

GOPAL KRISHNA COLLEGE OF ENGINEERING AND TECHNOLOGY

GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005

LESSON PLAN

Name of the Subject: ENGINEERING MECHANICS(EM)

Name of the Faculty: Er. Ch. Krushna Chandra Reddy

Subject code:23ES1003

Course Structure:3-0-0

Semester: 2nd Semester

Branch:Mechanical

Semester From: January to April

No. of Weeks: 16

Week	Day	Theory / Practical Topics	Classes
1		Unit 1 – Statics of Particles and Rigid Bodies	15
	1	Introduction to Engineering Mechanics, basic concepts of force, types of forces	1
	2	Concurrent coplanar forces: composition and resolution	1
	3	Equilibrium of concurrent coplanar forces	1
2	4	Method of moments and its applications	1
	5	General case of forces on a plane	1
	6	Equilibrium of forces in a plane	1
3	7	Plane trusses: introduction and assumptions	1
	8	Method of joints	1
	9	Method of sections	1
4	10	Friction: fundamentals and laws of friction	1

Week	Day	Theory / Practical Topics	Classes
	11	Problems involving friction	1
	12	Applications: ladders and wedges	1
5	13	Principle of virtual work	1
	14	Applications of virtual work	1
	15	Problem-solving session	1
		Unit 2 – Centroid and Moment of Inertia	12
6	16	Parallel forces: general case	1
	17	Center of parallel forces and center of gravity	1
	18	Centroid of plane figures	1
7	19	Centroid of composite figures	1
	20	Theorems of Pappus and Guldinus	1
	21	Numerical problems	1
8	22	Moment of inertia: basic concepts	1
	23	MI of plane figures about different axes	1
	24	Parallel axis theorem	1
9	25	Polar moment of inertia	1
	26	Applications of moment of inertia	1
	27	Problem-solving session	1

Week	Day	Theory / Practical Topics	Classes
		Unit 3 – Dynamics of Particles	12
10	28	Rectilinear motion: kinematics	1
	29	Principle of dynamics	1
	30	D'Alembert's principle	1
11	31	Work and energy principles	1
	32	Conservation of energy	1
	33	Applications and numerical problems	1
12	34	Impulse and momentum	1
	35	Conservation of momentum	1
	36	Impact: direct and central impact	1
13	37	Coefficient of restitution	1
	38	System of rigid bodies	1
	39	Problem-solving session	1
		Unit 4 – Curvilinear Motion and Rotation of Rigid Bodies	9
14	40	Curvilinear motion: kinematics	1
	41	Equation of motion in curvilinear motion	1
	42	Projectile motion	1

Week	Day	Theory / Practical Topics	Classes
15	43	D'Alembert's principle in curvilinear motion	1
	44	Kinematics of rotation of rigid bodies	1
	45	Applications and numericals	1
16	46	Revision of all modules	1
	47	Problem-solving session	1
	48	Doubt clearing and discussion	1

Books Recommended

1. *Engineering Mechanics* by R.K. Bansal
2. *Engineering Mechanics* by S.S. Bhavikatti
3. *Engineering Mechanics: Statics and Dynamics* by Beer and Johnston
4. *Engineering Mechanics* by Timoshenko and Young

NPTEL Lectures

1. <https://nptel.ac.in/courses/112103109>
2. <https://nptel.ac.in/courses/112106286/>