

GUJARAT TECHNOLOGICAL UNIVERSITY

P.D.D.C. SEMESTER : VIII

CIVIL ENGINEERING

Subject Name: **REPAIRS AND REHABILITATION OF STRUCTURES**
(DEPARTMENT ELECTIVE – II)

Subject Code: **X80605**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
4	2	0	6	70	30	30	20

Sr. No.	Course Contents	Total Hrs
1.	REPAIR STRATEGIES : Causes of distress in concrete structures, Construction and design failures, Condition assessment and distress-diagnostic techniques, Assessment procedure for Inspection and evaluating a damaged structure,	
2.	SERVICEABILITY AND DURABILITY OF CONCRETE: Quality assurance for concrete construction concrete properties – strength, Permeability, thermal properties and cracking. – Effects due to climate, temperature, chemicals, corrosion – design and construction errors – Effects of cover thickness and cracking	
3.	MATERIALS AND TECHNIQUES FOR REPAIR: Special concretes and mortar, concrete chemicals, special elements for accelerated strength gain, Expansive cement, polymer concrete, sulphur infiltrated concrete, Ferro cement, Fibre reinforced concrete. Rust eliminators and polymers coating for rebars during repair, foamed concrete, mortar and dry pack, vacuum concrete, Guniting and Shotcrete, Epoxy injection, Mortar repair for cracks, shoring and underpinning. Methods of corrosion protection, corrosion inhibitors, corrosion resistant steels, coating and cathodic protection.	
4.	REPAIRS, REHABILITATION AND RETROFITTING OF STRUCTURES: Repairs to overcome low member strength, Deflection, Cracking, Chemical disruption, weathering corrosion, wear, fire, leakage and marine exposure, long term health monitoring techniques.	
5.	DEMOLITION TECHNIQUES: Engineered demolition techniques for Dilapidated structures – case studies	

TEXT BOOKS:

- Denison Campbell, Allen and Harold Roper, Concrete Structures, Materials, Maintenance and Repair, Longman Scientific and Technical UK, 1991.
- R.T.Allen and S.C.Edwards, Repair of Concrete structures, Blakie and Sons, UK, 1987

REFERENCES:

- Handbook on Repairs and Rehabilitation of structures, CPWD, Delhi
- M.S.Shetty, Concrete Technology – Theory and Practice, S.Chand and Company, New Delhi, 1992.
- Santhakumar, A.R., Training Course notes on Damage Assessment and repairs in Low Cost Housing, “RHDC – NBO” Anna University, July 1992.
- Raikaar, R., Learning from failures – Deficiencies in Design, Construction and Service – R & D centre (SDCPL), Raikaar Bhavan, Bombay, 1987.
- Lakshmipathy, M. et al. Lecture notes of Workshop on “Repairs and Rehabilitation of Structures”, 29 -30th October 1999.