

GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Diploma Engineering	Branch	Civil Engineering						
Semester	IV	Version	1.0.0.0						
Effective from Academic Year	2019-20	Effective for the batch Admitted in	June 2019						
Subject code	1CI2401	Subject Name	Mechanics of Structures - II						
Teaching scheme	Examination scheme (Marks)								
(Per week)	Lecture(DT)	Practical(Lab.)	Total	CE	SEE	Total			
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	60

Pre-requisites:

Engineering Mechanics (1ES202), Mechanics of Structure – I (1CI 2301)

Course Learning Outcomes:

Successful completion of the course shall make student be able to :

- CO1. Understand static indeterminacy of structural components.
- CO2. Understand behavior of such structural components under certain loading conditions.
- CO3. Understand behavior of columns for different end conditions.
- CO4. Analyse the structural components for principal stresses.
- CO5. Apply the knowledge to real life problems.

Course Content

Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hrs
UNIT – 1 Fixed Beam	1.1 Different types of Determinate & Indeterminate Structures & Structural components/Elements. 1.2 Advantages of fixed beam over simply supported beam. 1.3 Concept of analysis by Area Moment method 1.4 μ and μ' diagram. 1.6 Numerical for SF & BM diagrams for fixed beam with central point load &/or UDL over Full Span.	Draw shear force & Bending moment diagram for fixed beams	08	08
UNIT – 2 Continuous Beam	2.1 Statically indeterminate beam like propped cantilever continuous beam with or without over hang define free moment & fixed end moment diagrams. 2.2 Theorem of three moment (clapeyron's theorem). 2.3 Formulae to find B.M of a continuous beam using theorem of three moment method. 2.4 Point of contra flexure & its importance. 2.5 Numerical to draw S.F & B.M diagram for two or three span continuous beams with different loading and support conditions.	Draw shear force & Bending moment Diagram for continuous beam using three moment theorem moment distribution method	15	12

	2.6 Stiffness, flexibility, carry over factor & distribution factor. 2.7 Moment distribution method. 2.8 Numerical to draw S.F & B.M diagram for two or three span continuous beams with different loading and support conditions.			
UNIT – 3 Principle Stresses & Principle Planes	3.1 Formulae for Normal , Tangential & Resultant Stresses due to Direct Orthogonal Stresses & Shear Stress. 3.2 Formulae for Principal Stresses and for Location of Principal Planes. 3.3 Mohr’s Circle and its application.	Calculate principal stresses & principal plane on a plane in a strained structural material.	15	12
UNIT – 4 Analysis Of Truss	4.1 Perfect & Imperfect Truss 4.2 Various trusses for different spans and Application. 4.3 Analysis of Triangle, North Light & Fan trusses under Panel Point Loads using Graphical & Method of Joint.	Analyse statically Determinate trusses.	12	08
UNIT – 5 Column & Strut	5.1 Column & Strut 5.2 Short & Long Column 5.3 End Condition of Column and effective Length of Column & Modes of Failure in column 5.4 Radius of Gyration , Slenderness Ratio 5.5 Euler’s Crippling Load 5.6 Rankin’s load / Buckling Load of Column.	Calculate load carrying capacity of columns & struts.	10	05
		Total	60	45

List of Practical		
No.	Unit	Name of Practical
1	ALL	Solve at least six problems based on every unit.
2	4	Analyse truss using graphical method (at least three trusses) and verify using analytical method.
3	5	Demonstrate End Conditions of Column using suitable model / example.

List of Instruments / Equipment / Trainer Board	
1	Model for column with different end conditions.

List of Reference Books			
No	Title of Reference Books	Authors	Publication
1	Strength of Materials	R S Khurmi, N. Khurmi	S Chand Publications
2	Strength of Materials	S Ramamrutham	Dhanpat Rai Publishing Company(P) Ltd.
3	Strength of Materials	Dr. B. C. Punamia, Er. Ashokkumar Jain Dr. Arun Kumar Jain	Laxmi Publications

Link of Learning Web Resource	
1	https://www.coursera.org/learn/mechanics-1
2	https://nptel.ac.in/courses/106106108

PO & CO Mapping

Sr.No.	Name of PO	Description	Co1	Co2	Co3	Co4	Co5
1	PO 1	Acquire fundamental knowledge of mathematics, science, and civil engineering.	Slight	Slight	Slight	Slight	Moderate
2	PO 2	Design and conduct experiments, as well as analyze and interpret data.	Moderate	Moderate	Moderate	Moderate	Substantial
3	PO 3	Use the techniques, skills, and modern engineering tools necessary for engineering practice	Substantial	Substantial	Substantial	Substantial	Substantial
4	PO 4	Function in multi-disciplinary teams and identify, formulate, and solve engineering problems.	Substantial	Substantial	Substantial	Substantial	Substantial
5	PO 5	Clear understanding of his duties and responsibilities as a civil engineer.	None	None	None	None	None
6	PO 6	Develop effective communication skill and provide leadership for professional development.	None	None	None	None	None
7	PO 7	Engage in life-long learning in civil engineering field and comprehend issues related to environment and sustainable development.	None	None	None	None	None
8	PO 8	Graduate will demonstrate knowledge of professional and ethical responsibilities.	None	None	None	None	Slight
9	PO 9	Incorporate economics and business practice including project and risk management.	None	None	None	None	Slight
10	PO 10	Graduated are able to share their knowledge to the industries as well as society.	None	None	None	None	None
11	PO 11	Graduated will be able to apply their skill and knowledge for the sustainable development of nation.	Slight	Slight	Slight	Slight	Slight

12	PO 12	Graduated are able to learn to work with the team and also with the inter discipliners.	None	None	None	None	None
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