

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



Sault College

CICE COURSE OUTLINE

COURSE TITLE: Welding

CODE NO. : MET210

SEMESTER:

MODIFIED CODE: MET021

PROGRAM: Truck Coach / HED Technician

AUTHOR: Dennis Clement-Socchia

MODIFIED BY: Velma Simon, Learning Specialist CICE Program

DATE: April 2006 **PREVIOUS OUTLINE DATED:** N/A

APPROVED:

DEAN

DATE

TOTAL CREDITS: 2

PREREQUISITE(S):

HOURS/WEEK: 2

Copyright ©2006 The Sault College of Applied Arts & Technology
Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.
For additional information, please contact the Dean,
School of Health and Human Services
(705) 759-2554, Ext. 2603

I. COURSE DESCRIPTION:

Part one of this curriculum has been designed to provide clients who have successfully completed year 1 of the Truck Coach / HED Technician program with the opportunity to further develop their skill with the SMAW process. Part two will introduce GMA Welding and provide clients with a sound working knowledge of the process as well as the ability to develop job entry skills.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the CICE student, with the assistance of a Learning Specialist, will demonstrate a basic ability to:

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

Potential Elements of the Performance:

- review proper eye, hand and face protection as well as the need to wear it at all times while in the welding shop
- review proper footwear and clothing
- review the dangers associated with contact lenses, butane lighters, exposed metal jewelry, long hair and beards
- review the location of commonly used welding tools, face shields and leather jackets
- identify personal safety equipment that must be supplied by the student
- locate and identify shop lighting and ventilation controls
- locate and identify emergency shop exits
- review emergency shop evacuation procedures
- locate and identify manifold shut-off valves for the shop gas system

2. ***Demonstrate the ability to identify, select and inspect the proper tools and equipment necessary operate a SMA Welding station in a safe manner.***

Potential Elements of the Performance:

- identify and select correct shade of filter lens based upon required welding current
- review procedure(s) to install filter lenses, gaskets, clear lens and retaining spring
- identify source(s) of high voltage electrical hazards
- review arc welding cables, holders and ground clamps and inspect same for damage / unsafe condition(s)
- review open circuit voltage and its danger to the operator
- perform a routine inspection of assigned workstation to determine the condition of welding machine, cables, electrode holders and related equipment
- correct deficiencies prior to the commencement of shop assignment

3. ***Demonstrate a basic working knowledge of how to perform SMA Welding operations in the flat, horizontal and vertical up position(s)***

Potential Elements of the Performance:

- make full penetration groove type welds on plate in the flat position based upon CSA W59 workmanship techniques for the E4924 electrode class
- make fillet and groove welds on plate in the horizontal position based upon CSA W59 workmanship techniques for the E4918 electrode class
- perform destructive bend tests on selected weld samples to verify weld soundness.

4. ***Demonstrate the ability to identify, select and inspect the proper tools and equipment necessary operate a GMA Welding station in a safe manner.***

Potential Elements of the Performance:

- identify source(s) of high voltage electrical hazards
- identify potential fire, fume and explosion hazards associated to either the Gas Metal Arc or the Flux Core Arc welding process
- briefly describe the differences between a constant current and a constant voltage welding machine
- explain why a constant voltage machine is used for the GMAW process
- identify electrode types, sizes and AWS specification
- identify various shielding gases and their potential use(s)
- 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 the commencement of work
- describe procedures for setting shielding gas flow rate, voltage, wire feed speed and visible (electrode) stick-out distance.
- describe techniques for arc ignition, setting gun angle and travel speeds

5. ***Demonstrate a basic working knowledge of how to perform GMA Welding operations in the flat and horizontal positions.***

Potential Elements of the Performance:

- make full penetration groove type welds on **plate** in the flat position based upon CSA W59 workmanship techniques for the E49S-6 electrode class
- make full penetration groove type welds on **10ga metal** in the flat position based upon CSA W59 workmanship techniques for the E49S-6 electrode class
- make fillet and groove type welds on **plate** in the horizontal position based upon CSA W59 workmanship techniques for the E49S-6 electrode class
- make fillet and groove type welds on **10ga metal** in the flat position based upon CSA W59 workmanship techniques for the E49S-6 electrode class
- perform destructive bend tests on selected weld samples to verify weld soundness.

III. TOPICS:

1. Personal and Shop Safety
2. Functions, Construction and Principle(s) of Operation of Shielded Metal Arc Welding equipment
3. SMA Welding Operations in the Flat and Horizontal Position
4. Functions, Construction and Principle(s) of Operation of Gas Metal Arc Welding equipment
5. SMA Welding Operations in the Flat and Horizontal Position
6. Weld Testing and Quality Assurance

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
- Pocket Note-pad for Shop Demonstration and Discussion Content
- Text: (T.B.A.) Talk to your Course Instructor before purchasing a text.

V. EVALUATION PROCESS/GRADING SYSTEM:

NOTE

1. Re-writes are NOT allowed for any written assignment, quiz or test.
2. Repeats are NOT allowed for any shop test

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

Factor		Weight
Shop Assignments and Tests	=	75%
Theory Quiz and / or Tests	=	25%
Total	=	100%

The following semester grades will be assigned to students:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
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.	

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 2703 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 the *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.

CICE Modifications:**Preparation and Participation**

1. An Integrative Educational Assistant will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Integrative Educational Assistant may not attend all classes with the student(s), support will always be available. When the Integrative Educational Assistant does attend classes he/she will remain as inconspicuous as possible.

A. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

B. Tests will be written in CICE office with assistance from an Integrative Educational Assistant.***The Integrative Educational Assistant may:***

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

C. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Integrative Educational Assistant may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

D. Evaluation:

Is reflective of modified learning outcomes.