YEDİTEPE UNIVERSITY
FACULTY OF ENGINEERING

COURSE DESCRIPTION FORM

COVER PAGE

2022/2023-2

Course Code & Name	CE 441 FOUNDATION ENGINEERING

Course Schedule	Lectures: Tuesday 11.00-14.00
Room	3E-07
Instructor's Name **Phone-Room** **E-mail** **Office Hours**	Assoc. Prof. Dr. Hakkı Özhan 0216-578 00 00 / 3227 – A910 (6th floor) hakki.ozhan@yeditepe.edu.tr Thursday 10.00-11.00
Assistant's Name **Phone** **E-mail**	Yunus Emre Tütüncü Room #A103 emre.tutuncu@yeditepe.edu.tr

Additional Information

Grading	Homeworks (4 HW)	15%
	Midterm Exam	35%
	Final Exam	50%
	(**You have to get at least 45/100 from the final exam!**)	
	Total	100%

Attendance	**80 %**

Homeworks	Homework problems will be given regularly from YULEARN system (online). No excuse for delayed papers, you will get zero; homeworks copied from others will also be graded as zero Work homework problems individually - This is a requirement of the class! (You can ask classmates to explain problems that you do not understand, but you should prepare your own solutions by working the problem out for yourself). The data for some homeworks will be taken from Architecture Department and the students will solve them by also evaluating architectural perspective

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FACULTY OF ENGINEERING

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COURSE INFORMATON				
Course Code	**441**	**Course Title**	**FOUNDATION ENGINEERING**	
Semester	*Credits*	*ECTS*	*C +P + L Hour*	Prerequisites
7	3	6	3+0+0	CE 341: Soil Mechanics

Language of Instruction	**Course Level**	**Course Type**
English	Bachelor's Degree (First Cycle Programmes)	Core

Course Coordinator	Assoc. Prof. Dr. Hakkı Özhan
Instructors	Assoc. Prof. Dr. Hakkı Özhan
Assistants	Yunus Emre Tütüncü
Goals	The goal of this course is to teach the students how to apply the soil mechanics principles and engineering behavior of soils, that they have learned in Soil Mechanics course, to the foundation engineering with new topics on design of shallow foundations.
Content	Applications of soil mechanics principles to design and analyses of foundations: Introduction to Foundation Engineering and foundation types, Site exploration and characterization, Bearing pressure, Bearing Capacity, Settlement of shallow foundations, Geotechnical design of spread footings, Classical lateral earth pressure theories, Retaining structures, Geotechnical design of cantilever retaining walls.
Contribution of the Course to the Professional Education	All civil engineering structures rest on the ground and interact with the underlying soil layers. Any civil engineering structure like building, highway, bridge etc. would transfer its load to the underlying soils by their foundation systems. This course adds a significant contribution to the Professional education by teaching the students shallow foundations.

Course Learning Outcomes	**Detailed Program Outcomes**	**Teaching Methods**	**Assessment Methods**
1) Ability to define the purpose and types of shallow foundations.	1a, 6b	1,3,5	A,E
2) Ability to explain the importance of site exploration and soil investigation and knowledge about how to conduct them.	1a	1,3,5	A,E
3) Ability to do the geotechnical design of the shallow foundations by considering bearing pressure, eccentric loading, bearing capacity and settlement criteria.	3a, 3b, 6b	1,3,5	A,E

4) Ability to calculate the lateral loads acting on an earth retaining structure by using lateral earth pressure theories.	1b, 2a	1,3,5	A,E

Teaching Methods:	1: Lecture by instructor, 2: Lecture by instructor with class discussion, 3: Problem solving by instructor, 4: Use of simulations, 5: Problem solving assignment, 6: Reading assignment, 7: Laboratory work, 8: Term research paper, 9: Presentation by guest speaker, 10: Sample Project Review, 11: Interdisciplinary group working, 12: ...
Assessment Methods:	A: Written exam, B: Multiple-choice exam C: Take-home quiz, D: Experiment report, E: Homework, F: Project, G: Presentation by student, H: ...

