SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE: Welding

CODE NO. : IRN704 **SEMESTER:** N / A

PROGRAM: Ironworker Apprentice (Intermediate)

AUTHOR: Dennis Clement-Socchia

DATE: Mar 2004 **PREVIOUS OUTLINE DATED:** Aug 2002

APPROVED:

_____ _____

DEAN **DATE**

TOTAL CREDITS: 5

PREREQUISITE(S): Successful completion of the 'Basic Ironworker' level of in-school training or its equivalent.

HOURS/WEEK: 5 Hr / Week

I. **COURSE DESCRIPTION:** This curriculum that has been designed to provide apprentices with a sound working knowledge and level of skill in the safe use and operation of typical SMAW welding equipment and procedures. It's terminal objective will be to develop within the apprentice the skill required to pass the CBW plate test in both the horizontal and vertical positions.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. ***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
   - understand procedures for evacuation of shop areas in case of emergency

2. ***Demonstrate by means of practical shop assignments and tests a sound working knowledge of how to perform SMAW procedures and troubleshoot / correct weld defects.***

   Potential Elements of the Performance:
   - describe potential fire, fume and explosion hazards associated to the SMAW process
   - perform appropriate adjustments to SMAW equipment specific to the demands of single and multi-pass fillet welds
   - make single and multi-pass fillet welds on mild steel
   - perform appropriate adjustments to SMAW equipment specific to the demands of single and multi-pass groove welds
   - make single and multi-pass groove welds on mild steel
   - perform destructive tests on welded joints to verify overall soundness
   - describe and diagnose common weld defects

3. ***Demonstrate by means of practical shop assignments and tests a sound working knowledge of how to prepare fillet and groove weld joints according to AWS and CSA workmanship standards.***

Potential Elements of the Performance:

- describe fillet welds according to:
  - leg size
  - throat size
  - profile
  - quality and soundness
  - fit up and design

- describe groove welds according to:
  - throat size
  - profile
  - quality and soundness
  - fit up and design
  - the use of backing strips

4. ***Demonstrate by means of practical shop assignments and tests a sound working knowledge of how to perform pass a CWB plate test .***

Potential Elements of the Performance:

- describe the physical dimensions of the CWB test plate assembly including:
  - bead sequence
  - position and number of stop / restarts
  - the acceptance criteria for the size and shape of the completed weld
- describe the physical bend test procedure to include:
  - plate thickness, width and length
  - bevel angle
  - root opening
  - number and size of bend test coupons
- describe the welding procedure to include:
  - preparation and condition of bend coupons
  - identification of face vs root bend coupons
  - acceptance criteria for possible defects

III. TOPICS:

1. Personal and Shop Safety
2. OFG Cutting and Scarfing Practices
3. SMAW Welding Practices
4. Fillet and Groove Weld Preparation
5. CWB S-Class and T-Class Test Procedures

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')
- Pocket Note-pad (for Shop Demonstrations)
- Text 'Principles of Industrial Welding'

V. EVALUATION PROCESS/GRADING SYSTEM:

The final course grade will be calculated by means of the following weighted factors:

Factor	***Value***
Shop Assignments	35 %
CWB S & T Class Tests	35 %
Theory Test	30 %

The following will be assigned to students:

Grade	Definition	*Grade Point Equivalent*
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 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.