

- Implement the techniques for repairing of concrete structures.
- Dismantle and demolish structures which cannot be repaired in an environment friendly, with maximum saving of materials and in a safe way.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	150
3	0	2	5	70	30	20	30	

Legends: L- Lecture; T- Tutorial/Teacher Guided Student Activity; P - Practical; C –Credit; ESE-End Semester Examination; PA-Progressive Assessment

5. COURSE CONTENT DETAILS

Unit	Major Learning Outcomes (in Cognitive Domain)	Topics and Sub-topics
Unit-I Maintenance of Buildings	1.1 Explain the requirement of Maintenance in building. 1.2 Explain various types of maintenance in building. 1.3 Assess the quality aspects of existing building.	1.1 Introduction 1.2 Importance of maintenance 1.3 Types of maintenance - daily, weekly, monthly, Annually 1.4 General Maintenance - Painting of Buildings - Home Electricity System
Unit-II Repair Strategies	2.1 Explain distress diagnostic techniques 2.2 Carry out inspection and evaluation of damaged structure.	2.1 Causes of distress in structures 2.2 Construction and design failures 2.3 Condition assessment and distress-diagnostic techniques 2.4 Inspection and evaluating damaged structure.
Unit-III Durability and Serviceability of Concrete	3.1 Explain concrete properties required for construction work. 3.2 Explain weather effect on structure.	3.1 Quality assurance for concrete construction based on concrete properties like (a) strength (b) Permeability (c) Thermal properties (d) cracking 3.2 Effects due to (a) climate (b) temperature (c) chemicals (d) corrosion 3.3 Design and construction errors 3.4 Effects of cover and cracks

UNIT-IV Materials and Techniques For Repair	4.1 Identify materials for repair in building. 4.2 Explain techniques for Repairs.	4.1 Materials for Repair - Special concretes and mortar - concrete chemicals - construction chemicals - Expansive cement - polymer concrete - sulphur infiltrated concrete - Ferro cement - Fibre reinforced concrete - Rust eliminators and polymers coating for rebars - foamed concrete - dry pack - vacuum concrete - asphalt sheeting 4.2 Techniques for Repairs -Guniting, grouting and Shotcrete - Epoxy injection
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Unit	Major Learning Outcomes (in Cognitive Domain)	Topics and Sub-topics
		- Jacketing - shoring and underpinning - Methods of corrosion protection (a) corrosion inhibitors (b) corrosion resistant steels (c) coating and cathodic protection
UNIT-V Repair, Retrofitting and Rehabilitation	5.1 Explain the Repair work of various component in existing masonry building 5.2 Explain the Repair work of various component in existing concrete structure 5.3 Discuss principles of Retrofitting and Rehabilitation.	5.1 Repair of - stone, brick and block masonry (Cracks, dampness, efflorescence, joint separation, etc.) - Flooring - Roofs (sloping, flat, pitched, etc.) - Concrete members due to (i) Steel Corrosion (ii) Lack of Bond (iii) shear, tension, torsion, compression failure - Rainwater Leakage in Buildings - Leakage in Basement, toilet area 5.4 Control on Termites (White Ants) in Buildings 5.5 Fungus Decay of wood works

		in Buildings 5.6 Estimation of Repair and retrofitting.
UNIT-VI Demolition and Dismantling Techniques	6.1 Explain demolition techniques for structures. 6.2 Enlist safety measures to be followed during demolition. 6.3 Explain care to be taken in dismantling of buildings so that maximum resale value material is generated.	6.1 Define: Demolition 6.2 Demolition techniques (a) Non Engineering Demolition - Manual Demolition (b) Engineering Demolition - Mechanical Method (i) Wrecking Ball Method (ii) Pusher Arm technique (iii) Thermic Lance Technique (iv) Non – Explosive Demolition (v) Concrete Sawing Method (vi) Deliberate Collapse Method (vii) Pressure Jetting - Implosion - Deconstruction Method 6.4 Safety measures during demolition operation 6.5 Dismantling of buildings and reuse of materials/fittings from environmental and financial point of view.

6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS(Theory)

Unit	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Maintenance of Buildings	05	3	2	2	7
II	Repair Strategies	04	2	3	2	7