GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Minor/Hons. Program

Level: UG

Branch: Minor/Hons. Forensic Structural Engineering

Course / Subject Code: BE040AU011

Course / Subject Name : Forensic Science & Law

w. e. f. Academic Year:	2025-26
Semester:	4th
Category of the Course:	Core Courses

Prerequisite:	Basic Civil Engineering
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, appreciated 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 Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Understanding of the importance of the Laws in Forensic science.
02	UN Interpret the reasoning behind the principles and laws of forensic science
03	Develop a knowhow of the current status of forensic science in India

Teaching and Examination Scheme:

Teaching – Learning Scheme (in Hours per Semester)					Total Credits = TH/30	Assessment Pattern and Marks					Total Marks
						Theory		Tutorial / Practical			
L	T	P	PBL*	TH		ESE I	PA (M)	PA/ (I)	PBL/ (I)	ESE (V)	
30	0	0	30	60	02	70	0	0	30	0	100

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Nature, need and scope	4	10
2.	Principles and laws of forensic science	8	30
3.	Global development of Forensic Science	8	30
4.	Forensic Science in India	8	30
	Total	28	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
70	**30**	0	**0**	**0**	**0**

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

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)

(b) Open source software and website:

1. https://nptel.ac.in/courses

Suggested Course Practical List: NA

List of Laboratory/Learning Resources Required: NA

Suggested Project List:

List of Suggested Activities for Problem-Based Learning:

Sl. No.	Name of the activity	No. of hours	Evaluation Criteria
1.	Case studies – Litigation involved in failure of structures	Duration of study – 5 hrs Report preparation – 5 hrs Total = 10hrs.	Based on the report – Observations made regarding the cause of failure
2.	Technical articles related to the prima-facie action plan post failure	4 articles = 20 hrs. (5 hrs/each articles)	Summarize research paper and evaluation critical parameters
3.	Self-learning online course	Minimum duration of the course should be 10hrs. Total = 10hrs.	Examination based assessment at the end of course. Based on the certificate produced.
4.	Poster/chart/power point preparation on technical topics	Duration = 6 hrs.	Based on poster/chart Preparation and presentation skills
5.	Technical Video based learning related to the subject	Duration of video = 5hrs. Report preparation = 5hrs. Total = 10hrs.	Report /presentation based on the video learning outcomes.
6.	Technical papers related to the Legal concerns after a failure	4 articles = 20 hrs. (5 hrs/each articles)	Summarize research paper and evaluation critical parameters
7	Group Discussion on The engineering investigation process and steps involved in investigation	Duration = Min. 1 hr. per Failure. Max. 3 hrs.	Based on performance in group discussion, technical depth, knowledge etc.
8	Self-learning online course	Minimum duration of the course should be 10hrs. Total = 10hrs.	Examination based assessment at the end of course. Based on the certificate produced.
9.	Working/non-working model on technical topics	Working = 12 hrs. Non- working = 8 hrs.	Based on inter department/external evaluation

10	Industrial exposure for 2-3 days to observe and provide tentative solutions on society/environment/health/sustainability/any other issue	Duration = 15 hrs. for Industrial exposure Problem identification and tentative solution = 10 hrs. Total = 20 hrs.	Based on evaluation of critical problems and solutions
11	Videos on Industrial safety/Disaster Management aspects based on subject	Duration of video = 5hrs. Report preparation = 5hrs. Total = 10hrs.	Based on quiz/report submitted
12	Real world case studies-based learning	Duration of data collection/study = 5hrs. Report preparation = 5hrs. Total = 10hrs.	Based on in-depth study, technical depth, data collected, fact finding, etc.
13.	Application/Software	Duration = 10 hrs.	Depending on the complexity
14.	Identification and solution Of Complex problem	Maximum 2 problems. Study of the problem and solution finding, Total = 10hrs.	Based on the depth of the solution submitted.

Note:

- All the suggested activity should be related to the subject.
- The number of hours is suggestive. Faculty can sub-divide the number of hours based on the activity. However, total number of hours is fixed.
- Rubrics for the evaluation can be prepared by the faculty.
- Subject teacher can add the relevant activities other than those listed above, with the consent of head of the department and DQAC.
- All records pertaining to the evaluation and assessment of self-learning activities must be properly maintained and preserved at the institute level. These records should be made available to the university upon request.
- Institutes are encouraged to utilize digital platforms, such as Microsoft Teams, for effective record- keeping and to ensure transparency in the evaluation and assessment of self-learning activities.

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