

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

COURSE OUTLINE

COURSE TITLE: Welding

CODE NO. : HED800 / MVM812 **SEMESTER:** N / A

PROGRAM: Heavy Duty Equipment Mechanic – Phase 2
Truck Coach Technician – Phase 2

AUTHOR: Dennis Clement-Socchia

DATE: Mar 2004 **PREVIOUS OUTLINE DATED:** May 1998

APPROVED:

DEAN

DATE

TOTAL CREDITS: N / A

PREREQUISITE(S): Successful completion of the 'Phase 1' level of in-school training for either of the above Apprenticeships or their equivalent.

HOURS/WEEK: 2 Hrs / Week

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*For additional information, please contact Colin, Kirkwood, Dean
School of Technology, Skilled Trades & Natural Resources*

(705) 759-2554, Ext. 688

I. COURSE DESCRIPTION: This curriculum has been designed to provide a combination of theoretical knowledge and hands on skill in the safe use and operation of typical Shielded metal Arc Welding equipment. The method of delivery is intended to be a combination of shop demonstrations / assignments together with independent reading assignments.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. ***Demonstrate and describe a sound working knowledge of personal and shop safety.***

Potential Elements of the Performance:

- identify proper eye, hand and face protection
- identify proper footwear and clothing
- identify and locate shop ventilation devices
- identify and locate emergency fire exits and power switches
- locate and understand how to operate the main shut-off valves for welding shop gases
- understand the procedure for evacuation of the welding shop in case of emergencies
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2. ***Demonstrate a sound working knowledge of how to set up and operate a typical SMAW workstation***

Potential Elements of the Performance:

- identify, select and adjust welding helmets and filter lenses
- identify electrode according to type, size and AWS / CSA numbering system
- identify ASME / CSA standards for the storage and handling of electrodes
- identify techniques for adjusting both welding current and polarity
- perform a routine inspection of assigned workstations to determine the condition of cables, electrode holder and related equipment
- correct deficiencies prior to the commencement of work
- explain basic of SMAW joint designs and base metal edge / surface preparation
- describe techniques for arc ignition, setting electrode angle and travel speed
- produce trial beads in the flat and horizontal positions
- identify possible weld defects and verify initial settings

3. ***Demonstrate a sound working knowledge of how to perform typical SMAW procedures as well as identify / correct common weld defects.***

Potential Elements of the Performance:

- perform adjustments to SMAW equipment specific to the demands of single and multi-pass fillet welds and groove welds
- describe and diagnose common weld defects
- take corrective action to eliminate the presence of weld defects
- perform destructive test on fillet welds to determine weld soundness
- identify and explain ASME and CSA acceptance standards for weld soundness

4. ***Identify and describe typical welding procedures for cast iron and aluminum.***

Potential Elements of the Performance:

- understand the increased risk produced by the type and amount of fumes produced by the welding of these metals
- identify the possible welding processes that may be employed
- understand that some types of aluminum and cast iron are not weldable
- identify the required electrode(s) and shielding gases
- understand basic welding procedures and the need for:
 - joint preparation and cleaning
 - base metal cleaning
 - preheat and inter-pass temperatures
 - post weld cooling

III. TOPICS:

1. Personal and Shop Safety
2. SMAW Equipment and Workstation Set-up
3. SMAW Practices and Procedures
4. Aluminum and Cast Iron Welding

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- CSA Approved (Impact Resistant) Safety Glasses
- CSA Approved (8 inch High Cut) Safety Work Boots
- CSA Approved (Gauntlet Type) Welding Gloves
- Appropriate Work Wear (see 'Welding Shop Guidelines')
- Pocket Note-pad (for Shop Demonstrations)
- Text 'Principles of Industrial Welding'

V. EVALUATION PROCESS/GRADING SYSTEM:

A final course grade will be calculated using the following list of weighted factors:

Factor	Value
Shop Assignments / Tests	70 %
Theory Test	30 %

The following grades will be assigned to students.

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
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: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 493 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.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. 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.

<include any other special notes appropriate to your course>

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.