



**Guru Nanak Dev University,  
Punjab B.E./B.Tech MECH Sem 2  
syllabus**

**Engineering Graphics and Drafting**

**SECTION - A**

1

Introduction: Instruments used, Lettering, Types of Lines used, Scales, Types of Projections in use, Dimensioning of Figures, etc.; Orthographic Projections of Points, Lines & Lamina  
Lab Work: Introduction to AutoCAD, Practice of 2D commands, Exercises related to the theory contents of this section.

**SECTION - B**

2

Projection of Solids: Section of Solids & its Projections; Interpenetration of Solids & Curve of Interpenetration; Development of Surfaces.  
Lab Work: Familiarity with 3D commands, Exercises related to the theory contents of this section.

**SECTION - C**

3

Isometric Drawing & Isometric Projection  
Lab Work: Lab Exercises related to the theory contents of this section.

**SECTION - D**

Free-Hand sketching of Engineering Components, Advance 3D Commands: Solving

Problems using AutoCAD.

Lab Work: Lab Exercises related to the theory contents of this section.

### **Suggested / Reference Books:**

1 Engineering Drawing, N. D. Bhatt

2 Engineering Graphics with AutoCAD, James D. Bethune

3 Engineering Drawing & Graphics, K. Venugopal

4 Engineering Drawing PS Gill

Engineering Drawing Author: M. B. Shah & B. C. Rana

5 Engineering Drawing, M. B. Shah & B. C. Rana

## **Physics**

### **SECTION - A**

Introduction: Force system, dimensions and units in mechanics, laws of

mechanics, vector algebra, addition and subtraction of forces, cross and dot products

of vectors, moment of a force about a point and axis, couple and couple moment,

transfer of a force to a parallel position, resultant of a force system using vector

method, Problems involving vector application. Equilibrium: Static and dynamic

equilibrium, static indeterminacy, general equations of equilibrium, Varignon's

theorem, Lami's theorem, equilibrium of bodies under a force system, Problems.

### **SECTION - B**

Truss and Frames: Truss, classification of truss, assumptions in truss analysis,

perfect truss, analysis of perfect plane truss using method of joints and method of

sections, Problems. Centroid, Centre of mass and Centre of gravity, Determination

of centroid, centre of mass and centre of gravity by integration method of regular

and composite figures and solid objects, Problems.

## **SECTION - C**

Moment of Inertia: Area moment of inertia, mass moment of inertia, parallel axis and perpendicular axis theorems, radius of gyration, polar moment of inertia, product of inertia, principle axis, problem based on composite figures and solid objects. Kinematics: Concept of rigid body, velocity and acceleration, relative velocity, translation and rotation of rigid bodies, equations of motion for translation and rotation, problems.

## **SECTION - D**

Particle Dynamics: Energy methods and momentum methods, Newton's laws, work energy equation for a system of particles, linear and angular momentum equations, projectile motion, problem. Shear Force and Bending Moment Diagram for statically determinant beams Classification of beams, types of loads, shear force and bending moment calculation and their graphical presentation, point of inflection, problem.

### **Suggested / Reference Books:**

- 1 Engineering Mechanics - Irving H. Shames, PHI Publication.
- 2 Engineering Mechanics - U.C. Jindal, Galgotia Publication.
- 3 Mechanics-Berkeley Physics Course, Vol-I (Second Edition): C. Kittel, W.D. Knight, M.A. Ruderman, C.A. Helmholtz and R.J. Moyer-Tata McGraw Hill Publishing Company Ltd., New Delhi.

## **Engineering Mechanics**

### **SECTION - A**

Introduction: Force system, dimensions and units in mechanics, laws of mechanics, vector algebra, addition and subtraction of forces, cross

and dot products  
of vectors, moment of a force about a point and axis, couple and couple  
moment,  
transfer of a force to a parallel position, resultant of a force system  
using vector  
method, Problems involving vector application. Equilibrium: Static  
and dynamic  
equilibrium, static indeterminacy, general equations of equilibrium,  
Varignon's  
theorem, Lami's theorem, equilibrium of bodies under a  
force system, Problems.

## **SECTION - B**

Truss and Frames: Truss, classification of truss, assumptions in truss  
analysis,  
perfect truss, analysis of perfect plane truss using method of joints  
and method of  
sections, Problems. Centroid, Centre of mass and Centre of gravity,  
Determination  
of centroid, centre of mass and centre of gravity by integration  
method of regular  
and composite figures and solid objects, Problems.

## **SECTION - C**

Moment of Inertia: Area moment of inertia, mass moment of inertia,  
parallel axis  
and perpendicular axis theorems, radius of gyration, polar moment of  
inertia,  
product of inertia, principal axis, problem based on composite figures  
and solid  
objects. Kinematics: Concept of rigid body, velocity and acceleration,  
relative  
velocity, translation and rotation of rigid bodies, equations of motion  
for  
translation and rotation, problems.

## **SECTION - D**

Particle Dynamics: Energy methods and momentum methods,  
Newton's laws, work  
energy equation for a system of particles, linear and angular  
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Diagram for

statically determinant beams Classification of beams, types of loads, shear force and bending moment calculation and their graphical presentation, point of inflection, problem.

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