SCHEME OF COURSE WORK

Course Details:

Course Title	**:** REPAIRS AND REHABILITATION OF STRUCTURES		
Course Code	**:** 19CE2155	**L P C**	**: 3 0 3**
Program:	**: M. Tech.**		
Specialization:	**: Structural Engineering**		
Semester	**: I**		
Prerequisites	**: concrete technology**		
Courses to which it is a prerequisite	**: None**		

Course Outcomes (COs):
At the end of the course, the student will be able to:

1	Discuss the maintenance and repair strategies for evaluating a damaged structure
2	Summarize the concepts of serviceability and durability of concrete
3	Discuss the materials used for Repairs using special concretes
4	Describe the application and techniques for repairs and protection methods
5	Develop the concepts to overcome lesser strength, deflection, cracking and chemical disruption

Program Outcomes (POs):
Post graduates will be able to:

1	Synthesize existing and new knowledge in various sub areas of structural engineering
2	Analyse complex engineering problems critically with adequate theoretical background for practical applications.
3	Evaluate a wide range of feasible and optimal solutions after considering safety and environmental factors.
4	Demonstate the ability to pursue research by conducting experiments and extract the relevant information through literature surveys.
5	Use state –of- the- art of modern tools for interpeting the behaviour and modeling of complex engineering structures.
6	Attain the capability to work in multi disciplinary teams to achieve common goals.
7	Demonstrate the knowledge to perform the projects efficiently in multi disciplinary environments after consideration of economical and financial matters.
8	Communicate effectively on complex engineering activities to prepare reports and make presentations.
9	Engage in life-long learning independently to improve knowledge.
10	Understand the responsibility of carrying out professional practices ethically for sustainable development of society.
11	Examine critically and independently one's actions and take corrective measures by learning from mistakes.

Course Outcome versus Program Outcomes:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	S	S	M	M								M
CO-2	S	S	M		M							M
CO-3	S	S	M	M							M	
CO-4	S	S		M								
CO-5	S	S	S	M	S							M

S - Strongly correlated, M - Moderately correlated, *Blank - No correlation*

Assessment Methods:	Assignment / Seminar / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week No.	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Maintenance, Repair and Rehabilitation, Facets of Maintenance	CO-1	What is difference between repair and rehabilitation.	▫ Lecture/ Discussion	
2	Importance of Maintenance, Various aspects of Inspection,.	CO-1	Discuss various types of inspections	▫ Lecture ▫ Lecture	
3	Assessment procedure for evaluating a damaged structure, causes of deterioration	CO-1	Assess the evaluating procedure for damaged structure	▫ Lecture ▫	
4	Quality assurance for concrete – Strength, Durability and Thermal properties, of concrete.	CO-2	. Discuss various types of quality assurance techniques	▫ Lecture ▫ Lecture	Assignment
5	. Cracks, different types, causes – Effects due to climate, temperature, Sustained elevated temperature,	CO-2	What are different types of cracks.	▫ Lecture ▫ Lecture	
6	Corrosion – Effects of cover thickness and cracking.	CO-2	Explain the corrosion process	▫ Lecture	Seminar
7	Special concretes and mortar, concrete chemicals, special elements for accelerated strength gain,	CO-3	Discuss various types of special concretes.	▫ Lecture ▫ Lecture	Assignment
8	Expansive cement, polymer concrete, sulphur infiltrated concrete	CO-3	Explain polymer concrete.	Lecture ▫ Lecture	
9	**MID TEST – I**				
10	Ferro cement, Fibre reinforced concrete	CO-3	Explain Fibre reinforced concrete..	▫ Lecture	
11	Rust eliminators and polymers coating for rebars during repair, foamed concrete, mortar and dry pack	CO-4	What are rust eliminators	▫ Lecture	Assignment
12	, vacuum concrete, Gunite and Shotcrete, Expoxy injection, Mortar repair for cracks, shoring and underpinning	CO-4	What is the difference between shorcrete and gunite	▫ Lecture	
13	Methods of corrosion protection, corrosion inhibitors, corrosion resistant steels,	CO-4	What are corrosion prevention methods.	▫ Lecture	
14	coatings and cathodic protection. Engineered demolition techniques for dilapidated structures – case studies	CO-4	What is cathodic protection	▫ Lecture	

15	Repairs to overcome low member strength.	CO-5	Discuss repairs with regard to strength	▫ Lecture	
16	Deflection, Cracking, Chemical disruption, weathering corrosion	CO-5	Discuss repairs with regard to deflection	▫ Lecture ▫	Assignment
17	wear, fire, leakage and marine exposure.	CO-5	Discuss repairs with regard to fire	▫ Lecture	
18	**MID TEST – II**			▫	