BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI
INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017
Course Handout (Part - II)

Date: 02.08.2016

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 : **D. BHUNIA**

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.
3. Hibbeler R.C. , Structural Analysis. Pearson Education Inc. 2013.

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
6-20	Fundamentals of the Flexibility Method	Introduction, flexibility method, temperature changes, prestrains, support displacements, joint displacements, member end actions, support reactions, flexibilities of prismatic members, formalization of the flexibility method, example problems.	TB: Ch. 2
21-28	Fundamentals of the Stiffness Method	Introduction, Stiffness method, Temperature changes, Prestrains, and support displacements, stiffness of prismatic members, formalization of the stiffness method, example problems.	TB Ch. 3
29-36	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 meber stiffnesses, computer programming.	TB: Ch. 4 & 5

Lect. No.	Learning objective	Topics to be covered	Reference* Chap./Sec.
37-42	Additional topics for stiffness method	Introduction, rectangular framing, symmetric structures, loads between joints, automatic dead load analysis, temperature changes and prestreains, support displacement, oblique supports, elastic supports, translation of axes, Curved members.	TB: Ch.6

Evaluation Scheme

Evaluation Component No	Evaluation Component	Duration	Weightage	Date time and Venue	Nature of component.
1	Mid-Semester Test	1-hour and 30-minutes	40%	<TEST_1>	CB
2	Projects including Seminars, Take Home Assignments		10%+5%	Continuous	OB
3	Comprehensive Examination	3-hours	45%	<TEST_C>	OB

Chamber Consultation Hour : To be announced in the 1st class.

Notices: All Notice concerning to the course will be displayed on **Notice Board** of Civil Engg. Department and/or e-mail notice will be sent to the concerned students registered for the course.

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

Instructor-in-charge
CE G617