BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
INSTRUCTION DIVISION
FIRST SEMESTER 2015-2016
Course Handout (Part II)

Date: 03-08-2015

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

Course No.	:	**CE G554**
Course Title	:	**Advanced Structural Design**
Instructor-in-charge	:	**G MUTHUKUMAR**

1. Scope and Objective of the Course:

The main goal of this course is to provide a deep understanding of design of structural elements in industry. The detailed structural design is necessary to execute the project. The innovative construction of buildings/structures would not have been possible without proper structural design. The failure of many buildings could have been avoided had there been proper design and construction. The present course aims at providing the various aspects of structural design of buildings/specialized structures. Nevertheless, the scope of the course lies only with concrete and steel structures. Students are expected to be learning the use of commercial softwares in the actual design of structures.

2. Text Book:

- T1: S. U. Pillai and D. Menon, " Reinforced Concrete Design", Third Edition, Tata McGraw Hill.
- T2: N. Subramanyan, "Design of Steel Structures" oxford university press

3. Reference Books:

- R1: IS 456, IS 800, IS 802, IS 875, IS 1893, IS 3370, IS 6533, IS 13920.
- R2: Bwick Davison & Graham W Owens, "Steel designers Manual" The steel construction institute, UK
- R3: S. N. Manohar, "Tall chimneys: Design and construction", Tata McGraw Hill.
- R4. A R Santhakumar and S. S. Murthy , "Transmission line structures", Tata McGraw Hill
- R5: Other relevant BIS codes and International code of practice
- R6: Punmia, B.C., Jain, A.K., Jain, A.K., "Comprehensive Design of Steel Structures", Laxmi Publications (P) Ltd., New Delhi.
- R7: Raju, N.K., "Advanced RCC Design", CBS Publishers and distributors, New Delhi.
- R8: Gambhir, M.L., "Design of Reinforced Concrete Structures", PHI Learning Pvt. Ltd., New Delhi.

4. Course Plan:

Lec No.	Learning Objective	Topics to be covered
1-5	**RC Framed structures**	Aspects of RC Frame buildings including Tall structures - Modelling, Analysis, design and detailing including seismic resistance
6-10	**Alternate structural configurations**	Design aspects of Shear wall-Frame structures, Tubular structures (Framed tube, Braced frame tube, tube-in-tube structures), Pre-stressed pre-cast structures, Pre-stressed poles, piles and railway sleepers
11-13	**Liquid retaining structures**	Water tank and Chemical Storage tank
14-19	**Special concrete structures**	Industrial building design (Power plant structures, airport structures, stadiums etc) - Standards and guidelines

20-23	**Utility structures**	Design aspects of Chimneys and cooling towers, Indian Standards & other guidelines
24-29	**Steel structures**	Steel Frame Buildings, Connections, design aspects, codal provisions - Indian & International guidelines, structural stability.
30-34	**Steel bridge structures**	Railway truss bridges & Railway plate girder bridges
35-37	**Special steel structures**	Design concepts of Steel plate shear walls, Transmission towers, Use of cellular beams.
38-40	**Recent developments**	Performance based design, design aspects for extreme loading cases such as earthquake, fire, fatigue

Reading assignments will be given whenever necessary.

5. Evaluation Scheme:

Component	Duration	Weightage	Date & Time	Remarks
Mid-semester	90 mins	30%	8/10 4:00 - 5:30 PM	OB
Project	-	20%	Continuous	OB
Monthly assignments		10%	Continuous	OB
Comprehensive	3 hrs	40%	9/12 AN	CB/OB

6. Chamber Consultation Hour: Saturday 6 pm -7 pm

7. Notice: Notices will be displayed on Civil Engineering Department Notice Board only.

Instructor-in-charge