Sault College of Applied Arts and Technology
Sault Ste Marie, ON

Sault College

Course Outline

Course Title WELDING

Course No: IRN7040 Semester N / A

Program IRONWORKER APPRENTICE (Intermediate)

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Date August 2002 Previous Outline Dated June 1998

Approved _____ _____
Dean Date

Total Credits 5

Prerequisites The successful completion of the Basic Ironworker Level of in-school training or its equivalent.

Length of Course 8 Weeks Total Credit Hours 40

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 and OFG welding, cutting and heating equipment. 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) ***Communicate clearly and correctly in the written form as well as 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) ***Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments and tests, a sound working knowledge of how to perform SMAW procedures and diagnose / correct 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) ***Communicate clearly and correctly in the written form as well as 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 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) ***Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments and tests, a sound working knowledge of how to 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

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:

- be present for all scheduled classes
- be in the shop or classroom within 5 minutes of the scheduled starting time
- be present for the taking of attendance
- provide a satisfactory reason to the professor for having to leave class early
- provide a reasonable excuse to the professor 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

III. TOPICS:

1. Personal and Shop Safety
2. SMAW Welding and Cutting Practices
3. Fillet Welds
4. Groove Welds
5. CWB Testing
6. Employment Readiness

IV. REQUIRED STUDENT RESOURCES / TEXTS and 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: Principles of Industrial Welding

V. GRADING SYSTEM:

The final course grade will be calculated based upon the following weighted factors:

Shop Assignments	25%
CWB Test	30%
Theory Test	35%
Employment Readiness	10%

Final course grades are then assigned by means of the following breakdown:

Grade	***Definition***
A+	95 – 100%
A	86 – 94%
B	76 – 85%
C	60 – 75%
R (Repeat)	59% or below

VI. SPECIAL NEEDS

1. Special Needs: If you are a student with special needs (e.g. physical limitations, visual impairment, hearing impairment, 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.

2. 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 post secondary institutions.

3. 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.

4. 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.

5. Substitute course information is available in the Registrars 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.