CE/BOS/CE C211/0210

K L UNIVERSITY

SOIL MECHANICS (CE C 211)

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SYLLABUS

UNIT – 1 Origin and Classification of Soils

Soil Origin, Criteria for soil classifying soil, Classification on the basis of Grain Size, plasticity, Symbols and graphic representation, classified soil and its engineering properties, IS soil classification.

The Three Phase System: Jargon, Weight Relationships, Volume Relationships, Density and Unit Weight Relationships, Inter-relationships

UNIT- II Effective Stress Principle

The Principle, Measurable Stresses, Nature of effective stress

Effective Stress under Hydrostatic Conditions: Distribution of effective stress with depth, Influence on effective stress of a shift in the water table, ground surface.

Permeability: Permeability as a function of Soil Type, Void Ratio, Soil Structure, Permeant, and effective stress

Measuring Permeability: Darcy's law, Constant Head Permeameter, Falling Head Permeameter, Laboratory measurement of permeability.

Effective Stress under Steady State One-Dimensional Flow: Seepage Force, Downward Flow, Upward Flow, Quick Condition

UNIT- III Compressibility

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

Effective Stress Under Transient Hydrodynamic Conditions: An analogy, mechanical model, condition of continuity, Terzaghi's One-Dimensional Consolidation theory, Effective stress distribution in a compressible layer during consolidation

Measuring Compressibility Characteristics And Computing Amount Of Time For Consolidation: Consolidation and Settlement, Determining Coefficients of compressibility and consolidation, limitations in predicting consolidation behavior, amount of consolidation, time for consolidation.

UNIT- IV Shear Strength and Its Measurement: Measurement of shear strength, Mohr's Circle, types of triaxial compression tests, shear stress, shear strength and triaxial test, stress strain behavior of sands and clays, concept of failure, shear strength as a function of effective stress, cohesion and friction, pore water pressure paramerters.

Shear Strength Parameters: Shear strength and strength parameters, Effective stress-strength parameters as a function of soil type, stress history and stress range, Relavant parameters.

UNIT -V Engineering properties of natural on-land deposits, natural offshore deposits, man-made deposits. On partially saturated soils.

TEXT BOOK:

1. Geotechnical Engineering by Shashi K Gulhati and Manoj Datta, TATA McGraw HILL Publishing Company Limited, New Delhi, 2008

REFERENCE BOOK:

1. Soil Mechanics and Foundation Engineering by V. N. S. Murthy, CBS Publishers & Distributors, New Delhi