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Program: Welding

Curriculum Map

Program Outcomes: Upon completion of the program, graduates will be able to...	Institutional Skills	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Courses												
WELD 101 Welding Safety	CPW					IRMA	IRMA					IRMA
WELD 103 Blueprint Reading for Welders	CPW			IRMA	IRA		IRMA					R
WELD 106 Mathematics for Welders	CPW				IRMA		IRMA					R
WELD 110 Introduction to AWS Welding		IRMA				IRMA	IRMA	IRMA				
WELD 111 Shielded Metal Arc Welding	CP	IRMA	IRMA			IRMA	IRMA		IRMA	IRMA		
WELD 120 Intermediate AWS Welding		RMA				RMA	RMA	RMA				
WELD 122 Gas Metal Welding	CPW	IRMA	IRMA			R	IRMA		IRMA	IRMA		
WELD 200 Advanced AWS Welding		RMA				RMA	IRMA	RMA				
WELD 201 Gas Tungsten Arc Welding	CPW	IRMA	IRMA			R	IRMA		IRMA	IRMA		
WELD 212A Industrial Welding I	CPW					RMA	IRMA		IRMA	IRMA		
WELD 212B Industrial Welding II	CPW					RMA	IRMA		IRMA	IRMA		
WELD 213 Layout and Fabrication	CPW			RMA	RMA	RMA	IRMA					
WELD 214 Pipefitting	CPW			IRMA	RMA		IRMA	IRMA			IRMA	
PCDE 109 Career Success												IR
ENGL 100 - APPLIED COMMUNICATIONS												IRMA
SPCH 113 Interpersonal Communications												IRMA

Mapping	
I	Introduced
R	Reinforced
M	Mastered
A	Assessed/Artifact

Essential Skills	
1	written communication
2	oral communication
3	critical thinking
4	cultural diversity
5	social responsibility

Employability Skills	
C	communication
P	problem solving
W	work ethic

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WELD 101: Welding Safety

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
identify and describe welding and cutting safety hazards					IRMA	IRMA					IRMA
identify different types of warning labels					IRMA	IRMA					IRMA
identify the need and describe PPE for welding and cutting					IRMA	IRMA					IRMA
identify the risks associated with electricity and high voltage					IRMA	IRMA					IRMA
demonstrate the lockout/tagout process					IRMA	IRMA					IRMA
identify confined spaces					IRMA	IRMA					IRMA
describe purpose and use of a hotwork permit					IRMA	IRMA					IRMA
locate data sheets and explain their use					IRMA	IRMA					IRMA

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WELD 103: Blueprint Reading for Welding **Curriculum Map**

Program Outcomes	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
describe parts of a weld symbol			IRMA			IRMA					R
interpret supplemental weld symbol information			IRMA			IRMA					R
identify welding detail drawing components			IRMA			IRMA					R
identify isometric views			IRMA			IRMA					R
point out dimensions and tolerances on drawings			IRMA	IRA		IRMA					R
interpret basic weld symbol information			IRMA			IRMA					R
interpret supplemental weld symbol information			IRMA			IRMA					R
interpret lines			IRMA			IRMA					R

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WELD 106: Mathematics for Welders

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
add whole numbers on a written test				IRMA		IRMA					R
add and subtract fractions on a written test				IRMA		IRMA					R
add and subtract decimals on a written test				IRMA		IRMA					R
calculate averages on a written test				IRMA		IRMA					R
find the perimeter of squares and rectangles on written test				IRMA		IRMA					R
determine angles on a written test				IRMA		IRMA					R
determine takeoffs for pipefittings on a written test				IRMA		IRMA					R
calculate rolling offsets with trigonometry				IRMA		IRMA					R

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WELD 110 SMAW (DC Pathway)

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(IF, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(IF, 2F, 1G +1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
· Pass Welding and Cutting Safety Test	IRMA				IRMA	IRMA	IRMA	IRMA			
Relate SMAW electrode classifications with base metals.	RMA							IRMA			
Explain, safely set up and adjust SMAW, and Oxyfuel cutting equipment					IRMA	IRMA		IRMA			
Join metals by welding.	IRMA				IRMA	IRMA		IRMA			
Build pads of weld beads with selected electrodes in the flat position using SMAW.	IRMA		IRA		IRMA	IRMA					
Perform basic SMAW welds on selected weld joints.	IRMA		IRA		IRMA	IRMA		IRMA			
Weld mild carbon steel in flat and Horizontal positions utilizing the SMAW process.	IRMA		IRA		IRMA	IRMA		IRMA			
Stow SMAW equipment					IRMA	IRMA	IRMA				

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WELD 111: Shielded Metal Arc Welding

