Course Number and Name
BCE403 - SOIL MECHANICS
Credits and Contact Hours
3 & 45
Course Coordinator's Name
Mr.P.Dayakar
Text Books and References

TEXT BOOKS:

1. Punmia P.C., "Soil Mechanics and Foundations ", Laxmi Publications Pvt. Ltd., New Delhi 2005

REFERENCES:

1. Holtz R.D. and Kovacs W.D., "Introduction to Geotechnical Engineering ", Prentice-Hall, 1995.
2. McCarthy P.D.F., "Essentials of Soil Mechanics and Foundations ", Prentice-Hall, 1973.
3. Sutten B.H.C., "Solving Problems in Soil Mechanics", Longman Group Scientific and Technical, U.K.England, 1994.
4. Khan I.H., "A text book of Geotechnical Engineering ", Prentice Hall of India, New Delhi, 1999.
5. Arora K.R., "Soil Mechanics and Foundation Engineering ", Standard Publishers and Distributors, New Delhi, 1997.

Course Description

- To impart knowledge on behavior and the performance of saturated soil.
- To understand and access both physical and engineering behavior of soils, mechanism of stress transfer in two-phase systems and stability analysis of slopes

Prerequisites	Co-requisites
Engineering Mechanics	NIL

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

Course Outcomes (COs)

CO1	To carry out soil classification
CO2	To solve three phase system problems
CO3	To solve any practical problems related to soil stresses estimation, permeability and seepage including flow net diagram.
CO4	To estimate the stresses under any system of foundation loads
CO5	To solve practical problems related to consolidation settlement and time rate of settlement.

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

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

CO2	H			H	M							
CO3				H								
CO4	M			M								
CO5		M		H								

List of Topics Covered

UNIT I INTRODUCTION 10

Nature of soil - Soil description and classification for engineering purposes - IS Classification system – Phase relationships - Soil compaction - Theory, comparison of laboratory and field compaction methods – Ground improvements by compaction.

UNIT II SOIL WATER AND WATER FLOW 8

Soil water - static pressure in water - Permeability measurement in the laboratory and field - Seepage - Introduction to flow nets - Simple problems.

UNIT III STRESS DISTRIBUTION AND SETTLEMENT 9

Effective stress concepts in solids - Stress distribution in soil media - Use of influence charts - Components of settlement - Immediate and consolidation settlement - Terzaghi's one dimensional consolidation theory.

UNIT IV SHEAR STRENGTH 9

Shear strength of cohesive and cohesion less soils - Mohr - Coulomb failure theory - saturated soil mass - Measurement of shear strength - direct shear - triaxial compression, UCC and Vane shear tests - Pore pressure parameters.

UNIT V SLOPE STABILITY 9

Slope failure mechanisms - Types - Infinite slopes - Finite slopes - Total stress analysis for saturated clay - Method of slices - friction circle method - Use of stability number - Slope protection measures.