चौधरी रणबीर सिंह राजकीय अभियांत्रिकी एवं तकनीकी संस्थान, झज्जर
Ch. Ranbir Singh State Institute of Engineering and Technology
Silani Kesho, Jhajjar, Haryana 124103

Department of Civil Engineering

III Yr. VI Semester (Civil Engineering)

LESSON PLAN

Program	:	**B.Tech**
Year & Sem.	:	**III & VI**
Course No/code	:	**PEC-CEEL-312 G**
Course Title	:	**REPAIR & REHABILITATION OF STRUCTURE**
Max Marks	:	**75**
No. of Total Lecture	:	**44 Lecture/ 11week Plan**
Schedule	:	**04 Lecture per week** (As per Guidelines of Head of Deptt.)
Name of Faculty	:	**Dr.Sandeep Malik**

Recommended Books:

- Concrete microstructure, Properties and materials – P Kumar Mehta and Paulo J.M.Monterio.
- Handbook on Repairs and Rehabilitation of RCC buildings – CPWD, Government of India.
- Concrete Technology by M.L.Gambhir, Tata McGraw-Hill Education, Third Edition
- V. M. Malhotra, Nicholas J. Carino 2004 "Handbook on Nondestructive Testing of Concrete"
- "Repair and Strengthening of Concrete structures" , FIP guide, Thomas Telford, London.
- Concrete Structures, Protection, Repair and Rehabilitation by R.Dodge Woodson.
- Repairs and rehabilitation of concrete structures by P. I. Modi & C. N. Patel, PHI Publication

Lesson Plan:

LESSON PLAN (As per Guidelines of Head of Deptt.)	
Deptt.: Civil Engg.	**Name of Faculty: Dr. Sandeep Malik**
Semester : 6th	**Subject: REPAIR & REHABILITATION OF STRUCTURE (PEC-CEEL-312 G)**

Total Duration:11week		**Workload of subject: 04 Lecture per week** (As per Guidelines of Head of Deptt.)
Week	**Lecture Day**	**Name of Topic**
1st	1st	Introduction to Subject
	2d	Overview of Distress, Deterioration in Concrete Structures
	3rd	Global Scenario of Distressed Structures
	4th	Need for Repairs and Upgrading of Structures, Process for Durable Concrete Repair
2nd	5th	Revision
	6th	Problems of Module- I
	7th	**Deterioration of concrete structures** Types of Deterioration - causes & symptoms
	8th	mechanism & micro-structure of concrete, Physical and Chemical Deterioration and its factors
3rd	9th	Deterioration due to Water Leakage, Fire – detection & mitigation
	10th	Deterioration due to Ageing and Inadequate Maintenance, Design & Construction Deficiencies like Overloading
	11th	Revision
	12th	Problems of Module- II/ UNIT-I/Section-A
4th	13th	**Visual deterioration of structures** Types of Cracks, Causes & Characteristic of Cracking in Various Structural Components
	14th	Measurement of Cracks
	15th	Interpretation of the Cracking Phenomena
	16th	**Conditional/damage assessment & Evaluation of structures** Structural Assessment- importance, objective, various stages
5th	17th	Conditional evaluation of the structure, Damage Assessment Procedure
	18th	Preliminary & Detailed Investigation – scope, objectives, methodology & rapid visual inspection of structures
	19th	Damage Assessment Allied Tests (Destructive, Semi-Destructive and Non-Destructive)
	20th	Field & Laboratory Testing Procedures- strength, corrosion activity, performance & Integrity, Durability
6th	21st	Problems of Module- III& IV/UNIT-II/Section-B
	22nd	**Repairs of concrete structures** Repairing Materials- criteria, selection of repair materials, methodology
	23rd	performance requirements, preparatory stage of repairs
	24th	different types of repair materials & their application and repair techniques
7th	25th	Problems of Module- V/ UNIT-III/Section-C
	26th	**Retrofitting/Strengthening** Need for Retrofitting, Design Philosophy of Strengthening Structures
	27th	Conventional and Advanced Techniques Available for Strengthening
	28th	Seismic Retrofit of Concrete Structures-deficiencies in structure requiring seismic retrofit and its design philosophy
8th	29th	Latest Techniques to Enhance the Seismic Resistance of Structures
	30th	Problems of Module- VI/UNIT-III/Section-C

	31st	**Protection & maintenance of structures:** Importance of Protection & Maintenance
	32nd	Categories of Maintenance, Building Maintenance
9th	33rd	Corrosion Mitigation Techniques
	34th	Problems of Module- VII
	35th	Revision
	36th	Problems of Module- VII/UNIT-IV/Section-D
10th	37th	**Structural health monitoring (SHM)** Definition and Motivation for SHM
	38th	Basic Components of SHM and its Working Mechanism
	39th	Revision
	40th	Class Test
11th	41st	SHM as a Tool for Proactive Maintenance of Structures
	42nd	Revision and Doubts
	43rd	Revision and Doubts
	44th	Problems of Module- VIII/UNIT-IV/Section-D

Dr. Sandeep Malik
Assistant Professor (Guest Faculty)
Civil Engg. Deptt.
CRS-SIET, Jhajjar

Approved By:

HOD
Civil Engg. Deptt.
CRS-SIET, Jhajjar