

# Trade Fundamentals Basic Welding

# 2023-24 Academic Year

Program Title	Ministry Title	Major	Year	Semester
STA-Trades Fundamentals		TRDE	1	2

Course Code:	TFBW 1304 Course Equiv. Code(s): N/A				
Course Hours:	42 Course GPA Weighting: 3				
Prerequisite:	N/A				
Corequisite:	N/A				
Laptop Course:	Yes No X				
Delivery Mode(s):     In class     X     Online     Hybrid     Flexible     HyFlex					
Remote proctori	ing required Yes No X				
Authorized by (	Dean or Director): Rebecca Milburn Date: September 2023				

Prepared by		
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# **Course Description:**

This course includes a 1 hour theory and a 2 hour practical class. The theory portion develops the student's knowledge of the Oxy Fuel, SMAW and GMAW welding processes. The student will learn about equipment and components, welding procedures, quality and safety. In the 2 hour practical, the student will learn to apply the principles from the theory class. They will practice welding using the Oxy Fuel, SMAW and GMAW welding processes.

# **Campus Closure Notice**

In the event of a campus closure during which time classes cannot be conducted or attended in person, course delivery will be conducted remotely where possible. Should teaching and learning resume on campus, students may be organized into smaller groups for classroom delivery, in accordance with directions from public health authorities. In either situation, the learning plan sequence and/or evaluation methods may be adjusted to address topics requiring

# Subject Eligibility for Prior Learning Assessment & Recognition (PLAR):

Prior Learning Assessment and Recognition (PLAR) is a process a student can use to gain college credit(s) for learning and skills acquired through previous life and work experiences. Candidates who successfully meet the course learning outcomes of a specific course may be granted credit based on the successful assessment of their prior learning. The type of assessment method (s) used will be determined by subject matter experts. Grades received for the PLAR challenge will be included in the calculation of a student's grade point average.

The PLAR application process is outlined in http://www.durhamcollege.ca/plar. Full-time and part-time students must adhere to all deadline dates. Please email: PLAR@durhamcollege.ca for details.

### **PLAR Eligibility**

Yes X No

### PLAR Assessment (if eligible):



# **Course Learning Outcomes**

Course Learning Outcomes contribute to the achievement of Program Learning Outcomes for courses that lead to a credential (e.g. diploma). A complete list of Vocational/Program Learning Outcomes and Essential Employability Skill Outcomes are located in each Program Guide.

### **Course Specific Learning Outcomes (CLO)**

Student receiving a credit for this course will have reliably demonstrated their ability to:

- CLO1 Define the fundamentals, components and equipment of the oxy-fuel welding process.
- CLO2 Describe and practice the safe use of all welding processes and equipment.
- CLO3 Perform fusion welding and cutting of mild steel.
- CLO4 Define the fundamentals, equipment and components of the Gas Metal Arc Welding(GMAW) process.
- CLO5 Perform the welds required using the Gas Metal Arc Welding (GMAW) process.
- CLO6 Define the fundamentals, equipment and the components of the Shielded Metal Arc Welding (SMAW) process.
- CLO7 Perform the welds required using the Shielded Metal Arc Welding(SMAW).
- CLO8 Identify the requirements and expectations of becoming a welder.

### Essential Employability Skill Outcomes (ESSO)

This course will contribute to the achievement of the following Essential Employability Skills:

- X EES 1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
- X EES 2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
- X EES 3. Execute mathematical operations accurately.
- X EES 4. Apply a systematic approach to solve problems.
- X EES 5. Use a variety of thinking skills to anticipate and solve problems.
- EES 6. Locate, select, organize, and document information using appropriate technology and information systems.
- EES 7. Analyze, evaluate, and apply relevant information from a variety of sources.
- EES 8. Show respect for the diverse opinions, values, belief systems, and contribution of others.
- X EES 9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
- X EES 10. Manage the use of time and other resources to complete projects.
- X EES 11. Take responsibility for one's own actions, decisions, and consequences.

# **Evaluation Criteria:**

The Course Learning Outcomes and Essential Employability Skills Outcomes are evaluated by the following evaluation criterion.

