COURSECONTENT

ADVANCED STRUCTURAL ANALYSIS AND DESIGN LABORATORY								
II Semester: SE								
Course Code	**Category**	**Hours/ Week**			**Credits**	**Maximum Marks**		
2522074	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		0	1	2	2	40	60	100
Contact Classes: Nil	**Tutorial Classes: 15**	**Practical Classes: 30**				**TotalClasses:45**		
Prerequisites: RCC and Steel design								

Course Overview:

This course focuses on the analysis and design of various structural systems using modern engineering approaches and tools. It covers practical applications such as bridge decks, industrial structures, gantry girders, and high-rise buildings with different structural configurations. The course emphasizes advanced design concepts including shear walls, flat slab systems, and raft foundations. Students gain hands-on experience in modeling, analysis, and interpretation of results for real-world structures. It enhances skills required for structural design, safety evaluation, and professional engineering practice.

Course Objectives:

1. To develop the ability to model, analyze, and interpret structural behaviour of bridges, buildings, and industrial systems using advanced structural analysis tools.
2. To design various structural systems—including PEBs, gantry girders, high-rise buildings, and specialized floor systems—following relevant codal provisions.
3. To understand the influence of different lateral load-resisting systems such as shear walls and flat slab systems on high-rise structural performance.
4. To analyze and design different types of foundation systems such as flat-slab raft and beam-slab raft foundations for real-world applications.
5. To integrate analysis results with design procedures to produce safe, efficient, and economical structural engineering solutions.

Course Outcomes: After completion of the course, students will be able to

1. Analyze the behavior of bridge decks using grillage analogy.
2. Apply structural principles to pre-engineered building (PEB) structures for effective load management.
3. Evaluate gantry girders for strength and serviceability under applied loads.
4. Formulate analysis procedures for high-rise multi-storey buildings, including those with shear walls and flat slab systems.
5. Synthesize foundation designs for flat slab and beam slab raft foundations based on site and load requirements.

List of Experiments:

1. Analysis of a Bridge Deck by Grillage Analogy
2. Analysis and Design of a PEB Structure
3. Analysis and Design of a Gantry Girder
4. Analysis and Design of a High-Rise Multistoried Building
5. Analysis and Design of a High-Rise Multistory Building with Shear Wall
6. Analysis and Design of a High-Rise Multistory Building with Flat Slab System
7. Analysis and Design of Flat Slab Raft Foundation
8. Analysis and Design of Beam Slab Raft Foundation

REFERENCESES:

1. *P.C. Varghese* – Advanced Reinforced Concrete Design
2. *S.S. Bhavikatti* – Design of Steel Structures
3. *C.S. Krishnamurthy* – Structural Analysis

MATERIALS ON LINE:

1. Virtual labs
2. Content beyond syllabus