

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY
SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: STRUCTURAL BLUEPRINT READING

CODE NO.: WLD108 SEMESTER: FALL

PROGRAM: WELDING and FABRICATING -Techniques
AVIATION WELDING

AUTHOR: D. SOCCHIA

DATE: / / , PREVIOUS OUTLINE DATED: 1994-06-24

APPROVED:  / C " ^ ^ h _____ /4-^- \ ^^ (f5
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TOTAL CREDITS

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

PHILOSOPHY/GOALS:

To provide students with an intermediate level of exposure to the concepts and principles of structural detailing as developed by CISC/AISC standards for dimensioning practices, abbreviations and orthographic projection. Ultimately, the student should be able to read typical site/erection drawings and/or structural (shop) drawings complete with dimensions, notes, welding symbols and bills of material.

n. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES):

Upon successful completion of this course the student will:

- 1) Appreciate the differences between mechanical drafting and structural steel detailing.
- 2) Sketch structural steel members to show dimensions, details and attached parts.
- 3) Read structural shop prints
- 4) Make up simple 'Bills of Material', 'Cut' and 'Order Lists'
- 5) Read typical site/erection drawings.
- 6) Sketch a simple 'Floor and Wall Elevation'

in. TOPICS TO BE COVERED:

Approximate Time Frame

- | | |
|---------------------------------------------------------------------------------------------|-------|
| 1) Course Introduction and Orientation | |
| 2) Concepts of Orthographic Projection
Independent Assignment | 3wks |
| 3) The Welding Symbol
Theory Test # 1 and Review | 3 wks |
| 4) Reading Structural (Shop) Prints
Theory Test # 2 and Review
Independent Assignment | 3 wks |
| 5) Reading Site/Erection Drawings
Theory Test # 3 and Review
Independent Assignment | 3 wks |

rV. LEARNING ACTIVITIES/REQUIRED RESOURCES

Topic/Unit - #1. Course Introduction and Orientation

Learning Activities:

- 1.1 > A lecture presentation of the following major course documents:**
- a. course outline**
 - b. course guidelines**
 - c. course marking system including attendance requirements**

Resources:

- > printed handouts, overheads, chalkboard notes.**

Topic/Unit - # 2. Concepts of Orthographic Projection

Learning Activities:

- 2.1 > A lecture presentation and class discussion of the following major items:**
- a. definition / description of orthographic projection**
 - b. identification / selection of the front view**
 - c. placement and development of required views**
 - d. right angle rotation of views**
- 2.2 > Discussion and chalkboard development of an orthographic drawing using ratio and proportion.**
- 2.3 > Independent Study Assignment c/w review questions based upon the following 'alphabet of lines' required for use with orthographic projection.**
- a) object and hidden lines**
 - b) extension and dimension lines**
 - c) construction lines**
 - d) centre lines.**

- 2.4 > **Independent study assignment requiring the development of an orthographic sketch using ratio and proportion .**

- 2.5 > **A lecture presentation and class discussion of section views to include:**
 - a. **purpose and development**
 - b. **types and location**
 - c. **identification**
- 2.6 > **Discussion and chalkboard development of typical section views .**
- 2.7 > **A lecture presentation and class discussion of auxiliary views to include:**
 - a. **purpose and development**
 - b. **types and location**
 - c. **identification**

- 2.8 > **Independent study assignment based upon the following 'alphabet of lines' required for use with auxiliary and section views.**
 - a. **cutting plane line**
 - b. **viewing plane line**
 - c. **leaders**
 - d. **break lines**
 - e. **cross-hatch lines**

- 2.9 > **Independent study assignment requiring the development of both auxiliary | and section views using ratio and proportion.**

Resources

- > **WIC Modules #2 and # 3, chalkboard notes, overheads, models and assignment sheets.**

Topic/Unit - #3 The Welding Symbol

Learning Activities:

- 3.1 > A lecture presentation and class discussion of the following major items:**
 - a. basic joint designs and weld types**
 - b. components of a welding symbol**
 - c. functions of welding symbol components**
 - d. arrow side vs other side significance**
 - e. typical (fillet and groove weld) symbol information**

- 3.2 > Independent module reading assignment c/w review questions based upon the Learning Activity #3.1**

- 3.3 > Review of material to date using actual structural shop drawings to demonstrate the effective use of welding symbols and orthographic projection.**

- 3.4 > A lecture presentation and class discussion of the following weld symbols to include:**
 - a. fillet welds**
 - b. plug and slot welds**
 - c. square, bevel and vee groove welds**
 - d. J and U groove welds**
 - e. field weld and weld all-around**
 - f. melt thru and burn thru**

- 3.5 > Independent module reading assignment c/w review questions based upon the Learning Activity # 3.4**

- 3.6 > Review of material to date using actual structural shop drawings to demonstrate the effective use of welding symbols.**

- 3.7 > A lecture presentation and class discussion on the use of dimensions to indicate weld size, depth of joint preparation, effective throat, weld length and contour.**

- 3.8 > Independent module reading assignment c/w review questions based upon Learning Activity # 3.7**

Resources:

- > WIC Modules # 2 and # 3, chalkboard notes, overheads, shop drawings and assignment sheets.

