

Welding PROGRAM OUTCOMES - PSLOs		Related ISLOs	Enter "X" in boxes as appropriate											
PSLO A	Apply the principles and practices used with multiple welding processes to develop knowledge and skill sets meeting industry standards.	2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D, 4D			X						X			
PSLO B	Safely demonstrate knowledge of equipment together with critical thinking, problem-solving and sound reasoning strategies used in design, planning, execution, and completion of metal fabrication projects or welding assignments.	1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D, 4D				X					X			
PSLO C	Identify and recall the historical development of common welding processes and their differences, compared with the technological advances presently used for industrial applications.	1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D, 4B, 4D						X				X		
PSLO D	Differentiate ferrous and non-ferrous metals, both pure and alloys with comprehensive understanding of the specific effects of welding heat and rates of cooling.	1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D						X					X	
PSLO E	Utilize the certification standards and codes of the welding profession through application of solid principles for industrial design and creative metal work.	1A, 1B, 2A, 2B, 2C, 2D, 3A, 3B, 3C, 3D, 4A, 4D		X						X				X
PSLO F	Recognize the value and sustainability of building with steel.	2B, 3B, 4A, 4C, 4D,								X				X
Total Number of Program Outcomes (manually enter)		6	6	6	6	6	6	6	6	6	6	6	6	6
Number of Program Outcomes Assessed (per formula)			0	1	1	1	1	1	2	1	1	1	1	2
Percentage of Program Outcomes Assessed (per formula)			0%	17%	17%	17%	17%	17%	33%	17%	17%	17%	17%	33%
Welding Certificate Outcomes - same as PSLOs														
Weld 10 Exploring Metals/Intro to Gas Welding		Related PSLOs	Enter "X" in boxes as appropriate											
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment with focus on Oxy-Acetylene welding, hand and power tool equipment used in the building of assigned student project.	B			X						X			
CSLO 2	Student will define terms related to this course; abrasive, acetylene, backfire, band saw, brazing, center punch, leaf brake, MSDS - Material Safety Data Sheets, neutral flame, power punch, PPE - Personnel Protective Equipment, twist drill, rivet, RPM - Revolutions per Minute, tap & die set.	A, B, C		X						X				
CSLO 3	Student will gain practice to produce manipulative skills of basic Oxy-Acetylene welding, hand and power tools used in the construction of assigned student project.	A, B, C, D, F					X					X		
CSLO 4	Student will gain insight into the historical development of non-electric welding processes used by blacksmiths and Oxy-fuel welding methods.	C					X					X		
Weld 15 Intro Welding for Metalworking			Enter "X" in boxes as appropriate											

CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment with focus on SMAW, GMAW, GTAW welding processes, plus OFC, PAC cutting processes, and hand and power tool equipment used in the building of assigned student project.	A, B	X					X						
CSLO 2	Student can define terms related to this course; electrode, shielded metal arc, arc length, porosity, slag, resistance welding, box and pan brake, layout, PPE - Personnel Protective Equipment.	A, B, C		X					X					
CSLO 3	Student will gain practice to produce manipulative skills of the basics of the three common electric arc welding processes, hand and power tools used in the construction of assigned student project.	A, B, C, D, F				X					X			
CSLO 4	Student will gain insight into the historical development of electric arc welding processes used from the early 1900's SMAW, late 1940's GMAW and early 1940's GTAW.	C, F					X					X		
Weld 20 Introduction to Welding Technology - Career Path														
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment with focus on SMAW and GMAW, welding processes, and OAW welding process, plus OFC, PAC cutting processes, to perform student assignments.	A, B	X					X					X	
CSLO 2	Student will define terms related to this course; constant current output, duty cycle, fast freeze electrode, fill freeze electrode, low hydrogen, stringer or weave manipulation, regulator, undercut, weld toe.	A, B, C			X					X				
CSLO 3	Student will learn manipulative skills using both SMAW and GMAW welding processes with stringer and weaved techniques on carbon steel plate in 2F, 3F and 4F positions. OAW on carbon steel sheet in 2F, 2G, 3F, 3G and 4F positions.	A, B, C, D, F		X					X					X
Weld 25 Intermediate Welding Technology - Career Path														
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment with focus on SMAW, FCAW welding processes, plus OAW welding of small diameter pipe plus track OFC cutting process on plate.	A, B				X								
CSLO 2	Student will define terms related to this course; open groove, backhand torch angle, low hydrogen exposure limit, carbon arc gouging.	A, B, C					X							
CSLO 3	Student will develop manipulative skills to prepare materials and deposit SMAW and FCAW welds with both stringer and weaved techniques on carbon steel plate in 3F, 3G and 4F, 4G position, and OAW on carbon steel pipe in 2G position.	A, B, C, D, F						X						
Weld 30 Advanced SMAW Welding of Plate and Pipe - Career Path														
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment with focus on the SMAW welding process, plus track OFC cutting process on plate and circular OFC cutting methods, plus other thermal and mechanical activities such as cutting steel and grinding.	A, B	X					X					X	
CSLO 2	Student will define terms related to this course; essential variables, welding procedure specification, procedure qualification record, root opening, tie-in, pipe schedule, electrode oscillation and whip technique.	A, B, C			X					X				
CSLO 3	Student will utilize manipulative skills of an advanced level to prepare and deposit SMAW welds with both stringer and weaved techniques on carbon steel plate in 3G and 4G position, and on carbon steel pipe in 2G, 5G, and 6G welding positions	A, B, C, D, F		X					X					X

	Weld 40 Wire Feed Processes MIG Welding - Career Path													
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment with focus on GMAW, FCAW welding processes to perform student assignments.	A, B			X					X				
CSLO 2	Student will define terms related to this course; electrical stick out, inductance, pinch effect, slope, synergic control, mode of transfer, transition current, whiskers.	A, B, C				X					X			
CSLO 3	Student will develop then utilize manipulative skills GMAW welding with stringer and weaved techniques on carbon steel plate in 2F, 3F and 4F position with short circuit mode of transfer. Student will develop then utilize manipulative skills GMAW welding on carbon steel plate in 2F with spray and pulsed spray transfer modes. FCAW on carbon steel in 2F, 3F, 3G, and 4F welding positions, both with gas shield and self shield derivatives of this welding process.	A, B, C, D, F										X		
	Weld 50 Gas Tungsten Arc Welding - Career Path													
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment with focus on GTAW welding process to perform student assignments.	A, B		X						X				
CSLO 2	Student will define terms related to this course; collet and collet body, tungsten, inert, alternating frequency, square wave output.	A, B, C			X					X				
CSLO 3	Student will develop, analyze, and then utilize manipulative skills GTAW welding with selected techniques on carbon steel sheet in 2F, 3F, 3G and position on very thin and thick to thin student job assignments. Student will develop, analyze, and then utilize manipulative skills GTAW welding on stainless steel sheet in 2F and 3F positions. Student will develop, analyze, then utilize manipulative skills GTAW welding on aluminum material in 2F and 3F positions with unbalance alternating current application, and a/c frequency adjustments. Student will complete assigned student skills project as part of the course.	A, B, C, D, F							X				X	
CSLO 4	Student will research and formally make a presentation on selected GTAW subject by participation in a group learning process.	B, C						X					X	
	Weld 60 Welding Metallurgy - Career path													
CSLO 1	Student will gain knowledge of safety standards for both a learning lab environment and worksite environment of a metallurgy lab.	B, D				X						X		
CSLO 2	Student will define terms related to this course; cooling rate, cementite, ferrite, martensite, pearlite, phase change, microstructure, spheroidite, temper	B, D, F						X						X
CSLO 3	Student will gain practice of performing lab assignments and reports results during the study of microstructure changes present resulting the heating and cooling of metals.	D						X						X
CSLO 4	Student will produce reportable results in experiments in the study of ferris metal microstructure under high magnifications.	B, C						X						X
	Weld 70 Foundations Of Fabrication - Career Path		Enter "X" in boxes as appropriate											
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment with focus on metal fabrication equipment used in the construction of a chosen student project.	A, B			X						X			
CSLO 2	Student will define terms related to this course; fixture, model, tolerance, buck, annealed state, cold work, drawing quality steel, fixture, distortion, shrinkage.	A, B, C				X						X		

