

ELECTIVE MODULE FOR NORMAL (TECHNICAL) STUDENTS

Module Title: Computer Aided Drafting-2D

Duration: 30 hours
(30P)

Pre-requisite: Nil

Aims of Module

- (i) To create a learning interest in engineering drawings using Computer-Aided Drafting software (AutoCAD).

Learning Outcomes

At the end of the module, students will be able to:

- (a) Read and identify simple engineering drawings.
- (b) Produce 2-D drawing using basic operation CAD commands
- (c) Create 2-D engineering drawing with dimensioning, layers and text in accordance with ISO Standards
- (d) Produce 2-D engineering component in First and Third Angle Orthographic Projections.
- (e) Produce assembly and detailed drawing of engineering components with sectional views.

Module Outline

Students are trained to produce 2-D engineering drawings with dimensioning, sectioning and material list of engineering components in first and third angle projections.

Outline of Module Syllabus

<u>Item</u>	<u>Technical Skills/Knowledge</u>	<u>Instructional Hours</u>
1	Students should be able to: Explain the advantages of using CAD software for design and drafting on a computer. 1.1 Explain the hardware and software in CAD system. 1.2 State the advantages of using CAD system.	1

- 2 Produce 2-D drawing using basic operation CAD commands. 6
- Startup for CAD drawing
- 2.1 Explain different methods of creating a new drawing.
- 2.2 Setup a new drawing session using basic drawing commands.
- UNITS
 - LIMITS
 - UCS
 - UCSICON
- 2.3 Open and save a CAD file.
- Types of Lines
- 2.4 Explain the common types of lines used in engineering drawings.
- CAD interface and toolbar
- 2.5 Apply different types of interface and toolbar in the drawing.
- 2-D CAD Drawing
- 2.6 Illustrate the types of coordinate systems using Absolute, Cartesian and Polar coordinate system in a CAD system.
- 2.7 Apply the use of Snap, Ortho, Osnap and Grid mode to construct drawing.
- 2.8 Produce simple 2-D CAD drawing using the following methods:
- Direct distance method
 - User Coordinate System
 - Object snap
 - Polar tracking method
- 3 Produce 2-D engineering drawing with dimensioning, layers and text in accordance with ISO Standards. 7
- DIM command
- 3.1 Explain the use of dimensioning toolbars and command in a drawing.
- Dimension style
- 3.2 Create and modify different types of dimension style in a drawing.
- Geometrical tolerances
- 3.3 Apply different types of geometrical tolerances in a

drawing.

Layers and object properties

- 3.4 Create different layers with line properties and colours setting.

TEXT command

- 3.5 Create text in the drawing using the following methods:
- Single line text entry
 - Multi line text editor
 - Create text style

Modify commands

- 3.6 Edit drawing using modifying toolbars and commands.

2-D Engineering drawing

- 3.7 Produce 2-D engineering drawing with dimensioning, layers and text in accordance with ISO Standards.

- 4 Produce 2-D engineering component in First and Third Angle Orthographic Projections. 7
- 4.1 Convert isometric views to orthographic views of an engineering component.
- 4.2 Perform Array command using the following methods:
- Rectangular array
 - Polar array
- 4.3 Perform Block command using the following methods:
- Insert block
 - Create block
 - Modify block
- 4.4 Produce 2-D drawing of an engineering component in First and Third Angle Projection.
- 5 Produce assembly and detailed drawing of engineering components with sectional views. 6
- 5.1 Identify different types of sectional views used in the industry.
- 5.2 Interpret sectional views of engineering components with imaginary cutting planes.
- 5.3 Explain different types of cutting planes in a drawing.
- 5.4 Create title block with correct information.

- 5.5 Produce assembly drawing of machine parts
 - Insert library part using block command
 - Explode drawing to modify the parts
 - Create material list
- 5.6 Produce detailed drawing in Third Angle Projection.
- 5.7 Use HATCH command to represent sectional views of a drawing.

Produce the hardcopy of drawing using printer

Revision and Assessment

<ul style="list-style-type: none"> • 1 Practical Assignment 	3
Total	30

Teaching and Learning Approaches

Based on the needs and profile of the NT pupils, the lessons will consist of mostly hands-on practices in constructing simple 2D drawing using the AutoCAD software. Student will be exposed to the various concepts in producing engineering drawings that meets the industry requirement.

Completion Criterion

Students will be deemed to have successfully completed the module if they score the average marks of 50 for the assessment. The guidelines for the assessments are given below.

<u>Assessment Component</u>	<u>Assessment Guidelines</u>
(i) Produce 2-D drawing of an intermediate casing with dimensions and appropriate sectioning.	Marks will be awarded for the correct interpretation of the 2D drawing in term of orthographic projection, accurate dimensioning and sectioning technique.

Target Audience

Sec 3 / 4 Normal (Technical) students

Class Size

16 students per class

Duration

30 instructional hours

Certification

ITE Certification of Attendance will be issued upon successful completion of the course. ITE Certificate of Achievement will be issued upon students meeting the assessment criteria.