DURHAM COLLEGE
SUCCESS MATTERS

Faculty of STA (Skld Trds)

Trade Fundamentals Basic Welding

2024-25 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 proctoring required	**Yes** [ ] **No** [X]		
Authorized by (Dean or Director):	Rebecca Milburn	**Date:**	October 2024

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

hands-on, practical learning activities.

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):

- [X] Assignment
- [ ] Exam
- [X] Portfolio
- [X] Other

Skills Demonstration

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. Weight total for three weeks is 5	CLO1, CLO2, CLO8	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	5
Test: Oxy-Acetylene Theory Test Week 4	CLO1, CLO2	EES2, EES10, EES11	8
Test: Oxy Acetylene Practical Test -weld test for butt joint without and with filler -oxy-acetylene cutting test	CLO1, CLO2, CLO3	EES2, EES5, EES9, EES10, EES11	14
Assignment: Safety Intro and GMAW In-Class Worksheets -to do done weeks 5-8. Points per worksheet to vary. Weight total for four weeks at 10	CLO1, CLO2, CLO4, CLO8	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	10
Test: GMAW Theory Test Week 9	CLO2, CLO4	EES1, EES2, EES5, EES10, EES11	8
Test: GMAW Practical Test -weld test for 1F 2F 3F -all welds to be demonstrated each week -3F can be marked lightly for trying it	CLO2, CLO5	EES2, EES5, EES9, EES10, EES11	14
Assignment: Safety Intro and SMAW In-Class Worksheets -to do done weeks 10-13. Points per worksheet to vary. Weight total for four weeks at 10	CLO1, CLO2, CLO6, CLO8	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	10
Test: SMAW Theory Test Week 14	CLO2, CLO6, CLO7	EES1, EES2, EES10, EES11	8
Test: SMAW Practical Test -weld test for 1F 2F 3F -all welds to be demonstrated each week -3F can be marked lightly for trying it	CLO2, CLO7	EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	14
Lab Activity: Weekly Weld Practice Coupons/Participation Marks -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	2.5

Assignment: Theory Assignment -career in welding assignment with presentation or display of industry engagement with assignment submission DC connect	CLO8	EES1, EES2, EES10, EES11	6.5
Total			**100%**

Notes:

1. 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.
5. 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.
7. 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
+ Acceptable Use of Information Technology + Academic Policies + Academic Integrity + Standards for Student Conduct for all Learning Environments can be found at https://durhamcollege.ca/wp-content/uploads/Standards-of-Student-Conduct-for-all-Learning-Environments.pdf + Information about academic policies and procedures can be found on-line at https://durhamcollege.ca/about/governance/policies	+ attendance + absence related to tests or assignment due dates + excused absences + writing tests and assignments + classroom management can be found in the Program Guide (full time programs only) in 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 .
6. 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.
8. In compliance with the Directive on the Costs of Educational Material under the Ministry of Training, Colleges and Universities Act (MTCU Act), please visit this link to determine textbook costs: https://durham.bookware3000.ca/course-materials/textbook-search. Please speak with your professor to determine if prior versions of a textbook are acceptable.

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 Learning Outcomes** CLO1, CLO2
	Essential Employability Skills **Taught:** EES1, EES2, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES9, EES10, EES11
	Intended Learning Objectives/Topics Program Orientation; -Times, dates of program -Classroom and workshop timetables -Evaluation methods and procedures -Safety standards and procedures in welding -Personal safety -Workshop safety -Emergency procedures -Fire drill -Fire extinguishers and blankets -Protective clothing -Welding goggles and filter lenses -Fumes and ventilation Safety precautions and standards; -Cylinders -Rupture disc -Pressure regulators -Acetylene -Cylinders -Fusible plugs -Generators -Pressure regulators -Other industrial gasses
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and Oxy Acetylene In-Class Worksheets -to do done weeks 1-3. Points per worksheet to vary. Weight total for three weeks is 5 — 5

Week/ Module	**Hours:** 2 **Delivery:** Shop
1	**Course Learning Outcomes** CLO2, CLO3
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics 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
	Intended Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks 2.5 -all welding practice coupons to be handed in and recorded for full completion