Evaluation Description	Course Learning Outcomes	EESOs	Weighting
Assignment: Safety Intro and Oxy Acetylene In-Class Worksheets - to do done weeks 1-3. Points per worksheet to vary, approx. weight total for 3 weeks at 10	CLO1, CLO2, CLO8	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	9
Test: Oxy-Acetylene Theory Test	CLO1, CLO2	EES2, EES10, EES11	6
Test: Oxy Acetylene Practical Test - weld test for corner joint, butt joint with filler, lap joint with filler - oxy-acetylene cutting test	CLO1, CLO2, CLO3	EES2, EES5, EES9, EES10, EES11	8
Assignment: Safety Intro and GMAW In-Class Worksheets - to do done weeks 5-7. Points per worksheet to vary, approx. weight total for 3 weeks at 10	CLO1, CLO2, CLO4, CLO8	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	12
Test: GMAW Theory Test	CLO2, CLO4	EES1, EES2, EES5, EES10, EES11	10
Test: GMAW Practical Test - weld test for 1F 2F	CLO2, CLO5	EES2, EES5, EES9, EES10, EES11	10
Assignment: Safety Intro and SMAW In-Class Worksheets - to do done weeks 11-13. Points per worksheet to vary, approx. weight total for 3 weeks at 10	CLO1, CLO2, CLO6, CLO8	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	12
Test: SMAW Theory Test	CLO2, CLO6, CLO7	EES1, EES2, EES10, EES11	10
Test: SMAW Practical Test - weld test for 1F 2F	CLO2, CLO7	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	10
Lab Activity: Weekly Weld Practice Coupons - all welding practice coupons to be handed in and recorded for full completion	CLO1, CLO2, CLO3, CLO4, CLO5, CLO6, CLO7	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	5
Assignment: Theory Assignment Weeks 9,10 - career in welding assignment with presentation or display of industry engagement	CLO8	EES1, EES2, EES10, EES11	8

Total		100%

### Notes:

- Assignments are due by the due date assigned in class and posted on DC Connect. Each professor will provide a facility for the submission of late assignments up to a maximum of 48 hours after the assignment due date. All late submissions will be assessed a penalty of 25% of the total possible grade for the assignment, regardless of the number of hours late up to but not beyond 48 hours. Assignments should be submitted on time, on a regular basis, to enable you to stay on track within the class.
- 2. Test dates are tentative and will be confirmed by the professor.
- 3. Part of the content and evaluation of this course is to be completed online and it is the responsibility of the student to become familiar with the use of DC Connect in order to complete the course successfully.
- 4. In-process marks are a combination of in-class work, assigned homework and other evaluations throughout the term. These cannot be made up if missed. For any in-process classroom work, a grade of zero is assigned if the student is absent or if they do not participate fully.
- Assignments, labs, tests and in process activities may not be redone. Extra assignments will not be created for students to increase their grades during or after the course is complete. Missed assignments and tests receive a mark of zero.
- 6. To reflect established practice in the workplace and demonstrate responsibility, students are required to contact their professor within 24 hours before the start time/day of an assessment if unable to be in attendance for an assessment. A failure to comply will result in a mark of zero for that assessment.
- If the welding shop practical assignments are too advance or not advanced enough, faculty can remove or add welding assignments. Faculty would then dilute or divide the weighted grade to still match what the weight should be for that welding process.

## Required Text(s) and Supplies:

1. PPE Required: Welding Gloves, Safety Glasses, CSA Approved Work Boots, Long Pants (Denim)

### **Recommended Resources (purchase is optional):**

N/A

# Policies and Expectations for the Learning Environment:

### **General Policies and Expectations:**

General College policies related to	General policies related to					
<ul> <li>Acceptable Use of Information Technology</li> <li>Academic Policies</li> <li>Academic Integrity</li> <li>Standards for Student Conduct for all Learning Environments can be found at https://durhamcollege.ca/wp- content/uploads/Standards-of-Student-Conduct-</li> </ul>	<ul> <li>+ attendance</li> <li>+ absence related to tests or assignment due dates</li> <li>+ excused absences</li> <li>+ writing tests and assignments</li> <li>+ classroom management can be found in the Program Guide (full time programs only) in</li> </ul>					
<ul> <li>for-all-Learning-Environments.pdf</li> <li>Information about academic policies and procedures can be found on-line at https://durhamcollege.ca/about/governance/polici es</li> </ul>	MyDC https://durhamcollege.ca/mydc/					
All students at Durham College have the responsibility to familiarize themselves with and abide by the college's Academic Integrity Policy. Students are expected to complete and submit their own work in an honest manner, in accordance with the policy. Durham College has zero tolerance for breaches of academic integrity. All suspected breaches of academic integrity will be investigated and documented following procedures outlined in the policy, and should a breach be confirmed, appropriate penalties will be levied. Breaches of academic integrity refer to a variety of practices including, but not limited to:						

· copying another person's work;

- using unauthorized materials or resources during an evaluation;
- obtaining unauthorized copies of evaluations in advance;
- collaborating without permission;
- colluding or providing unauthorized assistance;
- falsifying academic documents or records;
- misrepresenting academic credentials;
- buying, selling, stealing, soliciting, exchanging or transacting materials or information for the purpose of academic gain;
- bribing or attempting to bribe personnel;
- impersonation;
- submitting the same work in more than one course without authorization;
- improper use of computer technology and the internet;
- depriving others of academic resources;
- misrepresenting reasons for special consideration of academic work;

• plagiarizing or failing to acknowledge ideas, data, graphics or other content without proper and full acknowledgement;

• any unauthorized use of generative or other artificial intelligence.

If you have questions or concerns about what constitutes appropriate academic conduct or research and citation methods, and what your responsibilities are towards academic integrity, please visit the Academic Integrity website on MyDC, reach out to Student Academic Learning Services (SALS), or speak with your professor or Student Advisor.

