

Soil Mechanics

1st Semester

Theoretic : 2 Hour/week

Practical : 2 Hour/week

: 1 Hour/week

Item	Subject	Hours
1	Basic characteristics of soils -Soil Formation -Clay Minerals -Soil fabric -Specific Gravity	3
2	Weight-Volume Relationships - Weight-Volume Relationships - Relationships among Unit Weight, Void Ratio, Moisture Content, and Specific Gravity -Relationships among Unit Weight, Porosity, and Moisture Content -Various Unit-Weight Relationships -Relative Density	6
3	Plasticity of Fine-Grained soils -Introduction -Liquid Limit (<i>LL</i>) -Plastic Limit (<i>PL</i>) -Shrinkage Limit (<i>SL</i>) -Plasticity Chart	3
4	Classification of Soil -Mechanical Analysis of Soils -Partical-size distribution curve -Unified Soil Classification System	6

5	<p>Soil Compaction</p> <ul style="list-style-type: none"> - Compaction-General Principles - Standard Proctor Test -Factors Affecting Compaction - Modified Proctor Test -Field Compaction -Specifications for Field Compaction -Determination of Field Unit Weight of Compaction 	6
6	<p>Permeability</p> <ul style="list-style-type: none"> -Bernoulli's Equation -Darcy's Law - Hydraulic Conductivity - Laboratory Determination of Hydraulic Conductivity - Equivalent Hydraulic Conductivity in Stratified Soil - Permeability Test in the Field by Pumping from Wells -In Situ Hydraulic Conductivity of Compacted Clay Soils 	6
7	<p>Seepage</p> <ul style="list-style-type: none"> - Laplace's Equation of Continuity - Flow Nets - Seepage Calculation from a Flow Net - Flow Nets in Anisotropic Soils -Uplift Pressure Under Hydraulic Structures -Seepage Through an Earth Dam on an Impervious Base -Earth Dams With Drainage Blanket -Control of Piping - Filter Design 	9
8	<p>In Situ Stresses</p> <ul style="list-style-type: none"> -Stresses in Saturated Soil without Seepage -Stresses in Saturated Soil with Upward Seepage -Stresses in Saturated Soil with Downward Seepage -Seepage Force -Heaving in Soil Due to Flow Around Sheet Piles -Use of Filters to Increase the Factor of Safety Against Heave -Capillary Rise in Soils -Effective Stress in the Zone of Capillary Rise 	6

Soil Mechanics

2nd Semester

Theoretic : 2 Hour/week

Practical : 2 Hour/week

: 1 Hour/week

Item	Subject	Hours
9	Stresses in a Soil Mass -Normal and Shear Stresses on a Plane -The Pole Method of Finding Stresses Along a Plane	3
10	Compressibility of Soil -Contact Pressure and Settlement Profile -Relations for Elastic Settlement Calculation -Fundamentals of Consolidation -One-Dimensional Laboratory Consolidation Test - Void Ratio–Pressure Plots -Normally Consolidated and Overconsolidated Clays -Calculation of Settlement from One-Dimensional Primary Consolidation - Secondary Consolidation Settlement - Time Rate of Consolidation - Coefficient of Consolidation - Methods for Accelerating Consolidation Settlement	18
11	Shear Strength of Soil - Mohr–Coulomb Failure Criterion -Inclination of the Plane of Failure Caused by Shear -Laboratory Tests for Determination of Shear Strength Parameters - Direct Shear Test - General Comments on Direct Shear Test -Triaxial Shear Test-General	18

	<ul style="list-style-type: none"> -Consolidated-Drained Triaxial Test -Consolidated-Undrained Triaxial Test - Unconsolidated-Undrained Triaxial Test -Unconfined Compression Test on Saturated Clay - Vane Shear Test 	
12	<p>Lateral Earth Pressure: At-Rest, Rankine, and Coulomb</p> <ul style="list-style-type: none"> -At-Rest, Active, and Passive Pressures -Earth Pressure At-Rest -Rankine’s Theory of Active Pressure -Theory of Rankine’s Passive Pressure -Coulomb’s Active Pressure -Coulomb’s Passive Pressure 	6