

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON



COURSE OUTLINE

COURSE TITLE: WELDING

CODE NO.: MPC600 **SEMESTER:** N / A

PROGRAM: MOTIVE POWER - COMMON CORE

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DATE: May 2000 **PREVIOUS OUTLINE DATED:** May 1998

APPROVED: _____
DEAN

DATE

TOTAL CREDITS N / A

PREREQUISITE(S): An apprenticeship in one of the Motive Power Trades

LENGTH OF COURSE: 2 Hours / Week

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For additional information, please contact Kitty DeRosario, Dean,
School of Technology, Engineering & Technical Trades at (705) 759-2554, Ext. 642.

I. COURSE DESCRIPTION:

A curriculum that has been designed to provide sound theoretical knowledge of the safe use and operation of typical oxyacetylene welding, cutting and heating equipment. It will include shop demonstrations and some practical application of the above equipment in order to reinforce learning.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

Upon successful completion of this course the student will :

- 1) ***Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments a sound working knowledge of both personal and shop safety.***

Potential Elements of the Performance:

- identify proper eye, hand, and face protection
- identify proper footwear and clothing
- locate and identify shop ventilation devices
- locate and identify emergency fire exits
- identify the location of shut-off valves for the shop manifold gas system
- explain procedures for evacuation of shop areas in case of emergency
- describe the physical construction of both oxygen and acetylene cylinders
- identify the built-in safety devices for both oxygen and acetylene cylinders
- describe methods for identifying oxygen and acetylene cylinders, hoses, regulators and fittings
- identify basic physical properties and dangers associated with oxygen gas
- identify basic physical properties and dangers associated with acetylene gas
- describe procedures for cylinder handling
- describe procedures for setting up, pressurising, purging and shutting down a portable oxyacetylene station

- 2) ***Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments a sound working knowledge of how to set up and operate a typical oxyacetylene workstation.***

Potential Elements of the Performance:

- perform a routine inspection of assigned workstations to determine the condition of torch body, hoses, regulators and tips
- correct deficiencies prior to the commencement of work
- understand the differences in construction and operation between a balanced pressure and an injector torch
- pressurize and purge regulators, hoses, torch body and tip
- explain the dangers associated to the hazards of backfire and flashback
- explain the correct safe response to backfire and flashback
- identify correct versus unsafe flame ignition procedures
- adjust the oxyacetylene flame to produce flames designated as carburizing, neutral and oxidising
- describe procedures for the shutting down of the oxyacetylene torch, regulators and assigned workstation

- 3) ***Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments a sound working knowledge of how to perform both fusion and braze welding operations.***

Potential Elements of the Performance:

- describe potential fire, fume and explosion hazards associated to the fusion welding of metals
- identify proper fusion welding techniques
- perform appropriate pressure settings and flame adjustments for specific fusion welding exercises
- perform basic fusion welding operations on mild steel
- describe potential fire, fume and explosion hazards associated to the braze welding of metals
- identify proper braze welding techniques
- perform appropriate pressure settings and flame adjustments for specific braze welding exercises
- perform basic braze welding operations on mild steel

- 4) ***Communicate clearly and correctly in the written form a reasonable working knowledge of how to perform flame cutting and heating operations.***

Potential Elements of the Performance

- describe potential fire, fume and explosion hazards associated to the flame cutting of metals
- identify proper flame cutting techniques, appropriate pressure settings and flame adjustments for specific flame cutting exercises
- describe potential fire, fume and explosion hazards associated to the heating of metals
- describe potential changes to ductility and hardness that can as a result from the heating and rapid cooling of metals

5. ***Demonstrate by means of regular attendance, punctuality, respect for fellow students as well as lab / shop equipment, a willingness to assume the responsibilities of employment.***

Potential Elements of the Performance:

