GUJARAT TECHNOLOGICAL UNIVERSITY

BACHELOR OF ENGINEERING SYLLABUS

Minor/Honours Degree : Computer Aided Civil Engineering Processes

Subject Code : N116AV01

Subject Name : Basics of Structural Design (RCC) - Software Applications

WEF Academic Year:	2025-26
Semester:	6
Category of the Course:	Compulsory

Type of course: Minor Degree

Prerequisite: Basic concepts of RCC Design, Manual concepts as per IS Codal provisions for various structural elements.

Rationale: The subject will help students to analyze multistory building in structural designing software.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
2	0	4	4	70	00	30	00	100

Content:

Sr. No.	Course Content	No. of Hours
1	**Introduction to the RCC Design Code** Discussion of important clauses to be used in design from IS 456, for Beam, column, slab and footing design. Discussion of important clauses from NBC from drafting of RCC Structural design Discussion from SP 34 :- Handbook on concrete reinforcement detailing	10
2.	**Software used for RCC Structural Design (STAAD-Pro.)** Introduction the various designing software like, Etabs, STAAD-Pro, Revit Structures, SAP-2000, etc. Installation of STAAD-Pro. Introduction to the opening window of STAAD-Pro. Basic command discussion, Creation of simple structural member Geometry, Application of Loads, Provision of support conditions, analysis of structural members, and learn to read output of analysis.	06
3	**Analysis of beam (Manual Vs Software)** Analysis of Simply supported beam, Cantilever beam, Continues beam, Fixed beam by manually and verify the results by model it in Software	06
4	**Analysis of Multistorey building** Geometry Creation by using various methods, Provision of structural members	10

	like, beam & column, Property application over structural members, Static loads (Dead load & live load) over the buildings, Analysis of structures, Apply design command for the design of structural members, study of output file/results of design.	
5	**Dynamic Analysis of Multistorey building** Basic understanding of Seismic load as per IS Codal provisions, Basic understanding of wind load as per IS Codal provisions, Generation of seismic force definition and apply over the structures, Generation of wind load definition and apply over the structures. Creation of Load combination for design of structures.	10
	Total Hrs.	**42**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10%	**15%**	**25%**	**20%**	**10%**	**20%**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Reinforced Concrete Vol. I and II. By Dr. H.J.Shah, Published by Charotar Publications.
2. Design of Reinforced Concrete Structures by N.Subramanian, Published by Oxford University Press.
3. Design of R.C.C Buildings using Staad Pro V8i with Indian Examples English by T.S.Sharma.
4. MASTERING STAAD PRO: A Comprehensive Guide to Structural Analysis and Design by Syed Mohd Abid.

Course Outcomes:

No	Course Outcomes	Marks % weightage
CO1	Student will be able to learn use of designing software	20%
CO2	Students will be able to learn static analysis of RCC Multistory building	45%
CO3	Students will be able to learn dynamic analysis of RCC Multistory buildings	35%

List of Experiments:

1. Solved example to design beam, column, slab and footing manually.
2. Analysis of beam in software and compare the analysis results by performing manual analysis.
3. Provide static analysis of multistorey building in STAAD-pro. And generate design (Minimum 3)
4. Provide Dynamic analysis of Multistorey building in STAAD-pro. And generate design (Minimum 3)
5. Provide analysis and design of any one live project which is run nearby location of institute and compare the results with professional one. (Minimum 1)

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