



CIV E 481 Soil Engineering

Fall 2017 - September to December

Class time: 10:00-10:50 Location: NRE 1 003

Instructor:

Lijun Deng, PhD, PENG
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Donadeo Innovation Cntr for Engineering 6-261
Office Hours: 16:00-17:00 Tu Th

Course Description:

*3 (fi 8) (either term, 3-0-3/2) Site investigation; strength of soils; geosynthetics for soil improvement; design of excavations and earth pressures on retaining structures; stability of natural slopes and their improvement; design of cuts and embankments; foundation design, stability and settlement; pile foundations; frost action and permafrost.

Prerequisites: CIV E 381.

TA Information:

Keshab Sharma, keshab@ualberta.ca, NREF 5-027
Weidong Li, weidong1@ualberta.ca, NREF 5-027

Lab Sections:

Section	Day	Time	Location
LAB D1		14:00 - 16:50	NRE 1 003
LAB D2		14:00 - 16:50	ETLC E2001

Course Objectives & General Content:

Building on the basics of soil mechanics learnt in CIVE 381, the objective of this course is to develop an understanding of the geotechnical design principles for shallow and deep foundations, earth pressures and retaining walls, slope stability and finally, how site characterization is undertaken to provide geological and soil properties for these designs.

Marking Scheme:

Activity	Due/Scheduled	Weight
Assignments		25%
Midterm exam	November 7, 2017	30%
Final exam	Check BearTracks	45%

The Faculty recommended grade point average for a 400 level course is 3.1. Instructors have the leeway to deviate from this average and can assign grades based on their own scheme. All grades are approved by the department chair (or delegate). The office of the Dean has final oversight on all grades.

Term Work

All term work solutions will be posted no later than the last day of classes. All term work will be returned to students by the final day of classes, with the exception of major term work due in the last week of classes. The latter will be returned by the day of the final examination or the last day of the examination period if there is no final examination in the course as per university policy; instructors will make accommodations to return these term work. It is the responsibility of the student to pick up all their term work at the specified time and place. Any unreturned term work, shall be retained and then shredded six months after the deadline for reappraisal and grade appeals. Final examinations will be kept for one year as required by university guidelines and the Government of Alberta's Freedom of Information and Protection of Privacy Act.

Calculator Policy

Approved programmable or approved non-programmable calculators are permitted in examinations. Any calculator taken into an examination must have a sticker identifying it as an acceptable programmable calculator (green sticker) or non-programmable calculator (gold sticker). Students can purchase calculators at the University Bookstore with the stickers already affixed. Calculators purchased elsewhere can be brought to the Dean's Office where the appropriate sticker will be affixed to the calculator.

Text and References (Recommended):

Canadian Geotechnical Society. 2006. Canadian Foundation Engineering Manual.
 Salgado, R. 2008. The Engineering of Foundation. New York: McGraw-Hill.
 Holtz, R.D., W.D. Kovacs, and T.C. Sheehan, 2010. An Introduction to Geotechnical Engineering. 2nd ed., Prentice Hall.

Website:

eClass

University Policies:

Policy about course outlines can be found in Course Requirements, Evaluation Procedures and Grading of the University Calendar.

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour (online at www.governance.ualberta.ca) and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the

University.

Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Only those items specifically authorized by the instructor may be brought into the exam facility. The use of unauthorized personal listening, communication, recording, photographic and/or computational devices is strictly prohibited. Students should refrain from bringing any unauthorized electronic device into an examination room, including cell phones, high tech watches, high tech glasses or other such devices.

Learning Outcomes:

By the end of this course, students should be able to:

1. Principles of Shallow Foundation Design
2. Principles of Deep Foundation Design
3. Application of Earth Pressure Theory to Design of Retaining Walls
4. Advance understanding of Slope Stability assessment, in particular the method of slices.

Did you know that the University of Alberta has various low-to-no-cost services to help students succeed? Visit <http://www.deanofstudents.ualberta.ca/> for information about the academic, wellness, and various other support services available to U of A students. It's never too early or too late to seek help!

