

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

**SAULT
COLLEGE**

COURSE OUTLINE

COURSE TITLE:	Welding		
CODE NO. :	MET621	SEMESTER:	Level 1 Apprenticeship
PROGRAM:	Plumber and Steamfitter (Basic)		
AUTHOR:	Steve Witty		
DATE:	August 2016	PREVIOUS OUTLINE DATED:	August 2015
APPROVED:	<i>“Corey Meunier”</i> CHAIR		
TOTAL CREDITS:	N/A		
PREREQUISITE(S):	None		
HOURS/WEEK:	3		

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*For additional information, please contact **Corey Meunier, Chair***
Technology & Skilled Trades
(705) 759-2554, Ext. 2610



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I. COURSE DESCRIPTION:

This curriculum is based on the Welding Curriculum designed for Plumber Apprentices and approved by the Ministry of Training, Colleges and Universities. No changes should be made to it without prior examination of the specific Learning Outcomes / Content of the Ministry document.

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 oxyacetylene cutting and welding equipment / accessories including their construction, operation, assembly and disassembly***Potential Elements of the Performance:**

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

3. *Identify, describe and demonstrate the theory of oxyacetylene cutting.*

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
 - bevel cut c/w re-start
 - piercing and making holes
- list and sketch five (5) joint designs for welded joints
- prepare plate edges for butt welding
- prepare pipe ends for butt welding

4. *Demonstrate the ability to recognize weld faults and control distortion.*

Potential Elements of the Performance:

- name the factors that determine weld quality
- list the properties of a good weld
- identify and sketch three types of oxyacetylene welding flames
- name the factors that determine tip selection
- state the purpose of using a filler rod
- list the factors that determine filler rod selection
- state the cause and methods of control for welding faults
- state the cause and methods of control for distortion

5. *Demonstrate the ability to deposit sound weld beads, tack welds and butt joints with filler rod in the flat position.*

Potential Elements of the Performance:

- set up equipment for oxyacetylene 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 plate with filler rod
- prepare butt joints to specification for welding
- tack weld joints to maintain alignment
- butt weld mild steel plate in the flat, horizontal and vertical position with filler rod
- butt weld a pipe joint in the horizontal fixed position

III. TOPICS:

1. Personal and Shop Safety
2. Oxy-Acetylene Welding and Cutting Equipment
3. Flame Cutting Practice and Procedure
4. Fusion Welding Practice and Procedures
5. Weld Defects and Distortion

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 MET621

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	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	
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.	

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

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.

It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.