SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: FABRICATION and LAYOUT I

CODE NO.: WLD107 SEMESTER: FaU

PROGRAM: WELDING and FABRICATING - Techniques
AVIATION WELDING

AUTHOR: D. SOCCHIA

DATE: /^ PREVIOUS OUTLINE DATED: Aug 95

APPROVED: DEAN

Fabrication and Layout 1 **WLD107**

COURSE NAME **CODE NO.**

TOTAL CREDITS 5 Comprised of: 1 - 2 Hour Theory Class with Professor
1-3 Hour Shop Class with Professor

PREREQUISITE(S): A secondary school diploma with grade 10 general math is the minimum requirement (grade 12 math is strongly recommended). Alternately, a combination of education and experience equal *to* the above.

L PHILOSOPHY/GOALS:

To provide students with a sufficient amount of knowledge and practical skills training for entry level positions with fabrication industry. Students should have the confidence to identify, select and operate the required tools and equipment in a safe, organized manner giving due consideration to the degree of accuracy required .

n. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES):

Upon successful completion of this course the student will:

1) **Identify, select and use typical hand, layout and measuring tools safely and correctly.**
2) **Identify, select, use and operate common power and metal cutting tools safely and correctly.**
3) **Perform basic layout and fabrication procedures in a safe, organized manner.**
4) **Demonstrate Employment Readiness**

m. TOPICS TO BE COVERED: **Approximate Time**

1) **Course Introduction and Orientation**

2) **Hand and Measuring Tools** **@ 4 wks**
Theory Test # 1
Shop Test # 1

3) **Hand and Power Tools** **@ 4 wks**
Theory Test # 2
Shop Test # 2 and # 3

4) **Basic Layout and Fitting** **@ 6 wks**
Theory Test # 3
Shop Test # 4

NOTE: 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.

IV. LEARNING ACTIVITIES/REQUIRED RESOURCES

TopicAJnit - # 1. Course Introduction and Orientation

Learning Activities;

1.1 > A lecture presentation of the following major course documents:

- **a) course outline**
- **b) guidelines**
- **c) marking system including attendance requirements**

Resources;

> printed handouts, overheads, chalkboard notes

Topic/Unit; - # 2. Hand and Measuring Tools

Learning Activities;

2.1 > A lecture presentation and classroom/shop discussion of hand and measuring tools for the purpose of explaining:

- **a) standard features and scales**
- **b) maximum obtainable accuracy**
- **c) correct application / use**
- **d) proper handling, storage and maintenance procedures**

> The list of tools shall include (but shall not be limited to) the following:

- **a) steel tape rule**
- **b) steel (bevel) square**
- **c) combination square**
- **d) straightedge**
- **e) dividers**
- **f) protractors**
- **g) soapstone**

(Module: Introduction and Program Orientation)

2.2 > A shop demonstration with student participation and practice of the following major items:

- **a) drawing perpendicular lines**
- **b) bisecting lines and circles**
- **c) subdividing lines and circles**
- **d) drawing polygons**
- **e) finding the centres of a square, circle and rectangle**
- **f) generating 45 deg, 60 deg, and 30 deg bevels**

(Text: 'Metal Trades Handbook)

2.3 > A classroom/shop demonstration and practice involving the use of imperial and metric units of measurement with homework practice assignment to include:

- **a) feet, inches and fractions of an inch**
- **b) metres, centimetres and millimetres**

2.4 > Reading / Study Assignment #1
" Layout and Measuring Tools "
(Module: 'Introduction and Program Orientation')

2.6 > SHOP TEST #1 - BEVELS AND POLYGONS
- using shop template paper

2.7 > A second lecture presentation with classroom demonstration of hand and measuring tools to include:

- **a) standard features**
- **b) application and limitations**
- **c) correct use**
- **d) proper handling, storage and maintenance procedures**

> The second list of tools shall include (but shall not be limited to) the following:

- **a) dividers**
- **b) trammels**
- **c) centre punch**
- **d) number punch**
- **e) scriber**
- **f) hammers**
- **g) files**
- **h) hacksaws**

(Module: Introduction and Program Orientation)

2.8 > A classroom/shop demonstration and practice involving the conversion between imperial and metric units of measurement with homework practice assignment to include:

a) Feet and inches to millimetres
b) Millimetres to inches and feet

2.9 > Reading / Study Assignment # 2
" Metal Cutting Tools "
(Module: 'Introduction and Program Orientation')

2.10 > SHOP TEST #2 - CONNECTING PLATE
- using V^ inch plate and supplied Shop Drawing

Resoprces:

> Module: 'Introduction and Program Orientation'
Text: ' Metal Trades Handbook'
printed handouts, chalkboard notes, assignment sheets, shop tools, template stock, mild steel plate.

