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SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: MECHANICAL ENGINEERING DRAWING AND DESIGN I

Code No.: DRF 210-5

Program: Mechanical Drafting Technician

Semester: Three

Date: September 1988

Author: F. G. MacLean

New: \_\_\_\_\_ Revision: <sup>X</sup> \_\_\_\_\_

APPROVED: *F. G. MacLean*  
Chairperson

88/09/06  
Date

MECHANICAL ENGINEERING DRAWING & DESIGN I

DRF 210-5

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Course Name

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**PHILOSOPHY/GOALS:**

To make the student aware of standard methods used to describe more complicated detail, parts and assemblies.

To make the student aware of the most commonly used standard parts and components, and how to incorporate them into assembly drawings.

To provide the opportunity for the student to improve drafting techniques and skills.

To introduce the student to an organized approach to design, and give practice in making design decisions.

To encourage the student to consider material cost, properties, and availability before specifying on a detail drawing.

To encourage the student to carefully consider the manufacturing processes involved in the fabrication of the new design, and ensure that this process is practical and as uncomplicated as possible.

**METHOD OF ASSESSMENT (GRADING METHOD):**

The final grade will be determined by combining the marks obtained in the drawing assignments, with those obtained in written tests. The accumulation of marks will be an ongoing process throughout the semester.

For a more complete explanation, see "Requirements for the Successful Completion of the Technical Drawing Course".

**TEXTBOOK:**

Engineering Graphics      W. P. Spence  
Prentice Hall

**REFERENCE TEXTS:**

- 1. C.S.A. "Technical Drawings - General Principles"  
B78.1-M83
- 2. C.S.A. "Dimensioning and Tolerancing of Technical Drawings"  
B78.2-86
- 3. C.S.A. "Tolerances and Standard Fits for Mating Parts, Metric Sizes"  
B97.3-M1982
- 4. C.S.A. "Standard Fits for Mating Parts, Inch Sizes"  
B97.3-1970
5. "Machinery's Handbook" Ref. TJ 151.M3
6. A.S.M. Metals Handbook - "Properties and Selection of Metals" <sup>Ref</sup> TA459.A5  
1978
7. A collection of Industrial Catalogs will be made available for student use.

TOPIC NO.	APPROX. HRS.	TOPIC
1	10	<u>REVIEW:</u> Preparation of drawings to demonstrate knowledge in: <ul style="list-style-type: none"><li>- screw threads</li><li>- threaded fasteners</li><li>- dimensioning and tolerancing</li><li>- fits</li><li>- surface finish specification</li><li>- standard symbols and abbreviations</li><li>- material selection</li><li>- CSA drawing standards</li><li>- sectioning</li></ul>
2	10	<u>CAMS</u> <ul style="list-style-type: none"><li>- applications</li><li>- nomenclature</li><li>- types of followers</li><li>- follower motions</li><li>- displacement diagrams</li><li>- drawing of the CAM profile</li><li>- preparation of table of angular and radial displacement dimensions</li><li>- preparation of a CAM drawing</li></ul>
3	10	<u>GEARS</u> <ul style="list-style-type: none"><li>- types of gears</li><li>- involute curves</li><li>- terminology</li><li>- spur gear calculations</li><li>- drawing of spur gears, bevel gears, and worm gears</li><li>- preparation of a gear assembly drawing</li></ul>
4	10	<u>FITS</u> <ul style="list-style-type: none"><li>- international tolerance grades and tolerance positions</li><li>- use of tables in CSA B97.3 M1982 to determine limit dimensions for mating parts.</li></ul>
5	10	<u>STANDARD PARTS</u> <ul style="list-style-type: none"><li>- drawing and specification of: taper and straight pins, rivets, cotter pins, keys, retaining rings, bearings, seals.</li></ul>

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| 6 | 10 | <u>SPRINGS</u> <ul style="list-style-type: none"><li>- spring nomenclature</li><li>- drawing of coil springs</li><li>- information included on a drawing of a spring</li><li>- preparation of a compression spring drawing</li></ul>   |
| 7 | 5  | <u>GEOMETRIC TOLERANCING</u> <ul style="list-style-type: none"><li>- true-position and basic dimensions</li><li>- maximum material condition, virtual size condition, least material condition, regardless of feature size</li><li>- use of feature control symbols on a drawing, and datum identification.</li></ul>  |
| 8 | 10 | <u>ASSEMBLY DRAWINGS</u> <ul style="list-style-type: none"><li>- definition of sub-assembly and final assembly drawings</li><li>- bill of materials</li><li>- use of standard parts and components</li><li>- identification of separate details on assembly drawings</li><li>- numbering system relating detail and assembly drawings</li><li>- appropriate dimensions</li></ul> |
| 9 | 5  | <u>TECHNICAL DRAWING WITH INK</u> <ul style="list-style-type: none"><li>- care and use of the Technical Pen</li><li>- use of lettering instruments</li><li>- drawing on plastic film</li></ul>   |