

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON



COURSE OUTLINE

COURSE TITLE: **WELDING**

CODE NO.: ASM200 **SEMESTER:** 3

PROGRAM: AUTOMOTIVE TECHNICIAN – SERVICE MANAGEMENT

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DATE: October 2001 **PREVIOUS OUTLINE DATED:** October 1999

APPROVED:

DEAN

DATE

TOTAL CREDITS 2

PREREQUISITE(S): ASM112

LENGTH OF COURSE: 8 Weeks

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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 a combination of theoretical knowledge and practical (hands on) skill in the safe use and operation of typical Shielded Metal Arc and Gas Metal Arc welding equipment.

II. **LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

- 1 ***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 SMAW workstation.***

Potential Elements of the Performance:

- identify personal protective clothing, work boots, gloves and eye protection.
- identify, select and adjust welding helmets and filter lenses
- identify electrodes according to AWS / CSA numbering system, type and size
- identify guidelines for electrode selection and application
- identify techniques for setting polarity and the correct amount of welding current
- perform a routine inspection of assigned workstations to determine the condition of cables, electrode holder, ground clamp and related equipment.
- report and correct deficiencies prior to the commencement of work
- explain basic SMAW joint designs and base metal edge / surface preparation
- describe techniques for arc ignition, setting electrode angle and travel speeds
- produce trial beads to identify possible defects and verify initial settings

- 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 perform SMAW procedures and diagnose / correct defects.***

Potential Elements of the Performance:

- describe potential fire, fume, explosion, electrical and radiation hazards associated to the SMAW process
- perform appropriate adjustments to SMAW equipment specific to the demands of variable welding exercises
- describe and diagnose common weld defects
- identify and explain limited repair and service to electrode cables, holders and protective equipment
- produce fillet and groove welds capable of passing visual examination and / or destructive testing

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 set up and operate a typical GMAW workstation.***

Potential Elements of the Performance:

- state the difference between constant voltage and constant current welding machines
- identify the type of power supply used with the GMAW process
- identify and explain basic service requirements to the drive rolls, contact tip, gas nozzle and gun liner
- identify electrodes according to AWS / CSA numbering system, type and size
- identify guidelines for setting polarity, wire feed speed and voltage
- identify various shielding gases and their potential use
- describe methods for identifying cylinders, hoses, regulators and fittings

Potential Elements of the Performance continued.....

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- identify physical properties and dangers associated with a typical shielding gas
- perform a routine inspection of assigned workstations to determine the condition of wire feeder, cables, torch body, hoses and regulators
- report and correct deficiencies prior to the commencement of work
- follow procedures for pressurizing and purging with a GMAW shielding gas
- understand procedures for setting gas flow rate, voltage, wire feed speed and visible (electrode) stick-out distance
- state the relationship between electrical stick-out and weld quality
- describe techniques for arc ignition, setting gun angle and travel speeds
- produce trial beads to identify possible defects and verify initial settings

4. ***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 GMAW procedures and diagnose / correct defects.***

Potential Elements of the Performance:

- describe potential fire, fume, explosion, electrical and radiation hazards associated to the GMAW process
- demonstrate proper welding techniques
- perform appropriate adjustments to GMAW equipment specific to the demands of variable welding exercises
- describe and diagnose defective welds
- identify and explain limited repair and service to electrode cables, holders and protective equipment
- produce fillet and groove welds capable of passing visual examination and / or destructive testing

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:

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- 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
- remove all scrap and thoroughly clean individual and/or assigned station

III. TOPICS:

1. Personal and Shop Safety
2. Shielded Metal Arc Welding
3. Gas Metal Arc Welding
4. Employment Readiness

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
 Text: Principles of Industrial Welding

V. EVALUATION PROCESS/GRADING SYSTEM:

Shop Projects and Tests = 55%
Theory Test = 35%
Employment Readiness = 10%

The following semester grades will be assigned to students in post-

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secondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field placement or non-graded subject areas.	
U	Unsatisfactory achievement in field placement or non-graded subject areas.	
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see <i>Policies & Procedures Manual – Deferred Grades and Make-up</i>).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has not been possible for the faculty member to report grades.	

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 instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

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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.

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)

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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.