

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

FABRICATION and LAYOUT II

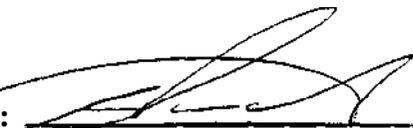
COURSE TITLE:

CODE NO.: WLD113 **SEMESTER:** 02

PROGRAM: AVIATION WELDING
WELDING and FABRICATING - Techniques

AUTHOR: D. SOCCffIA

DATE: Jan 1997 **PREVIOUS OUTLINE DATED:** Aug 1995

APPROV*n>: 
DEAN

 **DATE**

TOTAL CREDITS 5

PREREQUISITE(S): The successful completion of: WLD107 Fabrication and Layout I
<and> WLD129 Structural Blueprint Reading

LENGTH OF COURSE: 11 Weeks

TOTAL CREDIT HOURS: 66

Fabrication and Layout II
COURSE NAME

WLD113
CODE NO.

COURSE DESCRIPTION: This course will stress safe work practices and provide instruction for the use of metal cutting and forming equipment. It will include the study of typical fabrication requirements under CSA - W59.1 and W47.1 as well as stair stringer design, bolts and bolted connections. A significant amount of technical mathematics will be included.

- n. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**
(Generic Skills Learning Outcomes placement on the course outline will be determined and communicated at a later date.)

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 / tests a sound working knowledge of both personal and shop safety.*

Potential Elements of the Performance:

- identify proper eye, hand, face protection
- identify proper footwear and clothing
- identify proper hearing protection
- locate and identify shop ventilation devices
- locate and identify emergency fire exits
- identify the location of shut-off valves for the shop gas manifold system
- explain procedures for evacuation of shop areas in case of emergency
- identify potential fume and electrical hazards
- identify personal protective equipment and typical safe work habits related to the fabrication trades

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE
(Continued)

2) *Communicate clearly and correctly in the written form as well as demonstrate by means of independent study assignments and/or practical shop assignments / tests a sound working knowledge of the basic design, mathematical calculation for and fabrication of a simple stair stringer.*

Potential Elements of the Performance;

- identify and describe specific terms associated to the design and fabrication of a simple stair stringer.
- identify and select mathematical formula associated to the design and fabrication of a simple stair stringer.
- identify basic information and field dimensions required for the design of a simple stair stringer
- identify and describe the design of stair treads employing either the 'bolted' or the 'welded' methods of attachment
- identify and describe the miscellaneous attachments required for a set of stairs
- identify hand and measuring tools required for the layout of a simple stair stringer
- design a simple stair stringer given either the required field dimensions or the site of final installation
- lay out a simple stair stringer based upon previous design and calculations
- simultaneously lay out two stringers using either the 'as shown' or the 'opposite hand' technique
- fabricate a complete set of stairs* based upon previous design and calculations
- identify CSA W59.1 and W47.1 requirements for acceptable and unacceptable joint design, edge preparation and fit-up prior to welding.
- identify CSA W59.1 and W47.1 requirements for acceptable and unacceptable weld profiles

* **NOTE:** Only one complete set of stairs will be fabricated during this course of instruction based upon the availability / cost of materials as well as the rate of student progress.

LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE
(Continued)

- 3) *Communicate clearly and correctly in the written form as well as demonstrate by means of independent study assignments and/or practical shop assignments / tests a sound working knowledge of the basic design, mathematical calculation for and fabrication of a cranked stair stringer.*

Potential Elements of the Performance;

- identify and describe specific terms associated to the design and fabrication of a 'cranked' stair stringer.
- identify and select mathematical formula associated to the design and fabrication of a "cranked' stair stringer.
- identify basic information and field dimensions required for the design of a 'cranked' stair stringer
- identify and describe the design of stair treads employing either the 'bolted' or the 'welded' methods of attachment
- identify and describe the miscellaneous attachments required for a set of stairs
- identify hand and measuring tools required for the layout of a 'cranked' stair stringer
- design a 'cranked' stair stringer given either the required field dimensions or the site of final installation
- lay out a 'cranked' stair stringer based upon previous design and calculations
- simultaneously lay out two stringers using either the 'as shown' or the 'opposite hand' technique
- fabricate a complete set of stairs* based upon previous design and calculations
- identify CSA W59.1 and W47.1 requirements for acceptable and unacceptable joint design, edge preparation and fit-up prior to welding.
- identify CSA W59.1 and W47.1 requirements for acceptable and unacceptable weld profiles

* **NOTE:** Only one complete set of stairs will be fabricated during this course of instruction based upon the availability / cost of materials as well as the rate of student progress.