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
Explain the Shielded Metal Arc Welding Process(SMAW)											
Demonstrate the safe and correct set up of the SMAW workstation	IRMA	IRMA			IRMA	IRMA		IRMA	IRMA		
Relate SMAW electrode classifications with base metals and joint criteria.	IRMA	IRMA						IRMA	IRMA		
Demonstrate proper electrode selection and use based on metal types and thicknesses.	IRMA	IRMA			IRMA	IRMA		IRMA	IRMA		
Build pads of weld beads with selected electrodes in the flat position.	IRMA	IRMA	IRMA		IRMA	IRMA		IRMA	IRMA		
Build pads of weld beads with selected electrodes in the horizontal position.	IRMA	IRMA	IRMA		IRMA	IRMA		IRMA	IRMA		
Perform basic SMAW welds on selected weld joints.	IRMA	IRMA	IRMA		IRMA	IRMA		IRMA	IRMA		
Perform visual inspection of welds.	IRMA	IRMA	IRMA		IRMA	IRMA	IRMA	IRMA	IRMA		
Perform SMAW Certification tests to AWS Standards, D1.1 or ASME Section IX	IRMA	IRMA	IRMA		IRMA	IRMA		IRMA	IRMA		

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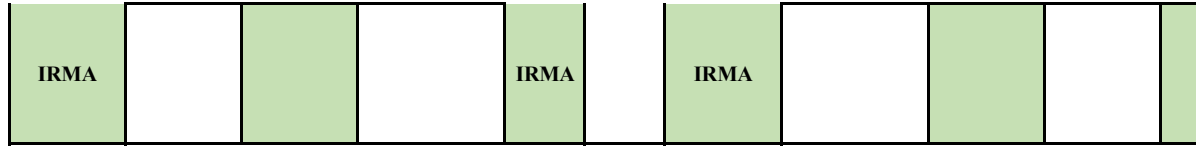
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WELD 120 GMAW (DC Pathway)

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
Pass Welding and Cutting Safety Test	RMA				IRMA	IRMA	RMA				
Relate GMAW electrode classifications with base metals.	RMA				IRMA	IRMA	RMA				
Explain, safely set up and adjust GMAW and Oxyfuel cutting equipment	IRMA				IRMA		IRMA				
Join metals by welding	IRMA	IRM	IRMA		IRMA		IRMA	IRMA			
Perform basic GMAW welds on selected weld joints	IRMA	IRMA	IRMA		IRMA		IRMA	IRMA			
Weld mild carbon steel in flat and Horizontal positions utilizing the GMAW processes	IRMA	IRMA	IRMA		IRMA		IRMA	IRMA			

Stow GMAW equipment



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WELD 122: Gas Metal Arc Welding		Curriculum Map									
Program Outcomes	demonstrate the ability to weld in different plate positions (F, 2F, 1G)	demonstrate the ability to weld in different pipe positions (G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of materials as related to regions, fabrication and pipefitting.	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and state the ability to use them	demonstrate the ability to weld in different plate positions (F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions (G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
Explain gas metal arc welding process (GMAW).					IRMA	IRMA	IRMA	IRMA			
Demonstrate the safe and correct set up of the GMAW workstation.	IRMA				IRMA	IRMA	IRMA	IRMA			
Correlate GMAW electrode classifications with base metals and joint criteria.	IRMA				R	IRMA	IRMA	IRMA			
Demonstrate proper electrode selection and use based on metal types and thicknesses.	IRMA				R	IRMA	IRMA	IRMA			
Build pads of weld beads with selected electrodes in the flat position.	IRMA		IRMA		IRMA	IRMA		IRMA	IRMA		
Build pads of weld beads with selected electrodes in the horizontal position.	IRMA		IRMA		IRMA	IRMA		IRMA	IRMA		
Produce basic GMAW welds on selected weld joints.	IRMA		IRMA		IRMA	IRMA	IRMA	IRMA	IRMA		
Conduct visual inspection of GMAW welds.					IRMA	IRMA		IRMA			
Perform GMAW Certification tests to AWS Standards, D1.1 or ASME Section IX	IRMA		IRMA		IRMA	IRMA	IRMA	IRMA	IRMA		

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WELD 200 (GTAW DC Pathway)

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
Pass Welding and Cutting Safety Test	RMA				RMA	RMA	RMA				
Relate GTAW electrode classifications with base metals.											
Explain, safely set up and adjust GTAW and Oxyfuel cutting equipment	IRMA				IRMA	IRMA					
Join metals by welding.	IRMA		R		RMA	IRMA		IRMA			
Perform basic, GTAW welds on selected weld joints.	IRMA		R		IRMA	IRMA		IRMA			
Weld mild carbon steel in flat, Horizontal, Vertical, and Overhead positions utilizing the GTAW process.	IRMA		R		IRMA	IRMA		IRMA			
Stow GTAW equipment	RMA				RMA	RMA	RMA				

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WELD 201: Gas Tungsten Arc Welding

