

CE442/542: Ground Improvement

Spring 2018

Instructor:	Dr. Lianyang Zhang, CE Building/Room 200A Phone: 626-0532; E-mail: lyzhang@email.arizona.edu
Time and Room:	TueThu, 11:00AM – 12:15PM; Music, Room 204
Office Hours:	TueThu 3:30-5:30 PM or By Appointment

Course Description

Ground Improvement is an important topic in Geotechnical Engineering. In engineering practice, a geotechnical engineer often needs to design new structures on or in problematic soils/rocks or repair failed or near-failure geotechnical structures. For both cases, the knowledge of Ground Improvement is required. This course will talk about different ground improvement techniques including those without addition of materials, by adding materials and using reinforcing elements. Upon successful completion of this course, the student will be able to

- Understand the principles, applications, and design procedures for various ground improvement techniques.
- Use analytical/theoretical/numerical calculations to assess the effectiveness of a ground improvement technique.
- Gain competence in properly evaluating alternative solutions, and the effectiveness before, during and after using ground improvement.

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.

Grading Criteria

ACTIVITIES	PERCENTAGES
Quizzes, Attendance & Participation	10%
Homework	20%
Mid-Term Exam	20%
Final Exam	30%
Term Paper	20%

Quizzes, Attendance & Participation (10%)

Attendance will be randomly recorded during class hours by giving quizzes. If you miss any class(es) on the days when the attendance is recorded, you will receive a reduced grade proportional to the number of missed classes. 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 have 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%)

If not specified, home work will be due a week after it is handed out. 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.

Mid-Term Exam (20%)

One exam will be given in the middle of the semester. The exam is tentatively scheduled on Thursday March 1, 2018 and will be held at the same location as the class. It will be open book and open notes.

Term Paper (20%)

You can pick any topic related to ground improvement and write a term paper. Your topic needs to be approved by the instructor by first submitting a one-page brief description of it. If you do not have a topic in mind, I will give you possible topics for your paper. You will need to type your paper (double-spaced, left and right justified, 1" margins on all sides). Total single-sided pages in the paper including tables and figures shall not exceed 15.

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.

Text Book:

There is no textbook for this course. Please concentrate on the Lecture Notes and Handouts. However, the following are good reference books:

Gray, D. H., and Sotir, R. B. (1996). *Bio Technical & Soil Engineering Slope Stabilization*. John Wiley, p. 400.

Indraratna, B., and Chu, J. (2005). *Ground Improvement: Case Histories*. Elsevier Science & Technology Books, p. 608.

Jewell, R. A. (1996). *Soil Reinforcement with Geotextiles*. Construction Industry Research and Information, p.332.

Moseley, M. P., and Kirsch, K. (2004). *Ground Improvement*. Taylor & Francis, p. 428.

Van Impe, W.E. (1994). *Soil Improvement Technique & Their Evolution*. Balkema Publishers.

Han, J. (2015). *Principles and Practice of Ground Improvement*. Wiley. P. 418.

Absent Policy

The following is the University policy on absence:

Students are expected to be regular and punctual in class attendance. The University believes that students themselves are primarily responsible for attendance. Instructors will provide students with written statements of their policies with respect to absences. Excessive or extended absences from class is sufficient reason for the instructor to recommend that the student be administratively dropped from the course. For those courses in which enrollment is limited, missing the first class session may be interpreted as excessive absence. If this action is filed in the Registrar's Office by the end of the fourth week of classes, it will result in cancellation of registration in the course. If the student is administratively dropped after the end of the fourth week of classes, it will result in a failing grade being awarded in that course.

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.