

CE/BOS/CE E44/0210

**K L UNIVERSITY**

**DESIGN OF EARTH RETAINING STRUTURES (09 – CE E44)**

**SYLLABUS**

**UNIT – 1**

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Retaining walls - different types - Gravity, Cantilever-counter fort and Crib types. Basement or foundation retaining walls. Design principles of retaining walls, Design and Construction of Reinforced Soil Walls, Reinforced Soil Wall (A Case Study), Geosynthetics for Warehouse Grade Slab and Retaining Wall, Geogrid-Reinforced Retaining Walls, Restoration of Wharf Road by Geosynthetic Reinforced Soil Wall, Abutments and wing walls and allowable bearing capacity settlement tilting. Safety against general slip failure. Type of Failures of Retaining Walls – Stability Requirements – Drainage behind Retaining walls – Provision of Joints – Relief Shells.

**UNIT – 2**

Braced cuts – Lateral Pressure in Braced cuts – Design of Various Components of a Braced cut – Stability of Braced cuts – Bottom Heave in cuts.

**UNIT – 3**

Sheet Pile Structures – Types of Sheet piles – Cantilever sheet piles in sands and clays – Anchored sheet piles – Free earth and fixed earth support methods – Row’s moment Reduction method – Location of anchors, Forces in anchors.

**UNIT – 4**

Soil reinforcement – Reinforced earth - Different components – their functions – Mechanics of reinforced earth – Failure modes-Failure theories – Design of Embankments on problematic soils.

**UNIT – 5**

Cofferdams – types, suitability, merits and demerits – Design of single – wall Cofferdams and their stability aspects – TVA method and Cummins’ methods.

**TEXT BOOKS:**

1. Gopal Ranjan and A.S.R. Rao “Basics and Applied soil mechanics ”, New age International Publishing, second edition, 2007
2. G Venkatapparao P.K. Banerjee, J.T.Shahu, G.V. Ramana By Geo-Synthetics-New Horizons - 2004
3. P.C.Varghese Foundation Engineering Prentice-Hall of India Pvt Ltd , New Delhi - 2006

**REFERENCE BOOKS:**

1. Principles of foundation engineering by Braja M. Das,PWS-KENT Publishing company,boston
2. Foundation analysis and design- Bowles, JE- McGraw Hill
3. Analysis and design of foundation and retaining structures, Prakash, SSaritha Prakashan, Meerut