- be present for all scheduled classes
- provide a satisfactory reason for having to leave class early
- provide a reasonable excuse for being absent from class
- provide a written statement to the professor explaining the reason(s) for being absent on an assignment due date or the day of a scheduled test
- demonstrate behaviour that does not interfere with or obstruct the over-all learning environment
- actively participate in all course assignments and projects
- operate any and all lab / shop equipment according to guidelines prescribed by the college and / or course professor
- wear personal protective equipment at all times while in the shop
- return all equipment and unused practice materials to their designated place* upon completion of work (Read page 8 of the handout entitled “***Welding Shop Guidelines***” for a description of these responsibilities)
- remove all scrap and thoroughly clean individual and / or assigned station* (Read page 8 of the handout entitled “***Welding Shop Guidelines***” for a description of these responsibilities)

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- C.S.A. Approved (High Cut) Safety Work Boots
- C.S.A. Approved (Impact Resistant) Safety Glasses
- Appropriate Work Wear
- Notebook c/w Paper
- Two Finger (Gauntlet Type) Welding Gloves
- Module: "Principles of Industrial Welding"

V. EVALUATION PROCESS/GRADING SYSTEM

The evaluation for Learning Outcomes # 1 through # 4 will consist of an over-all theory test as well as designated lab/shop assignments and / or practical shop tests for which students must demonstrate proficiency in both 'knowledge' and 'hands on' skill.

Failure to complete all designated shop assignments shall result in the loss of the entire 10 % allocated to the "Employment Readiness" evaluation.

The over-all *theory test* will represent **65%** of the final course mark and will be '*open book*' using MPC600 course notes and the identified module.

Practical lab / shop assignments and *tests* will represent a combined total of **25%** of the final course mark must be completed prior to the writing of the said theory test.

The evaluation for *employment readiness* will consist of a day to day recording of the Elements of Performance listed. Each infraction will constitute the loss of one percentage point from the **10 percentage points** allocated to this outcome.

While all tests and assignments are designed to be completed with the specified time limit (or less), students **MUST** report to the shop/ classroom fully prepared. Your professor will supply only the assignment or test instructions.

Course Grading Scheme

Final Mark (*see item # 3 under Special Notes)

A	85 - 100%
B	75 - 84%
C	60 - 74%
D	50 - 59%
F	0 - 49%

Shop Assignments	25%
Theory Test	65%
Employment Readiness	10%

VI. SPECIAL NOTES:

1. Special Needs

If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 so that support services can be arranged for you.

2. 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 post-secondary institutions.

3. Student evaluations concerning the **'Final Mark'** are further affected by the conditions set forth in the printed handout, **'Welding Department Guidelines'** . Be sure that you receive a copy of these guidelines.

4. Course materials that are discussed and / or explained during any and all lab or shop demonstrations are subject to evaluation. Students are therefore responsible for the content of all lab / shop demonstrations.

5. Your Professor reserves the right to modify the course as he/she deems necessary to meet the needs of students.

6. Substitute Course Information is available at the Registrar's Office.

7. Any person caught cheating or substituting another person's work in place of their own for the purpose of grading or evaluation will automatically fail the said assignment or test. College policy* also dictates that such persons may be subject to immediate dismissal.

Students should refer to the definition of "academic dishonesty" provided in the Sault College "Statement of Student Rights and Responsibilities" .

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VII. PRIOR LEARNING ASSESSMENT

Students who wish to apply for **Advanced Credit** in the course should read page 8 of the printed handout entitled “Welding Shop Guidelines” and then speak with their course Professor.

Credit for **Prior Learning** will be granted based upon one of the following situations:

1. The successful completion of an oxyacetylene flame cutting and welding course with Learning Outcomes and Elements of Performance that are at least 80% compatible with this course outline ...

AND

2. The successful challenge of the over-all theory test identified by this course outline.

<<<<<<OR>>>>>>

1. Documented proof of at least three (3) years of competent trade experience involving oxyacetylene described in MPC600...

AND

2. The successful challenge of the over-all theory test identified by this course outline.