COURSE INFORMATION

Course Title: Foundation Design
Course Number: CE 421
Meeting Time(s): Tuesday, Thursday 8:00 am – 9:15 am;
Meeting Location(s): Engineering Bldg. A, Room 222

INSTRUCTOR INFORMATION

Instructor Name: Dr. Vijay K. Puri
Office Location: Engineering Bldg. B 28
Office Hours: M, W 9:00-11:00 AM, TR 10:00-11:00 AM
Office Telephone: 453-7818
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COURSE GOALS AND TOPICS

Brief Summary of Course Goals and Topics:
The aim of this course is to give fundamental knowledge and understanding of mainly shallow foundation design. This course includes several topics e.g., bearing capacity theories, design of shallow foundations; earth pressure theories, design of retaining wall and earth retaining structures; pile foundations, piles and piles group subjected to vertical loads.

TEXTBOOKS AND MATERIALS

Required Textbook(s):
4. Additional references may be assigned.

Recommended Textbook(s):
ASSIGNMENTS AND EVALUATIONS

Type and Number of Planned Assignments

Total approximately 10-12 Assignments from different topics

Methods of Evaluation

Exams and Homework Assignments.

COURSE SCHEDULE OVERVIEW

General Outline of Course Topics

Introduction to Foundation Design, Theories of Bearing capacity, Bearing capacity factors, General Bearing capacity equations;

Design of Shallow Foundations, Effect of water table; Eccentrically loaded foundation Bearing capacity of layered stratum;

Stress increase in soil mass due to new load, Settlement of shallow foundation, Immediate settlement of shallow foundation, Consolidation settlement of shallow foundation;

Lateral earth pressure (LEP), Lateral earth pressure at rest, active, passive, Rankine earth pressure theory, Rankine theory to calculate LEP due to surcharge, Effect of wall movement & sloping backfill on LEP Coulomb’s theory to calculate LEP;

Types of Retaining wall, Design of retaining wall; Stability of retaining wall, Mechanically stabilized retaining walls;

Introduction to deep foundation, Pile foundation and types of piles, Compression capacity of single pile in sand, Compression capacity of single pile in clay;

Settlement of single pile, Settlement of pile groups; Pile load test, Efficiency of pile groups.