### **Course Specific Policies and Expectations:**

# **General Course Outline Notes:**

- 1. Students should use the course outline as a learning tool to guide their achievement of the learning outcomes for this course. Specific questions should be directed to their individual professor.
- 2. The college considers the electronic communication methods (i.e. DC Mail or DC Connect) as the primary channel of communication. Students should check the sources regularly for current course information.
- 3. Professors are responsible for following this outline and facilitating the learning as detailed in this outline.
- 4. Course outlines should be retained for future needs (i.e. university credits, transfer of credits etc.)
- 5. A full description of the Academic Appeals Process can be found at https://durhamcollege.ca/about/governance/policies/academic-policies .
- Faculty are committed to ensuring accessible learning for all students. Students who would like assistance with academic access and accommodations in accordance with the Ontario Human Rights Code should register with the Access and Support Centre (ASC). ASC is located in room SW116, Oshawa Campus and in room 180 at the Whitby Campus. Contact ASC at 905-721-3123 for more information.
- 7. Durham College is committed to the fundamental values of preserving academic integrity. Durham College and faculty members reserve the right to use electronic means to detect and help prevent plagiarism. Students agree that by taking this course all assignments could be subject to submission either by themselves or by the faculty member for a review of textual similarity to Turnitin.com. Further information about Turnitin can be found on the Turnitin.com Web site.

# Learning Plan

The Learning Plan is a planning guideline. Actual delivery of content may vary with circumstances.

Students will be notified in writing of changes that involve the addition or deletion of learning outcomes or evaluations, prior to changes being implemented, as specified in the Course Outline Policy and Procedure at Durham College.

Week/ Module	Hours:		1	Delivery:	In Class	
1	Course Lear	rning Outcom	es			
	CLO1, CLO	2				
	Essential Er	nployability S	kills			
	Taught:	EES1, EES EES11	2, EES9,	EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11
	Intended Le	arning Object	ives/Topi	ics		
	Program O -Times, dat -Classroom -Evaluation -Safety star -Personal s -Workshop -Emergenc -Fire drill -Fire exting -Protective -Welding go -Fumes and Safety prec -Cylinders -Rupture di -Pressure r -Acetylene -Cylinders -Fusible plu -Generators -Pressure r -Other indu	rientation; es of program and workshop methods and ndards and pro afety safety y procedures uishers and bla clothing oggles and filte d ventilation autions and sta sc egulators strial gasses	o timetable procedures i cedures i ankets er lenses andards;	es es n welding		
	Intended Le	arning Activit	ies			
	Guided disc Demonstra	tions	j			
	Resources a	and Reference	s			
	N/A					
	Evaluation Assignmen - to do done total for 3 w	t: Safety Intro a e weeks 1-3. P /eeks at 10	and Oxy A oints per	Acetylene In-C worksheet to	Class Worksheets vary, approx. weig	<b>Weighting</b> 9 ght

Week/ Module	Hours:		2	Delivery:	Shop			
1	Course Lear	ning Outcome	es					
	CLO2, CLO3	3						
	Essential Employability Skills							
	Taught:	EES1, EES2 EES5, EES9	2, EES3, E 9, EES10,	EES4, EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11		
	Intended Lea	rning Objecti	ves/Topi	cs				
	Setting up Oxy Acetylene Equipment and shutting it down properly. Setting the flame, knowing the difference between carburizing, neutral and oxidizing flames. Welding demonstration of; - Carrying a molten pool without filler wire. - Corner joint w/o filler wire. - Butt joint w/o filler wire.							
	Intended Lea	rning Activiti	es					
	Demonstrati Discussions	ons						
	Resources a	nd Reference	s					
	N/A							
	Evaluation Lab Activity: - all welding completion	Weekly Weld practice coup	Practice ons to be	Coupons handed in ar	nd recorded for fu	Weighting 5 II		

Week/ Module	Hours:		1	Delivery:	In Class			
2	Course Lear	ning Outcom	es					
	CLO1, CLO2	2						
	Essential Em	ployability S	kills					
	Taught:	EES1, EES2 EES11	2, EES9,	EES10,	Practiced:	EES1, E EES11	EES2, EES9, EES10,	
	Intended Lea	rning Object	ives/Topi	cs				
	<ul> <li>-Handling oxygen and acetylene cylinders safely and maintaining equipment</li> <li>-Set-up and operating the oxy fuel equipment safely</li> <li>-Pressure regulator operation and maintenance</li> <li>-Two stage regulators</li> <li>-Diaphragms</li> <li>-Gauges</li> <li>-Working pressure</li> <li>-Cylinder pressure</li> <li>-Fuel gasses</li> <li>-Acetylene</li> <li>-Oxy fuel flames: oxidizing, neutral, carborizing</li> </ul>							
	Power point Guided disc Demonstrati	presentations ussions ons	es					
	Resources a	nd Reference	S					
	N/A							
	Evaluation Assignment - to do done total for 3 we	: Safety Intro a weeks 1-3. Pe eeks at 10	and Oxy A pints per	Acetylene In-C worksheet to	Class Worksheets vary, approx. weig	ght	<b>Weighting</b> 9	