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
Explain the gas tungsten arc welding process (GTAW).	IRMA	IRMA			R	IRMA	IRMA	IRMA	IRMA		
Demonstrate the safe and correct set up of the GTAW workstation.	IRMA	IRMA			R	IRMA	IRMA	IRMA	IRMA		
Relate GTAW electrode and filler metal classifications with base metals and joint criteria.	IRMA	IRMA			R	IRMA	IRMA	IRMA	IRMA		
Build proper electrode and filler metal selection and use based on metal types and Thicknesses.	IRMA	IRMA			R	IRMA	IRMA	IRMA	IRMA		
Build pads of weld beads with selected electrodes and filler material in the flat position.	IRMA	IRMA			IRMA	IRMA	IRMA	IRMA	IRMA		
Build pads of weld beads with selected electrodes and filler material in the horizontal position.	IRMA				IRMA	IRMA	IRMA	IRMA	IRMA		
Perform basic GTAW welds on selected weld joints	IRMA	IRMA			IRMA	IRMA	IRMA	IRMA	IRMA		
Perform visual inspection of GTAW welds.	IRMA	IRMA			IRMA		IRMA	IRMA	IRMA		

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WELD 212A: Industrial Welding I

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(1F, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(1F, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
demonstrate proper use of hand tools					RMA	IRMA		IRMA	IRMA		
properly prepare pipe coupons to be welded with SMAW					RMA	IRMA		IRMA	IRMA		
perform a quality 2G weld using SMAW					RMA	IRMA		IRMA	IRMA		
perform a quality 5G weld using SMAW					RMA	IRMA		IRMA	IRMA		
perform a quality 6G weld using SMAW					RMA	IRMA		IRMA	IRMA		
demonstrate the knowledge of proper SMAW filler metal selection					RMA	IRMA		IRMA	IRMA		
demonstrate proper use of pipefitting power tools					RMA	IRMA		IRMA	IRMA		
properly fit pipe coupons together with proper gap for SMAW					RMA	IRMA		IRMA	IRMA		

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WELD 212B: Industrial Welding II

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(IF, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(IF, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
demonstrate proper use of hand tools					RMA	IRMA		IRMA	IRMA		
properly prepare pipe coupons to be welded with GTAW					RMA	IRMA		IRMA	IRMA		
perform a quality 2G weld using GTAW					RMA	IRMA		IRMA	IRMA		
perform a quality 5G weld using GTAW					RMA	IRMA		IRMA	IRMA		
perform a quality 6G weld using GTAW					RMA	IRMA		IRMA	IRMA		
demonstrate the knowledge of proper GTAW filler metal selection					RMA	IRMA		IRMA	IRMA		
demonstrate proper use of pipefitting power tools					RMA	IRMA		IRMA	IRMA		
properly fit pipe coupons together with proper gap for GTAW					RMA	IRMA		IRMA	IRMA		

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WELD 213: Layout and Fabrication

Curriculum Map

Program Outcomes	demonstrate the ability to weld in different plate positions(IF, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(IF, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
define basic terms pertaining to metal layout						IRMA					
interpret basic elements of a drawing			RMA			IRMA					
demonstrate proper use of a level and plumb bob					RMA	IRMA					
design weldment, submit field sketch for review			RMA			IRMA					
convert denominate numbers and solve problems using them				RMA		IRMA					
select and use layout and marking tools				RMA	RMA	IRMA					
interpret lines			RMA			IRMA					
demonstrate proper use of a square					RMA	IRMA					

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WELD 214: Pipefitting	Curriculum Map										
Program Outcomes	demonstrate the ability to weld in different plate positions(IF, 2F, 1G)	demonstrate the ability to weld in different pipe positions(1G)	interpret welding symbols and demonstrate the ability to work off of a blueprint	demonstrate proper use of math skills as related to layout, fabrication, and pipefitting	use tools and equipment found in a welding shop.	describe and practice welding safety	analyze different welding processes and demonstrate the ability to use them	demonstrate the ability to weld in different plate positions(IF, 2F, 1G + 1 additional position)	demonstrate the ability to weld in different pipe positions(1G, 2G, 5G, 6G)	interpret pipe and tube data related to pipefitting from a reference book	communicate effectively
Course SLO: Students will be able to											
demonstrate knowledge of steel pipe sizes				RMA		IRMA	IRMA			IRMA	
differentiate between tube and pipe			RMA	RMA		IRMA	IRMA			IRMA	
demonstrate knowledge of different valves				RMA		IRMA	IRMA			IRMA	
demonstrate knowledge of threaded pipe fittings				RMA		IRMA	IRMA			IRMA	
identify different flange types				RMA		IRMA	IRMA			IRMA	
calculate rise, run and travel			IRMA	RMA		IRMA	IRMA			IRMA	
demonstrate use of Pythagorean theorem			RMA	RMA		IRMA	IRMA			IRMA	
determine use of a pipe wrap-a-round			IRMA		RMA	IRMA	IRMA			IRMA	