Marwadi University

Syllabus for Master of Technology

Structural Engineering

Computer Application in Structural Engineering

01ST0106 (EE)

Objective of the Course: Objectives of introducing this subject at first year level in Masters of civil 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 replicating its on-site conditions.
2. Interpret the software results and process them in an appropriate manner.
3. Develop the skills to address the core issues and suggestive or implementable solutions for the problems.

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)	
00	00	04	02	00	00	00	25	25	50

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Detailed Syllabus

Sr No.	Title of the unit	Number of hours
1	**Design of Structural Elements** Application of Excel & Other Tools for Design of Various Structural Elements like, Slabs, Beams, Columns & Foundations etc. Application of FORTRAN/MATLAB/MATHEMATICA to obtain Structural Response.	**20**
2	**Application of Commercially available Software Packages for Analysis & Design Structures** Modelling of Various Types of Structures in Commercially available Software. Structural Analysis of 2D and 3D Trusses. Structural Analysis of 2D and 3D Rigid Frames and Braced Frames Application of Gravity & Lateral Loads as per Indian Standards. Modelling & Analysis of Industrial Shed Structures. Interpretation & Understanding Post-Processing Results from Software. Modelling of Advanced Concepts like, Brick Infill Walls, Bracing, Structural Walls, Rigid Links.	**40**

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

Instructional Method and Pedagogy:

1. Use of Learning Management system like canvas
2. Demonstration through ppt and videos and lectures
3. Brainstorming and group discussion sessions
4. Collaborative learning

Recommended Study Material:

Reference Book:

1. Structural Design of Multi-storeyed Buildings, Varyani U. H., 2nd Ed., SouthAsian Publishers,New Delhi.
2. Structural Analysis and Design of Tall Buildings, Taranath B. S., Mc Graw Hill, 1988
3. Advanced Design of Concrete Structures – Krishana Raju N., Tata Mc-Graw Hill, Delhi
4. Design of Multi Storeyed Buildings, Vol. 1 & 2, CPWD Publications.
5. Tall Building Structures, Smith Byran S. and Coull Alex, Wiley India
6. High Rise Building Structures, Wolfgang Schueller, Wiley
7. Tall Building Structures on Elastic Subgrade and Research of Semi-Analytical method by Gong Yaoqing. Beijing: Tsinghua University
8. Tall Chimneys, Manohar S. N., Tata Mc Graw Hill Publishing Company, New Delhi
9. Advanced Reinforced Concrete, Varghese A. V., Prentice Hall of India.
10. Advanced Reinforced Concrete Design, Varghese P. C., Prentice Hall of India, New Delhi.
11. Unified Theory of Concrete Structures, Hsu T. T. C. and Mo Y. L., John Wiley & Sons, 2010.
12. IS Codes : IS:456, IS:875, IS:1893, IS:4326, IS:13920, IS: 3370, IS: 4995 (I & II), SP:16, SP:34,
12. IS:800, IS:226, SP:6(1), SP:6(6)
13. Design of Steel Structures – N. Subrhamanyan, Oxford.
14. Steel Structure -Design and Behaviour, Salmon, C.G., and Johnson, J.E. Harper and Row
15. Design of Steel Structure - Duggal, Tata Mc Graw Hill.
16. Steel Structures, William McGuire, Prentice Hall, Inc., Englewood Cliffs, N.J.1986

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

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