Week/ Module	Hours:		2 Delive	ery: Shop	
2	Course Learr	ning Outcome	S		
	CLO2, CLO3				
	Essential Em	ployability Sk	<b>kills</b>		
	Taught:	EES1, EES2 EES5, EES9	, EES3, EES4, , EES10, EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Lea	rning Objectiv	ves/Topics		
	Welding den - Corner join - Butt joint w - Lap joint in	nonstration of; t with out filler /o filler wire. the Horizontal	wire. position with fille	er wire.	
	Intended Lea	rning Activitie	es		
	Demonstration Discussions	ons			
	Resources ar	nd References	5		
	N/A				
	Evaluation				Weighting
	Lab Activity: - all welding completion	Weekly Weld I practice coupo	Practice Coupon ons to be handed	s in and recorded for	5 full

Week/ Module	Hours:	1	Delivery:	In Class		
3	Course Lea	rning Outcomes				
0	CLO1, CLO	2				
	Essential Er	nployability Skill	ls			
	Taught:	EES1, EES2, E EES11	EES9, EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11	
	Intended Le	arning Objective	es/Topics			
	Intended Learning Objectives/Topics         Welding and cutting torches care and use:         - Types of torches         - Service         - Mixing the gasses         - Welding and heating tips         - Welding tip cleaners.         - Flashback arresters         - Reverse flow check valves         - Hoses and fittings         - Flashbacks and backfires         - Types of flames         - Leak detection         - Turning on and testing a torch         - Turning off the welding torch         - Dismantling and storage of the equipment         - Manifold systems and operations         - Identify and describe the basic safe set up and operation of the Oxy fuel cutting process includin         - Types of cutting torches         - Cutting tips         - Hand cutting         - Selecting the correct tips and pressures -Chemistry and physics of the cut         - Preheat         - Speed         - Safe set up of the oxy-acetylene cutting equipment         - Pressure					
	- Methods o	of improving cuts				
	Intended Le	arning Activities	•			
	Power poin	t presentations				
	Demonstra	tions				
	Resources a	and References				
	N/A					
	Evaluation Assignmen - to do done total for 3 w	t: Safety Intro and e weeks 1-3. Poin /eeks at 10	l Oxy Acetylene In- its per worksheet to	Class Worksheets vary, approx. we	<b>Weighting</b> 9 ght	

Week/ Module	Hours:	2	Delivery:	Shop	
3	Course Lear	ning Outcomes			
	CLO2, CLO	3			
	Essential En	nployability Skills			
	Taught:	EES1, EES2, EES EES5, EES9, EES	3, EES4, 10, EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Lea	arning Objectives/Te	opics		
	Welding dei - Corner joir - Butt joint v - Lap joint ir	monstration of; nt with out filler wire. v/o filler wire. n the Horizontal posit	on with filler wir	e.	
	Intended Lea	arning Activities			
	Demonstrat Discussions	ions S			
	Resources a	Ind References			
	N/A				
	Evaluation Lab Activity - all welding completion	: Weekly Weld Practi practice coupons to	ce Coupons be handed in ar	nd recorded for fu	Weighting 5
Week/ Module	Hours:	1	Delivery:	In Class	
4	Course Lear	ning Outcomes			
	CLO1, CLO	2			
	Essential En	nployability Skills			
	Taught:	EES1, EES2, EES EES11	9, EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11
	Intended Lea	arning Objectives/Te	nino		
			plics		
	Theory Test	t for Oxy-Acetylene S	ection		
	Theory Test	t for Oxy-Acetylene S arning Activities	ection		
	Theory Test Intended Lea Power point Guided disc Demonstrat	t for Oxy-Acetylene S arning Activities t presentations cussions ions	ection		
	Theory Test Intended Lea Power point Guided disc Demonstrat Resources a	t for Oxy-Acetylene S arning Activities t presentations cussions ions	ection		
	Theory Test Intended Lea Power point Guided disc Demonstrat Resources a N/A	t for Oxy-Acetylene S arning Activities t presentations ussions ions Ind References	ection		

Week/ Module	Hours:		2	Delivery:	Shop			
4	Course Learn	ing Outcome	S					
	CLO2, CLO3							
	Essential Em	ployability Sk	ills					
	Taught:	EES1, EES2 EES5, EES9	, EES3, E , EES10,	ES4, EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11		
	Intended Learning Objectives/Topics							
	Weld Test fo -corner joint -butt joint wit -lap joint with Safe assemb -Cut a straigl	r; h filler h filler oly of the oxy-a ht line and cut	acetylene a circle o	cutting equip ut of mild ste	oment for oxy-ace el plate.	tylene cutting;		
	Intended Lear	rning Activitie	es					
	Demonstration Discussions	ons						
	Resources ar	nd References	6					
	N/A							
	Evaluation					Weighting		
	Test: Oxy Ac - weld test fo - oxy-acetyle	etylene Practi r corner joint, ne cutting test	cal Test butt joint	with filler, lap	joint with filler	8		

