

I. COURSE DESCRIPTION:

This curriculum has been designed to provide new and / or inexperienced clients with a combination of theoretical knowledge and basic practical (hands on) skill in the safe use and operation of both OFG and SMAW welding, cutting and heating 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 work boots, gloves and eye protection
- identify recommended fabrics and materials for personal protective clothing
- understand the general organization and layout of the welding shop facility
- locate and identify shop lighting and ventilation controls
- locate and identify emergency exits
- identify and select proper shades of welding / cutting lens
- identify, select and adjust helmets for proper fit and vision
- understand procedures for evacuation of shop areas in the case of emergencies

2. *Identify and describe oxyacetylene cutting and heating equipment and accessories including their construction, operation, assembly and disassembly.***Potential Elements of the Performance:**

- cylinder identification and general construction
- pressure regulators
- manual valves
- manifold systems
- gages, hoses and torch body
- tips used for
 - cutting
 - heating
 - welding
- cutting attachments
- flashback arrestors
- check equipment for safe operating condition

3. Demonstrate and describe the process of Oxyacetylene Flame Cutting and Heating.

Potential Elements of the Performance:

- set up equipment for oxyacetylene cutting
- select tip size and set cutting pressures for a given thickness of metal
- check equipment for safe operation
- pressurize, ignite, adjust and safely operate a cutting torch
- perform typical flame cutting operations to include
 - square cut c/w re-start
 - piercing and making holes
- distort / shape gauge metal by means of heating and cooling
- create a mild steel repair patch

4. Demonstrate and describe the process of:

- a) Oxyacetylene Fusion Welding.**
b) Oxyacetylene Braze Welding.

Potential Elements of the Performance:

- set up equipment for oxyacetylene fusion welding
- select tip size and set welding pressures for a given thickness of metal
- pressurize, ignite, adjust and safely operate a welding torch
- check equipment for safe operation
- deposit weld beads on mild steel sheet metal with filler rod
- set up equipment for oxyacetylene braze welding
- select tip size and set welding pressures for a given thickness of metal
- pressurize, ignite, adjust and safely operate a welding torch
- check equipment for safe operation
- deposit brass beads on mild steel sheet metal

5. Demonstrate and describe the process of making a welded patch repair by means of the Oxyacetylene Process

Potential Elements of the Performance:

- set up equipment for oxyacetylene braze or fusion welding
- select tip size and set welding pressures for a given thickness of metal
- pressurize, ignite, adjust and safely operate a welding torch
- check equipment for safe operation
- tack weld patch repairs to maintain alignment
- braze weld mild steel patch in the flat and horizontal and position

6. Demonstrate and describe how to set up and operate a typical SMAW Workstation.

Potential Elements of the Performance:

- identify, select and adjust welding helmets and lenses
- identify SMAW electrodes according to type, size, current type, polarity and welding position according to AWS designation
- identify and describe the various types of welding machine according to construction, duty cycle and current type
- perform a routine inspection of assigned workstation to determine the condition of welding machine, cables, electrode holders and related equipment
- understand the hazards of open circuit voltage (OCV) and arc voltage
- identify / set welding machine controls to their designated value(s)
- describe techniques for arc ignition, electrode manipulation and travel speeds
- produce trial weld beads to identify possible defects and verify current settings

7. Demonstrate and describe the process of making a welded patch repair by means of the SMAW Process

Potential Elements of the Performance:

- set up equipment for shielded metal arc welding
- check equipment for safe operation
- select electrode size, current and polarity for the given thickness of metal
- tack weld patch repairs to maintain alignment
- weld mild steel patch in the flat and horizontal and position

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. C.S.A. Approved (6") Safety Work Boots
2. C.S.A. Approved Safety Glasses
3. C.S.A Approved Welding Gloves (Gauntlet Type)
4. Appropriate Work Wear – (as per the Welding Department Guidelines)
5. Modules: Course Pack MSE616 (Bundle "A")

III. TOPICS:

1. Personal and Shop Safety
2. Cylinder Construction and Safe Operation / Use
3. Flame Cutting and Heating Equipment and Techniques
4. Fusion and Braze Welding Equipment and Techniques

5. Shielded Metal Arc Welding Equipment and Techniques
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:

<i>Factor</i>	<i>Value</i>
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:

<u>Grade</u>	<u>Definition</u>	<i>Grade Point Equivalent</i>
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:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.