DISCIPLINE: CIVIL ENGINEERING	SEMESTER: III	NAME OF THE TEACHING FACULTY: SHAKTI SAMANTA SAHU
SUBJECT: MECHANICS OF MATERIALS	NO. OF DAYS/PER WEEK CLAS ALLOTTED: 03 HOURS	NO. OF WEEKS: 18
Week No.	**Day**	**Topics**
1	1	Definition of centre of gravity -Centre of gravity of Symmetrical shapes (solid / hollow square, rectangular, circular, I Sections)
	2	Moment of inertia (M.I.) Definition, M.I. of plane lamina, Radius of gyration, section mod- ulus
	3	Parallel and Perpendicular axes theorems (without derivations)
2	1	M.I. of rectangle, square, circle, semicircle
	2	M.I. of quarter circle and triangle section
	3	M.I. of symmetrical and unsymmetrical I-section, Channel section, T-section
3	1	Angle section, Hollow sections and built up sections about centroidal axes and any other referenceaxis
	2	Polar Moment of Inertia of solid circular sections. **(UNIT I ENDS-8 Hours)**
	3	Definition of rigid, elastic and plastic bodies, deformation of elastic body under various forces
4	1	Definition of stress, strain, elasticity, Hook's law, Elastic limit, Modulus of elastic-ity.
	2	Type of Stresses-Normal, Direct, Bending and Shear and nature of stresses i.e. Tensile and Compressive stresses.
	3	Standard stress strain curve for tor steel bar under tension, Yield stress, Proof stress, Ultimate stress
5	1	**Monthly Test**
	2	Strain at various critical points, Percentage elongation and Factor of safety.
	3	Deformation of body due to axial force, forces applied at intermediate sections.
6	1	Maximum and minimum stress induced, Composite section under axial loading.
	2	Concept of temperature stresses and strain, Stress and strain developed due to temperature variation in homogeneous simple bar (no composite section)
	3	Longitudinal and lateral strain, Modulus of Rigidity, Poisson's ratio, Biaxial and tri-axial stresses, volumetric strain, change in volume, Bulk modulus (Introduction only)
7	1	Relation between modulus of elasticity, modulus of rigidity and bulk modulus (without derivation)
	2	Occurrence of normal and tangential stresses - Concept of Principal stress and Principal Planes– major and minor principal stresses and their orientations – stresses on a given plane – shear and normal stress components on any inclined plane
	3	Mohr's circle and its use in solving problems on complex stresses - Numerical problem **(UNIT-II ENDS-12HOUR)**
8	1	Doubt Clearing Session
	2	**Monthly Test**
	3	Previous Year Question Discussion
9	1	Types of supports, beams and loads
	2	Concept and definition of shear force and bending moment, Relation between load, shear force and bending moment (without derivation).
	3	Shear force and bending moment diagram for cantilever beams subjected to point loads
10	1	Shear force and bending moment diagram for simply supported beams subjected to point loads
	2	Shear force and bending moment diagram for uniformly distributed loads
	3	Shear force and bending moment diagram for Couple
INTERNAL ASSESSMENT ON 3RD WEEK OF SEPTEMBER		
11	1	(combination of any two types of loading).
	2	Point of Contraflexure
	3	Doubt Clearing Session
12	1	Previous Year Question Discussion **(UNIT III ENDS-10 Hours)**
	2	Concept and theory of pure bending, assumptions.
	3	flexural equation (without derivation), bending stresses and their nature
13	1	bending stress distribution diagram
	2	Concept of moment of resistance, simple numerical problems using flexural equation
	3	Shear stresss equation
14	1	relation between maximum and average shear stress for rectangular and circular section, shear stress distribution diagram
	2	Shear stress distribution for square, rectangular, circle, hollow,
	3	Shear stress distribution for angle sections, channel section, I-section, T section
15	1	**Monthly Test**
	2	Simple numerical problems based on shear equation **(UNIT IV ENDS- 9 Hours)**
	3	Concept of compression member, short and long column, Effective length.
16	1	Radius of gy- ration, Slenderness ratio, Types of end condition for columns, Buckling of axially loadedcolumns
	2	Euler's theory, assumptions made in Euler's theory and its limitations, Application of Eu- ler's equation to calculate buckling load
	3	Rankine' s formula and its application to calculate crippling load.
17	1	Concept of working load/safe load, design load and factor of safety **(UNIT V ENDS- 6 Hours)**
	2	Doubt Clearing Session
	3	Previous Year Question Discussion
18	1	Revision
	2	Numerical Practice
	3	**Monthly Test**

CONCERNED FACULTY

11/07/25.

HOD/CIVIL ENGG.

11/07/25