Week/ Module	Hours:	1	Delivery:	In Class				
5	Course Learn	ning Outcomes						
	CLO1, CLO2	2						
	Essential Em	ployability Skill	s					
	Taught:	EES1, EES2, E	ES10, EES11	Practiced:	EES1, EES2, EES10, EES11			
	Intended Learning Objectives/Topics							
	Introduction to safety procedures and equipment of Gas Metal Arc Welding (GMAW)							
	<ul> <li>-turning on power source</li> <li>-locations of welding tip, welding nozzle, diffuser, cables, liners, wire spool, reloading wire spool</li> <li>-use and purpose of welding gases</li> <li>Intended Learning Activities</li> </ul>							
	Power point presentations Guided discussions Demonstrations							
	Resources a	nd References						
	N/A							
	Evaluation Assignment: - to do done total for 3 we	Safety Intro and weeks 5-7. Poin eeks at 10	GMAW In-Class W ts per worksheet to	/orksheets vary, approx. wei	Weighting 12 ght			
Week/ Module	Hours:	2	Delivery:	Shop				
5	Course Learn	ning Outcomes						
	CLO2, CLO3	•						
	Essential Em	ployability Skill	s					
	Taught:	EES1, EES2, E EES5, EES10,	ES3, EES4, EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES10, EES11			
	Intended Lea	rning Objective	s/Topics					
	Demonstration of safety procedures and equipment of Gas Metal Arc Welding (GMAW) -turning on power source -locations of welding tip, welding nozzle, diffuser, cables, liners, wire spool, reloading wire spool -use and purpose of welding gases, how to turn on MIG MIX -welding demonstration of beads and weaves on 4x6 mild steel plate							
	Intended Lea	rning Activities						
	Demonstration Discussions	Demonstrations Discussions						
	Resources a	nd References						
	N/A							
	Evaluation Lab Activity: - all welding completion	Weekly Weld Pr practice coupons	actice Coupons s to be handed in a	nd recorded for fu	Weighting 5 II			

Week/ Module	Hours:		1	Delivery:	In Class			
6	Course Learning Outcomes							
	CLO2, CLO4							
	Essential Employability Skills							
	Taught:	EES1, EES2 EES11	, EES9, E	EES10,	Practiced:	EES1, EE EES11	S2, EES9, EES10,	
	Intended Lea	rning Objectiv	ves/Topi	cs				
	Explain the f - Welding Ma - Cable Asse - Shielding G - Wire Feede - Spool gun - Drive Roll A - Liners - Gas Diffuse - Contact Tip - Nozzles	unction of the achine (power embly Bas er Assembly er	compone source)	nts in the GN	/AW process in d	epth;		
	Intended Lea Power point Guided discu Demonstration	rning Activitie presentations ussions ons	es					
	Resources a	nd References	5					
	N/A							
	Evaluation Assignment: - to do done total for 3 we	Safety Intro a weeks 5-7. Po eeks at 10	nd GMAV ints per v	V In-Class W vorksheet to	/orksheets vary, approx. wei	<b>N</b> 12 ght	<b>/eighting</b>	

Week/ Module	Hours:	2	Delivery:	Shop					
6	Course Learning Outcomes								
	CLO2, CLO5								
	Essential Employability Skills								
	Taught:	EES1, EES2, EES3, EES5, EES9, EES1(	EES4, ), EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11				
	Intended Lea	rning Objectives/Top	oics						
	Welding der -1F (flat fillei -students to marks Weld -1F (flat fillei -students to marks (see Intended Lea	nonstration for; t) multiple passes learn tacking the 5 cou- ing demonstration for; t) learn tacking the 5 cou- demonstrated 5 piece mining Activities	upon pieces to upon pieces to coupon setup)	gether and cut in	half to rejoin for full completion half to rejoin for full completion				
	Demonstrati Discussions	ons							
	Resources a	nd References							
	N/A								
	Evaluation Lab Activity: - all welding completion	Weekly Weld Practice practice coupons to b	e Coupons e handed in ar	nd recorded for fu	Weighting 5				

Week/ Module	Hours:	1	Delive	ry: In Class				
7	Course Learning Outcomes							
	CLO4							
	Essential Employability Skills							
	Taught:	EES1, EES2, I EES11	EES9, EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11			
	Intended Learning Objectives/Topics							
	Explain the f - Welding M - Cable Asse - Shielding C - Wire Feede - Spool gun - Drive Roll A - Liners - Gas Diffus - Contact Tip - Nozzles	Function of the co achine (power so embly Bas er Assembly er	omponents in the	e GMAW process in d	epth;			
	Intended Lea Power point Guided disc Demonstrati	rning Activities presentations ussions ons	5					
	Resources a	nd References						
	N/A							
	Evaluation Assignment: - to do done total for 3 we	Safety Intro and weeks 5-7. Poir eeks at 10	d GMAW In-Clas nts per workshee	s Worksheets t to vary, approx. wei	Weighting 12 ght			

