

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
HYDERABAD CAMPUS
INSTRUCTION DIVISION
FIRST SEMESTER 2014-2015
Course Handout (Part -II)

Date: 01/08/2014

In addition to part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : CE G617

Course Title: Advanced Structural Analysis

Instructor-in-charge: Sri Kalyana Rama J

Scope & Objective of the Course

Advanced structural analysis techniques and methods provide efficient means and tools for analysis and design of framed structures using matrix approach. Hence learning advance structural analysis will be very useful for structural analyst and designers. The basic objective of this course is to acquire the fundamental concepts of matrix methods of structural analysis and their implementation in development of computer programs for computer aided structural analysis of structures. By the end of the course, the students will be familiar with matrix methods of structural analysis using self-developed computer programs.

Text Book

1. Willilam, W. & Gere J.M. "Matrix Analysis of Framed Structures", CBS Publishers & Distributers, 1986.

Reference Books

- 1 Ghali A. and Neville A.M. Structural Analysis, A unified classical and Matrix approach. Chapman and hall, London third Edition. 1989
- 2 Harold C. Martin, Introduction to Matrix Methods of Structural Analysis. McGraw Hill. Inc. 1966. .

Course Plan

Lect. No.	Learning objective	Topics to be covered	Reference* Chap./Sec.
1-5	Basics of Structural Analysis	Introduction, Static and Kinematic Indeterminacy, General Methods of Analysis of Indeterminate Structures, Selection of Method, Equivalent joint loads	TB: Ch. 1
6-12	Fundamentals of the Flexibility Method	Introduction, flexibility method, temperature changes, pre-strains, support displacements, joint displacements, member end actions, support reactions, flexibilities of prismatic members, formalization of the flexibility method, example problems	TB: Ch. 2

13-20	Fundamentals of the Stiffness Method	Introduction, Stiffness method, Temperature changes, Pre-strains, and support displacements, stiffness of prismatic members, formalization of the stiffness method, example problems	TB Ch. 3
21-30	Computer Oriented Direct Stiffness Method	Introduction, direct stiffness method, complete member stiffness matrices, formation of joint stiffness matrix, formation of load vector, analysis of plane truss, analysis of plane frame, grid member stiffnesses, analysis of grids, space truss member stiffnesses, space frame member stiffnesses, computer programming	TB: Ch. 4 & 5
30-35	Additional topics for stiffness method	Introduction, rectangular framing, symmetric structures, loads between joints, automatic dead load analysis, temperature changes and pre-strains, support displacement, oblique supports, elastic supports, translation of axes, Curved members	TB: Ch.6
35-42	Shear Deformation and Shear Wall Analysis	Introduction to Shear Walls, Analysis of Shear Walls. Shear deformation theory	RB-1: Ch.14

Evaluation Scheme

Ec. No.	Evaluation component	Duration	Weightage	Date, time	Nature of component
1.	Test I	1hr	15%	16/9/2014, 9.30 -- 10.30 AM	CB
2.	Test II	1hr	15%	31/10/2014, 9.30 -- 10.30 AM	OB
3.	Project/Seminars		40%	Continuous	OB
4.	Compre. Exam	3 hrs	30%	04/12/2014 AN	CB-20%/OB-10%

Chamber Consultation Hour: To be announced in the class.

Notices: All Notice concerning to the course will be displayed on **Notice Board** of Civil Engg. Department.

Make up policy: Makeup will be given only to the genuine cases with prior permission.

