

B.E. Semester: IV
Civil Engineering

Subject Name: STRUCTURAL ANALYSIS II (CV405)

A. Course Objective:

The main objectives of the course are

- To understand the structural behavior before and after application of loads.
- To be able to analyze various structure.
- To be aware of various reinforced techniques to enhance Designing of structure.

B. Teaching /Examination Scheme

Teaching scheme				Total Credit	Evaluation Scheme					Total
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract/ Tut.	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
03	02	00	05	05	03	70	30	20	30	150

C. Detailed Syllabus:

1 Fixed Beam:

Analysis of Fixed Beam (Plotting of Shear Force and Bending Moment Diagrams for Various Static Loads on it)

1. Propped Cantilever Beam:

Analysis of Propped Cantilever Beam (Plotting of Shear Force and Bending Moment Diagrams for Various Static Loads on it)

2. Continuous Beam:

Analysis of Continuous Beam (Plotting of Shear Force and Bending Moment Diagrams for Various Static Loads on it)

By Slope and Deflection Method

By Moment Distribution Method

3. Influence Lines for Indeterminate Structures

Muller-Breslau's Principle, Steps for obtaining I.L for Reactions and Internal Forces in Propped Cantilever Beam and Continuous Beam, Qualitative I.L.D for Rigid Jointed Structures Having Higher Statically Indeterminacy

4. Energy Principles :

Castigliano's Theorems, Computation of Displacements of Statically Determinate Beams, Trusses and Frames by Unit Load Method, Analysis of Indeterminate Structures (Beams, Trusses, Frames and Two Hinge Arches

5. Prestressed Concrete.

Introduction, Properties of High Strength Materials, Methods of Prestressing (Pre Tensioning and Post Tensioning), Losses in Prestressed Concrete, Analysis of a Section for Flexure

D. Lesson Planning

Sr. No.	Title of the Unit	Minimum Hours	Weightage
1.	Fixed Beam	09	25%
2.	Propped Cantilever Beam	06	8%
3.	Continuous Beam	09	22%
4.	Influence Lines for Indeterminate Structures	07	12%
5.	Energy Principles	09	25%
6.	Prestressed Concrete	05	8%

E. List of Tutorials:

Minimum 5 theory and 10 Numerical Problems on each Unit.

F. Instructional method and pedagogy (Continuous Internal Assessment Scheme) (CIA)

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures and practical which carries marks.
- At regular intervals assignments will be given. Students should submit all assignments during given period.
- Classroom participation and involvement in solving the problems in Tutorial rooms carries marks.
- Internal exam of 30 marks will be conducted as a part of Mid semester evaluation.

G. Students Learning Outcomes:

- Students will learn Analysis of structures.
- Students will learn prestressing techniques.

H. Recommended Study Materials

(A) Reference Books :

1. Structural Analysis I and II by Thandarmurthy, Oxford Publication
2. Prestressed Concrete by Krishna Raju
3. Structural Analysis I and II by Rama Mrutham, Dhanpatrai Publication
4. Structural Analysis I and II by Rama Mrutham, Dhanpatrai Publication
5. Structural Analysis I and II by Junarkar, S.B and Shah H.J, Charotar Publication
6. IS 1893-2002
7. IS 1893-1984

(B) Web material :

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