Week/ Module	**Hours:** 1 **Delivery:** In Class
2	**Course Learning Outcomes** CLO1, CLO2
	Essential Employability Skills
	Taught: EES1, EES2, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES9, EES10, EES11
	Intended Learning Objectives/Topics -Handling oxygen and acetylene cylinders safely and maintaining equipment -Set-up and operating the oxy fuel equipment safely -Pressure regulator operation and maintenance -Two stage regulators -Diaphragms -Gauges -Working pressure -Cylinder pressure -Fuel gasses -Acetylene -Oxy fuel flames: oxidizing, neutral, carborizing
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and Oxy Acetylene In-Class Worksheets -to do done weeks 1-3. Points per worksheet to vary. Weight total for three weeks is 5 — 5

Week/ Module	Hours: 2 Delivery: Shop	
2	**Course Learning Outcomes** CLO2, CLO3	
	Essential Employability Skills	
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Welding demonstration of; - Butt joint without filler - Butt joint with filler - Demonstrate and practice cutting straight lines and circles *all to be shown between weeks 1-3 for test week 4 at faculty discretion	
	Intended Learning Activities Demonstrations Discussions	
	Resources and References N/A	
	Evaluation Lab Activity: Weekly Weld Practice Coupons/Participation Marks -all welding practice coupons to be handed in and recorded for full completion	**Weighting** 2.5

Week/ Module	**Hours:** 1 **Delivery:** In Class
3	**Course Learning Outcomes** CLO1, CLO2
	Essential Employability Skills
	Taught: EES1, EES2, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES9, EES10, EES11
	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 including: - 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 - Slag - Plate cutting - Methods of improving cuts
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and Oxy Acetylene In-Class Worksheets -to do done weeks 1-3. Points per worksheet to vary. Weight total for three weeks is 5 — 5

Week/ Module	Hours: 2 Delivery: Shop		
3	**Course Learning Outcomes** CLO2, CLO3		
	Essential Employability Skills		
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	
	Intended Learning Objectives/Topics Welding demonstration of; - Butt joint without filler - Butt joint with filler - Demonstrate and practice cutting straight lines and circles *all to be shown between weeks 1-3 for test week 4 at faculty discretion		
	Intended Learning Activities Demonstrations Discussions		
	Resources and References N/A		
	Evaluation Lab Activity: Weekly Weld Practice Coupons/Participation Marks -all welding practice coupons to be handed in and recorded for full completion		**Weighting** 2.5
Week/ Module	**Hours:** 1 **Delivery:** In Class		
4	**Course Learning Outcomes** CLO1, CLO2		
	Essential Employability Skills		
	Taught: EES1, EES2, EES9, EES10, EES11	**Practiced:** EES1, EES2, EES9, EES10, EES11	
	Intended Learning Objectives/Topics Oxy-Fuel Theory Test		
	Intended Learning Activities Power point presentations Guided discussions Demonstrations		
	Resources and References N/A		
	Evaluation Test: Oxy-Acetylene Theory Test Week 4		**Weighting** 8

Week/ Module	Hours: 2 Delivery: Shop
4	**Course Learning Outcomes** CLO2, CLO3
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Weld Test for; -butt joint without filler -butt joint with filler -Cut a straight line and a circle out of 3/8th mild steel plate 4X6" laid out specifically by faculty
	Intended Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Test: Oxy Acetylene Practical Test 14 -weld test for butt joint without and with filler -oxy-acetylene cutting test
Week/ Module	**Hours:** 1 **Delivery:** In Class
5	**Course Learning Outcomes** CLO1, CLO2
	Essential Employability Skills
	Taught: EES1, EES2, EES10, EES11 **Practiced:** EES1, EES2, EES10, EES11
	Intended Learning Objectives/Topics Introduction to 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
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and GMAW In-Class Worksheets 10 -to do done weeks 5-8. Points per worksheet to vary. Weight total for four weeks at 10

Week/ Module	**Hours:** 2 **Delivery:** Shop
5	**Course Learning Outcomes** CLO2, CLO3
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES10, EES11
	Intended Learning Objectives/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 Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks 2.5 -all welding practice coupons to be handed in and recorded for full completion

