

College of Engineering

Department of Civil Engineering

جامعة
الملك سعود
King Saud University



CE 584 Geotechnical Measurements and Exploration

Credit and Contact hours	3/ 3 (Lectures), 0 (Tutorials), 0 (Laboratory)												
Required, or Elective	Required for a MSCE degree												
Course Description	Planning and execution of subsurface exploration. Exploratory holes and sampling. Field instrumentation and testing. Generation of field parameters. Interpretation of field data for planning and design. Special laboratory tests.												
Prerequisites or Co-requisites	None												
Course Learning Outcomes	<p>Students completing this course successfully will be able to</p> <table border="1"><thead><tr><th>Course Learning Outcomes</th><th>Related Program Outcomes</th></tr></thead><tbody><tr><td>CLO1: Recognize and identify the newest method of subsurface exploration</td><td>K1</td></tr><tr><td>CLO2: Plan and execute subsurface exploration</td><td>S1</td></tr><tr><td>CLO3: Determine the appropriate number, depth of boreholes and method of boring.</td><td>S1</td></tr><tr><td>CLO4: Determine the appropriate sampling techniques, appropriate testing methods and measurement techniques</td><td>S1</td></tr><tr><td>CLO5: Interpret and evaluate field data for planning and design.</td><td>C2</td></tr></tbody></table>	Course Learning Outcomes	Related Program Outcomes	CLO1: Recognize and identify the newest method of subsurface exploration	K1	CLO2: Plan and execute subsurface exploration	S1	CLO3: Determine the appropriate number, depth of boreholes and method of boring.	S1	CLO4: Determine the appropriate sampling techniques, appropriate testing methods and measurement techniques	S1	CLO5: Interpret and evaluate field data for planning and design.	C2
Course Learning Outcomes	Related Program Outcomes												
CLO1: Recognize and identify the newest method of subsurface exploration	K1												
CLO2: Plan and execute subsurface exploration	S1												
CLO3: Determine the appropriate number, depth of boreholes and method of boring.	S1												
CLO4: Determine the appropriate sampling techniques, appropriate testing methods and measurement techniques	S1												
CLO5: Interpret and evaluate field data for planning and design.	C2												
Student Outcomes related to this Course	<p>K1. Recognize advanced engineering knowledge, concepts and techniques to identify, interpret and analyze complex and real-life engineering problems.</p> <p>S1. Provide solution for complex and real-life engineering problems through critical thinking and using modern engineering tools and identify its impact on social and ethical issues.</p>												

	C2. Design novel advanced Civil Engineering systems and evaluate its performance and effectiveness for engineering practice and its impact on society.	
Topics Covered	List of Topics	Related CLOs
	1. <u>Introduction to soil mechanics:</u> Index properties, consolidation tests , direct shear tests, Triaxial tests	CLO1
	2. <u>Subsurface exploration:</u> Subsurface exploration, planning, drilling and sampling techniques	CLO2
	3. <u>Field tests:</u> Field testing and laboratory investigation of soil, including advanced equipment, instrumentation, data acquisition, and measurement techniques: SPT, CPT, DCPT, Pressuremeter, Dilatometer, Vane shear, etc	CLO3
	4. Geophysical field testing methods	CLO4
	5. <u>Data Interpretation:</u> Data interpretations for determination of engineering properties of soils, and their application to geotechnical design.	CLO5
	6. Preparation of site-investigation reports	CLO4
	7. Case studies for subsurface exploration	CLO5
Textbook(s) and Other Required Material	• Hand Book of Geotechnical Investigation and Design Tables 2007, Burt G. Look	
Grading System	Assignments	15%
	Term Project	15%
	Midterm Exam	30%
	Final Exam	40%
Instructors	Dr. Abdullah Abdulrahman A Almajid (2A101), e-mail: alabduallah@ksu.edu.sa	
Date of Review	February, 2021	