Week/ Module	Hours:	2	Delivery:	Shop				
7	Course Lear	ning Outcomes						
	CLO2, CLO5	5						
	Essential Em	ployability Skills						
	Taught:	EES1, EES2, EES EES5, EES9, EES	63, EES4, 610, EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11			
	Intended Lea	rning Objectives/T	opics					
	<ul> <li>vveiding demonstration for;</li> <li>-2F (horizontal fillet) multiple passes</li> <li>-students to learn tacking the 5 coupon pieces together and cut in half to rejoin for full completion marks (see demonstrated 5 piece coupon setup)</li> </ul>							
	Intended Learning Activities							
	Demonstrati Discussions	ons						
	Resources a	nd References						
	N/A							
	Evaluation Lab Activity: - all welding completion	Weekly Weld Pract practice coupons to	ice Coupons be handed in a	nd recorded for fu	Weighting 5 ull			
Week/ Module	Hours:	1	Delivery:	In Class				
8	Course Lear	ning Outcomes						
	CLO4							
	Essential Em	ployability Skills						
	Taught:	EES1, EES2, EES EES11	89, EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11			
	Intended Lea	rning Objectives/T	opics					
	GMAW The	ory Test						
	Intended Lea	rning Activities						
	Power point Guided disc Demonstrati	presentations ussions ons						
	Resources a	nd References						
	N/A							
	Evaluation Test: GMAW	V Theory Test			<b>Weighting</b> 10			

Module	Hours:	2	Delivery:	Shop					
8	Course Lear	ning Outcomes							
	CLO2, CLO	CLO2, CLO5							
	Essential Em	ployability Skills							
	Taught:EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11Practiced:EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11								
	Intended Lea	Intended Learning Objectives/Topics							
	Welding der -Practice 1F -students to marks (see d	Welding demonstration for; -Practice 1F, 2F multiple passes -students to learn tacking the 5 coupon pieces together and cut in half to rejoin for full completion marks (see demonstrated 5 piece coupon setup)							
	Intended Learning Activities								
	Demonstrations Discussions								
	Resources a	Resources and References							
	N/A	N/A							
	Evaluation Lab Activity: - all welding completion	Weekly Weld Practice practice coupons to be	Coupons e handed in ar	nd recorded for fu	<b>Weighting</b> 5 JII				
Wook/	Houro	4	Dellerener						
Module	nours.	1	Delivery:	In Class					
Module 9	Course Lear	ning Outcomes	Delivery:						
Module 9	CLO2, CLO2	ning Outcomes	Delivery:						
9	Course Learn CLO2, CLO4 Essential Em	ning Outcomes 4 nployability Skills	Delivery:						
9	CLO2, CLO4 Essential Em	ning Outcomes 4 hployability Skills EES1, EES2, EES9, EES11	EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11				
Module 9	CLO2, CLO4 Essential Em Taught:	ning Outcomes 4 nployability Skills EES1, EES2, EES9, EES11 nrning Objectives/Top	EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11				
9 9	CLO2, CLO4 Essential Em Taught: Intended Lea Career Proje Videos and Discussions Worksheet of	ning Outcomes ployability Skills EES1, EES2, EES9, EES11 arning Objectives/Top ect presentations on caree on careers in welding on what project is, presentations	EES10, ics entation type	Practiced:	EES1, EES2, EES9, EES10, EES11				
9 9	CLO2, CLO4 Essential Em Taught: Intended Lea Career Proje Videos and Discussions Worksheet of	ning Outcomes ployability Skills EES1, EES2, EES9, EES11 EES11 presentations on caree on careers in welding on what project is, presentations	EES10, ics ers in welding entation type	Practiced:	EES1, EES2, EES9, EES10, EES11				
9 9	Course Learn CLO2, CLO4 Essential Em Taught: Intended Lea Career Proje Videos and Discussions Worksheet of Intended Lea Power point Guided disc Demonstrati	ning Outcomes ployability Skills EES1, EES2, EES9, EES11 EES11 presentations on caree on careers in welding on what project is, presentations presentations presentations ussions ions	EES10, ics ers in welding entation type	Practiced:	EES1, EES2, EES9, EES10, EES11				
9 9	Course Learn CLO2, CLO4 Essential Em Taught: Intended Lea Career Proje Videos and Discussions Worksheet of Intended Lea Power point Guided disc Demonstrati	ning Outcomes a ployability Skills EES1, EES2, EES9, EES11 arning Objectives/Top ect presentations on caree on careers in welding on what project is, presentations ussions ons and References	EES10, ics ers in welding entation type	Practiced:	EES1, EES2, EES9, EES10, EES11				
9 9	Course Learn CLO2, CLO4 Essential Em Taught: Intended Lea Career Proje Videos and Discussions Worksheet of Intended Lea Power point Guided disc Demonstrati Resources a N/A	ning Outcomes 4 pployability Skills EES1, EES2, EES9, EES11 arming Objectives/Top ect presentations on caree on careers in welding on what project is, prese trning Activities presentations ussions ons nd References	EES10, ics entation type	Practiced:	EES1, EES2, EES9, EES10, EES11				

