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

**DEPARTMENT** Engineering  
**EFFECTIVE SESSION** Fall 2013

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

- [X] 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: 48100
- Long Title: Foundation Engineering
- Short Title: Foundation Engineering

**EXISTING:**
- Subject Abbreviation
- Course Number

**TERMS OFFERED**
- Check All That Apply:
  - [ ] Summer
  - [X] Fall
  - [X] Spring

**CAMPUS(ES) INVOLVED**
- Calumet
- Ft. Wayne
- Indianapolis
- N. Central
- Cont Ed
- Tech Statewide
- W. Lafayette

**CREDIT TYPE**
- 1. Fixed Credit: 3 Cr. Hrs.
- 2. Variable Credit Range: Minimum Cr. Hrs. (Check One) To
  - No
- Maximum Cr. Hrs. (Check One) To
  - Or
  - Yes
- Equivalent Credit: Yes
- Thesis Credit: Yes

**COURSE ATTRIBUTES:**
- 1. Pass/Not Pass Only
- 2. Satisfactory/Unsatisfactory Only
- 3. Repeatable
- 4. Credit by Examination
- 5. Designator Required
- 6. Special Fees
- 7. Registration Approval Type
  - Department
  - Instructor
- 8. Variable Title
- 9. Remedial
- 10. Honors
- 11. Full Time Privilege
- 12. Off Campus Experience

**COURSE DESCRIPTION (INCLUDE REQUISITES):**
P: CE 380, CE 381. The Foundation Engineering course focuses on geotechnical design of shallow and deep foundations and includes review of geotechnical properties of soil, subsurface exploration, seepage, bearing capacity of shallow foundations, lateral earth pressure theories, retaining walls, and deep foundations.

**OFFICE OF THE REGISTRAR**
Course

CE 48100 – Foundation Engineering

Catalog Description

The Foundation Engineering course focuses on geotechnical design of shallow and deep foundations and includes review of geotechnical properties of soil, subsurface exploration, seepage, bearing capacity of shallow foundations, lateral earth pressure theories, retaining walls, and deep foundations.

Credits

3

Contact Hours

3

Prerequisite Courses

CE 38000, CE 38100

Corequisite Courses

NA

Prerequisites by Topics

Soil Mechanics and Soil Mechanics Lab

Textbook


Course Objectives

To introduce students to the fundamental concepts of foundation analysis and design and to provide students with methods of analysis of geotechnical systems based on field and laboratory data.

Course Outcomes

Students who successfully complete this course will be able to:
1. Understand the basic concepts of geotechnical engineering and apply the concepts in the foundation design. [a, b, c, and e].
2. Plan a subsurface exploration and select appropriate field exploration tools for different soil profiles. [a, b, c, e, g, and k]
3. Identify necessary laboratory tests for appropriate design of foundations. [a, b, c, g, and k]
4. Evaluate laboratory and field data for appropriate selection of design parameters. [a, b, g, and k]
5. Utilize computational techniques such as finite element software and finite difference methods to analyze seepage flow. [a, b, c, g, i, and k]
6. Understand the bearing capacity concepts and apply bearing capacity equations for different soil and loading conditions. [a, c, and e]
7. Evaluate effect of layered soil system and water on bearing capacity analysis. [a, c, and e]
8. Understand the lateral earth pressure theories including Rankin’s theory of active and passive earth pressures apply these theories to design retaining wall structures and MSE walls. [a, c, e, k]
9. Apply the lateral earth pressure theories and bearing capacity concepts for proper stability control of retaining structures against overturning, sliding, and bearing capacity failure. [a, c, e, and k]
10. Identify appropriate deep foundation types for soil conditions. [a, c, and e]
11. Understand the load transfer mechanism in pile foundations and determine the bearing capacity in clay and sand. [a, c, e, and k]
12. Apply geotechnical engineering principles to a real life geotechnical engineering design project [c, e, f, g, h, j, k].

Lecture Topics
1. Review of geotechnical engineering concepts
2. Subsoil exploration and site investigation
3. Applied Computational Techniques in seepage
4. Bearing capacity analysis of shallow foundations
5. Settlement of shallow foundations
6. Lateral earth pressure
7. Retaining structures
8. Fundamentals of deep foundations
9. Case studies of failure

Computer Usage
Low

Laboratory Experience
None

Design Experience
Medium

Coordinator
Ahmadreza Hedayat, Ph.D.

Date
November 20, 2013