**I. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE
(Continued)**

4. *Communicate clearly and correctly in the written form as well as demonstrate by means of practical shop assignments / tests a sound working knowledge of how to successfully identify, install and torque structural bolts in slip-resistant connections.*

Potential Elements of the Performance:

- identify general types of forces and reactions that take place in a bolted connection
- identify and describe the two major types of bolted connections
- identify and describe structural bolts according to specification and grade
- identify and describe the technique by which the 'minimum bolt length' is determined
- identify and describe the procedure for installing, snugging and torquing structural bolts
- explain the differences between 'snugging' and 'torquing' as they apply to bolted connections
- identify CSA W59.1 requirements for base metals that are to be joined by means of slip-resistant connections
- install and torque bolts in a typical slip-resistant connection.

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 lab/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 course guidelines

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

C.S.A. Approved (High Cut) Safety Work Boots
C.S.A. Approved (Impact Resistant) Safety Glasses
C.S.A. Approved (Gauntlet Type) Welding Gloves
Appropriate Work Wear
Steel Measuring Tape (16ft c/w imperial and metric scales)
Scientific Calculator c/w Trig Ratios
HB Pencils
Text: "Modern Welding"
"Metal Trades Handbook"
Modules: " WIC Module # 16 - Techniques of Visual Inspection"

EVALUATION PROCESS/GRADING SYSTEM

The evaluation for Learning Outcomes # 1 thru # 4 will consist of independent study assignments and theory tests in addition to practical lab/shop assignments and tests for which students must demonstrate proficiency in both 'knowledge' and 'hands on' skill.

Independent Study Assignments will represent 10% of the mark for the above Learning Tasks while *Theory Tests* will represent another 30% of their value.

All *Practical Lab /Shop Assignments and Tests* will represent 50% of the mark for the above Learning Tasks.

While all tests and assignments are designed to be completed with the specified time limit (or less), students MUST report to the shop/ classroom fully prepared. Your professor will supply only the assignment or test instructions.

The evaluation for Learning Outcome # 5 will consist of a day to day recording of the Elements of Performance listed. Each infraction will constitute the loss of one percentage point from the 10 percentage *points* allocated to this outcome.

The Final Mark for WLD1 13 will be calculated as follows:

Final Mark (*see item \$ 3 under Special Notes)

Independent Study Assignments	10%
Theory Tests	30%
Shop Assignments / Tests	50%
Employment Readiness	10%

Course Grading Scheme

A+	90 - 100%	Outstanding Achievement
A	80 - 89%	Above Average Achievement
B	70 - 79%	Average Achievement
C	60 - 69%	Satisfactory Achievement
U		Unsatisfactory , only given on the midterm report
S		Satisfactory , only given on the midterm report
R		Repeat, signifies a failing grade
X		A temporary grade that is limited to instances where special circumstances have prevented the student from demonstrating the required elements of performance by the end of the course semester. An 'X' grade must have the Dean's approval and has a maximum time limit of 120 days after which it becomes an 'R' grade.

VI. SPECIAL NOTES:

1. Special Needs

If you are a student with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities), you are encouraged to discuss required accommodations with the instructor and/or contact the Special Needs OfBce, Room E1204, Ext. 493, 717, 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. Student evaluations concerning the '**Final Mark**' are further affected by the conditions set forth in the printed handout. *Welding Department Guidelines*'. Be sure that you receive a copy of these guidelines.

4. Course materials that are discussed and / or explained during any and all lab or shop demonstrations are subject to evaluation. Students are therefore responsible for the content of all lab / shop demonstrations.

5. Your Professor reserves the right to modify the course as he/she deems necessary to meet the needs of students.

6. Substitute Course Information is available at the Registrar's Office.

7. Any person caught cheating or substituting another person's work in place of their own for the purpose of grading or evaluation will automatically fail the said assignment or test. College policy* also dictates that such persons may be subject to immediate dismissal.

* Students should refer to the definition of "academic dishonesty" provided in the Sauh College "Statement of Student Rights and Responsibilities" .

VII. PRIOR LEARNING ASSESSMENT

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following:

1. The successful completion of an arc welding course with Learning Outcomes and Elements of Performance that are at least 80% compatible with this course outline ...

AND

2. The successful challenge of all theory tests identified by this course outline.

<OR>

3. Documented proof of at least three (3) years of competent trade experience involving the layout and fabrication of structural steel by means of bolting connections and welding

AND

4. The successful challenge of all theory tests identified by this course outline.