

## Course Outline

### 1. COURSE INFORMATION

<b>Course Code</b> (ie. ENGTECH 1EL3)	CIV TECH 3GT3	
<b>Course Name</b>	Geotechnical Engineering II	
<b>Session</b> (ie. Fall 2014)	Winter 2016	
<b>Date(s) and Time(s) of lectures</b>	Mondays; 6:30pm – 9:30pm	
<b>Program Name</b>	Civil Engineering Infrastructure Technology	
<b>Calendar Description</b>	Shear strength characteristics and failure criteria for soils; direct shear, triaxial, plane strain and field tests; earth pressure theory; bearing capacity theory; slope stability and embankment analysis.	
<b>Instructor</b>	Name(s): S. Pietruszczak e-mail address: pietrusz@mcmaster.ca	Office Hours: By appointment
<b>Teaching Assistant (TA)</b>	Name(s): e-mail address:	Office Hours:

### 2. COURSE SPECIFICS

<b>Course Objectives</b>			
<b>Instruction Type</b>	<b>Code</b>	<b>Type</b>	<b>Total Hours</b>
	C	Classroom Instruction	<b>27</b>
	L	Laboratory, workshop or fieldwork	<b>12</b>
	T	Tutorial	
	DE	Distance Education	
	<b>TOTAL HOURS</b>		<b>39</b>
<b>Resources</b>	<b>ISBN</b>	<b>Textbook Title &amp; Edition</b>	<b>Author &amp; Publisher</b>
	0415561264	<b>Craig's Soil Mechanics, Eighth Edition</b>	J.A. Knappett and R.F. Craig, Spon Press
	<b>Other Supplies</b>		
	<b>Book Available</b>	(online, print, amazon.com, etc)	
<b>Prerequisite(s)</b>	CIV TECH 3GE3		
<b>Corequisite(s)</b>	None		
<b>Antirequisite(s)</b>	None		
<b>Course Specific Policies</b>	*Including late submission policy		
<b>Departmental Policies</b>	<ul style="list-style-type: none"> <li>-Students must maintain a 3.5/12 GPA to continue in the program.</li> <li>-In order to achieve the required learning objectives, on average, B.Tech. students can expect to do at least 3 hours of "out-of-class" work for every scheduled hour in class. "Out-of-class" work includes reading, research, assignments and preparation for tests and examinations.</li> <li>-The use of cell phones, iPods, laptops and other personal electronic devices are prohibited from the classroom during the class time, unless the instructor makes an explicit exception.</li> <li>-Announcements made in class or placed on Avenue are considered to have been communicated to all students including those individuals that are not in class.</li> <li>-Instructor has the right to submit work to software to identify plagiarism.</li> <li>-Instructor is permitted to enforce a preference to shut off all electronic devices during class.</li> </ul>		

<b>3. SUB TOPIC(S)</b>		
Week 1	Review of basic soil mechanics concepts learned in CIV TECH 3GE3 State of stress: transformation rule, principal stresses, Mohr's circle representation.	
Week 2	Mohr-Coulomb failure criterion; representation in terms of principal stresses	
Week 3	Laboratory shear strength tests: direct shear test, triaxial tests. Stress paths in 'triaxial' configuration; Mohr- Coulomb failure criterion in terms of q,p invariants.	
Week 4	<b>LAB 1 – Direct Shear Test</b>	
Week 5	Mechanical response of saturated sand in 'triaxial' tests: drained and undrained behaviour, liquefaction	
Week 6	<b>LAB 2 - Vacuum triaxial on sand</b>	
Week 7	Lateral earth pressure theory: active and passive pressures, solutions based on limit equilibrium approach.	
Week 8	<b>LAB 3 – Undrained axial compression on sand</b>	
Week 9	Lateral earth pressure theory: active and passive pressures, solutions based on limit equilibrium approach – cont.	
Week 10	Stability of slopes: analytical solution for translational slip, finite slopes- limit equilibrium approach	
Week 11	Stability of slopes: analytical solution for translational slip, finite slopes- limit equilibrium approach – cont.	
Week 12	Bearing capacity of shallow foundations : Mohr-Coulomb material -limit equilibrium analysis	
Week 13	Bearing capacity of shallow foundations: Mohr-Coulomb material - limit equilibrium analysis – cont.	
<p>FINAL EXAMINATIONS will be scheduled, conducted and invigilated by the Office of the Registrar. All students entering the examination room must produce a McMaster photo identification card. No other identification will be accepted. In addition, for classes that allow you to use a calculator, you must use the McMaster standard calculator. For details, please consult your Instructor.</p>		
<p>Note: this structure represents a plan and is subject to adjustment term by term. The instructor and the university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes.</p>		
<b>4. ASSESSMENT OF LEARNING *including dates*</b>		<b>Weight</b>
In-Class Quizzes		<b>15%</b>
Midterm Exam		<b>25%</b>
Labs		<b>15%</b>

