MEC1101: Engineering Drawing

Hours per semester				Weighted total mark	Weighted exam mark	Weighted continuous assessment mark	Credit unit
LH	PH	TH	CH				CU
15	90	105	60	100	60	40	4

Course Description

This course introduces students to technical drawing a means of professional engineering communication. It will cover: sketching, line drawing, shape description, projections, drawing standards, sections and dimensioning.

Course Objectives

- To emphasize the importance of drawing as a language for engineers
- To develop skills in engineering drawing and drafting.
- To develop skills in interpretation of engineering drawings
- To develop skills in computer aided drafting and design.

Leaning outcomes

At the end of this course, students should be able to:

- Translate physical objects into paper and computer drawings and models.
- Produce orthographic and three dimensional drawings of engineering components.
- Use freehand, technical instruments and computer techniques for engineering drawing.

Course Content

1. **Introduction to engineering drawing (4 Hours)**

- Drafting as a language of industry
- Application of drawing in various fields
- Engineering drawing in the production process
- Drawing equipment including computer aided tools

2. **Basic Drafting Skills (6 Hours)**

- Standard drawing sizes and filing

- Drawing format
- Lines, circles and arc drawing
- Freehand sketching
- Computer aided drafting

3. Pictorial Drawings (8 Hours)

- Isometric Projection
- Oblique Projection
- Perspective projection

(12 Hours)

- Computer aided drafting

4. Theory of shape descriptions

- Orthographic Representations
    - One-, two- and three view drawings
    - Representation of common features
    - Computer aided drafting techniques

5. Dimensioning principles

- Basic dimensioning
- Dimensioning common features
- Limits and tolerances
- Fits and allowances
- Surface texture
- Computer aided drafting

6. Sections, auxiliary views and revolutions (8 hours)

- Sectional views
- Primary and secondary auxiliary views
- Revolutions
- Computer aided drafting

7. Surface development and intersections (4 hours)

- Sheet metal development
- The packaging industry
- Development of flat, cylindrical, conical, spherical surfaces etc **Learning Outcomes**

On completing this course the student should be able to:

- Apply the skills learnt in a modern, technology-intensive industry. Apply latest developments and current practices in all areas of graphic communication, CAD, functional drafting, material representation, shop processes, geometric tolerancing, electronic drafting and metrication.

- Understand the expression of technical ideas or ideas of a practical nature. Interpret drawings that describe an objects physical shape completely and accurately, communicating engineering concepts to manufacturing.

- Translate the ideas, rough sketches, specifications and calculations of engineers and designers into working plans that are used in making a product. Use both computer aided drafting and design (CADD) systems or manual drafting techniques as well as engineering handbooks, tables and calculators to assist in solving technical problems.

(8 hours)

- Use preliminary information provided by engineers to prepare design layouts and make drawings of any part shown on the layout, giving dimensions, material, and any other information necessary to make the detailed drawing clear and complete; carefully examine the drawing for errors in computing or recording sizes and specifications.

• Relate design concepts to engineering drawing practices and understand current ANSI. JIS, ISO and other drawing standards.

Delivery Mode

The course will be taught by using lectures and assignments. **Assessment Methods:**

Course work (assignments and tests) and final examination and their relative contributions to final grade are shown as follows:

Requirement	**Percentage contribution**
Course work	40%
Final examination	60%
Total	100%

Recommended and Reference Books

1 Cecil Jensen, Jay D. Hensel, 1996. Engineering Drawing and Design. 5th ed. Glencoe/McGraw-Hill. ISBN 0-02-801795-1.

2 James O. Morgan, Jesse E. Horner, Paul O. Biney, 2003. Design Modeling using Solid Edge for Engineers & Designers. Kendall/Hunt publishing Company. ISBN 07872-9701-1.

3 K.R. Hart, 1987. Engineering Drawing with problems and solutions, 3rd ed. Colorcraft Ltd. ISBN 0-340-17692-X.

4 M.A. Parker, F. Pickup, 1991. Engineering Drawing with worked examples 1 & 2, 3rd ed. Stanley Thornes (Publishers) Ltd. ISBN 0-7487-0311-X.

5 R.S. Rhodes, L.B. Cook, 1992. Basic Engineering Drawing. Longman Scientific & Technical. ISBN 0-582-06594-1.

6 N. Sidheswar, P. Kannaiah, V.V.S. Sastry, 1983. Machine Drawing. Tata McGraw- Hill Publishing Company Limited. ISBN 0-07-096599-4.