### Course Description:

**CE 482: Foundation Engineering**  
(Required for a BSCE degree)

This course will teach the student how to design the foundation of the structures considering the site and structure characteristics through different topics include an introduction to site investigation, types of foundations, bearing capacity of soils, evaluation of the settlement of foundation, design of shallow and deep foundations.

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### Prerequisite

CE 480 (Soil Mechanics), CE 471 (REINFORCED CONCRETE I)

### Course Learning Objectives

Students completing this course successfully will be able to:

1. Understand the methods of site investigations and determine the site characteristics.
2. Understand the types of foundations.
3. Understand the types of loads to be applied to foundations.
4. Understand suitability, feasibility, and desirability of each type of foundations.
5. Understand the aims of using the foundations.
6. Select the proper type of foundation according to the site and structure characteristics.
7. Evaluate the settlement of the selected foundations.
8. Improve the communication skills, including reading, writing, oral presentations.

### Topics Covered

1. Introduction (First week!!! 3hrs)
2. Site Investigations (3 hrs)
3. Types of foundation and foundation materials. (3 hrs)
4. Bearing capacity of shallow foundation. (15 hrs)
5. Bearing Capacity of Mat Foundation. (4 hrs)
6. Bearing capacity of deep foundations. (6 hrs)
7. Pile foundations and caissons. (5 hrs)

### Class/ tutorial Schedule

Three lecture sessions and one tutorial session per week (50 minute each session)

### Computer Applications

Computer spreadsheets are encouraged for developing design aids and carrying out systematic steps of design.  
Computer Grapher software is used for plotting  
Computer Program Z_Soil is briefly introduced

### Contribution of Course to Meeting the Professional Component

1. Students learn how to make a site investigation plane and the required field and laboratory tests to be used for characterizing the site of construction.
2. Students learn the analysis process to be involved in designing both types of shallow and deep foundations.
3. Students improve their writing, communication and presentation skills.

### Relationship of Course to Program Outcomes

1. Students apply principles of soil and rock mechanics.
2. Students are able to apply knowledge in mathematics, physics, and engineering science to civil and engineering problems.
3. Students are able to design experiments and analyze data.
4. Students are able to identify and formulate an engineering problem and to develop a
solution.
5. Students recognize the importance of analysis in selecting the type of foundation and the type of retaining structure.
6. Students are able to understand and apply specification requirements.
7. Students are encouraged to improve their writing, communication and presentation skills.

| Textbook(s) and/or Other Required Material | 1. Braja M. Das, Principles of Foundation Engineering, Fifth Edition
|                                            | 2. Bowels, Foundation Engineering, |
| Prepared by                               | Prof. H. Alawaji                   |
| Date of Preparation                      | February 16, 2008                  |

Grade Distribution

- Mid-term Exam: 35% (April 21, 08 & Rabi II 15, 1429; 5 to 6:30 PM)
- Homework and Quiz: 15%
- Final Exam: 50%