College of Engineering

Department of Civil Engineering

CE 382 Geotechnical Engineering-1

Credit and Contact hours	2/ 2 (Lectures), 1 (Tutorials), 0 (Laboratory)
Required, or Elective	Required for a BSCE degree
Course Description	Types and classification of rocks. Formation of soils. Weight-volume relationships. Consistency limits. Classification of soils. Soil compaction. Permeability and seepage. Total and effective stress principle. Soil stresses using elastic theory.
Prerequisites or Co-requisites	**Prerequisite:** Mechanics of Materials (CE 302) and Geology for Engineers (GEO 281) **Co-requisite:** Soil Mechanics Laboratory (CE 380)
Course Learning Outcomes	Students completing this course successfully will be able to

Course Learning Outcomes	*Related Student Outcomes (SO)*
CLO1. Determine parameters used to characterize and classify soils for geotechnical analyses	**SO1**
CLO2. Explain different mechanisms underlying specific soil behavior such as compaction, flow and stresses.	**SO4**
CLO3. Evaluate the effect of water on the behavior of different types of soils and provide solutions for undesired behaviors.	**SO4**

Student Outcomes related to this Course

SO1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics, and using modern engineering tools. [ABET 1].

SO4. 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. [ABET 4].

<table>
<tr><td>Topics Covered</td><td>
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<tr><th>List of Topics</th><th>Related CLOs</th></tr>
<tr><td>1. Introduction.</td><td>CLO1</td></tr>
<tr><td>2. Formation of soils.</td><td>CLO1</td></tr>
<tr><td>3. Grain size distribution.</td><td>CLO1</td></tr>
<tr><td>4. Weight-volume relationships.</td><td>CLO1</td></tr>
<tr><td>5. Consistency limits.</td><td>CLO1</td></tr>
<tr><td>6. Classification of soils.</td><td>CLO1</td></tr>
<tr><td>7. Soil compaction.</td><td>CLO2</td></tr>
<tr><td>8. Permeability.</td><td>CLO2</td></tr>
<tr><td>9. Seepage.</td><td>CLO2</td></tr>
<tr><td>10. In-situ stresses.</td><td>CLO2</td></tr>
<tr><td>11. Stresses in soil mass.</td><td>CLO2</td></tr>
<tr><td>12. Total and effective stresses.</td><td>CLO3</td></tr>
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<tr><td>Textbook(s) and Other Required Material</td><td>Braja Das (2010) Principle of Geotechnical Engineering” 8th Edition.</td></tr>
<tr><td>Grading System</td><td>Two Mid-term Exams 40 %
Assignments 10%
Quizzes 10%
Final Exam: 40%</td></tr>
<tr><td>Instructors</td><td>Dr. Abdullah H. Alsabhan (2A22/3), email; aalsabhan@ksu.edu.sa</td></tr>
<tr><td>Date of Review</td><td>November, 2020</td></tr>
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