Final Exam	45%
<b>TOTAL</b>	<b>100%</b>
Percentage grades will be converted to letter grades and grade points per the University calendar.	
<b>5. LEARNING OUTCOMES</b>	
1. Demonstrate working knowledge of basic soil mechanics' principles including, the concept of effective stress, and the basics of soil shear strength.	
2. Understand the results of typical lab tests used to evaluate the shear strength of soil – demonstrate an understanding of Mohr's circle.	
3. Being able to interpret the results of drained and undrained 'triaxial' tests using p,q representation.	
4. Understand the concept of lateral earth pressure and how it is used in geotechnical engineering.	
5. Understand how to calculate the bearing capacity and settlement of shallow foundations, understand the limit states design process for shallow foundations.	
6. Understand how to calculate the stability of a slope.	
<b>6. POLICIES</b>	
<b>Anti-Discrimination</b>	
The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible. <a href="http://www.mcmaster.ca/policy/General/HR/Anti-Discrimination%20policy.pdf">http://www.mcmaster.ca/policy/General/HR/Anti-Discrimination%20policy.pdf</a>	
<b>Academic Integrity</b>	
Attention is drawn to the Statement on Academic Ethics and the Senate Resolutions on Academic Dishonesty as found in the Senate Policy Statements distributed at registration and available in the Senate Office. Any student who infringes one of these resolutions will be treated according to the published policy. Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at: <a href="http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf">http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf</a>	
<b>Requests for Relief for Missed Academic Term Work (Assignments, Mid-Terms, etc.)</b>	
The McMaster Student Absence Form is a self reporting tool for <b>Undergraduate Students</b> to report absences that last up to 5 days and provides the ability to request accommodation for any missed academic work. Please note, this tool <u>cannot</u> be used during any final examination period. You may submit a maximum of 1 Academic Work Missed requests per term. It is YOUR responsibility to follow up with your Instructor immediately regarding the nature of the accommodation. If you are absent more than 5 days or exceed 1 request per term you MUST visit your Associate Dean's Office (Faculty Office). You may be required to provide supporting documentation. This form should be filled out immediately when you are about to return to class after your absence. <a href="http://www.mcmaster.ca/msaf/">http://www.mcmaster.ca/msaf/</a>	
<b>E-Learning Policy</b>	
Consistent with the Bachelor of Technology's policy to utilize e-learning as a complement to traditional classroom instruction, students are expected to obtain appropriate passwords and accounts to access Avenue To Learn for this course. Materials will be posted by class for student download. It is expected that students will avail themselves of these materials prior to class. Avenue can be accessed via <a href="http://avenue.mcmaster.ca">http://avenue.mcmaster.ca</a>	
<b>Communications</b>	
It is the student's responsibility to: <ul style="list-style-type: none"> <li>• Maintain current contact information with the University, including address, phone numbers, and emergency contact information.</li> <li>• Use the university provided e-mail address or maintain a valid forwarding e-mail address.</li> <li>• Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their @mcmaster.ca alias.</li> <li>• Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.</li> <li>• To check their McMaster/Avenue email and course websites on a regular basis during the term.</li> </ul>	

### Turnitin (Optional)

This course will be using a web-based service (Turnitin.com) to reveal plagiarism. Students will be expected to submit their work electronically to Turnitin.com and in hard copy so that it can be checked for academic dishonesty. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to <http://www.mcmaster.ca/academicintegrity/turnitin/students/index.html>

### Protection of Privacy Act (FIPPA)

The Freedom of Privacy of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades and all other personal information at all times. For example, the submission and return of assignments and posting of grades must be done in a manner that ensures confidentiality.

<http://www.mcmaster.ca/univsec/fippa/fippa.cfm>

### Academic Accommodation of Students with Disabilities Policy

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail [sas@mcmaster.ca](mailto:sas@mcmaster.ca). For further information, consult McMaster University's policy for Academic Accommodation of Students with Disabilities (<http://sas.mcmaster.ca>).

### Student Code of Conduct

The Student Code of Conduct (SCC) exists to promote the safety and security of all the students in the McMaster community and to encourage respect for others, their property and the laws of the land. McMaster University is a community which values mutual respect for the rights, responsibilities, dignity and well-being of others. The purpose of the Student Code of Conduct is to outline accepted standards of behavior that are harmonious with the goals and the well-being of the University community, and to define the procedures to be followed when students fail to meet the accepted standards of behavior. All students have the responsibility to familiarize themselves with the University regulations and the conduct expected of them while studying at McMaster University.

<http://studentconduct.mcmaster.ca/pdf/SCC.pdf>

<http://www.mcmaster.ca/policy/Students-AcademicStudies/StudentCode.pdf>

### McMaster University Grading Scale

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49 -- Failure