

Doc. #186

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: Drafting

CODE NO.: DRF 106

SEMESTER: One

PROGRAM: Machine Shop

AUTHOR: W. J. Adolph

DATE: September 1992 PREVIOUS OUTLINE DATED: 1989

APPROVED: _____
DEAN

R. P. Crockett

92-09-16
DATE

COURSE NAME
DRAFTING

CODE NO.
DRF106

TOTAL CREDIT HOURS: Three (3)

PREREQUISITE(S): None

I. PHILOSOPHY/GOALS:

This course provides the student with the skills of sketching and blueprint reading to support the needs of the trade and to prepare the student for the CAD course.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

- 1) Use basic drafting fundamentals to produce good quality freehand sketches.
- 2) Use the basic rules for dimensioning to properly and thoroughly dimension a sketched part.
- 3) Make an isometric sketch from orthographic views of an object and vice versa.
- 4) Understand and apply the information from tables of Limits and Fits.
- 5) Show interior detail by means of sectional views.
- 6) Use the proper symbols for surface texture.
- 7) Differentiate between various machine fasteners.
- 8) Dimension keys, keyways and keyseats.
- 9) Set out a sketch properly on paper, with an appropriate title block.
- 10) Letter the sketch legibly using uppercase Gothic as the style.

COURSE NAME
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III. TOPICS TO BE COVERED

HOURS

1. Bases for interpreting technical drawings	6
2. Working drawings	4
3. Producing drawings	5
4. Inclined surfaces	3
5. Circular features	5
6. Drawing to scale	3
7. Machine symbols	3
8. Sectional views	5
9. Surface texture	4
10. Limits and Fits	5
11. Fasteners	4
12. Revolved and removed sections	4
13. Keys and keyways	3
14. Primary auxiliary views	6

IV. LEARNING ACTIVITIES REQUIRED RESOURCES

1.0 BASES FOR INTERPRETING DRAWINGS

At the conclusion of this topic the student will be able to:

1.1 Differentiate between OBLIQUE,
PERSPECTIVE and ISOMETRIC.

1.2 Identify the six principal views
of an object.

Study pages 1-5

DRAFTING

DRF106

IV. LEARNING ACTIVITIES (cont'd)

REQUIRED RESOURCES

- | | | |
|-----|--|------------------------|
| 1.3 | State which views make up a third-angle orthographic projection. | Do job A-1 |
| 1.4 | Sketch the third-angle orthographic projection SYMBOL. | A-2 |
| 1.5 | From an isometric sketch, draw the top front and right side views. | A-3 |
| 1.6 | Given two views of an object, sketch in the third. | |
| 1.7 | Given the three views of an object, sketch the isometric. | |
| 2.0 | WORKING DRAWINGS
At the conclusion of this topic the student will be able to: | |
| 2.1 | Properly dimension a drawing using extension lines, dimension lines, leaders, arrow heads, figures, notes and symbols. | Study Pages
10 - 15 |
| 2.2 | Understand and use both the SI decimal-inch systems for dimensioning a part. | Do job A-4 |
| 3.0 | PRODUCING DRAWINGS
At conclusion of this topic the student will be able to: | |
| 3.1 | Understand how drawings are reproduced for eventual use on the manufacturing floor. | Study pages
19 - 25 |
| 3.2 | Understand that shop drawings should not be considered to be scaled to size. | Do jobs A-6 |
| 3.3 | Draw and interpret hidden lines. | A-7
A-8
A-9 |

DRAFTING

DRF106

IV. LEARNING ACTIVITIES (cont'd)

REQUIRED RESOURCES

4.0 INCLINED SURFACES

At the conclusion of this topic the student will be able to:

- 4.1 Identify the view in which the inclined surface is shown in true length.

Study pages
26 - 30

- 4.2 Draw and label lines that lie at angles to the horizontal and vertical.

Do jobs A-10
A-11
A-12

- 4.3 Use both decimal-degrees and degrees/min/sec.

5.0 CIRCULAR FEATURES

At the conclusion of this topic the student will be able to:

- 5.1 Draw center lines on circular features of cylindrical objects.

Study pages
31 - 39

- 5.2 Dimension cylindrical holes.

Do jobs A-13
A-14
A-15

- 5.3 Differentiate between drilling, reaming and boring.

6.0 DRAWING TO SCALE

At the conclusion of this topic the student will be able to:

- 6.1 Understand the meaning of various reduced scale ratios.

Study pages
40 - 47

- 6.2 Understand the meaning of various enlarged scale ratios.

Do jobs A-17
A-18

- 6.3 Understand the difference between decimal inch and fractional inch scales.

- 6.4 Use various scales to measure distances on drawings.

