 1.A RLST 11-12.4	50

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2. Horizontal 3. Vertical 4. Overhead			RSLT 11-12.3	
9. GTAW (TIG) *D3.3, D7.1, D7.4, D7.5, D8.1, D8.2* a. Equipment and Supplies i. Torches, cables, hoses ii. Shielding gases, regulators and flowmeters iii. protective equipment b. Equipment assembly and adjustment 1. Equipment assembly 2. Welding machine settings 3. Selecting and preparing the electrode c. Welding Positions 4. Flat 5. horizontal 6. vertical 7. overhead	Students will complete a padding exercise on a 4x4 inch plate. Students will perform BUTT, TEE, CORNER, LAP, joints in the flat position. Students will perform BUTT, TEE, LAP, joints in the vertical position. Students will perform BUTT, TEE, LAP, joints in the overhead position	6,10,11/C2.0,C4.0,C5,C8.0	PS 1.A RLST 11-12.4 RSLT 11-12.3	30
TOTAL				300

Text is “Welding Technology Fundamentals” by W.A. Bowditch, K.E. Bowditch, and M.A. Bowditch.

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Cross-Cutting Anchor Standards and Related Common Core Standards - *Detailed version for each Industry Sector available at link on IVROP web page.*

1. Academics (Analyze and apply appropriate academic standards for industry sector).	*See Matrix for Pathway*
2. Communications (Acquire and accurately use sector terminology and protocols at the career and college readiness level for communicating effectively…)	*LS 9-10, 11-12.6*
3. Career Planning and Management (Integrate multiple sources of career information from diverse formats to make informed career decisions…)	*SLS 11-12.2*
4. Technology (Use existing and emerging technology to investigate, research, and produce products and services…)	*WS 11-12.6*
5. Problem Solving and Critical Thinking (Conduct short and sustained research to create alternative solutions to solve a problem using critical & creative thinking…)	*WS 11-12.7*
6. Health and Safety (Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms…)	*RSTS 9-10, 11-12.4*
7. Responsibility and Flexibility (Initiate/participate in a range of collaborations demonstrating behaviors that reflect personal and professional responsibility & flexibility)	*SLS9-10, 11-12.1*
8. Ethics and Legal Responsibilities (Practice professional, ethical, and legal behavior, responding thoughtfully…)	*SLS 11-12.1d*
9. Leadership and Teamwork (Work with peers to promote divergent and creative perspectives, leadership, group dynamics…)	*SLS 11-12.b1*
10. Technical knowledge and Skills (Apply essential technical knowledge and skills…)	*WS 11-12.6*
11. Demonstration and Application (Demonstrate and apply the Knowledge and skills contained in the Industry anchor and pathway standards in classroom, laboratory, and workplace settings and through CTSO's career and technical student organizations).	