

Dicipline: <u>Civil</u>	Semester: <u>3rd</u>	Name of the Teaching Faculty: <u>Rajal 2me Pkt</u>	
Subject: <u>SM</u>	No of Days/Week Class Allotted: _____	Semester From date: <u>15/09/22</u> To date: <u>17/10/23</u>	No. of Weeks: <u>15</u>

WEEK	Class Day	Theory Topics
01	1st	Basic principle of mechanics - force, moment, support conditions, C.G, MT
	2nd	Problems on CG and ME, free body diagram.
	3rd	Review of CG and ME of different sections.
	4th	Simple stresses and strains - Introduction, mechanical properties of materials - Rigidity, Elasticity, plasticity, compressibility, Hardness
	5th	Toughness, stiffness, Brittleness, Ductility, malleability, creep, fatigue, Tenacity, durability, Types of stresses - Tensile, compressive, shear.
02	1st	Types of strain, complimentary shear stress, Elongation & contraction, longitudinal & lateral strains.
	2nd	Poisson's Ratio, volumetric strain, computation of stress, strain, change in dimensions & Vol.
	3rd	Hook's law - elastic constants, Derivation of relationship between the elastic constants.
	4th	Application of simple stress & strain in engg field - Behaviour of ductile & brittle materials under direct loads, stress-strain curve.
	5th	Limit of proportionality, elastic limit, yield stress, ultimate stress, breaking stress, Percentage elongation, percentage reduction in area.
03	1st	Significance of percentage elongation and reduction in area of e/s
	2nd	Deformation of prismatic bars due to uniaxial load, Deformation of prismatic bar due to its self wt.
	3rd	Complex stress & strain - principle stresses and strains - occurrence of normal & tangential stresses.
	4th	Principal stress & principal planes.
	5th	Major and minor principal stresses and their orientations.

WEEK	Class Day	Theory Topics
04	1st	Mohr's circle and its application to solve problems of complex stresses.
	2nd	Stresses in beams and shafts - stresses in beams due to bending, Theory of simple bending.
	3rd	Assumptions, moment of resistance, Equation for flexure, flexural stress distribution
	4th	Curvature of beam, position of NA & centroidal axis, flexural rigidity, significance of section modulus.
	5th	Shear stress in beams - Shear stress distribution in beam of rectangular, circular & standard sections symmetrical about vertical axis.
05	1st	I-section, T-section
	2nd	Torsion - concept of torsion, assumption of pure torsion, torsion of solid & hollow circular sections.
	3rd	Polar moment of Inertia, torsional shearing stresses, angle of twist.
	4th	Torsional rigidity, equation of torsion combination of stress. Combined direct & bending stresses.
	5th	Maximum and minimum stresses in sections conditions for no tension, limit of eccentricity
06	1st	Middle third/fourth rule, core or kern for square, rectangular & circular sections.
	2nd	Chimneys, dam, retaining wall. Column & struts - Definition, short & long column.
	3rd	End conditions, equivalent length, slenderness ratio, Axially loaded short and long columns.
	4th	Euler's theory, critical load for columns with different end conditions.
	5th	SFD & BMD - types of loads & beams. Types of support, types of reactions.

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WEEK	Class Day	Theory Topics
07	1st	Types of beams based on support conditions, calculation of support reaction using equations of static equilibrium
	2nd	Shear force and bending moment - sign convention for SF & BM.
	3rd	S.F & BM of general cases of determinate beams with concentrated load.
	4th	S.F & BM. of general case of determinate beams with UDL
	5th	SFD & BMD for cantilever beam with point load with numericals.
08	1st	SFD & BMD for cantilever beam with UDL with numericals.
	2nd	SFD & BMD for simply supported beam with point load & numericals.
	3rd	SFD & BMD for simply supported beam with UDL and its numerical problems.
	4th	Over-hanging beam (SFD & BMD)
	5th	Problems on Over hanging beam, position of max ^m BM, Point of Contraflexure.
09	1st	Relationship between intensity of load SF & BM
	2nd	Slope & deflection - Introduction - Shape and nature of elastic curve (deflection curve)
	3rd	Relationship between slope, deflection & curvature (NO derivation)
	4th	Importance of slope and deflection
	5th	Slope and deflection of cantilever beam with concentrated load by Double Integration method.

WEEK	Class Day	Theory Topics
10	1st	Slope and deflection of cantilever beam with concentrated load by Macaulay's method
	2nd	Slope and deflection of simply supported beam with concentrated load by Double Integration method
	3rd	Slope and deflection of SSB with concentrated load by Macaulay's method
	4th	Slope and deflection of SSB with UDL by Double Integration method
	5th	Slope & deflection of SSB with UDL by Macaulay's
11	1st	Slope & deflection of cantilever beam with UDL by Macaulay's method
	2nd	Slope & deflection of cantilever beam with UDL by Macaulay's method.
	3rd	Indeterminate Beams - Indeterminacy of beams, Principle of consistent deformation.
	4th	Analysis of propped cantilever.
	5th	Fixed span cantilever beam by principle of superposition.
12	1st	Two span continuous beam by principle of superposition.
	2nd	SFD & BMD with point load full span.
	3rd	SFD & BMD with point load (eccentric) full span.
	4th	SFD & BMD with UDL covering full span.
	5th	SFD & BMD with UDL covering full span

21/11/20



ARYAN SCHOOL OF ENGINEERING & TECHNOLOGY

Discipline: <u>Civil</u>	Semester: <u>3rd</u>	Name of the Teaching Faculty:	
Subject: <u>S.M</u>	No of Days/Week Class Allotted: <u>5</u>	Semester From date: _____ To date _____	No. of Weeks:

WEEK	Class Day	Theory Topics
13	1st	Trusses - Introduction, Types of trusses, Definition.
	2nd	Statically determinate trusses and statically indeterminate trusses.
	3rd	Degree of indeterminacy, truss connections and supports.
	4th	Stable and unstable trusses joints under special loading conditions.
	5th	Advantages of trusses, method of joints.
14	1st	Analysis of trusses by the method of joints
	2nd	Problems on joint & members.
	3rd	Problems on given loading & determine the zero force member.
	4th	Important notes for a truss to be properly constrained.
	5th	Problems on determine the forces in beams
15	1st	Problems on find the forces in members using combination of joints & sections.
	2nd	Problems on roof truss.
	3rd	Revision SFD & BMD
	4th	Revision slope & deflection
	5th	Revision Trusses.

9/11/20

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