Week/ Module	Hours:	2	Delivery:	Shop					
9	Course Learn	ning Outcomes							
	CLO2, CLO5								
	Essential Em	Essential Employability Skills							
	Taught:	EES1, EES2, EES3 EES5, EES9, EES1	, EES4, 0, EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11				
	Intended Learning Objectives/Topics								
	Welding demonstration for; -Practice 1F, 2F multiple passes -students to learn tacking the 5 coupon pieces together and cut in half to rejoin for full completion marks (see demonstrated 5 piece coupon setup)								
	Intended Learning Activities								
	Demonstration Discussions	Demonstrations Discussions							
	Resources and References								
	N/A	N/A							
	Evaluation Lab Activity: - all welding completion	Weekly Weld Practic practice coupons to b	e Coupons be handed in ar	nd recorded for fu	Weighting 5 III				
Week/ Module	Hours:	1	Delivery:	In Class					
10	Course Learn	ning Outcomes							
	CLO2, CLO4								
	Essential Em	ployability Skills							
	Taught:	EES1, EES2, EES1	0, EES11	Practiced:	EES1, EES2, EES10, EES11				
	Intended Lea	rning Objectives/To	pics						
	Career Proje Videos and p Discussions Worksheet o	ect presentations on care on careers in welding n what project is pre-	ers in welding I						
	Power point	nresentations							
	Guided discu Demonstratio	ussions ons							
	Resources ar	nd References							
	N/A								
	Evaluation Assignment: - career in w engagement	Theory Assignment Velding assignment wit	Weeks 9,10 th presentation	or display of indu	Weighting 8 ustry				

Week/ Module	Hours:		2	Delivery:	Shop	
10	Course Learr	ning Outcom	es			
	CLO2, CLO5	5				
	Essential Em	ployability S	kills			
	Taught:	EES1, EES EES5, EES	2, EES3, E 10, EES11	ES4,	Practiced:	EES1, EES2, EES3, EES4, EES5, EES10, EES11
	Intended Lea	rning Object	ives/Topio	cs		
	Welding Tes -1F, 2F posit	t for; tions				
	Intended Lea	rning Activit	ies			
	Demonstrati Discussions	ons				
	Resources a	nd Reference	s			
	Text -Constructio -DC Connec	n Health and a	Safety Ma	nual		
	Evaluation Test: GMAW - weld test fo	/ Practical Test or 1F 2F	st			Weighting 10

Week/ Module	Hours:	1	Delivery	In Class				
11	Course Learning Outcomes							
	CLO2, CLO6	;						
	Essential Employability Skills							
	Taught:	EES1, EES2, E EES11	EES9, EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11			
	Intended Lea	rning Objective	s/Topics					
	Intended Learning Objectives/Topics Introduction to safety procedures and equipment of Shielded Metal Arc Welding (SMAW) -turning on power source -equipment setup for electrode holder, ground clamp -use and purpose of welding rods - Fusion - Arc characteristics, - Arc length. - Effect on voltage. - Travel speed - Weld contamination protection. Intended Learning Activities							
	Guided discu Demonstration	ussions ons						
	Resources a	nd References						
	N/A							
	Evaluation Assignment: - to do done total for 3 we	Safety Intro and weeks 11-13. Po eeks at 10	I SMAW In-Class V pints per workshee	Worksheets et to vary, approx. v	Weighting 12 veight			

Week/ Module	Hours:	2	Del	livery:	Shop		
11	Course Lear	ning Outcomes					
	CLO2, CLO7	,					
	Essential Em	ployability Skil	ls				
	Taught:	EES1, EES2, I EES5, EES9, I	EES3, EES4, EES10, EES	, 11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	
	Intended Learning Objectives/Topics						
	Demonstration of safety procedures and equipment of Shielded Metal Arc Welding (SMAW) -turning on power source -equipment setup for electrode holder, ground clamp -use and purpose of welding rods -welding demonstration of beads and weaves on 4x6 mild steel plate with E7018 rods -Safe set up and operation of the arc welding equipment; Clean and inspect welding helmets. Filter lens selection. Ventilation system. Chipping hammer wire brush. Intended Learning Activities						
	Demonstrati Discussions	ons					
	Resources a	nd References					
	N/A						
	Evaluation					Weighting	
	Lab Activity: - all welding completion	Weekly Weld P practice coupon	ractice Coup is to be hand	ons ed in ar	nd recorded for fu	5 II	