CSLO 3	Student will using a guided planned project, plan materials, layout and fabrication, final assembly and finish.	A, B, C, D, F						X						X		
Weld 80 Structural Steel Certification - Career Path																
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment of structural steel construction of buildings, bridges, and miscellaneous iron work.	A, B			X					X						
CSLO 2	Student will define terms related to this course; American Welding Society code D1.1 Structural Steel and D1.8 Seismic, access hole, cyclic load, demand critical joint, protected zone, preheat.	A, B, C, E			X					X						
CSLO 3	Student will produce manipulative welding skills in testing to American Welding Society structural welding code D1.1 and use code standards to evaluate qualification to become certified to weld structural steel applications	A, B, C, D, E, F			X					X						
CSLO 4	Student will be aware of the importance of the responsibilities of welding performed to code quality levels.	E			X					X						
Weld 82 - Uphill Pipe Welding Certification - Career Path																
CSLO 1	Student will gain knowledge of safety standards for both a learning enviroment and worksite enviroment of in plant pipe welding to American Society of Mechanical Engineers code.	A, B			X					X						
CSLO 2	Student will define terms related to this course; American Society of Mechanical Engineers (ASME), clocking the flange, internal undercut, keyhole, heavy end tie-in, pipe schedule, cluster porosity, root face, loop weave.	A, B, C, E			X					X						
CSLO 3	Student will produce manipulative welding skills in testing to American Society of Mechanical Engineers section IX and use code standards to evaluate qualification to become certified to weld pressure pipe and vessel applications.	A, B, C, D, E, F			X					X						
CSLO 4	Student will be aware of the importance of the responsibilities of welding performed to code quality levels.	E			X					X						

	Weld 83 Downhill Pipe Welding Certification - Career Path													
CSLO 1	Student will gain knowledge of safety standards for both a learning environment and worksite environment of cross country transportation pipeline.	A, B			X					X				
CSLO 2	Student will define terms related to this course; bell hole, pinhole porosity, restraint crack, hot pass, stripper pass.	A, B, C, E			X					X				
CSLO 3	Student will produce manipulative welding skills in testing to American Petroleum Institute and use code standards to evaluate qualification to become certified to weld transportation pipe applications.	A, B, C, D, E, F			X					X				
CSLO 4	Student will be aware of the importance of the responsibilities of welding performed to code quality levels.	E			X					X				
	Weld 95 Internship in Welding													
CSLO 1	Establish on-the-job learning objectives that are related to new or expanded responsibilities or that contribute to current occupational or educational goals	A, B, C, D, E				X					X			
CSLO 2	Evaluate learning experience in writing or by project related to learning objectives.	A, C				X					X			
CSLO 3	Through work experience, under the direction of worksite supervisor, perform duties related to learning objectives	B, C, D, E				X					X			
	Total Number of Courses (from last number assigned)		13	13	13	13	13	13	13	13	13	13	13	13
	Total Number of CSLOs (manually enter)		44	44	44	44	44	44	44	44	44	44	44	44
	Number of CSLOs Assessed Per Semester (per formula)		3	5	18	11	5	7	17	6	10	4	5	2
	Percentage of CSLOs Assessed (per formula)		7%	11%	41%	25%	11%	16%	39%	14%	23%	9%	11%	5%
	Number of Courses Assessed Per Semester (manually enter)		3	3	9	7	4	3	8	6	6	3	3	2
	Percentage of Courses Assessed (per formula)		23%	23%	69%	54%	31%	23%	62%	46%	46%	23%	23%	15%