



Jordan University of Science and Technology
Faculty of Engineering
Civil Engineering Department

CE783 Special Topics In Structural Engineering

Second Semester 2022-2023

Course Catalog

3 Credit Hours. Types of structural and non-structural defaults in concrete buildings, destructive and non-destructive testing of concrete elements, rating of concrete structures, determine the need for repair, propose proper repair configuration, bond mechanics of FRP to concrete, design for repair with FRP composites, rehabilitation work contracts, case studies.

Teaching Method: Blended

Text Book

Title	Concrete Structures: Protection, repair and Rehabilitation
Author(s)	R. Dodge
Edition	1st Edition
Short Name	1
Other Information	Butterworth-Heinemann, 2009

Course References

Short name	Book name	Author(s)	Edition	Other Information
2	Handbook on repair and rehabilitation of RCC buildings	K. Kumar	1st Edition	Central public works Department, India, 2002
3	DESIGN OF CONCRETE STRUCTURES	Arthur H. Nilson & David Darwin	13th Edition	

Instructor

Name	Prof. Rami Haddad
Office Location	C2L2

Office Hours	Sun : 08:30 - 11:30 Mon : 10:30 - 11:30 Tue : 08:30 - 11:30 Wed : 09:30 - 10:30
Email	rhaddad@just.edu.jo

Class Schedule & Room
Section 3: Lecture Time: Wed : 11:30 - 13:00 Room: DRNHALL

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2, 3	Cause of deterioration and durability aspects (steel corrosion, ASR, Sulfate attack).	From 1
Weeks 4, 5	Condition survey, structural rating, and destructive and non-destructive evaluation; analysis of tests	From 2
Week 6	Structural analysis and design; selection of repair material	From 1 , From 2 , From 3
Weeks 7, 8, 9	Rehabilitation and retrofitting materials and methods; Fiber reinforced polymers; their manufacturing, forms; properties, and installation, and their bond mechanics to concrete.	From 1
Weeks 10, 11	Design of structural repair using FRP composites.	From 2
Week 12	Rehabilitation work contracts	From 2
Weeks 13, 14	Case studies-instructor	
Weeks 15, 16	Terms project presentation and discussion	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
To be able to recognize types of structural and non-structural defaults in concrete buildings	15%	
To be able to use destructive and non-destructive testing and analyze results taken from concrete elements	20%	
To be able to categorize the status of concrete structures, and determine the need of their repair	15%	
To be able to select proper repair material and configuration	20%	
To be able to estimate bond mechanics of FRP to concrete	10%	

To be able to design repair of concrete elements using FRP composites	20%	
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Relationship to Program Student Outcomes (Out of 100%)						
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7

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