Course Number and Name	CE231-2 “Geotechnical Engineering – I”
Credits hours	3 Credits hours
Contact hours	3 Contact hours; 2 for lecture, 0 for tutorial and 1 for practical
Instructor/s name/s	Dr. Shamshad Alam
Textbook	1. Principles of Geotechnical Engineering by Braja M. Das, 10th Edition. 2021, Cengage Learning 2. Soil Mechanics and Foundation by Muni Budhu, 3rd Edition, 2011, John Wiley and Sons
Other supplemental materials	1. Geotechnical Engineering by C. Venkatramaiah, 3rd Edition, 2006, New Age International Publishers 2. Lecture notes.
Specific course information	
a. Catalog description	This course is intended to introduce the fundamentals of soil engineering. The course involves the study introduction to geotechnical Engineering; Concepts and fundamentals of soil classification and physical properties. Studying permeability of groundwater in soil and compaction. Studying stresses in soil, studying stresses in soil and settlement of soil due to excessive loads.
b. Prerequisite	CE213-3 “Strength of Material”
c. Required / Elective	Required
Specific goals for the course	
Course Learning Outcomes (CLOs)	By the end of this course, the student will be able to: 1. To estimate soil index parameters. 2. Classify the soil types. 3. Interpret soil behavior through learning soil compaction, consolidation, and analyses various theories. 4. Compute stress distributions regard total, effective and pore-water pressure. 5. To determine soil settlement under concentrated loading and under the corner of foundation. 6. To calculate 2D seepage, pore pressure coefficients, time-dependent consolidation for different soil types. 7. Measure soil properties in the laboratory.
Student outcomes that addressed by the course	The following student outcomes are addressed by the course: **SO1:** An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. **SO3:** An ability to communicate effectively with a range of audiences. **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. **SO6:** An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

	SO7: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topics to be covered	
Topic covered in Lecture	**Number of weeks**
Introduction to Geotechnical Engineering and fundamental of soil classification	1
Physical States of Soil and Phase Relationship	2
Index property of fine grained soil and detail classification of fine grained soil	1
Index Property of Coarse grained soil and detail classification of coarse grained soil	1
Detail Soil Classification Scheme as per Unified Soil Classification System (USCS)	2
Basics of Soil Compaction, Method of laboratory compaction, and Interpretation of compaction curve.	1
Method of field compaction and measuring the In-situ density of soil.	1
Introduction to permeability and laboratory method of finding the coefficient of permeability of coarse and fine soil	1
Finding the equivalent permeability of layered soil and exercise	1
Introduction to Two dimensional seepage, flow lines, equipotential line	1
Method of Plotting the flow net and calculation of total discharge	1
Stress distribution below the foundation	1
Introduction to consolidation, settlement of foundation	2
Total	**16**
Topic covered in Lab	**Number of weeks**
Measurement of soil property in the laboratory	**16**

Schedule of Assessment Tasks for Students During the Semester

Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	**Week due**	**Proportion of Total Assessment**
Homework	7th week	10
Quizzes	15th week	10
Midterm-exam I	8th week	15
Midterm-exam II	12th week	15
Lab Report	Every week	15
Final Lab Exam	16th week	5
Final Exam	After 16th week	30

CLO-SO Map							
	SO 1	SO 2	SO 3	SO 4	SO 5	SO 6	SO 7
CLO 1	√						
CLO 2	√		√				
CLO 3	√						
CLO 4	√						
CLO 5	√						
CLO 6	√						
CLO 7			√	√		√	√