

FUE - Future University in Egypt

Faculty of Engineering and Technology Department of Architectural Engineering

Course Specifications

SCM 317: Reinforced Concrete for architects

Programme (s) on which the course is given:	B.Sc. in Architectural Engineering
Major or minor element of programmes:	(Not Applicable)
Department offering the programme:	Architectural Engineering
Department offering the course:	Structural Engineering & Construction Management
Academic year/Level:	Level three – 6 th semester
Date of specification approval:	November 2017

A- Basic Information

Title: Reinforced Concrete for arch	Code: SCM 317
Credit Hours: 2 Cr. Hrs.	
Lectures: 2 Hrs.	
Tutorial: <u>2 Hrs.</u>	
Total: 4 Hrs.	
Prerequisite: SCM-214 – Theory of structures	

B- Professional Information

1- Catalog Course Description:

Design principles of reinforced concrete structures and behavior, Design loads, Design of members subjected to axial forces, flexure and shear. Design of columns and beams, Structural systems for flat slabs, hollow blocks, ribbed slabs and paneled beams, frames, Details of reinforcement.

2- Overall aims of the course:

Upon successful completion of the course, the student should be able to:

- Know the theory of transferring loads in skeleton buildings.
- Know the main types of concrete structure system elements.
- Know how to approximately dimension the structural concrete members.
- Know how to design several structural elements.
- Fulfill the typical connections and details of steel reinforcement.

3- Intended learning outcomes of course (ILOs):

3.1. Program ILOs related to course:

- A01** Demonstrate knowledge and understanding of concepts and theories of basic and engineering sciences appropriate to architectural engineering.
- A06** Demonstrate knowledge and understanding of different building construction systems and execution design methods and techniques
- A12** Demonstrate knowledge and understanding of Characteristics of engineering materials related to the discipline.
- B02** Compare, analyze and criticize different engineering problems and case studies, evaluate design alternatives and conclude results based on analytical thinking
- B08** Analyze results of numerical models and assess their limitations.
- B11** Integrate relationship of structure, building materials, and construction elements into design process.
- C10** Apply safe systems at work and observe the appropriate steps to manage risks.
- C11** Apply quality assurance procedures and follow codes and standards.
- C12** Exchange knowledge and skills with engineering community and industry.
- C13** Use appropriate construction techniques and materials to specify and implement different designs;
- D07** Work coherently as a part of a multidisciplinary team
- D08** Search for information and adopt life-long self-learning

3.2. Course Detailed ILOs:

a- Knowledge and understanding:

By the end of this course the student should be able to:

- a1. Recognize the scientific background (theories and history) of design of reinforced concrete as structural material.
- a2. Define concrete characteristics and how they affect the different types of concrete structures.
- a3. List main elements of each type of concrete structures.
- a4. Choose the main connections and suitable arrangement of rebars

b- Intellectual skills:

By the end of this course the student should be able to:

- b1. Analyze design problems.
- b2. Develop the design of two dimensional structural elements.
- b3. Create structural design of concrete elements and steel reinforcement.
- b4. Decide the best structural system and the optimum section size.

c- Professional and practical skills:

By the end of this course the student should be able to:

- c1. Draw professional neat structural engineering drawings.

d- General and transferable skills:

By the end of this course the student should be able to:

- d1. Work coherently and successfully as a part of a team in projects, assignments.
- d2. Use the internet in searching for information about specific building types.

4- Course ILOs versus Program ILOs relation

See Appendix, table [1]

5- Course Contents:

#	Topics	Lec.	Tut.	Total
1	Concrete and steel reinforcement properties	4	4	8
2	Behavior of concrete (Cracking, ultimate and ultimate limit).	2	2	4
3	Assessment of loads and Load distribution	4	4	8
4	Design of beams	6	6	12
5	Design of columns (short and long columns)	4	4	8
6	Shear design of beams	2	4	6
7	Serviceability limit state	4	2	6
7	Systems of slabs and halls including concrete dimensioning	4	4	8
Total		30	30	60

For the relation between the course contents and "Intended Learning Outcomes" (ILOs) see Appendix, table [2]

6- learning/teaching methods:

See Appendix, table [3]

7- ILOs Teaching & Assessment Method

See Appendix, table [4]

8- Weighting of assessments

- Final exam:..... 40%
- Year's work:..... 50%
 - In Class Quizzes and Assignments..... 40%
 - Project 10%
- Performance & Participation..... 10%

9- List of references:

1. The Egyptian Code of Practice of Loads assessment (EC-201).
2. The Egyptian Code of Practice of Design and Constructions of Concrete Structures (EC-203).
3. "Design of reinforced concrete structures" Volume 1 Mashour Ghoneim- El-Mehilmy –Cairo University

10- Facilities required for teaching and learning:

- White board
- Computer with Data show for presentations
- Internet Connection

Course coordinator:

Head of Department: Prof. Dr. Samir Sadek Hosny

Date: November 2017

Course Instructor:

Appendix (1)

Table [1]: Course ILOs/ Program ILOs Matrix

		Program ILOs								
		A01	A06	A12	B02	B08	B11	C12	D07	D08
Course ILOs	a1.	●								
	a2.			●						
	a3.		●							
	a4.		●							
	b1.				●					
	b2.					●				
	b3.						●			
	b4.						●			
	c1.							●		
	d1.								●	
	d2.									●

Table [2]: Course Content/ILO Matrix

Topic	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Reinforced Concrete properties and Behavior	●	●	●								●
Assessment of loads and Load distribution	●	●			●						●
Design of beams		●	●	●	●	●	●	●	●	●	
Design of columns (short and long columns)		●	●	●	●	●	●	●	●	●	
Shear Design		●		●	●	●	●	●	●	●	
Reinforcement and detailing	●			●			●		●	●	
Serviceability limit state		●			●	●	●	●	●	●	
Systems and concrete dimensioning of Slabs' types		●	●	●	●	●	●	●	●	●	

Table [3]: Learning Method/ILO Matrix

Learning Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Lecture	●	●	●	●	●	●	●	●	●		
Project			●	●	●	●	●	●	●	●	●
Class Work	●	●	●	●	●	●	●	●	●		

Table [4]: Assessment Method/ILO Matrix

Assessment Method	a1	a2	a3	a4	b1	b2	b3	b4	c1	d1	d2
Assignments	●	●	●	●	●	●	●	●	●		
Project			●	●	●	●	●	●	●	●	●
Midterm & Final Exam	●	●	●	●	●	●	●	●	●		