COURSECONTENT

COMPUTER AIDED DESIGN LABORATORY								
I Semester:SE								
CourseCode	**Category**	**Hours/ Week**			**Credits**	**Maximum Marks**		
2512071	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		0	1	2	2	40	60	100
contactClasses:Nil	**TutorialClasses:15**	**PracticalClasses:30**				**TotalClasses:45**		

Prerequisites:

- ComputerAided Civil Engineering Drawing Principles
- Microsoft Excel
- StructuralEngineering-1,StructuralEngineering–2

Course Overview:

This lab course focuses on the computer-aided analysis and design of structural systems using tools like Excel for developing automated calculation templates. It covers the analysis and design of beams, frames, space frames, roof trusses, and gantry girders under various loading conditions. Students gain practical experience in modeling and analyzing multi-storeyed buildings subjected to dead, live, wind, and earthquake loads. The course enhances skills in computational methods, result interpretation, and optimization of structural designs for safe and efficient engineering practice.

Course Objectives:

1. To analyze and design beams, frames, and truss systems using structural engineering principles.
2. To develop Excel templates for automating analysis and design of various structural components.
3. To perform analysis and design of multi-storeyed buildings under different loading conditions including DL, LL, WL, and EQ.
4. To apply structural analysis techniques to space frame systems and specialized structures like gantry girders.
5. To accurately compute wind and other environmental loads for roof trusses and building systems using Excel-based tools.

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

1. Analyze determinate and indeterminate beams, plane frames, and space frames using computational tools.
2. Design structural elements including beams, frames, and gantry girders based on applied loads and relevant codes.
3. Develop Excel templates and spreadsheets for structural analysis and design of various components such as beams, frames, and roof trusses.
4. Evaluate the structural response of multi- storied buildings subjected to different load combinations like dead load, live load, wind load, and earthquake load.
5. Interpret analysis results and optimize the design of structural systems for safety and serviceability.

LIST OF EXPERIMENTS:

1. Analysis and design of determinate and indeterminate beams & development of Excel template
2. Analysis and design of plane frames and development of Excel template
3. Analysis and design of space frame and development of Excel template
4. Analysis and design of a multistoreyed building subjected to DL, LL and WL
5. Analysis and design of multistoreyed building subjected to DL, LL and EQ
6. Analysis and design of roof trusses including WL calculation in Excel spreadsheet
7. Analysis and design of gantry girder and development of spreadsheet

REFERENCES:

1. Structural Analysis by C. S. Reddy, Tata McGraw-Hill Publications
2. Structural Analysis by Hibbeler R. C., Pearson Education
3. Design of Steel Structures by Duggal S. K., Tata McGraw-Hill Publications
4. Matrix Analysis of Structures by William Weaver Jr. and James M. Gere, CBS Publications
5. STAAD.Pro V8i for Structural Analysis by S. Rajasekaran, PHI Learning

MATERIALSONLINE:

1. Virtual labs
2. Content beyond syllabus