Fundamentals of Geotechnical Engineering – II CEng2142 Tentative Lecture Plan 2012EC Semester II (SPRING2020)				
Week (2020)	**Session**	**Subject**	**Delivery**	**Learning Outcome (Competence)**
08 [FEB. 17-23]	1	Start Session	Lecture	Introduction & Formalities
	2	Chapter 1 Session1	Lecture	**1. Genesis of Soils & Soil Mechanics** 1.1 Introduction 1.2 A recap of properties of rocks 1.3 Weathering 1.4 Soil as an engineering material 1.5 Soil Mechanics: An Introduction
	Assignment 1		20.03.2020	
09 [FEB. 24-MAR.1]	1	Chapter 2 Session1	Lecture / Exercise	**2. Simple Soil Properties & Soil Characterization** 2.1 Introduction 2.2 Phase relations ✓ Compute weight relations, volume relations & weight-volume relations ✓ Describe the laboratory procedure to determine moisture content
	2	Chapter 2 Session2	Lecture / Exercise	✓ Compute specific gravity and cross-parameter relations ✓ Describe the laboratory procedures to determine specific gravity
	3	Chapter 2 Session3	Lecture / Exercise	2.3 Grain size distribution 2.3.1 Introduction 2.3.2 Grain size distribution analysis 2.3.2.1 Sieve analysis ✓ Demonstrate a working knowledge of sieve analysis ✓ Draw soil grain size distribution curves based on sieve analysis results
10 [MAR. 2-8]	1	Chapter 2 Session4	Lecture / Exercise	2.3.2.2 Hydrometer analysis ✓ Demonstrate a working knowledge of hydrometer analysis ✓ Draw soil grain size distribution curves based on hydrometer analysis results
	2	Chapter 2 Session5	Lecture / Exercise	2.3.3 Grain size distribution curves ✓ Be able to interpret combined grain size distribution curves ✓ Calculate uniformity co-efficient and coefficient of gradation ✓ Determine the gap/uniform/well gradeness of a soil
	3	Chapter 2 Session6	Lecture / Exercise	2.4 Soil consistency 2.4.1 Introduction 2.4.2 Atterberg limits 2.4.2.1 Liquid limit
11 [MAR. 9-15]	1	Chapter 2 Session7	Lecture / Exercise	2.4.2.2 Plastic limit 2.4.2.4 Shrinkage limit
	2	Chapter 2 Session8	Lecture / Exercise	2.4.3 Indices Summary Exercises
	Assignment 2		10.04.2019	

12 [MAR. 16-22]	1	Chapter 3 Session1	Lecture / Exercise	**3. Classification and Field Identification of Soils** 3.1 Introduction 3.2 Soil classification 3.2.1 Grainsize classifications 3.2.2 Textural classification
	2	Chapter 3 Session2	Lecture / Exercise	3.2.3 Unified Soil Classification System
13 [MAR. 23-29]	1	Chapter 3 Session3	Lecture / Exercise	3.2.4 AASHTO classification ▪
	2	Chapter 3 Session4	Q&A	3.3 Field identification of soils ▪ Learn simple methods of rough identification of soils in the field such as texture, color, odor
	Assignment 3		24.04.2019	
14 [MAR. 30-APR. 5]	1	Lab. Part-I Session 1	Lab. practice	**Test 1: Moisture Content Determination** **Test2: Specific Gravity Determination** **Test 3: Sieve Analysis** **Test 4: Hydrometer Analysis**
	2	Lab. Part-I Session 2	Lab. practice	**Test 5: Liquid Limit Determination** **Test 6: Plastic Limit Determination** **Test 7: Shrinkage Limit Determination [Demo]**
Test 1: APRIL 3, 2020				
15 [APR. 6-12]	1	Chapter 4 Session1	Lecture / Exercise	**4. Soil Water, Permeability and Seepage** 4.1 Soil water 4.1.1 Adsorbed water 4.1.2 Capillary water 4.1.3 Gravitational water
	2	Chapter 4 Session2	Lecture / Exercise	4.2 Permeability 4.2.1 Introduction 4.2.2 Factors affecting permeability of soils 4.2.3 Hydraulic gradient 4.2.4 Darcy's law
16 [APR.13 – 19]	1	Chapter 4 Session3	Lecture / Exercise	4.2.5 Determination of permeability 4.2.5.1 Laboratory Methods (Constant head/falling head/Rowe cell) 4.2.5.2 Field Methods (Pumping in/pumping out) 4.2.5.3 Empirical equations 4.2.6 General equation of flow 4.2.7 Permeability in stratified soils 4.2.8 Aquifers

