Course Number and Name

BCE503 - FOUNDATION ENGINEERING

Credits and Contact Hours

3 & 45

Course Coordinator's Name

Dr. R. Venkata Krishnaiah

Text Books and References

TEXT BOOKS:

1. Punmia, B.C., Soil mechanics and foundations, Laxmi publications pvt. Ltd., New Delhi.

REFERENCES:

1. Khan, I.H., A text book of Geotechnical Engineering, Prentice Hall of India, New Delhi, 1999.
2. Arora K.R. Soil mechanics and foundation engineering, standard publishers and distributors, New Delhi, 1997.
3. Bowles J.E. Foundation analysis and design, McGraw Hill, 1994.
4. Gopal Ranjan and Rao, A.S.R. Basic and applied soil mechanics, Wiley Eastern Ltd., New Delhi (India), 1997.

Course Description

- To impart knowledge on common method of sub soil investigation and design of foundation and to acquire the capacity to investigate the soil condition and to select and design a suitable foundation.

Prerequisites	Co-requisites
Soil Mechanics	NIL

required, elective, or selected elective (as per Table 5-1)

Course Outcomes (COs)

CO1	Select type of foundation required for the given soil condition.
CO2	Determine the settlement of the foundation on different types of soil
CO3	Find the dimensions of the foundation for isolated footing, combined footing and floating foundation
CO4	Analyze the group of piles for their load capacity
CO5	Carry out stability analysis of retaining walls.

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1			H	H							
CO2			H	H							
CO3	L		H	H							

	CO4	M		H	H							
	CO5	H		H	H							

List of Topics Covered

UNIT I SITE INVESTIGATION AND SELECTION OF FOUNDATION 9

Introduction – Scope and objectives – Method of exploration: boring – Sampling – disturbed and undisturbed sampling – sampling techniques – Bore log and report – Penetration tests– Data interpretation – Selection of foundation based on soil condition

UNIT II SHALLOW FOUNDATION 9

Introduction – Location and depth of foundation – codal provisions – bearing capacity of shallow foundation on homogeneous deposits – bearing capacity from in-situ tests – Factors influencing bearing capacity – codal provisions – Settlement – Components of settlement – Settlement of foundations on granular and clay deposits – Allowable and maximum differential settlements of buildings – Codal provision – Methods of minimizing settlement.

UNIT III DESIGN OF FOOTING 9

Types of foundation – structural design of spread footing – Design aspects of combined and mat foundation – Codal provisions.

UNIT IV PILE FOUNDATION 9

Types of piles – Factors influencing the selection of pile – Carrying capacity in granular and cohesive soils – Static and dynamic formulae – Capacity from in-situ tests– Piles subjected to uplift – Negative skin friction – Group capacity – Settlement of pile groups – Interpretation of pile load test – Pile caps – Codal provisions

UNIT V RETAINING WALLS 9

Earth pressure theory – Plastic equilibrium in soils – active and passive states – Rankine's theory – Coloumb's wedge theory – Classical and limit equilibrium solution – Earth pressure on retaining walls of simple configurations – pressure on the wall due to single line load alone – Graphical method (Culmann's method alone) – Stability of retaining wall.