

Computer Application in Structural Engineering-II
01ST1207 (LC)

Objective of the Course: Objectives of introducing this subject at first year level in Masters of structural engineering are:

- To generate awareness regarding relating the theory to the real-life challenges pertaining to the structural engineering field.
- To provide a realistic platform to the students where, they understand the process of addressing the field issues, core knowledge application methods and ways of solutions for the problems by applying commercially available tools.

Credit Earned: 2

Students learning outcomes:

After successful completion of the course, it is expected that student will be able to,

1. Model the structural system for analysis & design based on its on-site conditions.
2. Interpret the software results and process them for design of structures.
3. Develop the skills to address the core issues and suggestive or implementable solutions for the problems.
4. Develop the design basis report of structural design of different projects.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	CSE (I)	IA (M)	Viva (V)	Term Work (TW)	
-	-	4	2	-	-	-	50	50	100

Structural Engineering
Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	<p>Project – Structural Design</p> <p>The project work has to be a design projects from the following projects; Students have to carried out structural design project from the following;</p> <ol style="list-style-type: none"> 1. Multistoried Reinforced Concrete Structure 2. Industrial Structure 3. Water storage structures 4. Concrete Bridges <p>It is compulsory to submit at least two structural design projects from concept level to execution level.</p> <p>Each Structural Design Project must be submitting with Design Basis Report (DBR) which includes; Framing System & Plan of Structures; Details of Materials & Properties being considered Loads & Load Combination Modelling of Structures with all relevant details Design Results Detailed Drawings</p>	20
2	<p>Application of Commercially available Software Packages for Analysis & Design of Structures</p> <p>Selection of Proper Layouts of Structures; Application of Wind Loads for RC & Steel Structures as per IS codes. Application of Earthquake Loads using Static Coefficient & Response Spectrum Methods as per IS codes. Analysis & Design of Shear Wall Building. Checks for Various Criteria for Earthquake Resistant Design as per IS codes: Storey Drifts, Beam-Column Capacity Ratio, Soft Storey & Various Irregularities etc.</p>	20
3	<p>Ductile Detailing & Drafting</p> <p>Ductile Detailing of Beams, Columns, Beam-Column Joints as per IS codes. Detailing and Drafting of Structural Members using commercially available software.</p>	15

Structural Engineering**Suggested Theory Distribution**

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
5%	5%	20%	25%	25%	20%

Recommended Study Material:**Reference Book:**

1. Manish Shrikhande & Pankaj Agrawal; Earthquake resistant design of structures, PHI Publication, New Delhi
2. S.K.Duggal; Earthquake resistance design of structures; Oxford University Press, New Delhi.
3. A.K.Chopra; Dynamics of structures , Pearson, New Delhi.
4. Clough & Penzin; Dynamics of structures.
5. Park & Pauly; Behaviour of RC structure
6. John M. Biggs; Introduction to Structural Dynamics
7. C V R Murthy - Earthquake Tips, NICEE
8. IITK-GSDMA EQ26 – V -3.0 Design Example of a Six Storey Building
9. S S Rao; Mechanical Vibration; Pearson, New Delhi

Web Resource

1. <https://www.nicee.org/EQTips.php>
2. www.nicee.org
3. www.eeri.org
4. www.gsdma.org
5. www.ndma.gov.in
6. www.nptel.iitm.ac.in/courses