Week/ Module	**Hours:** 1 **Delivery:** In Class
6	**Course Learning Outcomes** CLO2, CLO4
	Essential Employability Skills
	Taught: EES1, EES2, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES9, EES10, EES11
	Intended Learning Objectives/Topics Explain the function of the components in the GMAW process in depth; - Welding Machine (power source) - Cable Assembly - Shielding Gas - Wire Feeder - Spool gun - Drive Roll Assembly - Liners - Gas Diffuser - Contact Tip - Nozzles Career Project Introduction; Videos and presentations on careers in welding Discussions on careers in welding Worksheet on what project is, presentation type
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and GMAW In-Class Worksheets -to do done weeks 5-8. Points per worksheet to vary. Weight total for four weeks at 10 — 10

Week/ Module	Hours: 2 Delivery: Shop
6	**Course Learning Outcomes** CLO2, CLO5
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Welding demonstration for; -1F (flat fillet) multiple passes and/or weaving -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 in podium drawer booklets)
	Intended Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks 2.5 -all welding practice coupons to be handed in and recorded for full completion

Week/ Module	**Hours:** 1 **Delivery:** In Class
7	**Course Learning Outcomes** CLO4
	Essential Employability Skills
	Taught: EES1, EES2, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES9, EES10, EES11
	Intended Learning Objectives/Topics Explain the function of the components in the GMAW process in depth; - Welding Machine (power source) - Cable Assembly - Shielding Gas - Wire Feeder - Spool gun - Drive Roll Assembly - Liners - Gas Diffuser - Contact Tip - Nozzles Career Project Introduction; Videos and presentations on careers in welding Discussions on careers in welding Worksheet on what project is, presentation type
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and GMAW In-Class Worksheets -to do done weeks 5-8. Points per worksheet to vary. Weight total for four weeks at 10 — 10

Week/ Module	**Hours:** 2 **Delivery:** Shop
7	**Course Learning Outcomes** CLO2, CLO5
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Welding demonstration for; -2F (horizontal fillet) multiple passes ad/or weaving -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 in podium drawer booklets)
	Intended Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks 2.5 -all welding practice coupons to be handed in and recorded for full completion

Week/ Module	**Hours:** 1 **Delivery:** In Class
8	**Course Learning Outcomes** CLO4
	Essential Employability Skills
	Taught: EES1, EES2, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES9, EES10, EES11
	Intended Learning Objectives/Topics Review for testing; - Function of the components in the GMAW process in depth; - Welding Machine (power source) - Cable Assembly - Shielding Gas - Wire Feeder - Spool gun - Drive Roll Assembly - Liners - Gas Diffuser - Contact Tip - Nozzles Career Project introduction; Videos and presentations on careers in welding Discussions on careers in welding Worksheet on what project is, presentation type
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and GMAW In-Class Worksheets -to do done weeks 5-8. Points per worksheet to vary. Weight total for four weeks at 10 — 10

Week/ Module	Hours: 2 Delivery: Shop
8	**Course Learning Outcomes** CLO2, CLO5
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Welding demonstration for; -Practice 1F, 2F, 3F multiple passes and/or weaving -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 in podium drawer booklets)
	Intended Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks -all welding practice coupons to be handed in and recorded for full completion 2.5
Week/ Module	**Hours:** 1 **Delivery:** In Class
9	**Course Learning Outcomes** CLO2, CLO4
	Essential Employability Skills
	Taught: EES1, EES2, EES10, EES11 **Practiced:** EES1, EES2, EES10, EES11
	Intended Learning Objectives/Topics GMAW Theory Test
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Test: GMAW Theory Test Week 9 8

Week/ Module	Hours: 2 Delivery: Shop	
9	**Course Learning Outcomes** CLO2, CLO5	
	Essential Employability Skills	
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11	**Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Weld Test; - 1F, 2F, 3F	
	Intended Learning Activities Demonstrations Discussions	
	Resources and References N/A	
	Evaluation Test: GMAW Practical Test -weld test for 1F 2F 3F -all welds to be demonstrated each week -3F can be marked lightly for trying it	**Weighting** 14

Week/ Module	**Hours:** 1 **Delivery:** In Class
10	**Course Learning Outcomes** CLO2, CLO4
	Essential Employability Skills
	Taught: EES1, EES2, EES10, EES11 **Practiced:** EES1, EES2, EES10, EES11
	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 Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Theory Assignment Weeks 9,10 8 - career in welding assignment with presentation or display of industry engagement