Tutorial Schedule

Assign	Topic	Tutorial Session	Due date (In Class or In Box by 11:59 pm on:)
1	Review	Handed out in Class Sept 6 No tutorial class	Sept 14 (D1 & D2)
2	Shallow Foundation	Sept 18 (D1) Sept 20 (D2) (Handed out in Class Sept 13)	Sept 28 (D1 & D2)
3	Deep Foundations	Oct 2 (D1) Oct 4 (D2) (Handed out in Class Sept 27)	Oct 12 (D1 & D2)
4	Earth Pressure and Retaining Wall Design	Oct 23 (D1) Oct 18 (D2) (Handed out in Class Oct 16)	Oct 30 (D1 & D2)
5	Slope Stability	Nov 6 (D1) Nov 1 (D2) (Handed out in Class Oct 30)	Nov 23 (D1 & D2)
6	Review assignment	Nov 27 (D1) Nov 22 (D2) (Handed out in Class Nov 20)	Dec 7 (D1 & D2)

Time Table:

Date	Lecture Topic	Sections in CFEM	Tutorial Schedule
WEEK 1			
Wed, Sept 6	Review		
Fri, Sept 8	Review		
WEEK 2			
Mon, Sept 11	Shallow Foundation	Chapter 10 & 11	
Wed, Sept 13	Shallow Foundation	Chapter 10 & 11	
Fri, Sept 15	Shallow Foundation	Chapter 10 & 11	
WEEK 3			
Mon, Sept 18	Shallow Foundation	Chapter 10 & 11	Tutorial #1: D1
Wed, Sept 20	Shallow Foundation	Chapter 10 & 11	Tutorial #1: D2
Fri, Sept 22	Shallow Foundation	Chapter 10 & 11	
WEEK 4			
Mon, Sept 25	Shallow Foundation	Chapter 10 & 11	
Wed, Sept 27	Deep Foundations	Chapter 17, 18 &19	
Fri, Sept 29	Deep Foundations	Chapter 17, 18 &19	
WEEK 5			
Mon, Oct 2	Deep Foundations	Chapter 17, 18 &19	Tutorial #2: D1
Wed, Oct 4	Deep Foundations	Chapter 17, 18 &19	Tutorial #2: D2
Fri, Oct 6	Deep Foundations	Chapter 17, 18 &19	
WEEK 6			
Mon, Oct 9	No Lecture (Thanksgiving)		
Wed, Oct 11	Deep Foundations	Chapter 17, 18 &19	
Fri, Oct 13	Deep Foundations	Chapter 17, 18 &19	
WEEK 7			
Mon, Oct 16	Deep Foundations	Chapter 17, 18 &19	
Wed, Oct 18	Earth Pressure	Chapter 24 & 26	Tutorial #3: D2
Fri, Oct 20	Earth Pressure	Chapter 24 & 26	
WEEK 8			
Mon, Oct 23	Earth Pressure	Chapter 24 & 26	Tutorial #3: D1
Wed, Oct 25	Earth Pressure	Chapter 24 & 26	
Fri, Oct 27	Earth Pressure	Chapter 24 & 26	

Date	Lecture Topic	Sections in Book	Tutorial Schedule
WEEK 9			
Mon, Oct 30	Retaining Walls Design	Chapter 24 & 26	
Wed, Nov 1	Retaining Walls Design	Chapter 24 & 26	Tutorial #4: D2
Fri, Nov 3	Retaining Walls Design	Chapter 24 & 26	
WEEK 10			
Mon, Nov 6	Review for Midterm		Tutorial #4: D1
TUESDAY, Nov 7 MIDTERM EXAM, 5:00 – 7:00 pm, NREF 1-003 and NREF 1-001			
Wed, Nov 8	Excavations	Chapter 24 & 26	
Fri, Nov 10	Excavations	Chapter 24 & 26	
WEEK 11			
Mon, Nov 13	No lecture Remembrance Day in lieu		
Wed, Nov 15	No Lecture (Fall Term Class Break)		
Fri, Nov 17	No Lecture (Fall Term Class Break)		
WEEK 12			
Mon, Nov 20	Slope Stability	Handouts	
Wed, Nov 22	Slope Stability	Handouts	Tutorial #5: D2
Fri, Nov 24	Slope Stability	Handouts	
WEEK 13			
Mon, Nov 27	Slope Stability	Handouts	Tutorial #5: D1
Wed, Nov 29	Slope Stability	Handouts	
Fri, Dec 1	Slope Stability	Handouts	
WEEK 14			
Mon, Dec 4	Site Investigation	Chapter 4	
Wed, Dec 6	Ground Characterization	Chapter 4	
Wed, Dec 8	Review for Final Exam		