

K L UNIVERSITY
SOIL MECHANICS (11 - CE 206)

SYLLABUS

L	T	P	Cr
3	0	2	4

Origin of Soils: Soil Origin, rock cycle.

Phase Relations: Weight Relationships, Volume Relationships, Density and Unit Weight Relationships, Inter-relationships.

Laboratory tests on index properties of soils.

Soil Classification: coarse grained soils, fine grained soils., IS soil classification

Compaction: variables in compaction, laboratory tests, field compaction, specification and control.

Effective Stress: Effective stress Principle, effective stress, pore water pressure, and total stress variation with depth, vertical normal stress due to overburden, capillary effects in soils.

Permeability: Bernoulli's Equation, Darcy's law, Laboratory and field measurement of permeability, factors affecting permeability. Stress in soils due to flow, Seepage Force, Downward Flow, Upward Flow, Quick Condition.

Vertical stresses beneath the loaded areas: stresses due to point load, stresses due to line load, stresses under the corner of rectangular load, 2:1 distribution method.

Compressibility: Compressibility as a function of effective stress, soil type, stress history; normally consolidated and over consolidated clay.

Consolidation: Terzaghi's One-Dimensional Consolidation theory, consolidation test, Consolidation Settlement, Determining Coefficients of compressibility and consolidation, limitations in predicting consolidation behavior, amount of consolidation, time for consolidation, secondary compression.

Shear Strength: Mohr's Circle, Mohr Coulomb failure criterion, Mohr circles and failure envelopes interms of effective and total stresses. Drained and undrained loading tests, direct shear test, traixial test, skempton pore water pressure parameters. Field vane shear test

Site Investigations: Various geotechnical field investigations, geotechnical field report.

TEXT BOOK:

1. Geotechnical Engineering: A practical problem solving approach by N Sivakugan, and Braja M Das, Eureka series, J. Ross publishing, 2009.

REFERENCE BOOK:

1. Geotechnical Engineering by Shashi K Gulhati and Manoj Datta, TATA McGraw HILL Publishing Company Limited, New Delhi, 2008.
2. Soil Mechanics and Foundation Engineering by V. N. S. Murthy, CBS Publishers & Distributors, New Delhi.

K L UNIVERSITY
SOIL MECHANICS (11 - CE 206)

LIST OF EXPERIMENTS

L	T	P	Cr
3	0	2	4

CYCLE-I

1. (a) Determination of water content by oven dry method.
- (b) Visual identification of soils.
- 2 Determination of specific gravity of soils by using
 - (a) Density bottle method.
 - (b) Pycnometer method
- 3 To determine classification of soil by using I.S sieve method
- 4 To determine clay & silt percentage in soils by using hydrometer method.
- 5 (a) To determine of liquid limit of soils
 - (b) To determine of plastic limit of soils.
- 6 (a) To determine of field unit weight by using core cutter method.
- (b) To determine of field unit weight by using sand replacement method.

CYCLE-II

1. To determine of permeability of soils by constant head permeameter method
2. To determine of permeability of soils by variable head permeameter method
3. To determine shear strength parameter of soil by using direct shear apparatus
4. To determine of undrained shear strength soft clay by using vane shear apparatus
5. To determine compressive strength of soil by using unconfined compressive apparatus
6. (a) To determine soil OMC & MDD by standard proctor compaction test
 - (b) To determine soils OMC & MDD by modified proctor compaction test

DEMONSTRATION ONLY

1. To determine soil shear using field vane shear
2. To determine soil swell pressure by swell pressure apparatus
3. To determination of soils consolidation test