Week/ Module	**Hours:** 2 **Delivery:** Shop
10	**Course Learning Outcomes** CLO2, CLO5
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, 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 E7014 and/or 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 Demonstrations Discussions
	Resources and References Text -Construction Health and Safety Manual -DC Connect
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks 2.5 -all welding practice coupons to be handed in and recorded for full completion

Week/ Module	**Hours:** 1 **Delivery:** In Class
11	**Course Learning Outcomes** CLO2, CLO6
	Essential Employability Skills
	Taught: EES1, EES2, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES9, EES10, EES11
	Intended Learning Objectives/Topics 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 Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and SMAW In-Class Worksheets 10 -to do done weeks 10-13. Points per worksheet to vary. Weight total for four weeks at 10

Week/ Module	**Hours:** 2 **Delivery:** Shop
11	**Course Learning Outcomes** CLO2, CLO7
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Welding demonstration for; -1F (flat fillet) multiple passes and/or weaving -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 in podium drawer booklets)
	Intended Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks 2.5 -all welding practice coupons to be handed in and recorded for full completion

Week/ Module	**Hours:** 1 **Delivery:** In Class
12	**Course Learning Outcomes** CLO2, CLO6
	Essential Employability Skills
	Taught: EES1, EES2, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES9, EES10, EES11
	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 - Power sources - Power source control - Arc force - Electrodes - Electrode holders - Welding cables
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and SMAW In-Class Worksheets 10 -to do done weeks 10-13. Points per worksheet to vary. Weight total for four weeks at 10

Week/ Module	**Hours:** 2 **Delivery:** Shop
12	**Course Learning Outcomes** CLO2, CLO7, CLO8
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Welding demonstration for; -2F (horizontal fillet) multiple passes ad/or weaving -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 in podium drawer booklets)
	Intended Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks 2.5 -all welding practice coupons to be handed in and recorded for full completion

Week/ Module	**Hours:** 1 **Delivery:** In Class
13	**Course Learning Outcomes** CLO2, CLO8
	Essential Employability Skills
	Taught: EES1, EES2, EES9, EES10, EES11 **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 - Electrode holders - Welding cables
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Assignment: Safety Intro and SMAW In-Class Worksheets 10 -to do done weeks 10-13. Points per worksheet to vary. Weight total for four weeks at 10

Week/ Module	Hours: 2 Delivery: Shop
13	**Course Learning Outcomes** CLO2, CLO7
	Essential Employability Skills
	Taught: EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11 **Practiced:** EES1, EES2, EES3, EES4, EES5, EES9, EES10, EES11
	Intended Learning Objectives/Topics Welding demonstration for; -Practice 1F, 2F, 3F multiple passes and/or weaving -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 in podium drawer booklets)
	Intended Learning Activities Demonstrations Discussions
	Resources and References N/A
	Evaluation **Weighting** Lab Activity: Weekly Weld Practice Coupons/Participation Marks 2.5 -all welding practice coupons to be handed in and recorded for full completion
Week/ Module	**Hours:** 1 **Delivery:** In Class
14	**Course Learning Outcomes** CLO2, CLO6
	Essential Employability Skills
	Taught: EES1, EES2, EES10, EES11 **Practiced:** EES1, EES2, EES10, EES11
	Intended Learning Objectives/Topics SMAW Theory Test
	Intended Learning Activities Power point presentations Guided discussions Demonstrations
	Resources and References N/A
	Evaluation **Weighting** Test: SMAW Theory Test Week 14 14.5 Assignment: Theory Assignment -career in welding assignment with presentation or display of industry engagement with assignment submission DC connect

Week/ Module	Hours: 2 Delivery: Shop	
14	**Course Learning Outcomes** CLO2, CLO7	
	Essential Employability Skills	
	Taught: EES1, EES2, EES3, EES4, EES5, EES10, EES11	**Practiced:** EES1, EES2, EES3, EES4, EES5, EES10, EES11
	Intended Learning Objectives/Topics SMAW Welding Test -1F, 2F, 3F	
	Intended Learning Activities Demonstrations Discussions	
	Resources and References N/A	
	Evaluation Test: SMAW Practical Test -weld test for 1F 2F 3F -all welds to be demonstrated each week -3F can be marked lightly for trying it	**Weighting** 14