

PREREQUISITES: CE 351 (Introductory Soil Mechanics)

CREDIT HOURS: 3 (Contact hours 45)

CE 451 is a Design Elective Course for BSCE

INSTRUCTOR: Dr. H. Siriwardane

Office: 637 ESB

Office Hours: Tuesday, Thursday: 11:00 am – 12:00 pm

Phone: 304-293-9946

TEXTBOOK: Das, B. M. (2014) Principles of Foundation Engineering (Eighth edition), CENGAGE Learning Publishing Company

COURSE OBJECTIVES: The objective of this course is to provide coverage of analysis and design methods so that the student has adequate background on the design of basic foundations for buildings and also the design of earth-retaining structures.

| Course Outcome Description | ABET Program outcome * |
|---|-------------------------|
| (1) Learn about stresses and stress increments in a soil mass; analysis and design of shallow foundations | (a), (c), (e) |
| (2) Learn about analysis and design of deep foundations | (a), (c), (e), (j) |
| (3) Learn about analysis and design of earth retaining walls | (a), (c), (e), (j), (k) |

* ABET Program outcomes:

- (a) Apply knowledge of math, science, and engineering
- (c) Design Civil engineering projects and components of projects
- (e) Identify, formulate, and solve Civil Engineering problems
- (j) Knowledge of contemporary issues
- (k) Use techniques, skills, and modern engineering tools

COURSE GRADING

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|----------|------------|
| Exam 1 | 30 percent |
| Exam 2 | 30 percent |
| Exam 3 | 30 percent |
| Homework | 10 percent |

100 percent

ATTENDANCE

Students are expected to attend all class periods.

CLASS SCHEDULE

| WEEK | TOPIC |
|------|---|
| 1 | Introduction |
| 2 | Stress Distribution – Insitu stresses and stress increments |
| 3 | Settlement analysis – elastic settlements |
| 4 | Consolidation settlements |
| 5 | Consolidation settlements, Exam # 1 |
| 6 | Rate of Consolidation settlements |
| 7 | Bearing capacity: Terzaghi's bearing capacity equations, Shallow foundation design |
| 8 | Bearing Capacity: Generalized bearing capacity equations, Shallow foundation design |
| 9 | Deep Foundation Design – Piles in clay |
| 10 | Deep Foundation Design – Piles in sand, Exam # 2 |
| 11 | Lateral earth pressure theories: Rankine active and passive earth pressure |
| 12 | Lateral earth pressure theories: Coulomb active and passive earth pressure |
| 13 | Design of retaining walls |
| 14 | Design of retaining walls, Exam # 3 |
| 15 | Soil improvements |
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FINAL COMMENTS

- Good Luck with the course!
- Talking during class: Please do not disrupt class. Please respect class members.
- Questions: Encouraged during class.
- Homework related questions will be addressed during office hours
- Electronic communication devices such as mobile phones, laptops, etc. should not be used during the class and exams.

SOCIAL JUSTICE STATEMENT

West Virginia University is committed to social justice. West Virginia University is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect and inclusion.