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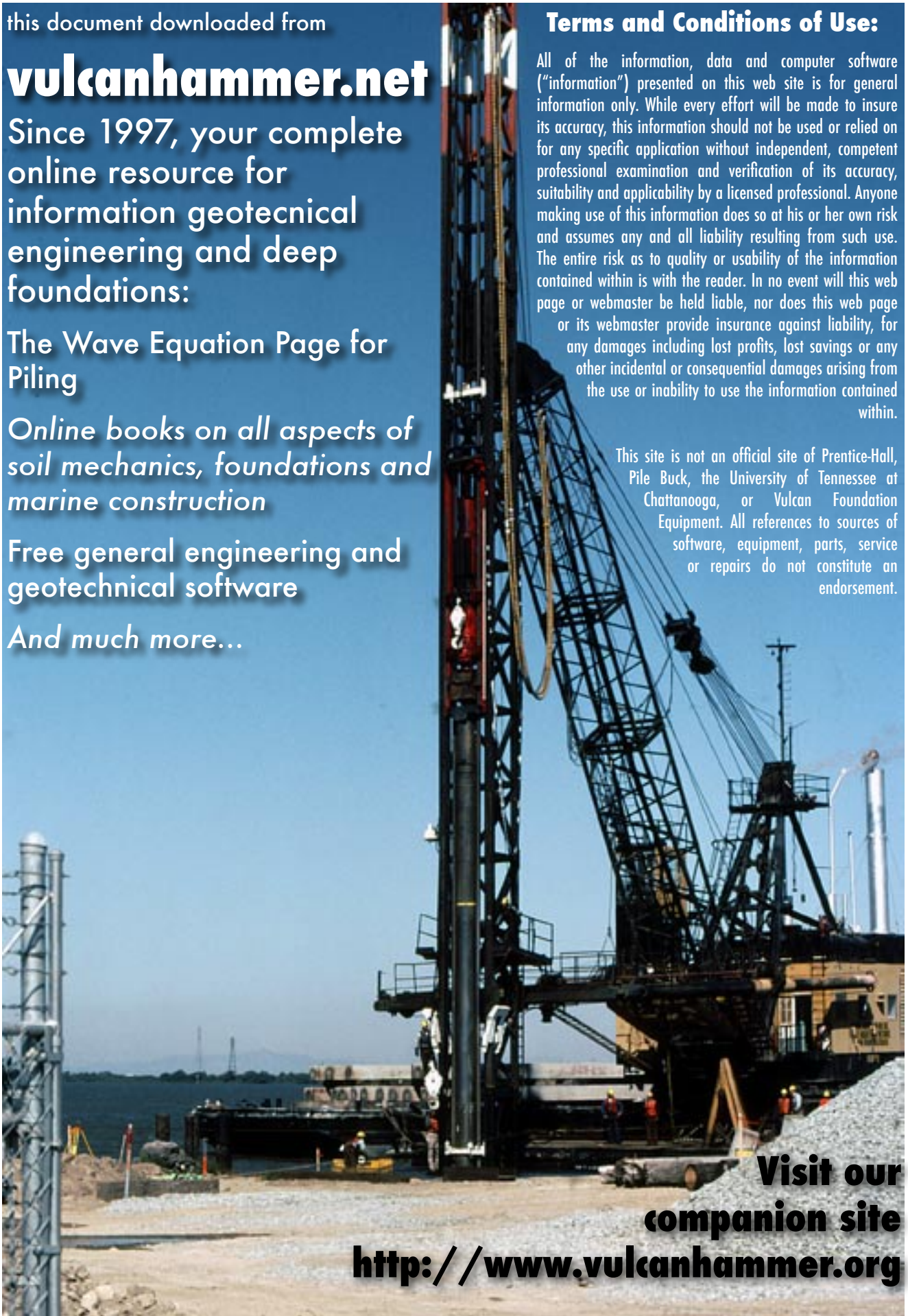
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**University of Tennessee at Chattanooga**  
**College of Engineering and Computer Science**  
**ENCE 4610 - Foundation Analysis and Design (3)**  
**40672 – Fall 2010**  
**M-W 0800-0915, EMCS 402**

**Catalog Description**

Fundamentals of soil mechanics as applied to the analysis and design of foundation systems; subsurface investigations; design of shallow and deep foundations. Retaining structures and lateral earth pressures. Lecture 3 hours. Prerequisites: ENCE3610 with a grade of C or better.

**Instructor**

Don C. Warrington, P.E., M.S.

Office: 430E EMCS (Textbook Museum)

Email [Don-Warrington@utc.edu](mailto:Don-Warrington@utc.edu)

Website for Course Slides: <http://www.vulcanhammer.net/utc/ence461/f2010/>

Office Hours M 0930-1130, Tu 1400-1700, W 0930-1030

More information on the instructor can be found at <http://www.vulcanhammer.info>

**Textbook**

Coduto, D.P. *Foundation Design: Principles and Practices*, 2<sup>nd</sup> ed. Upper Saddle River, NJ: Prentice Hall, 2001.

