Foundation Engineering II

Course Description Form

1. Course Name:
Foundation Engineering II
2. Course Code:
CIV42103
3. Semester / Year:
Second semester / Fourth year
4. Description Preparation Date:
1 September 2025
5. Available Attendance Forms:
The. 3 hr Tut.1 hr / 3 Units
6. Number of Credit Hours (Total) / Number of Units (Total)
The. 45 hr Tut.15 hr / 3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Lubna Abdulrahman Khdier Email: lubna.abddulrahman@muc.edu.iq
8. Course Objectives

Course Objectives	Graduation of civil engineers qualified to work in their various fields of specialization: 1. Providing the student with the necessary skills and mechanisms to deal with the latest developments in scientific and technical progress in their field of specialization. 2. Special care for outstanding students and enabling them to put forward their ideas. 3. Providing the student with high skill and the ability to solve problems and teamwork. 4. - Instilling the spirit of diligence and perseverance and encouraging them to create and innovate.

9. Teaching and Learning Strategies	
Strategy	1. Introduce students to definition of foundation design. 2. Self-regulated learning (i.e., planning, monitoring and evaluating one's own learning process in the classwork / Class team work). 3. Practice testing (short question answers and exams). 4. Self-explanation (i.e., explaining to oneself how new information is related to old information or explain steps taken when solving a problem or a task).

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1.	**Th.:4**	Students will understand the fundamentals of pile foundations, their definition, and engineering purpose.	**Chapter 1: Pile Foundation**	Lectures	Homework

2.	**Th.:4**	Students will identify types of piles and evaluate their structural and geotechnical characteristics.	Pile capacity in cohesive soils,	Lectures	Quiz
3.	**Th.:4**	Students will estimate pile length and differentiate between point-bearing and friction piles.	Pile capacity in cohesionless soils,	Lectures	Homework
4.	**Th.:4**	Students will analyze load transfer mechanisms and compute pile capacity in cohesive soils.	Pile capacity for c-o soils, Pile capacity of tension piles,	Lectures	Classwork
5.	**Th.:4**	Students will determine pile capacity in cohesionless soils and in c–ϕ soils.	Determination of pile capacity from in situ tests, Negative skin friction of piles.	Lectures	Quiz
6.	**Th.:4**	Students will evaluate tension pile capacity and interpret pile capacity from in-situ tests.	Pile Groups, Group efficiency, Capacity of a pile group, Efficiency formulas,	Lectures	Homework
7.	**Th.:4**	Students will assess negative skin friction and analyze pile group behavior and efficiency.	Pile groups subjected to moments, Settlement of pile and pile groups	Lectures	Classwork
8.	**Th.:4**	Students will calculate the capacity of pile groups under vertical and moment loading and estimate their settlement.	Pile Load Tests, ASTM D1143. Determination of Ultimate load capacity from pile load test	Lectures	Quiz
9.	**Th.:4**	Students will apply ASTM D1143 to evaluate pile load tests and determine ultimate load capacity. Students will understand lateral earth pressure concepts and compute Rankine active/passive pressures for horizontal surfaces.	**Chapter 2: Lateral earth pressure theory** Coulomb theory, active earth pressure, passive earth pressure, Problems on lateral earth pressure.	Lectures	Homework
10.	**Th.:4**		Mid-exam		Exam
11.	**Th.:4**	Students will compute Rankine earth pressures for inclined surfaces and apply Coulomb theory for active/passive conditions.	**Chapter 3: Retaining walls.**	Lectures	Quiz
12.	**Th.:4**	Students will solve engineering problems related to lateral earth pressure for various soil–wall configurations.	Design methods, stability of retaining walls, sliding, overturning,	Lectures	Homework
13.	**Th.:4**	Students will identify types of retaining walls and apply proportioning and stability checks (sliding, overturning, bearing).	Analysis and design of retaining walls.	Lectures	Quiz
14.	**Th.:4**	Students will perform full analysis and design of retaining walls and solve related practical design problems.	**Chapter 4: sheet piles**	Lectures	Homework
15.	**Th.:4**	Students will classify types of sheet piles, apply design methods in sand and clay, and analyze cantilever sheet pile systems.	Cantilever sheet piles, Supplementary problems on analysis and design of sheet piles	Lectures	Classwork

16. Course Evaluation

The grade distribution is as follows:

Assessment: Formative 40 marks 1. **Final exam: Theory 60 marks**

17. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Das, B.M. (2011),'' Principle of foundation Engineering'', 7th edition, Global engineering.
Main references (sources)	Bowles, J. E. (1996), "Foundation Analysis and Design", 5th edition Mc Graw-Hill Book Company Inc. New York.
Recommended books and references (scientific journals, reports…)	Al-Shakarchi, Y. & N. Al-Mohamadi, (1985) "Foundation Engineering'', (in Arabic)"
Electronic References, Websites	