

GAU, Faculty of Engineering

Course Unit Title	Soil Mechanics	
Course Unit Code	CVEN307	
Type of Course Unit	Compulsory, All civil engineering students	
Level of Course Unit	3rd Year BSc	
National Credits	3	
Number of ECTS Credits Allocated	5 ECTS	
Theoretical (hour/week)	2	
Practice (hour/week)	-	
Laboratory (hour/week)	2	
Year of Study	3	
Semester when the course unit is delivered	5	
Mode of Delivery	Face to face	
Language of Instruction	English	
Prerequisites and co-requisites	-	
Recommended Optional Programme Components	Basic background in statics	
Objectives of the Course:		
<ul style="list-style-type: none"> ➤ Basics of earth science ➤ Basics of soil mechanics; soil properties, flownets, stresses, consolidation, shear strength ➤ Analysis of lateral earth pressure and design of earth retaining walls 		
Learning Outcomes		
When this course has been completed the student should be able to		Assesment.
1	Understand the basics of earth science and soil mechanics and soil classification	1
2	Understand the basic concepts related to flow in soils and flow nets	1,2
3	Understand and analyse the stresses in soils	1
4	Understand the concept of consolidation	1
5	Understand the basics of shear strength of soils	1,2
6	Understand and analyse lateral earth pressures to aid the design of earth retaining walls	1
Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5. Lab. Work		
Course's Contribution to Program		
		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	4
2	Ability to design and conduct experiments as well as to analyze and interpret data	2
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	1
4	Ability to apply systems thinking in problem solving and system design	3
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	3
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	3
7	Ability to express their ideas and findings, in written and oral form	1
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	2
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3
10	Ability to manage time and resources effectively and efficiently while carrying out civil engineering projects	4
11	Ability to combine knowledge from different areas of civil engineering for problem solving and system design with an ethical and sustainable approach	3
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate 4: High, 5:Very High)		

Course Contents		
Week		Exams
1	Introduction to Earth Science and Soil Mechanics	
2	Soil properties and classifications	

3		Soil properties and classifications	
4		Flow of water in soil; Permeability, seepage	
5		Flow of water in soil; Hydraulic gradient, Darcy's law	
6		Stresses in a Soil Mass	
7		Stresses in a Soil Mass	
8		Revision and class exercises	
9			Mid Term
10		Consolidation theory	
11		Shear strength of soils; Mohr-Coulomb criteria	
12		Lateral earth pressures	
13		Design of retaining walls	
14		Revision	Quiz
15			Final

Recommended Sources

Textbook: Soil Mechanics Principles and Practice by G. E. Barnes.2 2nd ed. Palgrave Macmillan, 2000. ISBN 0-333-77776-X.

Supplementary Material (s): Braja M. Das, Principles of Foundation Engineering, 6th ed., Thomson, 2007.

Assessment

Attendance	-	
Laboratory	-	
Assignment	5%	
Midterm Exam (Written)	35%	
Quiz (Written)	15%	
Final Exam (Written)	45%	
Total	100%	

ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including the Exam week)	15	3	45
Labs and Tutorials	-	-	-
Assignments	1	5	5
Project/Presentation/Report Writing	-	-	-
E-learning Activities	-	-	-
Quizzes	1	8	8
Midterm Examination	1	14	14
Final Examination	1	22	22
Self Study	14	4	56
Total Workload			150
Total Workload/30 (h)			5
ECTS Credit of the Course			5