School of Civil and Construction Engineering
OREGON STATE UNIVERSITY

CE 571 – ADVANCED FOUNDATION ENGINEERING
Fall Term 2011 (4 credits)

Instructor: Dr. Armin W. Stuedlein, P.E. armin.stuedlein@oregonstate.edu
340 Owen Hall 541.737.3111
Office Hours: **M** 11:00 – 12:00; 11:00 – 12:00 **W**

Class Sections: Lecture: 1 hr 50 min, 2 days/ week (No recitation or laboratory)
Days: **T**, **Th** Time: 10:00 – 11:50 Location: Kearney 205

Prerequisites: CE 373 and CE 471 or equivalent, or consent of the instructor

Textbook: *Required*: The Engineering of Foundations, 2008, Salgado
Recommended References:

1. Foundation Engineering Handbook, 2nd Ed., 1991, Fang. **ON RESERVE**
2. An Introduction to Geotechnical Engineering, 2nd Ed., 2011, Holtz, et al. **ON RESERVE**
3. Soil Mechanics in Engineering Practice, 3rd Ed., 1996, Terzaghi, et al. **ON RESERVE**
4. EPRI Manual for Estimating Soil Properties for Foundation Design (to be provided)
5. Elastic Solutions for Soil and Rock Mechanics, Poulos & Davis (to be provided)
6. FHWA Manuals: http://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm

Course Description: This course presents the planning, analysis, and design of shallow and deep foundations. Topics supporting course objectives include aspects of subsurface investigations, in-situ testing, factors of safety, margin of safety, reliability, and Load and Resistance Factor Design. Advances in foundation engineering practice in the Pacific Northwest are discussed.

Course Learning Outcomes: At the end of this course, all students should be able to:

1. Describe the requirements for the successful design of foundation elements;
2. Evaluate factors affecting the planning of subsurface investigations;
3. Analyze the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters;
4. Analyze the bearing capacity of shallow foundations;
5. Evaluate immediate settlement of shallow foundations;
6. Synthesize the concepts of allowable stress design, appropriate factors of safety, margin of safety, and reliability;
7. Analyze single and groups of piles and drilled shafts for axial capacity;
8. Analyze single and groups of piles and drilled shafts for lateral capacity; and,
9. Evaluate immediate settlement of deep foundations.

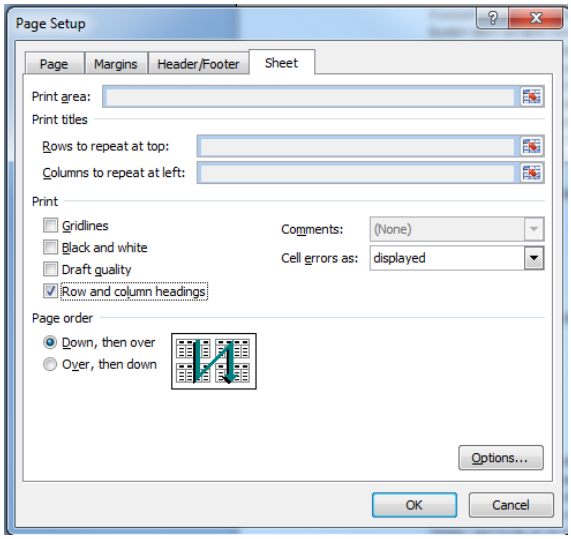
Grading Basis

Homework	50 %
Mid-Term Exam	25 %
Final Exam	25 %
	100 %

Homework Policy

Homeworks will be assigned during lectures. All homework assignments will be due one week after they are assigned, unless otherwise stated. Problem sets are due at the beginning of the period indicated (e.g., lecture). **Late homework** will be graded with a *50% penalty*, and *will not be accepted* more than **one (1) day** after the scheduled date *without* prior permission of the instructor.

*Preparation for Industry***:** Excel spreadsheet solutions are encouraged and will provide you with a work-ready tool to take with you to industry. However, any homework completed with a spreadsheet must be accompanied with a handwritten calculation package with an example calculation for each unique cell/column. Calculation packages must be clearly described and easy to follow; be sure to print spreadsheets with row and column headers (see image screenshot to the right), and reference the row and column headings in the package. The generation of a calculation package will help ensure that mathematical errors are avoided.



Class Policies

Lecture attendance is required. You are responsible for all material presented in lectures. A professional-level understanding of the course material will be significantly enhanced by full attendance and active participation in each class section. Please send an email if you anticipate missing a lecture. If you miss a lecture or recitation you should obtain copies of the course notes that cover the missed material from two of your classmates.

Reading assignments. This course will require the review of multiple sources of information, including books on reserve at the library, journal papers, conference proceedings, and design manuals. *Familiarity with library and electronic journal resources will be critical to your success.*

Expectations of Student Conduct and Academic Integrity. Students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas: cheating- use or attempted use of unauthorized materials, information or study aids; fabrication, falsification or invention of any information; assisting or helping another commit an act of academic dishonesty; tampering, altering, or interfering with evaluation instruments and documents; plagiarism or representing the words or ideas of another person as one's own. For more information about the University's policies and procedures in this area see:

http://oregonstate.edu/studentconduct/regulations/index.php#acdis

Disruptive Behavior: While the university is a place where the free exchange of ideas allows for debate and disagreement, all classroom behavior and discourse should reflect the values of

respect and civility. Behaviors that are disruptive to the learning environment will not be tolerated. OSU's policy on disruptive behavior may be found at:
http://oregonstate.edu/admin/stucon/disruptivebehavior.htm

Statement Regarding Students with Disabilities

"Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098."