

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 Level		
AUTHOR:	Steve Witty		
DATE:	January 2009	PREVIOUS OUTLINE DATED:	May 2007
APPROVED:	“Corey Meunier” CHAIR		_____
TOTAL CREDITS:	5		DATE
PREREQUISITE(S):	Successful completion of the ‘Intermediate Ironworker’ level of in-school training or its equivalent.		
HOURS/WEEK:	5		

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- I. **COURSE DESCRIPTION: COURSE DESCRIPTION:** This curriculum has been designed to provide apprentices with a combination of theoretical knowledge and practical (hands on) skill in the safe use and operation of SMAW welding procedures and equipment. Its terminal objective is to develop the skills necessary to pass a CWB Plate Test in the required position(s).

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

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

1. ***Identify equipment and procedures required to assure personal safety while engaged in shop activities.***

Potential Elements of the Performance:

- identify proper work boots, gloves and eye protection
- identify recommended fabrics and materials for personal protective clothing
- understand the general organization and layout of the welding shop facility
- locate and identify shop lighting and ventilation controls
- locate and identify emergency exits
- identify and select proper shades of welding / cutting lens
- identify, select and adjust helmets for proper fit and vision
- understand procedures for evacuation of shop areas in the case of emergencies

2. ***Demonstrate a sound working knowledge of how to perform SMAW procedures and to correct / troubleshoot 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
- identify common weld defects based upon fracture and / or bend test results
- describe and diagnose the cause(s) of common weld defects

3. ***Demonstrate 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
 - size / strength vs strength
 - the negative effects of undercut
 - quality and soundness
 - fit up and design
- describe groove welds according to:
 - throat size
 - profile
 - size / shape vs strength
 - the negative effects of under-fill
 - quality and soundness
 - fit up and design
 - the use of backing strips

4. ***Demonstrate a sound working knowledge of how to perform and 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

*S-Class Plate Test for Apprentices w/o a valid S-Class CWB Ticket

*T-Class Plate Test for Apprentices with a valid S-Class CWB Ticket

III. TOPICS:

1. Personal and Shop Safety
2. OFG Cutting and Scarfing Practices
3. Shielded Metal Arc Welding Equipment and Techniques
4. Joint Design for Fillet and Groove Welds
5. CWB S-Class and T-Class Test Procedures

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. C.S.A. Approved (6" High) Safety Work Boots
2. C.S.A. Approved Safety Glasses
3. Appropriate Work Wear – (as per the Welding Department Guidelines)
4. Welding Gloves (Gauntlet Type)
5. Theory Modules: Course Pack IRN704

EVALUATION PROCESS/GRADING SYSTEM:Part 1 NOTES:

1. Re-writes are NOT allowed for any written assignment, quiz or test.
2. Repeats are NOT allowed for any shop test
3. Course attendance is mandatory. One percent (1 %) per hour will be deducted from the final course grade for apprentices with more than 4 hours of unexcused* absence.

Any absence without a written, valid reason will be deemed unexcused.

Valid reasons would include:

- Doctor's note
- Apprenticeship Ministry note
- Family Death or Serious Illness supported by a written note.

Part 2 Final Course Grades:

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

Factor	Value
Shop Assignments	65 %
Theory Quiz & Test	35 %
Attendance	-1% per Unexcused Hour
Shop Clean-up	-1% per Incident

If you have a valid SMAW – CWB S-Class ticket in the required position(s) you will be required to pass the CWB T-Class Test(s) in the required position(s).

The following semester grades will be assigned to students:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 – 89%	3.00
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:

Cheating

Students caught cheating during any theory quiz, test or exam will be removed from class pending a public apology to their fellow classmates and a letter giving them permission to return to class from the Dean's Office.

Theft and Damage

Students caught stealing and / or deliberately damaging shop tools and equipment will be removed from class pending a public apology to their fellow classmates and a letter giving them permission to return to class from the Dean's Office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services 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.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *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 advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.