

## SYLLABUS

### CE 482: Foundation Design (3 units)

Prerequisite: CE 467 Geotechnical Engineering

Fall 2011, Mondays and Wednesdays 5-6:15 pm

Instructor	Carl C. Kim	Phone	213.542.1681 office 213.631.6006 mobile
Classroom	KAP 156	E-mail	<a href="mailto:carlkim@usc.edu">carlkim@usc.edu</a>
Office Hours	Wednesday @ 6:15 to 7 pm and Monday by appointment @ KAP 203		
Blackboard	20103_ce_482_29709: Foundation Design		
TA	Mehran Rahmani	E-mail	<a href="mailto:mrahmani@usc.edu">mrahmani@usc.edu</a>
TA Office Hours	Tuesday, Thursday @ 2:30 to 4 pm @ KAP 239 (to be confirmed)		

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#### Description:

This course introduces the geotechnical aspects of foundation design to students who have acquired a fundamental understanding of soil mechanics. The course focuses on the application of fundamental principles of soil mechanics to analyze and design foundation systems to deliver intended performance. The course explores various appropriate applications of load factors and factors of safety with respect to limit equilibrium. Important aspects of technical writing in reporting geotechnical design information will be introduced, discussed, and applied.

#### Goals:

- Review fundamental principles of soil mechanics.
- Review methodologies to obtain soil behavior information.
- Learn to apply safety factors in foundation design.
- Use available design tools for design of spread footings, mat foundations, retaining walls, shoring, pile foundations, and ground improvement.
- Develop reading and writing skills for consulting proposals and reports.
- Master geotechnical portion of PE exam.

#### Text:

- *Principles of Foundation Engineering, Seventh Edition*, by Braja M. Das, Nelson, Toronto, Ontario, Canada.
- *NAVFAC Design Manuals 7.1 and 7.2* (Copies available on Course Blackboard)

Evaluation:

Assignments (Homework/Projects) – 40%

Midterm Exam – 20%

Final Exam – 30%

Participation (Class Discussion, Team Projects, Project Presentations) – 10%

Grades:           A  $\geq$  85%  
                      B  $\geq$  75%  
                      C  $\geq$  65%  
                      D  $\geq$  50%  
                      F < 50%

Policies:

*Attendance:* Regular attendance will not be taken. However, examination questions will include items covered in lectures that are not covered in the textbook or other distributed notes. The student is responsible for all announcements and material covered in class.

*Class Conduct:* USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *Scampus*, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: <http://www.usc.edu/dept/publications/SCAMPUS/gov/>. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.

*Late work:* Homework and project reports are due at 5:10 pm 1 week after the assignment date. Solutions will be posted on the course blackboard 2 weeks after the assignment date. Homework may be submitted after the due date but before solutions are posted for 50% credit. Later submittals will not be accepted or graded.

*Disability:* Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Course Schedule:

Week	Topic	Suggested Reading (Das)	Homework Assignment
1 – 8/22/11	Lecture - Introduction / Geotechnical Engineering		
1 – 8/24/11	Guest Lecture – Tunneling	Handout	
2 – 8/29/11	Lecture – Soil Properties I	Chapter 1.1 – 1.9	1.1, 1.7, 1.11
2 – 8/31/11	Lecture – Soil Properties II	Chapter 1.10 – 1.19	1.23, 1.25
3 – 9/5/11	Lecture – Soil Deposits and Subsurface Exploration	Chapter 2	2.7, 2.13, 2.19
3 – 9/7/11	Labor Day Holiday		
4 – 9/12/11	Lecture – Forensic Engineering I	Handout	Forensic Report
4 – 9/14/11	Lecture – Shallow Foundations I	Chapter 3	3.7, 3.11, 3.13
5 – 9/19/11	Lecture – Shallow Foundations II	Chapter 4	4.1, 4.5, 4.9, 4.11
5 – 9/21/11	Lecture – Soil Mechanics Review (Shear Strength)	Handout	
6 – 9/26/11	Lecture – Shallow Foundation Settlement I	Chapter 5.1 – 5.14	5.7, 5.11, 5.14
6 – 9/28/11	Lecture – Shallow Foundation Settlement II	Chapter 5.15 – 5.20	5.15, 5.17, 5.19
7 – 10/3/11	Lecture – Mat Foundations	Chapter 6	6.1, 6.7, 6.10
7 – 10/5/11	<i>Midterm Review</i>		
8 – 10/10/11	Design Project I	Handout	
8 – 10/12/11	<i>Midterm Examination</i>		
9 – 10/17/11	Lecture – Lateral Earth Pressure	Chapter 7	7.1, 7.9, 7.11
9 – 10/19/11	Lecture – Retaining Walls	Chapter 8	8.1, 8.5, 8.7
10 – 10/24/11	Lecture – Sheet Pile Walls	Chapter 9	9.1, 9.3, 9.8
10 – 10/26/11	Design Project I	Presentation	
11 – 10/31/11	Lecture – Braced Cuts	Chapter 10	10.1, 10.3, 10.7
11 – 11/2/11	Lecture – Pile Foundations	Chapter 11	11.1, 11.11, 11.25
12 – 11/7/11	Lecture – Drilled Shaft Foundations	Chapter 12	12.1, 12.9, 12.15
12 – 11/9/11	Design Project II	Proposal	Proposal
13 – 11/14/11	Design Project II	Presentation	Report
13 – 11/16/11	Lecture – Foundations on Difficult Soils	Chapter 13	13.3, 13.4, 13.5
14 – 11/21/11	Lecture – Ground Improvement	Chapter 14	14.3, 14.11
14 – 11/23/11	Thanksgiving Recess		
15 – 11/28/11	Lecture – Corrosion	Handout	
15 – 11/30/11	<i>Review Session for Final Exam</i>		

**Final Examination: Wednesday, 12/7/11 @ 4:30 – 6:30 pm in KAP 156 and KAP 158**