TopicAJnit - THEORY TEST # 1 and REVIEW

Resources:

- > test booklets, student response sheets and grade/answer sheet

TopicAJnit - #4 Reading Structural (Shop) Prints

Learning Activities:

- 4.1 > A lecture presentation and class discussion of the proper format and page layout of a structural drawing to include:
 - a. title and revision block
 - b. structural notes
 - c. specified codes and standards
 - d. general shop notes
 - e. bill of material
 - f. types of views used by the detailer
- 4.2 > Review of material using actual shop drawings to demonstrate the effective use of drawing format and page layout
- 4.3 > A lecture presentation and class discussion of MAJOR and Minor piece marks as used on a structural drawing to include:
 - a. reference to page number and order of drawing
 - b. piecemark standards currently in use
 - c. relationship between drawing components, piece marks and the bill of material.
 - d. purpose of piece marks as related to the reading prints and the identification of structural members.
- 4.4 > Review of material using actual structural shop drawings to demonstrate the effective use of MAJOR and Minor piece marks.
- 4.5 > A lecture presentation and class discussion on the use of both standard dimensioning practices as well as standard abbreviations.
- 4.6 > Review of material using actual structural shop drawings to demonstrate the effective use of standard abbreviations and standard dimensioning practices.

- 4.7 > A lecture presentation and class discussion on the contents, organization and proper format for a typical 'Bill of Material', 'Cut and Order List'.
- 4.8 > Independent study assignment requiring students to 'read' a selected drawing and prepare a typical 'Bill of Material', 'Cut and Order List' according to the supplied set of instructions.

Resources:

- > chalkboard notes, overheads, printed handouts, structural drawings and assignment sheets.

Topic/Unit - THEORY TEST #2 and REVIEW

Resources:

- > test booklets, student response sheets, assignment sheets, 8.5 x 11 in blank drawing paper, selected shop drawing and grade/answer sheet.

Topic/Unit - # 5 Reading Site and Erection Drawings

Learning Activities:

- 5.1 > A lecture presentation and class discussion of the nine (9) possible sources of information on a typical site/erection drawing to include:
- a. title and revision block
 - b. structural notes
 - c. shop notes
 - d. project north
 - e. grid system
 - f. floor and wall elevations
 - g. structural members
 - h. column, lintel and base plate schedules
- 5.2 > Independent study assignment requiring students to 'read' a selected drawing and answer the supplied set of questions.

- 5.3 > A lecture presentation and class discussion of the relationship between structural shop drawings and the accompanying set of site/erection drawings to include:
- a. identification of building components via the piece mark system
 - b. location of building components via floor and wall elevations plus the use of typical T/S designations
 - c. identification of connection details and dimension
 - d. location and detail of components on shop drawings
 - e. location of component and sub-assemblies in the 'Bill of Material'
- 5.4 > Independent study assignment requiring students to 'read' a selected drawing and create the specified wall elevation(s) according to the supplied set of instructions.
- 5.5 > Review of material to date using a complete set of shop and site/erection drawings.

Resources:

- > chalkboard notes, overheads, printed handouts, site/erection drawings, shop drawings and assignment sheets.

TopicAJnit - THEORY TEST # 3 and REVIEW

Resources:

- > test booklets, student response sheets, assignment sheets, 8.5 x 11 in blank drawing paper, selected site/erection and shop drawings and assignment sheets.

structural Blueprint Reading

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—COURSE NAME

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

General Assessment

Final Mark *

A + = 90 - 100%
A = 80 - 89%
B = 70 - 79%
C = 60 - 69%
F/R = 0 - 59%

Theory Tests 60%
Independent Assignments 40%
Attendance (**See Attached)

V. 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 a structural blueprint reading course with student outcomes and course topics that are at least 80% compatible with this course outline... AND...
2. The successful challenge of all their tests identified by this course outline with a resulting average mark of at least 75 %.

<OR>

3. Written proof of at least five (5) years of trade experience involving the competent use of structural shop and site/erection drawings... AND...
4. The successful challenge of all their tests identified by this course outline with a resulting average mark of at least 75%.

Vn. REQUIRED STUDENT RESOURCES

12" Clear Plastic Desk Rule

4 - Pencils (2 pencils 'H' and 2 pencils 'HB')

1 - Eraser

1 - Binder c/w standard lined paper and quad-ruled paper

1 - WIC Module # 3 Symbols for Welding

VIII. SPECIAL NOTES

Students with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of each class.

" Student evaluations concerning the 'Final Mark' are further affected by the conditions set forth in the printed handout, 'Welding Department Guidelines'.

****' Special guidelines for class attendance are included in the above paper.**