

CE440/540: Foundation Engineering
Spring 2017

Instructor:	Dr. Lianyang Zhang, CE Building/Room 200A Phone: 626-0532; E-mail: lyzhang@email.arizona.edu
Time and Room:	TuTh 12:30-1:45PM; Elec & Comp Engr, Rm 107
Office Hours:	TuTh 4:45-6:00PM or By Appointment

Prerequisite(s)

CE343 Geotechnical Engineering and Design
or permission of the instructor. If the instructor has waived the prerequisite(s), you still take full responsibility for your performance in this course.

Textbook

Muni Budhu. Foundations and Earth Structures. John Wiley & Sons. 2008, 2nd printing.

References (which will be posted on D2L)

1. Peck, R. B. (1962). "Art and science in subsurface engineering." *Geotechnique*, 12(1), 60-66.
2. Peck, R. B. (1969). "Advantages and limitations of the observational method in applied soil mechanics." *Geotechnique*, 19(2), 171-187.
3. NHI (2001). "Manual on Subsurface Investigations." Publication No. FHWA NHI-01-031, National Highway Institute, Federal Highway Administration, Washington, DC.
4. Chris R. Daniel, John A. Howie, R. Scott Jackson, and Brian Walker (2005). "Review of Standard Penetration Test Short Rod Corrections." *J. Geotech. And Geoenviron. Engrg.* 131(4), 489-497.
5. Allen, T. M., Nowak, A. S., and Bathurst, R. J. (2005). "Calibration to Determine Load and Resistance Factors for Geotechnical and Structural Design." Transportation Research Circular E-C079, Transportation Research Board Washington, DC.
6. Paikowsky, et al. (2004). "Load and Resistance Factor Design (LRFD) for Deep Foundations." NCHRP Report 507, Transportation Research Board Washington, DC.

Grading Criteria

ACTIVITIES	PERCENTAGES
Attendance, Participation and Quizzes	10%
Homework	20%
Design Projects	20%
Mid-Term Exam	20%
Final Exam	30%

Attendance, Participation and Quizzes (10%)

Attendance will be randomly recorded by giving mini quizzes in class. If you miss a class when a quiz is given, you will lose the corresponding points for both the attendance and the quiz. Your participation in the class will be recorded based on answering oral questions in the class (right or wrong, does not matter) and participating in all class discussions. ***If you need to be absent from the class for justifiable reasons (sickness, family obligations, etc.), you must inform the instructor in advance (usually at least one week).***

Homework (20%)

Homework problems and due dates are listed on the schedule sheet. Homework must be turned in at the beginning of the class in the classroom on the due date. Late turned in homeworks will receive a zero grade. Students are expected to turn in neat and organized homework on engineering problem sheets using only one side of the sheet. Any homework which is sloppy, difficult to read, or difficult to understand will receive a reduced grade.

Design Projects (20%)

Two Design Projects, each worth 10%, will be given. The specific requirements for each project will be given on the assignment.

Mid-Term Exam (20%)

One mid-term exam will be given. The exam will be held at the same location as the class. It will be open book and open notes.

Final Exam (30%)

A final exam worth 30% of the total grade will be given at the end of the semester on the date/time listed in UA Calendar. The final exam will cover the entire syllabus (comprehensive) and be open book and open notes.

Grading Scale

Total Score	Grade Point	Total Score	Grade Point
≥ 90	A	≥ 60 to < 70	D
≥ 80 to < 90	B	< 60	E
≥ 70 to < 80	C		

- Notes:
1. If the class average is above 80, grades will be based on the “traditional” scale presented in the above table. If the class average is below 80, I may translate the grading scheme by statistical curving to reflect the true class average.
 2. The instructor will make the borderline decisions based on the student’s motivation, attendance, participation in the class, and quality of work.

Academic Integrity

Principle Integrity and ethical behavior are expected of every student in all academic work. This Academic Integrity principle stands for honesty in all class work, and ethical conduct in all labs and clinical assignments. This principle is furthered by the student Code of Conduct and disciplinary procedures established by ABOR Policies 5-308 through 5-404, all provisions of which apply to all University of Arizona students.

