University: Benha University
Faculty: Faculty of Engineering at Shobra
Department: Civil Engineering Department
Department offering the program: Civil Engineering Department
Department offering the course: Civil Engineering Department

1- Course Data

Course Code: CVS 313 **Course Title:** Reinforced Concrete 2-A
Semester/Year: First / 2021-2022 **Specialization:** Civil Engineering (Third Structures)
Credit Hours: 6 **Lecture:** 3 **Tutorial:** 3 **Lab:** 0

2- Course Objectives

For students undertaking this course, they will be able to:

1) Introduce practical reinforced concrete slabs design.
2) Understand the analysis, design and detailing of different statically systems of floor slabs including solid slabs, hollow block slabs and flat slabs. In addition, the design and detailing of the reinforced concrete stairs system should be fully understood.
3) Choosing suitable slab systems for different structures taking in consideration the economic aspect for each slab system.

3- Course Competencies (NARS-2018)

On completing this course, students will be able to:

- Program Competencies Served by the Course (A4, B2, C1)

Level (A) Engineering Competencies

A.4) Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.

Level (B) Engineering Competencies:

B.2) Achieve an optimum design of Reinforced Concrete and Steel Structures, Foundations and Earth Retaining Structures; and at least three of the following civil engineering topics: Transportation and Traffic, Roadways and Airports, Railways, Sanitary Works, Irrigation, Water Resources and Harbors; or any other emerging field relevant to the discipline.

Level (C) Engineering Competencies

C.1) Analyze, design, and develop calculation sheets and professional drawings of reinforced concrete and pre-stressed concrete structural systems including foundations; taking into account soil-structure interaction using computer packages and/or empirical methods which satisfy Egyptian Codes of Practice.

4- Learning Outcomes (LO's)

On completing this course, students will be able to:

Cognitive Domain	
LO1	Practice research techniques and methods of investigation as an inherent part of learning by producing research project.
LO2	Acquire and apply new knowledge; and practice self, lifelong by prepare research in the field of concrete structural systems.
Psychomotor Domain	
LO3	Achieve an optimum design of using slabs structure system to resist the applied loads.
LO4	Prepare Excel sheet for designing different reinforced concrete slabs and stairs.
Affective Domain	
LO5	Preform detailed drawings.
LO6	Investigate different reinforced concrete systems for residenetial and commerial buildings.

5- Mapping Learning Outcomes (LO's) with Competencies

LO's / NARS	A1	B2	C1
Cognitive Domain			
LO1	√		
LO2		√	
Psychomotor Domain			
LO3	√		√
LO4		√	
Psychomotor Domain			
LO5	√	√	√
LO6	√		√

6- Course Contents

a) Course Description (As indicated in program Bylaw)

Design of one-way and two-way slabs supported with beams - Design of hollow blocks slabs - Design of paneled beam slabs - Design of flat slabs - Calculation of the impact of concentrated loads on slabs - Design of stairs - Design according to the Egyptian code for concrete and the Egyptian code for loads.

b) Topics to be Covered weekly & Matrix of Competencies

Topics	week	Course Competencies, LOs					
		1	2	3	4	5	6
Analysis and design of one-way solid slab system	1	√		√			
Analysis and design of one-way solid slab system	2	√	√	√	√	√	
Analysis and design of two-way solid slab system	3	√		√			
Analysis and design of two-way solid slab system	4	√	√	√	√	√	
Analysis and design of two-way solid slab system	5	√	√	√	√	√	√
Analysis and design of hollow block slab system	6	√		√			
Analysis and design of hollow block slab system	7	√	√	√	√	√	
Analysis and design of hollow block slab system	8	√	√	√	√	√	√
Analysis and design of flat slab system (empirical method)	9	√		√			
Analysis and design of flat slab system (empirical method)	10	√	√	√	√	√	√
Analysis and design of RC stairs	11	√	√	√	√	√	√

7- a) Teaching and Learning Methods

Course Competencies		Teaching and Learning Methods							
		Face-to-face Lecture	Online Education	Tutorial / Exercise	Group Discussions	Laboratory	Mini Project	Research and Reporting	Brain Storming
Level A	LO1	√		√	√		√	√	
	LO2	√			√		√	√	√
Level B	LO3		√	√			√		
	LO4								
Level C	LO5	√	√		√		√	√	
	LO6								

7- b) Teaching and Learning Methods of Disables

None

8- Student Academic Counseling and Support

- Students are directed to contact teaching staff for academic support during specific office hours.
- Regarding this course, I will be available for students for two hours a week as indicated on my time table declared for students from the beginning of the semester.

9- Student Assessment

a- Student Assessment Methods

Course Competencies		Assessment Methods					
		Assignments	Online Exams	Mid-Term Exam	Final Exam	Design Project	Take-Home Exam
Level A	LO1	√		√	√	√	
	LO2	√		√	√	√	
Level B	LO3	√		√	√	√	
	LO4	√				√	
Level C	LO5			√	√	√	
	LO6				√	√	

b- Assessment Schedule and Weight

Assessment	Week	Weight
Midterm Examination	8	20 %
Final Examination	(As Schedule)	60 %
Semester work	---	20%
Total		**100** %

10- Facilities

The following facilities are needed for this course:

□ Classroom □ Smart Board □ Computer with software

■ Lecture Hall	■ White Board	□ MIS system
■ Sound and Microphone	■ Data Show	□ Internet Access
□ Other: ……		

11- List of References

a- Course Notes

1- course notes & solved examples

b- Books

1- Egyptian Code of Practice for analysis and design of R.C structures ECP-203 - print 2007

c- Recommended Books

1- M. Ghoneim & M. El-Mihilmy"Design of Reinforced Concrete Structures", Volume 2, Second Edition 2008, ISBN: 20154-2004
2- Jack C. McCormac & Russell H. Brown "Design_of Reinforced Concrete", 9 th edition 2014, ISBN 978-1-118-12984-5

d- Web Sites

http://www.hbrc.edu.eg/

https://www.concrete.org/publications/mcponline.aspx

10- Matrix of Course Objectives and Competencies

Course aim	LO1	LO2	LO3	LO4	LO5	LO6
1-Introduce practical reinforced concrete slabs design.	√	√	√	√	√	√
2- Understand the analysis, design and detailing of different statically systems of floor slabs including solid slabs, hollow block slabs and flat slabs. In addition, the design and detailing of stair systems should be fully understood.	√	√	√	√	√	√
3- Choosing suitable slab systems for different structures taking in consideration the economic aspect for each slab system.	√	√	√	√	√	√

- Course Coordinator: Prof. Gamal Taher **Signature:**

- Head of Department: Prof. Anwar Badway **Signature:**