Course Specification
(Bachelor)

Course Title:	**Foundations Engineering**
Course Code:	**CE 4204**
Program:	**Bachelor of Science in Civil Engineering**
Department:	**Civil Engineering Department**
College:	**College of Engineering & Islamic 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: (3) 10 / 5th Year					
4. Course General Description:					
This course covers the principles of designing and analyzing foundations for civil engineering projects. Topics include site investigations, earth moving, compaction, and stabilization techniques. Students will learn to design shallow and deep foundations, assess lateral earth pressures, and address the stability of natural slopes.					
5. Pre-requirements for this course (if any)**:**					
CE 3203					
6. Co-requisites for this course (if any)**:**					
7. Course Main Objective(s):					
The primary objective of this course is to enable students to effectively apply soil mechanics principles in the analysis and design of foundations. Through mastering topics such as soil exploration, compaction, QA/QC programs, and soil mechanics, students will learn to design shallow and deep foundations, retaining structures, and stabilize slopes, ensuring safe and efficient foundation systems in various geotechnical conditions.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100
2	E-learning	Not Applicable	
3	Hybrid • Traditional classroom • E-learning	Not Applicable	
4	Distance learning	Not Applicable	

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	Not Applicable
3.	**Field**	Not Applicable
4.	**Tutorial**	Not Applicable
5.	**Others (specify)**	Not Applicable
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	Knowledge of the basics of a subject.	**K.1**	Through lectures, module notes, tutorials, coursework, examinations, and group project work. Assignments, homework, quizzes, midterm and final.	Through lectures, module notes, tutorials, coursework, examinations, and group project work. Assignments, homework, quizzes, midterm and final
1.2	Knowledge of the fundamental physical and analytical principles of the subject.	K.1	Through lectures, Module notes, tutorials, coursework, examinations, and group project work.	Assignments, homework, quizzes, midterm and final.
2.0	**Skills**			
2.1	Ability to use the principles of the subject matter to identify and apply the basic laws to practical problems.	S.1	Through lectures, module notes, tutorials, coursework, examinations, and group project work.	Assignments, homework, quizzes, midterms, and finals.
2.2	Ability to use any engineering software related to the subject	S.1	Through lectures, module notes, tutorials, coursework, examinations, and group project work.	Assignments, homework, quizzes, midterms, and finals.
3.0	Values, autonomy, and responsibility			
3.1	To demonstrate Commitment to professional and academic values and standards in the engineering profession.	V.1	Lectures and training tutorials	The class works, written and oral examinations.
3.2	To demonstrate commitment to ethical	V-2	Lectures and training tutorials	Projects and reports

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
	code of conduct in the field of civil engineering.			
3.3	Ability to use EXCEL for plotting engineering data and ability to interpret the graphs.	S.1	Through lectures, Module notes, tutorials, coursework, examinations, and group project work.	Assignments, homework, quizzes, midterm and final.

C. Course Content

No	List of Topics	Contact Hours
1.	Site investigations and borrow area selection	6
2.	Criteria for choosing foundation types and designing foundations	3
3.	Design of shallow foundations	9
4.	Design of deep foundations	9
5.	Lateral earth pressures, and earth-retaining structures	9
6.	Slope Stability Analysis	6
7.	Earth moving, compaction, stabilization, and risk management	3
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework Assignment	Bi-Weekly	5%
2.	Quizzes	Monthly	5%
3.	Mid-Term	6	30%
4.	Final Examination	13	50%
5	Class (In-Person) Attendance	-	10%

*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	Das, B.M., (2011),"Principles of Foundation Engineering", 7th Edition, PWS - KENT, Boston, U.S.A.
Supportive References	Coduto, Donald P. Foundation design: principles and practices. Pearson Education Limited, 2014.
Electronic Materials	The Journal of Soil Mechanics and Foundation
Other Learning Materials	Class notes

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	White board and associated auxiliary items

Items	Resources
Technology equipment (projector, smart board, software)	Computer with multi-media, a printer, internet connection, data show, Microsoft Office, ArcView GIS, gINT
Other equipment (depending on the nature of the specialty)	Printers and laptops for staff members with required computer software programs are required.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness teaching and assessment	Faculty members who teach this course	٭ Students questioners running at the semester end, ٭ Analysis of students` marks
Effectiveness student's assessment f	Faculty members who teach this course	Homework, Assignments quizzes, and group oral discussions
Quality of learning resources	Independent member(s) teaching staff	Frequent improvement for teaching and learning techniques
The extent to which CLOs have been achieved	Specified target achieved	A sample of students' answer sheets needs to be revised by a specified committee of the department.
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**

Course Coordinator



Yahya Bin Mahfouz, Ph.D.

