

LESSON PLAN - CE 1024 –GEOTECHNICAL ENGINEERING II
Academic year 2015-16

Instructional Objectives

Instructional Objective No.	Instructional Objectives (IO)
1	Familiarize the students with a basic understanding of the essential steps involved in a geotechnical site investigation.
2	Introduce to the students, the principle types of foundation and the factors governing the choice of the most suitable type of foundation for a given solution.
3	Familiarize the students with the procedures used for: a) bearing capacity estimation, b) load carrying capacity of pile, c) determining earth pressure and d) concept on stability of slope.

Student Outcomes

Student Outcomes No.	Student Outcome (SO)
a	An ability to apply knowledge of mathematics, science, and engineering
e	An ability to identify, formulate and solve engineering problems
k	An ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Mapping of Instructional Objectives (IOs) with Student Outcomes (SOs)

CE 1024 –GEOTECHNICAL ENGINEERING II

Instructional Objective No	Instructional Objectives (IO)	Student Outcomes		
		a	e	k
1	Provide the students with basic understanding of the essential steps involved in a geotechnical site investigation.	x	x	
2	Introduce to the students, the principle types of foundation and factors governing the choice of most suitable type of foundation for a given solution.	x	x	x
3	Familiarize the students with the procedures used for: a) bearing capacity estimation, b) end bearing capacity, c) skin friction	x	x	x

Lesson Plan – 2015-16

CE1024	GEOTECHNICAL ENGINEERING II	Lecture Hours (L)	Tutorial Hours (T)	Practical Hours (P)	Credits (C)
		2	2	0	3

Lecture No.	Topic	No. of Hours	Instructional Objectives	Student Outcome	References
UNIT I – SITE INVESTIGATION AND SELECTION OF FOUNDATION					
1	Introduction- planning and stages in sub-surface exploration	1	1	a,e	1,2
2	Depth and spacing of exploration	1	1	a,e	1,2
3	Methods of exploration – Test pit-Trenches – Boring methods	3	1	a,e	1,2
4	Geophysical methods – Seismic refraction and Electrical resistivity method	2	1	a,e	1,2
5	Types of soil samples – disturbed and undisturbed samples - problems – Features of sampler affecting soil disturbance.	2	1	a,e	1,2
6	Standard penetration test – Corrections - problems – Static and Dynamic cone penetration test – bore log report	3	1,2	a,e	1,2
	Cycle Test 1	2			
UNIT II – BEARING CAPACITY					
7	Bearing capacity – definition -Types of failure	2	3	a,e,k	1,2
8	Bearing capacity of shallow foundation on homogenous deposits- Terzaghi's methods- problem	2	3	a,e,k	1,2
9	Skempton's methods- problem	1	3	a,e,k	1,2
10	BIS methods- problem	2	3	a,e,k	1,2
11	Effect of Water Table on bearing capacity- problem	1	3	a,e,k	1,2
12	Plate load test- Bearing capacity from in-situ tests – SPT,SCPT and Plate load test	3	3	a,e,k	1,2
13	Methods of improving bearing capacity	1	3	a,e,k	1,2
UNIT III – FOOTINGS AND RAFTS					
14	Types of foundation	1	2	a,e	1,2,3
15	Contact pressure distribution below isolated footing	1	2	a,e	1,2,3
16	Types and proportioning of combined footing-problem – Types and application of mat foundation – Floating foundation	4	2	a,e	1,2,3
17	Settlement: Total and differential settlements	3	2	a,e	1,2,3
18	Causes and methods of minimizing settlement.	3	2	a,e	1,2,3
	Cycle Test 2	2			

UNIT IV – PILE FOUNDATION					
19	Types and function of piles – Factors influencing the selection of pile	2	2,3	a,e,k	1,2,3,4
20	Load carrying capacity of single pile in cohesionless and cohesive soil – Static formulae- problem	2	2,3	a,e,k	1,2,3,4
21	Dynamic formulae (Engineering News and Hileys) - problem	2	2,3	a,e,k	1,2,3,4
22	Load carrying capacity from in-situ tests (SPT and SCPT) - Pile load test	2	2,3	a,e,k	1,2,3,4
23	Load carrying capacity of Pile group- problem- Negative skin friction – Under-reamed piles	2	2,3	a,e,k	1,2,3,4
24	Introduction to well foundation- Diaphragm walls	2	2,3	a,e,k	1,2,3,4
UNIT V – EARTH PRESSURE					
20	Earth pressure in soils: active and passive states- problem	2	1,2	a,e	1,2,3
21	Lateral earth pressure- Rankine’s Theory-Stratified soil- problem	4	1,2	a,e	1,2,3
22	Culmann’s Graphical method	2	1,2	a,e	1,2,3
23	Slopes- Finite and Infinite slopes-Types of failure- Causes of failure-Remedial measures	2	1,2	a,e	1,2,3
24	Procedure for slip circle method and method of slices	2	1,2	a,e	1,2,3
	Model Examination	3			
	Total Hours	60			

TEXT BOOKS

1. C.Venkatramaiah, “Geotechnical Engineering”, New Age International Publishers,
2. Joseph.E Bowles, “Foundation Analysis and Design”, Mc Graw Hill Publishing co., 2001
3. Murthy .V.N.S, “Textbook of Soil Mechanics and Foundation Engineering”, CBS Publishers and Distributors, New Delhi, 2009.

REFERENCE BOOKS

4. Arora .K.R.”Soil Mechanics and Foundation Engineering”, Standard Publishers and Distributors, New Delhi, 2011.
5. Punmia.B.C.,Soil Mechanics and Foundations, Laxmi publications Pvt Ltd.,2000
6. Das .B.M, “Principles of Foundation Engineering”(Fifth Edition), Thomson Books,2010.

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