

Soil Mechanics – I

Course Code CE- 222	Credit Hours 2-1
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Course Description

This course provides an elementary introduction to Soil Mechanics and provides the basic mechanics necessary for the detailed study of Geotechnical Engineering. This course aims to provide an understanding of the nature of soils as engineering materials; common soil classification schemes; the importance of water in the soil and the effects of water movement; and the stress-strain-strength response of soils

Text Book:

1. Das & Sobhan (2018). Principles of Geotechnical Engineering. 9th.
2. Das (2009). Fundamentals of Geotechnical Engineering. 3rd
3. Whitlow (2001). Basic soil mechanics, 4th.

Reference Book:

1. Mitchell & Soga (2005). Fundamentals of soil behavior, 3rd.
2. Holtz & Kovac (1981) An Introduction to Geotechnical Engineering.
3. Whitlow (2001) Basic Soil Mechanic
4. Terzaghi (1943) Theoretical Soil Mechanics.

Prerequisites :

Nil.

ASSESSMENT SYSTEM FOR THEORY

	Without Project (%)	With Project/Complex Engineering Problems (%)
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

ASSESSMENT SYSTEM FOR LAB

Lab Work/ Psychomotor Assessment/ Lab Reports	70%
Lab Project/ Open Ended Lab Report/ Assignment/ Quiz	10%
Final Assesment/ Viva	20%

Teaching Plan

Week No	Topics/ Learning Outcomes
1-2	Introduction: Origin of soils Soil Formation and Nature of Soil constituents, Clay Soil Formation
3	Mechanical analysis of soil (sieve analysis & hydrometer analysis)
4-5	Phase Relationships (Weight-Volume relationship)
6	Soil Plasticity
7-8	Soil Classification systems: USDA, AASHTO, & Unified Soil Classification System
9	Mid Semester Exam
11	Soil Compaction: Introduction, theory, and lab tests Field Density Determination
12-14	Soil Permeability
13-14	Seepage and Flow Nets
15	In-Situ Stresses
15-16	Vertical Stresses in Soil
17-18	End Semester Exam

Practical

Experiment No	Description
1	Moisture content determination
2	Sieve analysis.
3	Hydrometer analysis.
4	Atterberg limits.
5	Specific gravity.
6	Moisture content determination.
7	Standard and Modified Compactions
8	Density in situ by core cutter sand replacement and rubber balloon method.
9	Permeability by constant and variable head.