This Code of Academic Integrity (hereinafter "this Code") is intended to fulfill the requirement imposed by ABOR Policy 5-403.A.4 and otherwise to supplement the Student Code of Conduct as permitted by ABOR Policy 5-308.C.1.

Failure to follow the code of academic integrity will result in failing the course and be reported to the Dean of Students' office.

Prohibited Conduct: Conduct prohibited by this Code consists of all forms of academic dishonesty, including, but not limited to:

- 1 Cheating, fabrication, facilitating academic dishonesty, and plagiarism as set out and defined in the Student Code of Conduct, ABOR Policy 5-308-E.6, E.10, and F.1
- 2 Submitting an item of academic work that has previously been submitted without fair citation of the original work or authorization by the faculty member supervising the work.
- 3 Violating required professional ethics rules contained or referenced in the student handbooks (hardcopy or online) of undergraduate or graduate programs, or professional colleges.
- 4 Violating health, safety or ethical requirements to gain any unfair advantage in lab(s) or clinical assignments.
- 5 Failing to observe rules of academic integrity established by a faculty member for a particular course.
- 6 Attempting to commit an act prohibited by this Code. Any attempt to commit an act prohibited by these rules shall be subject to sanctions to the same extent as completed acts.

Student Responsibility

Students engaging in academic dishonesty diminish their education and bring discredit to the academic community. Students shall not violate the Code of Academic Integrity and shall avoid situations likely to compromise academic integrity. Students shall observe the generally applicable provisions of this Code whether or not faculty members establish special rules of academic integrity for particular classes. Students are not excused from complying with this Code because of faculty members' failure to prevent cheating.

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SPRING 2017 CLASS SCHEDULE

Instructor: Lianyang Zhang

Week	Date	Topic	Reading	HW/Project	Due
1	Thu Jan 12	Introduction	Ch. 1, 2,		
2	Tue Jan 17	Soil mechanics	3, 4, 5, 6		
	Thu Jan 19	Subsurface investigations	Ref. 1, 2,	HW1: 4.1, 4.2,	Feb 7
3	Tue Jan 24	Design methods	3, 4	4.4, 5.7	
	Thu Jan 26				
4	Tue Jan 31			HW2: 6.5, 6.6	Feb 14
	Thu Feb 2				
5	Tue Feb 7	Shallow foundations:	Ch. 7, 9		
	Thu Feb 9	Types of shallow foundations	Ref. 5	HW3: 7.1, 7.4,	Mar 1
6	Tue Feb 14	Bearing capacity of shallows foundations		7.6(a), (b)	
	Thu Feb 16				
7	Tue Feb 21	Settlement of shallows foundations		HW4: 7.7, 7.9*,	Mar 21
	Thu Feb 23	LRFD design of shallow foundations		7.14**	
	Tue Feb 28				
	Thu Mar 2				
9	Tue Mar 7			Project 1	Apr 11
	Thu Mar 9	Mid-Term Exam			
10	Tue Mar 14	<i>Spring recess – No class</i>			
	Thu Mar 16				
11	Tue Mar 21	Design of mat (raft) foundations			
	Thu Mar 23	Foundations on problematic soils			
12	Tue Mar 28	Pile foundations:	Ch. 8	HW5: 8.5, 8.7	Apr 18
	Thu Mar 30	Types of pile foundations	Ref. 6		
13	Tue Apr 4	Bearing capacity of single piles			
	Thu Apr 6	Settlement of single piles		HW6: 8.9, 8.10	Apr 27
14	Tue Apr 11	Vertically loaded pile groups			
	Thu Apr 13	Negative friction of piles			
15	Tue Apr 18	Horizontally loaded single piles			
	Thu Apr 20	Horizontally loaded pile groups			
	Thu Apr 20	Design of piled rafts		Project 2	May 2
16	Tue Apr 25	LRFD design of deep foundations			
	Thu Apr 27	Miscellaneous			
17	Tue May 2	Final Review			
FINAL EXAM (Open Book and Open Notes): Wed May 10: 1:00-3:00 pm					

* Assume GW at surface and use $D_f = 2$ m; ** Only do TSA.