**Reference Works<sup>1</sup>**

N.C. Samtani and E.A. Nowatski. *Soils and Foundations Reference Manual*. FHWA NHI-06-088 and NHI-06-089. Washington, DC: Federal Highway Administration, 2006.

NAVFAC DM 7.02, *Foundations and Earth Structures*. Naval Facilities Engineering Command, Alexandria, Virginia, 1986.

**Course Objectives (numbers in parentheses indicate relationship to civil engineering program outcomes)**

At the completion of the course, students will have demonstrated the ability to:

- ✓ Design a shallow foundation for maximum bearing capacity. (2, 3, 7)
- ✓ Design a spread footing for structural integrity. (2, 3, 7)
- ✓ Design a deep foundation for structural integrity. (2, 3, 7)
- ✓ Design a deep foundation for geotechnical capacity, and (for driven piles) evaluate drivability. (2, 3, 7)
- ✓ Design a retaining wall for structural and geotechnical capacity and integrity. (2, 3, 7)

**Course Outline**

- |                                     |   |
|-------------------------------------|---|
| 1. Introduction                     | c) Geotechnical Design of Spread Footings |
| a) Foundations in Civil Engineering | d) Structural Design of Spread Footings   |
| b) Performance Requirements         | e) Mat Foundations                        |
| 2. Shallow Foundations              | 3. Deep Foundations                       |
| a) General                          | a) General                                |
| b) Bearing Capacity                 | b) Capacity, Static Methods               |

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<sup>1</sup> Reference materials can be downloaded (or hard copies obtained if desired) from <http://www.vulcanhammer.net/utc/>

- c) Capacity, Dynamic Methods
- d) Structural Considerations in Deep Foundations
- e) Field Verification Methods
- f) Design of Deep Foundations

- 4. Retaining Walls
  - a) Lateral Earth Pressures
  - b) Types of Retaining Walls
  - c) Design Methods

### **Evaluation**

- Five (5) Homework Assignments @ 5% each: 25%
- Four (4) Unannounced Quizzes @ 4% each: 16%
- One (1) Mid-Term Test: 15%
- One (1) Design Project: 25%
- One (1) Final Examination: 19%

### **Course Policies**

- Due date for homework assignments will be announced when assignment is given. Homework turned in after due date will have 10% deducted from grade for each class period late. Homework turned in after last class session (or not turned in at all) will be given a grade of zero.
- Letter Grading System:
  - 90 – 100: A
  - 80 – 90: B
  - 70 – 80: C
  - 60 – 70: D
  - < 60: F
- All homework, quiz, project, test and final grades will be posted on Blackboard. All mid-term and final grades can be accessed through the Banner system.
- Attendance is required with the exception of special arrangements made before class as the only excused absences.
- It is preferred that all homework and tests be on engineering paper. This comes in light green or buff color and is available with five squares to the inch from the UTC bookstore. If you use paper other than engineering paper, make sure it is not ripped out of a notebook, or points will be taken off.
- When applicable, all problems must include a figure. All figures are to be neat and legible. Also when applicable, all problems must include a) Given b) Find c) Solution. On the first page of each problem set or test, in the upper right hand corner write a) Your Name, b) Course Number and c) Problem Set or Test Number. *Any problem set or test that does not follow these rules or is not neat will receive reduced credit.*
- Each time you use an equation, write down what it is: don't just put a bunch of numbers on the page and expect anyone to know what you did. This too will result in reduced credit.
- You are encouraged to work homework with someone but the work you turn in must be your own work.
- You are required to keep and assemble a three-ring (or other suitable binding) notebook with the following divisions in it:
  - Homework
  - Quizzes

- Tests
- Reports
- Class Notes (Optional)

You will turn this notebook in at the final exam. It will be inspected and returned to you. It is not necessary, when turning in the notebook, to include printed copies of the lecture slides.

- Make up quizzes and tests are considered on an individual basis.
- Criteria for the project report will be posted separately on Blackboard.
- You are studying now so that you may enter and practice the engineering profession later. The engineering profession is highly regarded by the public because those who practice it do so with ethical and social consciousness. The same is expected of students in this course. Any direct copying of homework, tests or exams will be considered a violation of the honor code and a course grade of "F" will be given.

### **Disabilities**

- **Attention:** If you are a student with a disability (i.e., physical, learning, psychiatric, etc) and think that you might need assistance or an academic accommodation in this class or any other class, please contact the Office for Students with Disabilities at 425-4006 or go to the office- 102 Frist Hall.