

I. COURSE DESCRIPTION:

A curriculum dealing with a combination of theoretical knowledge and practical (hands on) skill related to the safe use and operation of typical :

- a) Shielded Metal Arc Welding equipment
- b) Gas Metal Arc Welding Equipment.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. ***Identify equipment and procedures required to assure personal safety while engaged in shop activities.***

Potential Elements of the Performance:

- identify proper eye protection as well as the need to wear it at all times while in the welding shop
- identify proper hand and face protection as well as the need to wear it during any and all cutting, heating and welding operations
- identify recommended fabrics and materials for personal protective clothing
- identify proper footwear and clothing
- identify the dangers associated with contact lenses, butane lighters, exposed metal jewellery, long hair and beards
- identify the location of commonly used welding tools, face shields and leather jackets
- locate and identify shop lighting and ventilation switches
- locate and identify emergency exits
- understand procedures for evacuation of shop areas in the case of emergencies

2. ***Set up and Operation of a SMAW Workstation***

Potential Elements of the Performance:

- identify, select and adjust welding helmets and filter lenses
- identify electrodes according to type, size and AWS / CSA numbering systems
- identify CSA standards for the storage and handling of electrodes
- identify techniques for adjusting welding current and polarity
- perform a routine inspection of assigned workstation(s) to determine the condition of cables, electrode holder and related equipment
- report / correct deficiencies prior to commencement of work
- describe techniques for arc ignition, electrode manipulation and travel speed
- produce trial beads in the flat and horizontal positions to verify machine settings and operator technique

3. ***Perform SMAW Procedures (in the flat and horizontal positions) as well as Identify / Correct Weld Defects.***

Potential Elements of the Performance:

- produce single and multi-pass fillet welds
- produce single and multi-pass groove welds
- identify and describe common weld defects as well as take corrective action(s) to eliminate their presence
- produce destructive tests on fillet or groove welds to determine weld metal soundness
- identify and explain ASME and CSA acceptance standards for weld soundness.

4. ***Perform SMAW Procedures in the Vertical Up Weld Position.***

Potential Elements of the Performance:

- produce single and multi-pass fillet welds
- produce single and multi-pass groove welds
- identify and describe common weld defects as well as take corrective action(s) to eliminate their presence
- produce destructive tests on fillet or groove welds to determine weld metal soundness

5. ***Set up and Operation of a GMAW Workstation.***

Potential Elements of the Performance:

- identify potential fire, fume and explosion hazards associated with the Gas Metal Arc Welding Process
- explain why a constant voltage machine is used for the GMAW process
- identify electrode types, sizes and AWS / CSA specifications
- identify common shielding gases used with the process
- perform a routine inspection of assigned workstations to determine the condition of wire feeder, cables, torch body, hoses and regulators
- report / correct deficiencies prior to commencement of work
- describe techniques for arc ignition, electrode manipulation and travel speed
- produce trial beads in the flat and horizontal positions to verify machine settings and operator technique

6. ***Perform GMAW Procedures (in the flat and horizontal positions) as well as Identify / Correct Weld Defects.***

- produce single and multi-pass fillet welds and groove welds
- identify and describe common weld defects as well as take corrective action(s) to eliminate their presence
- perform in-service to drive roll tension, contact tip and nozzle

- produce destructive tests on fillet or groove welds to determine weld metal soundness
- identify and explain ASME and CSA acceptance standards for weld soundness.

7. ***Perform GMAW Procedures in the Vertical Down Weld Position.***

- produce single and multi-pass fillet welds and groove welds
- identify and describe common weld defects as well as take corrective action(s) to eliminate their presence
- perform in-service to drive roll tension, contact tip and nozzle
- produce destructive tests on fillet or groove welds to determine weld metal soundness

III. TOPICS:

1. Personal and Shop Safety
2. SMAW Practices and Procedures
3. GMAW Practices and Procedures
4. Destructive Testing of Welds
5. AWS / CSA Acceptance Criteria for Welds

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- CSA Approved (Impact Resistant) Safety Glasses
- CSA Approved (8 inch High Cut) Safety Work Boots
- CAS Approved (Gauntlet Type) Welding Gloves
- Appropriate Work Wear (see Welding Shop Guidelines)
- Modules: Course Pack TCT701

V. EVALUATION PROCESS/GRADING SYSTEM:

Part 1 NOTES:

1. Re-writes are NOT allowed for any written assignment, quiz or test.
2. Repeats are NOT allowed for any shop test
3. Course attendance is mandatory. One percent (1 %) per hour will be deducted from the final course grade for apprentices with more than 4 hours of unexcused* absence.

[Any absence without a written, valid reason will be deemed unexcused.]

Valid reasons would include:

- Doctor's note
- Apprenticeship Ministry note
- Family Death or Serious Illness supported by a written note.

Part 2 Final Course Grades:

The final course grade will be determined by means of the following list of weighted factors:

Factor	Value
Shop Assignments and Tests	65 %
CWB S-Class Test(s)	35 %
Attendance	-1 % per Unexcused Hour
Shop Clean-up	-1 % per Incident

The following semester grades will be assigned to students:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded	

	subject area.
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.
NR	Grade not reported to Registrar's office.
W	Student has withdrawn from the course without academic penalty.

VI. SPECIAL NOTES:

Cheating

Students caught cheating during any theory quiz, test or exam will be removed from class pending a public apology to their fellow classmates and a letter giving them permission to return to class from the Dean's Office.

Theft and Damage

Students caught stealing and / or deliberately damaging shop tools and equipment will be removed from class pending a public apology to their fellow classmates and a letter giving them permission to return to class from the Dean's Office.

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 703 so that support services can be arranged for you.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. Students who engage in academic dishonesty will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.