



**NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF MECHANICAL ENGINEERING
MECHANICAL-ELECTRICAL ENGINEERING PROGRAM**

MC501 – TECHNICAL DRAWING

I. GENERAL INFORMATION

CODE	:	MC501 Technical Drawing
SEMESTER	:	1
CREDITS	:	1
HOUR PER WEEK	:	2 (2 Practice)
PREREQUIREMENTS	:	None
CONDITION	:	Mandatory

II. COURSE DESCRIPTION

The graphic language; presentation of the drawings; Freehand drawing technique: lines, geometric figures, composition, scale, proportion, fit, multiple projection, isometric projection, oblique projection, perspective of a point and two points; Letters and numbers; Technical drawing using instruments; Geometric constructions: perpendicular, parallel, circumferences, tangents, links, regular polygons, irregular polygons, technical curves: ellipse, parabola, hyperbola, Archimedes spiral, helix, involute, cycloid, hypocycloid.

III. COURSE OUTCOMES

As a result of their learning experiences, the student will be able to:

1. Recognize and use properly the basic tools and materials of the technical draftsman.
2. Distinguish and select the most appropriate methods for the construction of geometric figures.
3. Select and locate views using standardization systems.
4. Apply the basic rules in the handling of drawing instruments, as well as for the care of them.
5. Apply the basic safety rules in the work of technical draftsman.
6. Relate and apply the basic knowledge of Geometry in technical drawing.
7. Develop with more precision, freehand drawings and with instruments of figures and mechanical parts.

IV. LEARNING UNITS

1. INTRODUCTION

Graphic language; Technical drawing over time; The modern technical drawing, drafting equipment, standardization.

2. PRESENTATION OF DRAWINGS

Characteristics; The sheet of design, formats, the labeling, the drawing pencil and its use.

The freehand technical line: straight horizontal line, vertical, inclined, wavy line, horizontal, vertical and inclined.

3. FREEHAND TECHNICAL LINE DRAWING APPLICATIONS

The technical line with instruments: use of squads, T-ruler, horizontal lines, vertical and inclined.

4. COMPOSITION WITH FREEHAND LINES

Proportion, fit, construction of perpendiculars: perpendicular bisector of a segment, perpendicular to a line by a point M of the same, perpendicular to a line that cannot be prolonged by its end.

5. PARALLEL CONSTRUCTION

Draw a parallel at a distance h from a line; Draw an outer point parallel to a straight line. Division of a segment of a line in equal parts; Division of a line into proportional apart.

6. FREEHAND STROKE

Ellipses; Views of bodies. Transfer of angles: construction of usual angles, trace of the bisector at a given angle.

7. FREEHAND TRACE

Scales, measure and proportion. Drawing of letters: vertical, inclined, uppercase and lowercase.

8. MULTIPLE PROJECTION

One view, two views; Contour lines, centerlines. Circumference construction: stroke of a circumference passing through three non-aligned points; Determination of the centers of an arc of circumference; Construction of tangents; Rectification of an arc of circumference.

9. ISOMETRIC PROJECTION OF OBJECTS AND ELLIPSES

Link construction: linking two concurrent lines by an arc of circumference; Linking an arc and a line by an arc of circumference; Two circumferences given by a given radius of circumference: the circumferences are externally tangent, the tangents internally, one of the given circumferences links externally and the other internally, S-shaped links; Curve tangent to three intersecting lines.

10. FREEHAND DRAWING

Perspective of a point of view, of two points of view. Technical curves I: ellipse, parabola, hyperbola, Archimedes' spiral. Technical curves II: the propeller; The involute or envelope of the circle; The cycloid; The hypocycloid.

V. METHODOLOGY

This subject, to promote its organic development, will postulate three correlative directions of work:

a) **Administrative Dimension**, to sequence the development of the subject through the sequential programming of functions of this nature.

- b) **Educational Dimension**, for the sequencing and correlation of technical work of the students and the teacher, programmed in the work schedule.
- c) **Research Dimension**, for the creation of proposals for the application of the content of the course.

VI. GRADING FORMULA

The evaluation is permanent and integral, depending on the objectives set. The evaluation system “D” will be applied, consisting of the average grade of the qualified sheets.

VII. BIBLIOGRAPHY

- **GUIESECKE MITCHELL – SPENCER HILL.** Technical Drawing. Ed. Collier Mac Millan International.
- **A.CHEVALIER.** Industrial Drawing.
- **MARCOS EVELSON.** Technical Drawing. ED. Hobby.