Course Specification
(Bachelor)

Course Title:	Reinforced Concrete Shells and Plates
Course Code:	CE4430
Program:	Bachelor of Science in Civil Engineering
Department:	Civil Engineering Department
College:	College of Engineering and Architecture
Institution:	Umm Al-Qura University
Version:	1
Last Revision Date:	31 January 2025

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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: (3rd Year)					
4. Course General Description:					
To present the concept of theory of plates – bending and shear deformation of plates – types of shells – theory and analysis of shells.					
5. Pre-requirements for this course (if any)**:**					
Dpartment Approval					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
The objective of this course is to present a complete and up-to-date design of classical as well as shear deformation of plates and shell theories and their solutions by analytical and numerical methods.					

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 Define the concept and different types of plates and shells.	**K1**	Lectures, class work and in class discussions	Class tests and quizzes
1.2	To describe the load, state the analysis, and design of different types of shells and plates.	**K2**	Lectures, class work and in class discussions	Class tests and quizzes
2.0	**Skills**			
2.1	To summarize the different types of RC shells and plates.	**S1**	Lectures, class work and in class discussions	Homework and evaluation of individual and group tasks
2.2	To analyze and design of different types of RC shells and plates.	**S1**	Lectures, class work and in class discussions	Homework and evaluation of individual and group tasks
2.3	To apply optimum methods in construction of RC shells and plates	**S3**	Lectures, class work and in class discussions	Homework and evaluation of individual and group tasks
3.0	**Values, autonomy, and responsibility**			

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.1	To demonstrate ability of life-long learning and applying of official codes, specification and practices in different concrete RC shells and plates.	**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.	Introduction in RC shells and plates	**3**
2.	Classical Theory of Plates (1)	**3**
3.	Classical Theory of Plates (2)	**3**
4.	Analysis of Plate Strips	**3**
5.	Analysis of Circular Plates **(1)**	**3**
6.	Analysis of Circular Plates (2)	**3**
7.	Bending of Simply Supported Rectangular Plates	**3**
8.	Bending of Rectangular Plates with Various Boundary Conditions	**3**
9.	General Buckling of Rectangular Plates (1)	**3**
10.	General Buckling of Rectangular Plates (2)	**3**
11.	Analysis of Folded Plates (1)	**3**
12.	Analysis of Folded Plates (2)	**3**
13.	Theory and Analysis of Shells	**3**
14.	Analytical Solutions of Thin Cylindrical Shells (1)	**3**
15.	Analytical Solutions of Thin Cylindrical Shells (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	**Reddy, J. N., Theory and Analysis of Elastic Plates and Shells, Second Edition, CRC Press, Taylor & Francis Group, 2007.**
Supportive References	Timoshenko, S., and Woinowsky-Krieger, S., Theory of Plates and Shells, McGraw-Hill. 1973.
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
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

Assessment Areas/Issues	Assessor	Assessment Methods
		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**