Week/ Module	Hours:	1	Delivery:	In Class					
12	Course Learning Outcomes								
	CLO2, CLO6	6							
	Essential Employability Skills								
	Taught:	Taught:EES1, EES2, EES9, EES10,Practiced:EES1, EES2, EES9, EES10,EES11EES11EES11							
	Intended Learning Objectives/Topics								
	Interdect Learning Objectives ropics Introduction to safety procedures and equipment of Shielded Metal Arc Welding (SMAW) -turning on power source -equipment setup for electrode holder, ground clamp -use and purpose of welding rods - Fusion - Arc characteristics, - Arc length. - Effect on voltage. - Travel speed - Weld contamination protection - Power sources - Power sources - Power source control - Arc force - Electrodes - Electrodes - Electrode holders - Welding cables								
	Intended Lea	Intended Learning Activities							
	Power point presentations Guided discussions Demonstrations								
	Resources a	nd References							
	N/A								
	Evaluation Assignment: - to do done total for 3 we	Safety Intro and weeks 11-13. Po eeks at 10	SMAW In-Class W ints per worksheet	orksheets to vary, approx. w	Weighting 12 reight				

Week/ Module	Hours:		2	Delivery:	Shop			
12	Course Learning Outcomes CLO2, CLO7, CLO8 Essential Employability Skills							
	Taught:	EES1, EES2, EES5, EES9,	, EES3, E , EES10,	ES4, EES11	Practiced:	EES1, EES2, EES5, EES9,	EES3, EES4, EES10, EES11	
	Intended Learning Objectives/Topics							
	<ul> <li>Welding demonstration for;</li> <li>-1F (flat fillet) multiple passes</li> <li>-2F (horizontal fillet) multiple passes</li> <li>-students to learn tacking the 5 coupon pieces together and cut in half to rejoin for full completion marks Welding demonstration for;</li> <li>-1F (flat fillet)</li> <li>-students to learn tacking the 5 coupon pieces together and cut in half to rejoin for full completion marks (see demonstrated 5 piece coupon setup)</li> </ul> Intended Learning Activities							
	Discussions							
	Resources a	nd References	3					
	N/A							
	Evaluation Lab Activity: - all welding completion	Weekly Weld I practice coupo	Practice ( ons to be	Coupons handed in ar	nd recorded for ful	Weigl 5	hting	

Week/ Module	Hours:	1	Delivery:	In Class			
13	Course Learning Outcomes						
	CLO2, CLO8						
	Essential Employability Skills						
	Taught:	EES1, EES2, EES EES11	S9, EES10,	Practiced:	EES1, EES2, EES9, EES10, EES11		
	Intended Learning Objectives/Topics						
	Safety procedures and equipment of Shielded Metal Arc Welding (SMAW) in depth; -turning on power source -equipment setup for electrode holder, ground clamp -use and purpose of welding rods - Fusion - Arc characteristics, - Arc length. - Effect on voltage. - Travel speed - Weld contamination protection - Power sources - Power source control - Arc force - Electrodes - Electrodes - Electrode holders - Welding cables						
	Intended Learning Activities						
	Power point presentations Guided discussions Demonstrations						
	Resources and References						
	N/A						
	Evaluation Assignment: - to do done total for 3 we	Safety Intro and Sl weeks 11-13. Poin eeks at 10	MAW In-Class Wo ts per worksheet	orksheets to vary, approx. w	Weighting 12 veight		

Week/ Module	Hours:	2	Delivery:	Shop					
13	Course Learning Outcomes								
	CLO2, CLO7								
	Essential Employability Skills								
	Taught:	EES1, EES2, EES3 EES5, EES9, EES <sup>2</sup>	3, EES4, 10, EES11	Practiced:	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11				
	Intended Lea	rning Objectives/To	pics						
	Welding demonstration for; -1F (flat fillet) multiple passes -2F (horizontal fillet) multiple passes -students to learn tacking the 5 coupon pieces together and cut in half to rejoin for full completion marks Welding demonstration for; -1F (flat fillet) -students to learn tacking the 5 coupon pieces together and cut in half to rejoin for full completion marks (see demonstrated 5 piece coupon setup)								
	Intended Learning Activities								
	Demonstrations Discussions								
	Resources and References								
	N/A								
	EvaluationWeightingLab Activity: Weekly Weld Practice Coupons5- all welding practice coupons to be handed in and recorded for full completion5								
Week/ Module	Hours:	1	Delivery:	In Class					
14	Course Learn	ning Outcomes							
	CLO2, CLO6	)							
	Essential Em	ployability Skills							
	Taught:	EES1, EES2, EES1	10, EES11	Practiced:	EES1, EES2, EES10, EES11				
	Intended Learning Objectives/Topics         SMAW Theory Test         Intended Learning Activities         Power point presentations         Guided discussions         Demonstrations								
	Resources a	nd References							
	N/A								
	Evaluation Test: SMAW	/ Theory Test			Weighting 10				

Week/ Module	Hours:		2	Delivery:	Shop			
14	Course Learning Outcomes							
	CLO2, CLO7							
	Essential Employability Skills							
	Taught:	EES1, EES EES5, EES	2, EES3, E 10, EES11	ES4,	Practiced:	EES1, EES2, EES3, EES4, EES5, EES10, EES11		
	Intended Learning Objectives/Topics							
	SMAW Welding Test -1F, 2F							
	Intended Learning Activities							
	Demonstrations Discussions							
	Resources and References							
	N/A							
	<b>Evaluation</b> Test: SMAW Practical Test - weld test for 1F 2F				Weighting 10			