DRAFTING

DRF106

IV. LEARNING ACTIVITIES (cont'd)

REQUIRED RESOURCES

7.0 MACHINE SYMBOLS

At the conclusion of this topic the student will be able to:

7.1 Identify the current surface machining allowance symbol.

7.2 Understand how to indicate the amount of metal to be removed.

7.3 Indicate with a symbol when removal of metal is prohibited.

Study pages
48 - 53

7.4 Know the symbol that indicates that a dimension has been altered and is not to scale.

Do job A-19

7.5 Know the rules for making drawing revisions.

7.6 Know how to use "break lines" to shorten the view of a long, uniform section.

8.0 SECTIONAL VIEWS

At the conclusion of this topic the student will be able to:

8.1 Know the current cutting plane symbol used when sectioning.

Study pages
54 - 60

8.2 Differentiate between full and half sections.

Do jobs A-20
A-21
A-22

8.3 Apply the proper shading to the cutting-plane view.

8.4 Differentiate between countersinks, counterbores and spotfaces.

DRAFTING

DRF106

IV. LEARNING ACTIVITIES (cont'd)

REQUIRED RESOURCES

9.0 SURFACE TEXTURE

At the conclusion of this topic the student will be able to:

9.1 Define the following:

Micrometer, microinch, and the terms which define roughness.

Study pages
64 - 75

9.2 Construct the roughness symbol and know the positions of the various characteristic values on the symbol.

Do job A-23

9.3 Define "chamfering" and "necking".

9.4 Read and interpret a surface roughness table as on page 47.

10.0 LIMITS AND FITS

At the conclusion of this topic the student will be able to:

10.1 Explain why Tolerances and Interchangeability are so essential to modern manufacturing efficiency.

Study pages
76 - 85

10.2 State the differences between the different ways of expressing tolerances.

10.3 State the standard tolerances on dimensions in SI and IS.

Do jobs A-24
A-25

10.4 Define "fit" and state the three basic categories of fit.

10.5 Given the conditions of a fit determine the sizes of a hole and shaft.

11.0 FASTENERS

At the conclusion of this topic the student will be able to:

11.1 Differentiate between permanent and removeable fasteners.

DRAFTING

DRF106

IV. LEARNING ACTIVITIES (cont'd)

REQUIRED RESOURCES

11.2 Name various kinds of fastener heads.

11.3 Differentiate between Pictorial, Schematic and Simplified thread presentations.

Study pages
86 - 95

11.4 Define "positional tolerance" of a thread.

Do job A-26

11.5 On a sketch of a thread show a complete thread callout as in fig. 11-4

11.6 For "inch" threads, on a sketch like fig. 11-5, show a complete thread callout.

11.7 Indicate that a thread is "left hand".

12.0 REVOLVED AND REMOVED SECTIONS

At the conclusion of this topic the student will be able to:

12.1 Explain when a revolved or removed section would be used.

Study pages
96 - 99

12.2 State how to make a revolved section.

Do job A-27

12.3 State why the removed section is used and where they are normally placed.

13.0 KEYS AND KEYWAYS

At the conclusion of this topic the student will be able to:

13.1 List three kinds of keys and describe them.

Study pages
100 - 105

13.2 Dimension a keyway or keyseat.

Do job A-28

13.3 List 5 types of setscrews.

13.4 Define Flats, Bosses and pads and state their purpose.

DRAFTING

DRF106

IV. LEARNING ACTIVITIES (cont'd)

REQUIRED RESOURCES

14.0 **PRIMARY AUXILIARY VIEWS**

At the conclusion of this topic the student will be able to:

14.1 State the conditions under which a primary auxiliary view would be required.

Study pages
106 - 109

14.2 Describe the procedure for making a primary auxiliary view.

Do job A-29

14.3 Make a sketch of an object which requires an auxiliary view.

Prepare sketch

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

At the end of each unit there are major jobs to be completed before proceeding. Each job is worth between 3 and 8 marks. Your performance on these constitutes 50% of the final mark with the other 50% made up of:

A test on Limits and fits	20%
A final test on all the course content	25%
Attendance (80% is considered great) (50% is considered poor)	5%

Rewrites and X-Grades

If at the end of the semester you have less than 60% you would normally be assigned an "R" grade and would be required to repeat the year. However if your attendance has been 80% or better and if by rewriting the final test, your mark could be raised to 60% then you would be allowed to rewrite.

Marks to Grades

Marks are converted to grades according to the following schedule:

A+	-	90-100
A	-	80-89%
B	-	70-79%
C	-	60-69%
R	-	less than 60%

DRAFTING

DRF106

VI. REQUIRED RESOURCES

The student is expected to bring his/her textbook/workbook to every class.

INTERPRETING ENGINEERING DRAWINGS

Second Edition (SI metric)

Jensen and Hines

Delmar Publishers ISBN 0-17-601756-9

VII. 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 students.