



Course Title: **BUILDING MAINTENANCE & REPAIRS**

Credit Units:03

Course Level:UG

Course Code: CEE408

L	T	P/S	SW/F W	TOTAL CREDIT UNITS
3	-	-	-	3

Course Objectives: : The Objective of this course is to develop capability to carry out planning for the maintenance/repair/ rehabilitation schemes and provides exposure to implementation process of the same in existing buildings.

Pre-requisites: Basic understanding of components of buildings.

Course Contents/Syllabus:

	Weightage (%)
Module I Descriptors/Topics : General-Quality Assurance & Control for concrete construction; Concrete property Strength, Permeability, Thermal Properties and Cracking; Rapid visual screening, Data Collection & Preliminary Evaluation.	20
Module II Descriptors/Topics : Influence on Serviceability and Durability-Effects due to climate, Temperature, Chemicals, Wear and Erosion, Design and Construction errors, Corrosion Mechanism, Effects of Cover thickness and Cracking, Methods of Corrosion protection, Corrosion Inhibitors, Corrosion Resistant Steels, Coatings, Cathodic Protection.	20
Module III Descriptors/Topics : Maintenance and Repair Strategies-Definitions-Maintenance, repair and rehabilitation, Importance of Maintenance, Preventive Measures on Various Aspects, Condition Assessment of buildings; Causes of Deterioration, Testing Techniques Repair & retrofit of Non-engineered buildings; Retrofit of Masonry Buildings; Retrofit of Historical & Heritage structures; Retrofit of RCC Buildings; Retrofit of Foundations; Retrofit using Fibre Reinforced Polymer Composites.	20
Module IV Descriptors/Topics : Materials for Repair-Special Concretes and Mortar, Concrete chemicals, Special Elements for accelerated strength gain, Expansive cement, Polymer Concrete, Sulphur Infiltrated Concrete, Ferro Cement, Fiber Reinforced Concrete.	20
Module V Descriptors/Topics : Techniques for Repair-Rust Eliminators and polymers coating for rebars during repair, foamed concrete, mortar and dry pack, vacuum concrete, Guniting and shotcreting, Epoxy Injection, Mortar Repairs for cracks, shoring and underpinning; Base Isolation & Energy Dissipation technique.	20

Student Learning Outcomes: Students will be able to:

1. Apply the knowledge of maintenance/repair/ rehabilitation schemes on real time projects on rehabilitation.
2. Function on multi-disciplinary teams
3. Identify, formulate, and solve engineering problems related to maintenance/repair/ rehabilitation of existing buildings
4. Use the techniques, skill, and modern engineering tools necessary for maintenance/repair/ rehabilitation of existing buildings.

Pedagogy for Course Delivery:

1. Class room teaching supported with presentation for enabling better understanding of the subject.
2. Application oriented assignments.
3. Class room lectures will be supplemented with field related examples.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	TOTAL
100	0	100

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	A	CT	S/V/Q	HA	EE
Weightage (%)	5	10	8	7	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

Text & References:

Books:

1. “Concrete Structures – Materials, Maintenance and Repair”, Dennison Campbell, Allen and Harold Roper, Longman Scientific and Technical UK, 1991.
2. “Repair of Concrete Structures”, R.T. Allen and S.C. Edwards, Blakie and Sons, UK, 1987.

References:

1. “Concrete Technology -Theory and Practice” M.S. Shetty, S. Chand, New Delhi, 1992.
2. “Learning from Failures – Deficiencies in Design”, R.N. Raikar, Construction and Service R & D Centre (SDCPL), Raikar Bhavan, Mumbai, 1987. Energy Assessment of Buildings.