PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(100-400 LEVEL)

DEPARTMENT: Engineering  EFFECTIVE SESSION: Fall 2010

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

☐ 1. New course with supporting documents
☐ 2. Add existing course offered at another campus
☐ 3. Expiration of a course
☐ 4. Change in course number
☐ 5. Change in course title
☐ 6. Change in course credit type
☐ 7. Change in course attributes (department head signature only)
☐ 8. Change in Instructional hours
☐ 9. Change in course description
☐ 10. Change in course requisites
☐ 11. Change in semesters offered (department head signature only)
☐ 12. Transfer from one department to another

PROPOSED:

Subject Abbreviation: CE
Course Number: 38000
Long Title: Soil Mechanics
Short Title: Soil Mechanics

EXISTING:

Subject Abbreviation
Course Number
Long Title: Soil Mechanics
Short Title: Soil Mechanics

TERMS OFFERED:

Check All That Apply:
☐ Summer  ☑ Fall  ☑ Spring

CAMPUS(ES) INVOLVED:

- Calumet
- Cont Ed
- Ft. Wayne
- Tech Statewide
- Indianapolis

Abbreviated title will be entered by the Office of the Registrar if omitted. (22 CHARACTERS ONLY)

CREDIT TYPE:

1. Fixed Credit: Cr. Hrs.
   ☐ 3

2. Variable Credit Range: Minimum Cr. Hrs. (Check One) To ☐ Or ☐ Maximum Cr. Hrs. (Check One)

3. Equivalent Credit: Yes ☐ No ☑

4. Thesis Credit: Yes ☐ No ☑

COURSE ATTRIBUTES: Check All That Apply

7. Registration Approval Type
   ☐ Department
   ☐ Instructor

8. Variable Title

9. Remedial

10. Honors

11. Full Time Privilege

12. Off Campus Experience

Instructional Type

Lecture
Recitation
Presentation
Laboratory
Lab Prep
Studio
Distance
Clinic
Experiential
Research
Ind. Study
Pract/Observe

Minutes Per Mtg
75
Meetings Per Week
2

Weeks Offered
10
% of Credit Allocated
100

Delivery Method (Asyn. Or Syn.)
Synchronized

Delivery Medium (Audio, Internet, Live, Text-Based, Video)

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES):

P: CE 252; C: CE 318, CE 381. Introduction to the nature and origin of soil and rocks; engineering classification of soil; soil compaction; permeability and seepage, engineering behavior and properties of soils; compressibility; and introduction to shear strength of soil, lateral earth pressure, and soil-bearing capacity for foundations.

Calumet Department Head: Date
Calumet School Dean: Date

Donna Long 4-9-10

Fort Wayne Department Head: Date
Fort Wayne School Dean: Date

Jean Kell 4-9-10

Indianapolis Department Head: Date
Indianapolis School Dean: Date

North Central Department Head: Date
North Central Chancellor: Date

West Lafayette Department Head: Date
West Lafayette College/School Dean: Date
West Lafayette Registrar: Date

OFFICE OF THE REGISTRAR
Required Course

CE 380 - Soil Mechanics
Offered each fall and spring

Catalog Data

Class: 3. Credits: 3
Introduction to the nature and origin of soil and rocks; engineering classification of soil; soil compaction; permeability and seepage, engineering behavior and properties of soils; compressibility; and introduction to shear strength of soil, lateral earth pressure, and soil-bearing capacity for foundations.

Prerequisite

CE 252 - Strength of Materials
Authorized equivalent courses or consent of instructor may be used in satisfying course prerequisites.

Corequisite

CE 318 - Fluid Mechanics
CE 381 - Soil Mechanics Laboratory

Required Textbook


References


Course Objectives

To provide students with basic understanding of physical and mechanical properties of soil, together with knowledge of basic engineering procedures to indentify factors controlling soil behavior and methods to determine soil properties. Students will acquire basic knowledge in engineering design of geotechnical systems.

Schedule:

Two classes of 75 minutes per week

Lecture Topics

1. Engineering Geology- Background
2. Origin of Soil and Grain Size
3. Phase Relationships
4. Soil classification
5. Soil Compaction
6. Permeability and Seepage
7. In Situ Stresses
8. Stresses in a Soil Mass
9. Compressibility of Soil
10. Shear Strength of Soil
11. Introduction to Lateral Earth Pressure
12. Introduction to Bearing Capacity
13. Quizzes/Exams

1 Class
1 Class
2 Classes
1 Class
2 Classes
3 Classes
2 Classes
3 Classes
4 Classes
3 Class
3 Classes
2 Classes
3 Classes
Course Outcomes

1. Understand the origin of the soil and geological cycle [a (1)]
2. Apply principles of phase diagram for soil properties and perform basic
   weight-volume calculations. [a (1)]
3. Understand consistency of soil- Atterberg limits. [a (1)]
4. Understand and use AASHTO method for soil classification. [a (1)]
5. Understand and use Unified Soil Classification System for soil classification.
   [a (1)]
6. Understand the basic science of soil compaction. [a (1), e (2)]
7. Understand basics principles of flow and soil permeability through porous
   media including Bernoulli's equation, Darcy's Law, and Hydraulic
   conductivity. [a (1), e (2), k (6)]
8. Understand seepage in soil include Laplace equation of continuity. [a (1)]
9. Construct flow nets for water flow calculations. [a (1), e (2), k (6)]
10. Calculate in situ stress in saturated soil with and without seepage, seepage
    force, and implement measures to control heave in soil. [a (1), e (2), k (6)]
11. Understand how stresses are transferred through soils and be able to
    compute both geostatic and induced stresses due to point, line, and area
    loads. [a (1), e (2), k (6)]
12. Estimate the amount of consolidation and settlement and time required for
    settlement under a given load. [a (1), e (2), h (9), k (6)]
13. Basic knowledge of shear strength principles [a (1), e (2), k (6)]
14. Basic understanding of Lateral Earth Pressure concept and theory [a (1), e (2),
    h (9), k (6)]
15. Understand the basic concept of ultimate bearing capacity of shallow
    foundations. [a (1), e (2), h (9), k (6)]

ABET category:
- Engineering science: 1.5 credits or 50%
- Engineering design: 1.5 credits or 50%