K L UNIVERSITY
FOUNDATION ENGINEERING (11 - CE 302)

Pre – requisite: 11-CE206
SYLLABUS

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3	1	0	4

Bearing Capacity of Shallow Foundations: Basic definitions, Principal modes of soil failures, Terzaghi's bearing capacity theory/ equation and its modifications for square, rectangular and circular foundation, Skempton's bearing capacity analysis for clays, Meyerhof's analysis, Hansen's bearing capacity theory, Vesic's bearing capacity theory, IS code recommendations for bearing capacity, Bearing capacity of granular soils based on SPT value and Static cone resistance, Bearing capacity of footings on layered soils, Factors influencing bearing capacity, Allowable bearing pressure. General requirements of foundations, Factors affecting location and depth of foundation, Choice of type of foundations, Steps involved in the proportioning of footings. **Pile Foundations:** Use of piles, Types of piles, Construction, Selection of pile type, Types of foundations to suit subsoil conditions, Pile load capacity, Static formulae, Dynamic formulae, Load tests, on piles, Group action of piles, Load carrying capacity of pile groups, Negative skin friction, Piles subjected to uplift loads. **Well Foundations:** Types of wells and caissons, components of well foundation, shapes of wells, depth of a well foundation, forces acting on a well foundation, lateral stability of well foundation, construction and sinking of a well. **Settlement Analysis:** Consolidation settlement, Immediate settlement, Corrections to settlement due to consolidation, Settlement in different soil types/Settlement from field tests, Allowable settlement, Settlement of pile group. **Stability Of Slopes:** Infinite slopes and translational slides, Definitions of factor of safety, Finite slopes-Forms of slip surface, Limiting equilibrium method and Critical stages in stability, Total stress and effective stress methods of analysis, $\phi_u = 0$ Analysis (total analysis), $c – \phi$ analysis - method of slices, Location of the most critical circle, Friction circle method, Taylor's stability number. **Earth Pressure And Retaining Walls:** Effect of wall movement on earth pressure, Earth pressure at rest, Rankine's theory of earth pressure, Coulomb's theory of earth pressure, Coulomb's equation for $c = 0$ back fills, Cullman's graphical method, Passive earth pressures-Friction circle method, Design considerations retaining walls.

TEXT BOOK:

1. Basic and Applied Soil Mechanics by Gopal Ranjan and ASR Rao, New Age International Publishers, Second Edition, 2007.

REFERENCE BOOKS:

1. Foundation Analysis and Design by J.E. Bowles, MacGraw Hill, 1996.

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

3. Geotechnical Engineering Principles and Practices by Donald P. Coduto, Man-Chu Ronald Yeung and William A.Kitch, PHI Learning Pvt. Ltd., Second Edition.

4. Foundation Design by W. C. Teng, Prentice hall