COURSE CONTENT

Week	Topics	Study Materials
1	General description of the course contents and other information about the course; Scope and contents of foundation engineering	Lecture Notes and Textbook
2	Introduction to Foundation Engineering and foundation types	Lecture Notes and Textbook
3	Site exploration and characterization	Lecture Notes and Textbook
4	Bearing pressure	Lecture Notes and Textbook
5	Eccentric loading criteria on foundations	Lecture Notes and Textbook
6	Bearing Capacity of shallow foundations	Lecture Notes and Textbook
7	Settlement of shallow foundations -1	Lecture Notes and Textbook
8	Settlement of shallow foundations -2	Lecture Notes and Textbook
9	MIDTERM EXAM	Lecture Notes and Textbook
10	Bearing capacity of mat foundations	Lecture Notes and Textbook
11	Geotechnical design of spread footings; Classical lateral earth pressure theories (Rankine Method)	Lecture Notes and Textbook
12	Classical lateral earth pressure theories (Coulomb Method)	Lecture Notes and Textbook

13	Retaining structures (retaining walls and sheet pile walls)	Lecture Notes and Textbook
14	Geotechnical design of cantilever retaining walls	Lecture Notes and Textbook

RECOMMENDED SOURCES	
Textbook	**Foundation Design, Principles and Practices** Prentice-Hall Publishers, 2nd Edition, 2001 Authors: Coduto, ISBN-10: 0-13-589706-8 **Principles of Foundation Engineering** Cengage Learning, 7th Edition, 2010 Authors: Braja Das, ISBN-10: 0-49-566810-9
Additional Resources	Lecture notes.

MATERIAL SHARING	
Documents	If needed, some course notes, announcements, slides and homeworks are shared with the students on electronic media (Moodle-Coadsys)
Assignments	homeworks are returned to students after they are graded
Exams	exams questions are solved if demanded

ASSESSMENT		
IN-TERM STUDIES	**NUMBER**	**PERCENTAGE**
Homeworks	4	30
Midterm Exam	1	70
Total		**100**
CONTRIBUTION OF FINAL EXAMINATION TO OVERALL GRADE (In order to pass, at least 45/100 from the final exam!)		50
CONTRIBUTION OF IN-TERM STUDIES TO OVERALL GRADE		50
Total		**100**

COURSE CATEGORY	Field Course

COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES		
No	Program Learning Outcomes	check √
1a	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline,	√
1b	Ability to use theoretical and applied knowledge in these areas in complex engineering problems.	√
2a	Ability to identify, formulate, and solve complex engineering problems,	√
2b	Ability to select and apply proper analysis and modeling methods for this purpose.	
3a	Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result,	√
3b	Ability to apply modern design methods for this purpose.	√
4a	Ability to devise, select and use modern techniques and tools needed for analyzing and solving complex problems encountered in engineering practice.	
4b	Ability to employ information technologies effectively.	
5a	Ability to design experiments for investigating complex engineering problems or discipline specific research questions,	
5b	Ability to conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or discipline specific research questions.	
6a	Ability to work efficiently in intra-disciplinary teams,	
6b	Ability to work efficiently in multi-disciplinary teams,	√
6c	Ability to work individually.	
7a	Ability to communicate effectively in Turkish, both orally and in writing,	
7b	Knowledge of a minimum of one foreign language,	
7c	Ability to write effective reports and comprehend written reports, prepare design and production reports,	
7d	Ability to make effective presentations,	
7e	Ability to give and receive clear and intelligible instructions.	
8a	Recognition of the need for lifelong learning, ability to access information, ability to follow developments in science and technology,	
8b	Ability to continue to educate him/herself.	
9a	Consciousness to behave according to ethical principles and professional and ethical responsibility.	

9b	Knowledge on standards used in engineering practice.	
10a	Knowledge about business life practices such as project management, risk management, change management.	
10b	Awareness in entrepreneurship and innovation.	
10c	Knowledge about sustainable development.	
11a	Knowledge about the global and social effects of engineering practices on health, environment, and safety,	
11b	Knowledge about contemporary issues of the century reflected into the field of engineering.	
11c	Awareness of the legal consequences of engineering solutions.	
12	Knowledge about project award mechanisms and tendering procedures.	
13	Knowledge about the interaction of designers and constructors.	

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION			
Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration	14	3	42
Hours for off-the-classroom study (Pre-study, practice)	14	5	70
Homeworks	4	3	12
Hours for studying the exams	2	9	18
Midterm Exam	1	2	2
Final Exam	1	2	2
Total Work Load			146
Total Work Load / 25 (h)			5.84
ECTS Credit of the Course			6

Prepared by: Assoc. Prof. Dr. Hakkı Özhan	Preparation date: 05/10/2020