



Course Weekly Outline

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Course name	Foundation engineering-1			
Course objective	When the student complete studying this course, he should be able to: 1. Understand the importance of soil investigations and be able to plan a soil investigation. 2. Estimate the bearing capacity and settlement of structures founded on soils. 3. Calculate stresses in soils from external loads. 4. Calculate one-dimensional consolidation settlement and time rate of settlement for foundations. 5. Estimation of elastic and secondary settlement for foundations. Analyze and design shallow foundations.			
Course description	This course is intended to; 1. To evaluate the general suitability of the site and enable adequate and economical design for the proposed project 2. Calculate the safe bearing capacity of soils. 3. Estimate the settlement of shallow foundations 4. Estimate the size of shallow foundations to satisfy bearing capacity and settlement criteria. 5. Provide the steps of structural design for shallow foundations.			
References	Foundation Analysis and Design By; Joseph E. Bowles			
External sources	Principles of Foundation Engineering – Ninth Edition By; Braja M. Das and Nagaratnam Sivakugan			
Course assessment	Lab.	Quizzes and assessment	Mid-term exam	Final exam
		40	10	50
General notes				



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Week No.	Theoretical	Experimental	Aims
1	Their Importance and Purpose, Foundation Classification, Requirements of Foundations		This course is intended to; 1. To evaluate the general suitability of the site and enable adequate and economical design for the proposed project 2. Calculate the safe bearing capacity of soils. 3. Estimate the settlement of shallow foundations 4. Estimate the size of shallow foundations to satisfy bearing capacity and settlement criteria. 5. Provide the steps of structural design for shallow foundations.
2	In-Situ (Field) Tests, Standard Penetration Test		
3	Bearing Capacity of Shallow Foundations;		
4	General (Hansen's) Bearing Capacity Equation, Skempton's Method		
5	Footings with Eccentric Loadings, Footing on Layered Soils, Bearing Capacity of Footings Adjacent to a Slope, Bearing Capacity from Field Tests		
6	Foundation Settlement; Introduction, Contact Pressure, Stresses in a Soil Mass,		
7	Consolidation Settlement, Secondary Settlement, Allowable Settlement		
8	Spread Footing Design; Ultimate Strength Design Method		
9	Design of R.C. Spread Footings, Design of Plain Concrete Spread Footings,		
10	Rectangular Footings, Eccentrically Loaded Spread Footings		
11	Combined Footing Design; Introduction, Rectangular Combined Footing,		
12	Trapezoidal Combined Footing, Strap (or Cantilever) Footing		
13	Trapezoidal Combined Footing, Strap (or Cantilever) Footing		

14	Mat Foundation Design; Introduction, Types of Mat Foundations, Bearing Capacity of Mat Foundations, Mat Settlements, Design of Mat Foundations		
15	Mat Foundation Design; Introduction, Types of Mat Foundations, Bearing Capacity of Mat Foundations, Mat Settlements, Design of Mat Foundations		