



GUJARAT TECHNOLOGICAL UNIVERSITY

BACHELOR OF ENGINEERING SYLLABUS

Minor/Honours Degree : Forensic Structural Engineering

Subject Code : N114AU02

Subject Name : Construction Failures

WEF Academic Year :	2024-25
Semester :	4
Category of the Course :	Compulsory

Prerequisite :	
Rationale :	Rapid economic development and fast-track modern construction practices can trigger catastrophic structural failures. To investigate structural failures scientifically, this program will become very useful. This program would help to understand Forensic Science & Law, appreciate and investigate construction failures along with Structural evaluation of existing structures, the experience of material testing and non-destructive testing, Prevention and resolution of Construction Disputes etc. Forensic Structural Engineering Studio will give opportunity to students to work on case studies as well as live projects.

Course Scheme:

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	2	4	70	-	30	-	100

Course Content: Construction Failures

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Definition of error, defect, and failure – Causes of failures	10	10
2	Masonry and Concrete Failures, Repairs	12	20
3	Man-Made and Natural Failures, Rehabilitation	8	30
4	Maintenance Problems and Their Solutions	5	20
5	Lab - Case studies of construction failures	7	20
	Total	42	100



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Reference Book :

1. Forensic Structural Engineering Handbook, Robert T. Ratay, McGraw-Hill Professional; 2nd edition (16 January 2010).
2. Forensic Engineering: Damage Assessments for Residential and Commercial Structures, Stephen E. Petty, CRC Press; 2nd edition (24 September 2021)
3. Structural Condition Assessment, Robert T. Ratay, John Wiley & Sons Inc; 1st edition (11 February 2005)
4. Repair And Rehabilitation Of Concrete Structures, Modi P.I. and Patel Chirag, PHI Learning Pvt Ltd (1 January 2016)

Course Outcome :

After Completion of the Course, Student will able to :

No	Course Outcomes	RBT Level*
01	Classify the different types of failures encountered in structures.	RM/UN
02	Distinguish the failures and repairs in Masonry and Concrete.	UN
03	Relate the solution with the problem	AP

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

Suggested Course Practical List :

1. Prepare a presentation on the quality control and safety measures to be taken during construction in order to avoid construction failures. To supplement presentation with real life case-studies of live projects.
2. Prepare a detailed report on any famous “Case study of Failure of any structure”

List of Laboratory/Learning Resources Required : NA