

Branch Name:	Civil Engineering
Semester/Year:	Semester V/ Third Year
Subject Title:	Structural Analysis - III
Subject Code:	1ET1060502
Pre-requisite:	Basic Knowledge of Mechanics of Solids and structural analysis

Course Objective:

- This subject is conceptual applications of principles of mechanics of rigid and deformable bodies in Engineering.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
03	01	00	04	70	30	-	-	100

Subject Contents				
Sr. No	Topic	Total Hours	Weightage (%)	
1	<u>Matrix Methods:</u> Types of skeletal structures, Internal forces and deformations. Introduction and applications of stiffness method to analyze beams, Trusses and plane frames by system approach. Introduction and applications of Flexibility method to analyze beams, Trusses and plane frames by system approach.	16	30	
2	<u>Domes:</u> Uses of domes, Types of domes, Nature of stresses in conical and spherical domes, Analysis of conical and spherical domes subjected to uniformly distributed load/ concentrated load at crown, Analysis of domes with opening.	04	15	
3	<u>Beam Curved in Plan:</u> Uses of curved beam, types of internal forces, Analysis of curved beam fixed at ends for point load, Uniformly distributed load, Analysis of circular beam supported symmetrically.	06	15	
4	<u>Arches, cables and suspension bridges:</u> Three hinge arch - segmental and parabolic shapes. Forces and end actions in cables, unstiffened three hinged parabolic and cantenary type suspension bridge	08	20	
5	<u>Plastic Method:</u> Concept, Assumptions, Shape factor for different cross section, Collapse load, Load factor, Plastic modulus of section, Plastic moment of resistance, Computation of collapse load for fixed beam, Continuous beam and plane frame subjected to various load cases.	08	20	

Term Work:

Term work shall consist of tutorials (minimum 30 problems) based on above course. Practical examinations shall consist of oral based on term work and above course.

List of Reference Books:

1. Gere & Weaver; Matrix Analysis of framed structures, CBS Publications.
2. Junnarkar S. B. & Shah H.J, Mechanics of Structures Vol-II, Charotar publishing house, Anand.
3. Wang C.K., Matrix methods of Structural Analysis Mc Graw Hill book Company, New Delhi.
4. Reddy C.S., Basic Structural Analysis, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.
5. Neal B G, Plastic Analysis, Mc Graw hill Publication.
6. Dr. Punmia B.C. Jain Ashok & Jain Arun, RCC Design, Laxmi Publications, New Delhi.

E-Resources :

1. <http://nptel.ac.in/>