Topic / Unit: - THEORY TEST # 1 and REVIEW

RgSOnrcgs;

> Test Booklets, Student Response Sheets and Grade/Answer Sheets

Topic / Unit; - # 3 Hand and Power Tools

Learning Activities:

3.1 > A lecture presentation and classroom / shop discussion of power drilling tools for the purpose of explaining:

a) standard features and scales
b) maximum obtainable accuracy
c) correct safe application / use
d) avoiding potential safety hazards
e) proper handling, storage and maintenance procedures

> The list of tools shall include (but shall not be limited to) the following:

a) radiograph
b) drill press
c) portable magnetic drill

3.2 > Reading / Study Assignment # 3
" Flame Cutting and Power Drilling Tools "
(Module: 'Introduction and Program Orientation')

3.3 > A second lecture presentation and classroom / shop discussion of power drilling tools for the purpose of explaining:

a) standard features and scales
b) maximum obtainable accuracy
c) correct safe application / use
d) avoiding potential safety hazards
e) proper handling, storage and maintenance procedures

> The list of tools shall include (but shall not be limited to) the following:

a) pedestal grinder
b) portable angle grinder

3.4 Reading / Study Assignment # 4
" Power Grinding Tools "
(Module: 'Introduction and Program Orientation')

3.5 > SHOP TEST # 3 - MISC ANGLES and PLATE
- using the Vi inch plate as shown on Shop Drawing

Resources:

> Module: 'Introduction and Program Orientation'
Text: 'Metal Trades Handbook*
printed handouts, chalkboard notes, assignment sheets, shop tools, template stock, mild steel plate.

Topic / Unit: - THEORY TEST #2 and REVIEW
(Fabrication and Layout -1)

Resources:

> Test Booklets, Student Response Sheets and Grade/Answer Sheets

Fabrication and Layout 1 **WLD107**

——COURSE NAME CODE NO.

Topic / Unit: - # 4 Basic Layout and Fitting

Learning Activities;

4.1 > A shop demonstration with student participation and practice of the following major items:

a) identification and selection of materials
b) checking materials for size, squareness, camber and sweep
c) 'squaring off the best end of the structural member
d) 'marking' and flame-cutting material to the required length.
e) locating and marking web and flange centrelines
f) locate and punch centres for required holes
g) locate and mark positions for attachments
(Text: - Metal Trades Handbook)

4.2 > SHOP TEST #4 -- BEAMS
- using 8 inch wide flange beams and the Shop Drawing

4.3 > A lecture presentation / review of decimals and the conversion between fractions and decimals with homework review assignment.

4.4 > A shop demonstration with student participation and practice of additional assembly and fabrication techniques to include:
a) control of distortion via clamping and/or the use of stiffeners
b) techniques for proper tack-welding assemblies
c) post-weld cleaning and identification of completed assembly

4.5 Reading / Study Assignment # 5
" Welding Distortion "
(Text: The Metal Trades Handbook)

4.6 > A lecture presentation and review of distortion and residual stress dealing specifically with problem areas and module review questions.

Resources:

> **Test: "The Metal Trades Handbook"**
> **printed handouts, chalkboard notes, assignment sheets, shop tools, structural shapes and plate**

Topic / Unit: - THEORY TEST #3 and REVIEW

Resources:

> **Test Booklets, Student Response Sheets and Grade/Answer Sheets**

V. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS, ETC.)

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.	

Final Mark Csec item # 3 ander special Notes)

Theory Tests	**35%**
Shop Tests	**50%**
Employment Readiness	**15%**

VI. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in FABRICATION & LAYOUT -1 should consult the instructor. Credit for prior learning will be given upon successful completion of the following:

1. **The successful completion of a structural fabrication course with student outcomes and course topics 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. **Written proof of at least three (3) years of competent trade experience involving the layout and fabrication of structural steel by means of welding ... AND**
4. **The successful challenge of all theory tests identified by this course outline.**

Vn. REQUIRED STUDENT RESOURCES

Work Boots (CSA Approved - steel toe and high cut)
Safety Glasses (CSA Approved - impact resistant)
Welding Gloves (CSA Approved - gauntlet type)
Steel Measuring Tape (16 ft c/w imperial and metric scales)
WIC Module # 16 Techniques of Visual Inspection
Metal Trades Handbook
Module: Program Introduction and Orientation
Scientific Calculator with Trig Ratios
HB or H Pencils
Blue Balpoint Pens
Notebook c/w Ruled Paper

Vra. SPECIAL NOTES

1. **Students with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with their professor and / or contact the Special Needs Office, Room E1204, Ext. 493, 717, 491 so that support services can be arranged for you.**

2. **Your professor reserves the right to modify the course as he/she deems necessary to meet the needs of students.**

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. **Any person caught cheating or substituting another person's woiii 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" as provided in the Sault College "Statement of Student Rights and Responsibilities"**

5. **NOTE: 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.**