

<b>CIVL451 - Foundation Engineering</b>	
<b>Department:</b> Civil Engineering	
<b>Program Name:</b> Civil Engineering	<b>Program Code:</b> 22
<b>Course Number:</b> CIVL451	<b>Credits:</b> 4 Cr
<input checked="" type="checkbox"/> Required Course <input type="checkbox"/> Elective Course	
<b>Prerequisite(s):</b> CIVL353 and CIVL354	
<b>Catalog Description:</b> Geotechnical properties of soils. Exploration, sampling, and in-situ soil measurements. Bearing capacity of foundations. Foundation settlements, improving site soils for foundation use. Factors to consider in foundation design. Spread footing design: Structural design of spread footings. Rectangular, eccentrically loaded spread footings, wall footings, design of spread footings with overturning moment. Special foundations: Rectangular combined footings, trapezoid-shaped footings, strap footings, mat foundations. Design of reinforced concrete retaining walls. Piles, piers, sheet pile walls: Introduction to design.	
<b>Course instructor:</b> Assoc. Prof. Dr. Eriş Uygur	
<b>Course Web Page:</b> <a href="http://civil.emu.edu.tr/courses/civl451">http://civil.emu.edu.tr/courses/civl451</a>	
<b>Textbook(s):</b> <ol style="list-style-type: none"> <li>1) Braja M. Das, Principles of Foundation Engineering, 7/e, Thomson, 2011.</li> <li>2) Coduto, D. P., Yeung M. R., Kitch, W. A., Foundation Design- Principles and Practices, 2/e, Prentice Hall, 2010.</li> <li>3) Cernica, J. N., Foundation Design, Wiley, 1995.</li> <li>4) Bowles, J. E., Foundation Analysis and Design, 4/e, McGraw-Hill, 1988.</li> </ol>	
<b>Course Outline:</b> <p>Week 1-2 Geotechnical properties of soils. (5 Classes)</p> <p>Week 3-4 Site exploration; borehole drilling and insitu testing methods. (10 classes)</p> <p>Week 5-8 Shallow foundations: Bearing capacity and settlement of single pad foundation. (20 classes)</p> <p>Week 9 Midterm Exam.</p> <p>Week 10-12 Structural design of shallow foundations; single pad foundation with eccentricity, continuous foundation, mat foundation, ACI method. (15classes)</p> <p>Week 13 Deep foundations: Bearing capacity and settlement of single pile foundation. (5 classes)</p> <p>Week 14 Elastic settlement of single pile, Insitu testing of piles. Stability analysis of cantilever retaining walls. (5 classes)</p> <p>Week 15 Final Exam.</p>	

<b>Course Learning Outcomes:</b> At the end of the course the students will be able to: <ol style="list-style-type: none"> <li>1. Exploration, sampling, and in situ soil measurements.</li> <li>2. Analysis of bearing capacity and settlement of foundations.</li> <li>3. Evaluation of factors considered in design of shallow foundations.</li> <li>4. Structural design of shallow foundations.</li> <li>5. Determination of lateral earth pressures and stability of retaining walls.</li> </ol>
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6. Determination of load capacity and settlement of deep foundations.

**Class Schedule:**

4 hrs of lectures per week

**Laboratory Schedule:**

1 hr of tutorial/laboratory per week

Assessment	Method	No	Percentage
	Midterm Exam(s)	1	30 %
	Homework	2	10 %
	Quiz(es)	2	20 %
	Final Examination	1	40 %

**NG Policy**

Attendance will be taken every lecture hour by the lecturer. Any student who has poor interest in the course, with poor attendance (less than 70%), with lack of exams (more than one) or does not submit project work or collect less than 25% will be given NG (nil grade). This rule will be followed strictly.

**Contribution of Course to Criterion 5**

Credit Hours for:

Mathematics & Basic Science : 0

Engineering Topic and Design : 4

General Education : 0

**Relationship of Course to Student Outcomes**

The course makes significant contributions to the following student outcomes:

1. an ability to identify, formulate, and solve complex engineering problems, by applying principles of engineering, science and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgement to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.