Course Specification
(Bachelor)

Course Title:	Reinforced Concrete Design (2)
Course Code:	CE 4106
Program:	Civil Engineering
Department:	Civil Engineering Department
College:	College of Engineering & Architecture
Institution:	Umm Al-Qura University
Version:	1
Last Revision Date:	31 January 2025

Table of Contents

A. General information about the course: 3

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods 4

C. Course Content 4

D. Students Assessment Activities 5

E. Learning Resources and Facilities 5

F. Assessment of Course Quality 5

G. Specification Approval 6

A. General information about the course:

1. Course Identification

1. Credit hours: (3)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (Level 10 / 4th Year)					
4. Course General Description:					
The course presents the principals of different design methods for various types of reinforced concrete slabs and footings such as solid slabs, ribbed slabs, flat slab, wall and isolated footings, and combined footings.					
5. Pre-requirements for this course (if any)**:**					
Reinforced Concrete Design (1)					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
The course aims to illustrate the principals and design rules according to the ACI design building code for design of structural reinforced concrete slabs and footings subjected to bending and shear stresses, and illustrate the reinforcement detailing in concrete structures for real-world application.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	To demonstrate the fundamental knowledge and understanding of analysis and design of one-way and two-way solid slabs.	K1	Lectures, class work and in class discussions	Class tests and quizzes
1.2	To outline the different methods of design and analysis of flat slab, and footings according to the Saudi Building Code SBC and the American code ACI.	K2	Lectures, class work and in class discussions	Class tests and quizzes
1.3	To demonstrate and imagine the details of R.C structures.	K1	Lectures, class work and in class discussions	Class tests and quizzes
2.0	Skills			
2.1	To solve different reinforced concrete problems under different loads and by using different design method.	S1	Lectures, class work and in class discussions	Homework and evaluation of individual and group tasks
2.2	To design different reinforced concrete slabs and footings using	S3	Lectures, class work and in	Homework and evaluation of individual and

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	realistic constraints.		class discussions	group tasks
2.3	To analyze, assess, and compare the design alternatives of reinforced concrete elements in order to provide best cost-effective alternative solutions.	S4	Lectures, class work and in class discussions	Homework and evaluation of individual and group tasks
3.0	**Values, autonomy, and responsibility**			
3.1	To demonstrate ability of life-long learning and applying of official codes, specification and practices in different reinforced concrete problems.	V3	English communications, ethics practice, and respecting deadlines.	Written exams and homework
3.2	To use skills required for the real-life concrete projects serving society.	V3	Applying reinforced concrete standards, codes and specifications	Written exams and homework

C. Course Content

No	List of Topics	Contact Hours
1.	Design of continuous beams	3
2.	Design of solid slabs supported on rigid beams: one-way.	3
3.	Design of solid slabs supported on rigid beams: two-way slabs.	3
4.	Design of ribbed slabs: one-way slabs (1)	3
5.	Design of ribbed slabs: one-way slabs (2)	3
6.	Design of ribbed slabs: two-way slabs.	3
7.	Design concept of flat slab. Direct design method of flat slab.	3
8.	Design for punching shear (1)	3
9.	Design for punching shear (2)	3
10.	Details of reinforcement of flat slab (1)	3
11.	Details of reinforcement of flat slab (2)	3
12.	Design of wall footings	3

13.	Design of isolated footings	3
14.	Design of combined footings (1)	3
15.	Design of combined footings (2)	3
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Class tests and quizzes	3, 5, 7, 11,13	20%
2.	Mid-Term Exam	8	30%
3.	Final Exam	16	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	• Macgregor, J.G., "Reinforced Concrete Mechanics and Design", Prentice Hall, 2nd Edition, 1992.
Supportive References	• Building Code Requirement for Structural Concrete (ACI 318), 2019. • Charles, G.S. and Chu-Kia W., "Reinforced Concrete Design", Harper and Row, Pub. New York, 5th Edition, 1994. • El-Dakhakhni, W.M., "Modern Design of Reinforced Concrete", Parts I and 2, The Anglo Egyptian Bookshop. Egypt, 1990. • ACI CODE-318-19(22): Building Code Requirements for Structural Concrete and Commentary (Reapproved 2022)
Electronic Materials	http://www.sciencedirect.com http://ocw.mit.edu/
Other Learning Materials	ACI Journal. ASCE Journal.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	- Whiteboards - Chairs - Curtains
Technology equipment (projector, smart board, software)	- Controls for the data show

Items	Resources
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	• Student's questioners at the end of the semester. • Analysis of student's feedback.
Effectiveness of Students assessment	Civil engineering Course coordinator	The faculty member would submit a course folder containing detailed information about the course, student's achievements and feedback.
Quality of learning resources	The specialized committee in each civil engineering division.	• C.E program Assessment Committee analyzes the data collected through various sources, e.g., student feedback surveys, assignments grades, etc. • Periodical workshop may be conducted to improve quality.
The extent to which CLOs have been achieved	Done by the Assessment Committee during the Faculty Council meeting.	The results are discussed with the faculty (by The Assessment Committee) during the Faculty Council meeting. The recommendations are documented. An action plan would be made for improvement after the approval of the Department Faculty Council and to be sent to The College Council for approval and implementation.
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	CIVIL ENGINEERING COUNCIL
REFERENCE NO.	THE FIFTEENTH SESSION OF THE ACADEMIC YEAR 1446
DATE	30 APRIL 2025

