CVLE 333 Soil Mechanics

Course Syllabus – Fall 2015-2016

Curricular Area		Civil Engineering – Structural Sequence
Type of Course		Compulsory – Major
Catalogue Description		- Introduction: Overview of Geotechnical Engineering. Types of problems encountered. - Origin and Formation of Soils: Sedimentary, Igneous and metamorphic Rock types, Clay minerals. - Phase Relationships: weight volume- Relative density. - Mechanical Analysis of soil- Sieve and Hydrometer Analysis tests. - Soil Consistency- Atterberg Limits tests. - Classification: USDA-AASHTO-USCS - In situ stresses: Effective stresses, Capillarity. stresses in soils, induced stresses due to different types of loading, principle of effective stress, quicksand, critical hydraulic gradient - Permeability: Bernoulli's Equation, Darcy's Law, Hydraulic Conductivity, Constant and Falling head tests, Equivalent permeability in stratified soils. - Seepage and Drainage: Flow nets, Piping and heave , Filter Requirements - Stresses within a Soil Mass - Mohr circle - Stresses due to surface loading - Compressibility: consolidation settlement, time rate consolidation- consolidation test. - Shear Strength of Soils: Mohr –Coulomb criteria, Direct shear test, Triaxial shear test.
Prerequisites by Courses		CVLE 231 Engineering Geology- CVLE 211 Mechanics of Materials
Prerequisites by Topics		Excel
Instructors		Eng. Lina Jaber
Office Hours		
Load		3 credits; 2Lectures/week –50 min per lecture + 1 laboratory /week – 100 min per session
Textbook		B. M. Das, "*Principles of Geotechnical Engineering*", Seventh Edition.
Reference Books		*Geotechnical Engineering. Soil Mechanics* - Cernica, J.N. (1995) *Soil Mechanics : Design Manual 7.1* –Department of the Navy NAVFAC
Topics	**Week [1-2]**	Week [1] Introduction: Overview of Geotechnical Engineering. Types of problems encountered Week [2] Origin and Formation of Soils: Sedimentary, Igneous and metamorphic Rock types, Clay minerals
	Week [3-5]	Week [3] Phase Relationships- weight volume- Relative density. Week [4] Mechanical Analysis of soil: Sieve and Hydrometer Analysis tests. Week [5] Soil Consistency: Atterberg Limits tests.

	Week [6-7]	Week [6] Soil Classification according to USDA, AASHTO and USCS Week [7] In situ stresses: Effective stresses, Capillarity.
	Week [8-9]	Week [8] Permeability: Bernoulli's Equation, Darcy's Law, Hydraulic Conductivity, Constant and Falling head tests, Equivalent permeability in stratified soils. Week [9] Seepage and Drainage: Flow nets, Piping and heave , Filter Requirements
	Week [10]	Week [10] Stress Distribution: Boussinesq, Influence Chart Method Stresses in a Soil Mass: The Pole Method
	Week [11-12]	Week [11-12] Compressibility: consolidation settlement, time rate consolidation-consolidation test.
	Week [13-15]	Week [13-15] Shear Strength of Soils: Mohr –Coulomb criteria, Direct shear test, Triaxial shear test.