

Course Syllabus

1. Course number and name: 020DNDES3 – Industrial Graphics
2. Credits and contact hours: 4 credits, 2x1:15 course hours
3. Instructor's or course coordinator's name: Elie Bou Chakra
4. Text book :
 - a. other supplemental materials: Professor textbook and course material
5. Specific course information
 - a. catalog description

This course introduces in section one: the drafting Instruments and their use, the lettering, the sketching type and line Techniques.

In section 2 it introduces: the multiview drawings, the sectional and the auxiliary view, the descriptive geometry, the patterns, the dimensioning and notation.

In section 3 it introduces: the computer-aided drafting technology.

In the section 4 it shows: the geometric dimensioning and tolerancing, the Pictorial Drawings, the technical representation of the mechanical elements (Fasteners, springs, bearings, Gear, etc...) and the assembly and detail drawings.

It covers the manufacturing technique (welding, casting, forging, extruding, stamping, machining), Pipe Drafting and the design process.
 - b. prerequisites or co-requisites: no
 - c. Required/Elective/Selected Elective: Required
6. Specific goals for the course
 - a. specific outcomes of instruction,
 - Read and understand the technical drawings.
 - Become familiar with the standards and conventions of the technical drawings.
 - Produce technical drawings according to standards.
 - Understand the importance of scale in a technical drawing.
 - Read and write the quotations.
 - Understand the projections.
 - Use a computer aided design (CAD) system and learn to visualize in 3D
 - Solve engineering problems by using the drawing.
 - Acquire knowledge of mechanical components.
 - Produce mechanical designs using the technical drawings.
 - Understand the steps of designing a product.

- b. KPIs addressed by the course.

KPI	a2	c1	c3	e2	e3	k2	k3
Covered	x	x	x	x	x	x	x

Assessed	x	x	x	x	x	x	x
Give Feedback	x	x	x	x	x	x	x

7. Brief list of topics to be covered and approximate lecture hours :

A. INTRODUCTION: (1 Lecture)

Drawings described , types of drawings, types of technical drawings, purpose of technical drawings, applications of technical drawings, regulation of technical drawings, what students of technical drawing and drafting should learn, conventional and CAD/CAM drafting equipment, scales, measuring, lettering, sketching and line techniques.

b. TECHNICAL DRAWING FUNDAMENTALS (11 Lectures)

-Multiview drawings : Orthographic projection, planning the drawing, sketching procedure, centering the drawing, rounds and fillets, runouts, curve plotting, cylindrical intersections, how to represent holes, conventional breaks, visualization, first-angle projection, problems. (2 Lectures)

-Sectional views: Cutting-plane line, direction of sight, section lining, multisection views, kinds of sections, sections through ribs or webs, holes, ribs and webs, spokes and keyways, aligned sections, fasteners and shafts in section intersections in section, problems. (3 Lectures)

-Auxiliary views: Auxiliary views defined, secondary auxiliary views partial views, auxiliary section, half auxiliary views, problems. (3 Lectures)

-Dimensioning and notation, Dimensioning systems, dimension components, laying out dimensions, specific dimensioning techniques, dimensioning rules, notation, rules for applying notes on drawings, problems. (3 Lectures)

c. COMPUTER-aided drafting technology (3 Lectures)

Overview of CAD, CAD software (2D and 3D)

d. DESIGN DRAFTING APPLICATIONS (2 Lectures/section = 8 Lectures)

- Geometric dimensioning and tolerancing.

- Classifications of fasteners, threads, screw thread forms, tap and die, pitch, thread representation, grooved fasteners, spring pins, fastening systems, retaining rings. Spring classification, helical springs, flat springs, terminology of springs, required spring data, how to draw a compression spring and an extension spring.

- Assembly and detail drawings, the engineering department, drawing revisions, title block, checking procedure, numbering system, the design procedure.

- Pictorial drawings, types of pictorial drawings, axonometric drawings, oblique, perspective drawing, isometric principles, nonisometric lines, hidden lines, center lines.

e. RELATED TECHNOLOGY (5 Lectures)

- welding processes, basic welding symbol, size of weld, length of weld, placement of weld, intermittent welds, process reference, contour symbol, field welds, welding joints, types of weld, multiple reference line, spot weld, projection weld welding template, problems (1 Lecture)

- Shop processes casting, forging, extruding, stamping, machining, special workholding devices and heat treatment of steels. (1 Lectures)

- Pipe drafting, types of pipe, types of joints and fittings, types of valves, pipe drawings, dimensioning, pipe drawings, problems. (3 Lectures)