	2	Chapter 4 Session4		4.3 Seepage 4.3.1 Introduction 4.3.2 Equation of continuity 4.3.3 Flow nets
17 [APR. 20 – 26]	1	Chapter 4 Session5		4.3.3.1 Construction of flow nets for hydraulic structures 4.3.3.2 Calculation of flow rate 4.3.3.3 Hydraulic uplift force under a structure 4.3.3.4 Flow nets in anisotropic soils
	2	Chapter 4 Session6		4.3.4 Critical flow conditions 4.3.4.1 Critical hydraulic gradient 4.3.4.2 Seepage forces 4.3.4.3 Piping
	Assignment 4		1.05.2019	
18 [APR. 27 – MAY. 3]	1	Chapter 5 Session1	Lecture / Exercise	**5. Soil Compaction** 5.1 Introduction 5.1.1 Definition and principle of compaction 5.1.2 Factors affecting compaction 5.1.3 Effects of Compaction 5.2 Laboratory compaction test 5.2.1 Standard Proctor test 5.2.2 Modified Proctor test
	2	Chapter 5 Session2	Lecture / Exercise	5.3 Engineering behavior of compacted soils 5.3.1 Clay structure 5.3.2 Swelling & Permeability 5.3.3 Compressibility & Strength 5.4 Field compaction and specification 5.4.1 Field compaction instruments 5.4.2 Factors affecting field compaction
19 [MAY 4 – 10]	1	Chapter 5 Session3	Lecture / Exercise	5.5 Compaction quality control 5.5.1 Field compaction control parameters 5.5.2 Determination of dry unit weight in the field
	2	Chapter 5 Session4	Q&A	Summary Exercises
	Assignment 5		22.05.2019	
20 [MAY 11 – 17]	1	Lab. Part-II Session 1	Lab. practice	**Test 8: Constant Head Permeability Test** **Test 9: Falling Head Permeability Test**
	2	Lab. Part-II Session 2	Lab. practice	**Test 10: Standard Proctor Compaction** **Test 11: Modified Proctor Compaction**
Test 2: May 20, 2020				

21 [MAY 18 – 24]	1	Chapter 6 Session1	Lecture / Exercise	**6. Stress in a Soil Mass** 6.1 Introduction 6.2 Basics of stress-strain relations 6.2.1 Definitions 6.2.2 Idealized stress-strain response & yielding 6.2.3 Hooke's law 6.2.4 Plane strain & axisymmetric conditions 6.3 Stress and strain states 6.3.1 Principal planes & principal stresses 6.3.2 Mohr's circle
	2	Chapter 6 Session2	Lecture / Exercise	6.4 Stress paths 6.4.1 Introduction 6.4.2 Stress & strain invariants 6.4.3 Plotting stress paths
	3	Chapter 6 Session3	Lecture / Exercise	6.5 Geostatic stress 6.5.1 Total stress 6.5.2 Neutral stress 6.5.2.1 Pore pressure distribution in flow net construction 6.5.2.2 Uplift forces under hydraulic structures 6.5.3 Effective stress 6.5.3.1 Seepage force 6.5.3.2 Modified effective stress during seepage 6.5.3.3 Static liquefaction due to seepage
22 [MAY 25 – 31]	1	Chapter 4 Session4	Lecture / Exercise	6.6 Additional stress 6.6.1 Equations based on elasticity 6.6.1.1 Point load / Line load / Strip load 6.6.1.4 Uniformly loaded circular area 6.6.1.5 Uniformly loaded rectangular area
	2	Chapter 4 Session5	Lecture / Exercise	6.6.2 Newmark's influence chart 6.6.3 Approximate methods for rectangular loads
	3	Chapter 4 Session6	Q&A	Summary Exercises
	Assignment 6		05.06.2019	
29-MAY-2020 Mini-Project Submission, Presentation and Defence				
Test 3: JUNE 3, 2020				
25 [JUNE 08 – 19]				**Final Examination [June 10, 2020]**