

**ENVT 165A - Geotechnical Sampling and Instrumentation**

*3 Credits, 2 Hours Lecture, 3 Hours Lab*

The course is an introduction to the practical field and laboratory techniques used in the construction of buildings, industrial facilities, roads, bridges, containment structures, waste handling facilities, power lines, pipe lines and recreation sites common to the area. Topics such as construction site safety and material sampling and testing (soil, gravel, concrete and asphalt) are covered

*Prerequisite: EAS 100*

**Instructor**

Instructor name: Neil O'Donnell  
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**Office Hours (Winter 2017)**

Monday	2:00 – 3:00
Tuesday	10:00 – 11:00
Wednesday	10:00 – 12:00
Friday	11:00 – 12:00

**Hours of Instruction (Winter 2017)**

Tuesday	1:00 – 2:50
Thursday	2:00 – 4:50 (Lab)

**Required Resources**

**Geotechnical Engineering: Principles and Practices.** 2<sup>nd</sup> edition, ISBN-13: 978-0-13-236868-1

**Course Outcomes**

Upon successful completion of this course, the student shall be able to:

- establish and explain connections of course knowledge, as it applies to relevant current events, with emphasis on those of environmental concern.
- recognize the scope of geotechnical engineering and the role of the technologist.
- describe the regulatory environment (codes, standards, regulations, standard practices) in which geotechnical engineering is conducted.
- understand the composition, structure and classification of soil, aggregates, concrete, and asphalt.
- identify the various geotechnical issues involved in the construction of foundations, roads, bridges, pond liners, ditches, weirs and dams.
- distinguish the field and laboratory testing equipment frequently used by geotechnical engineers.
- explain the function of various types of heavy construction equipment.
- assess issues related to job site safety and etiquette.

- categorize surficial land formations of importance to geotechnical engineers.
- collect sand and gravel samples in the field, and perform common laboratory soil tests as per standard methods (soil sieve and proctor analysis, hydrometer, specific gravity, unit weight, shrinkage + expansion, compressibility).
- describe concrete tests as per standard methods (slump test, ball penetration test, density, air content, cement content, aggregate sampling, strength tests). (Guest lecture possible).

### Evaluation

Labs & Assignments	30%
Problems, Quizzes, & Videos	20%
1 <sup>st</sup> Half Exam (February 21)	10%
2 <sup>nd</sup> Half Exam (April 4)	10%
Final Exam	30%
Total	100%

*A grade of C- is required for progression or transfer.*

### Term Mark

- Will be determined from all the labs, reports, and assignments.
- Mark will be the weighted average of all submissions.
- If 20% or more of submissions (labs, reports, and assignments) are missing, student will not be allowed to write the final exam

### Laboratory Sessions

Laboratory work will be conducted weekly starting the first week of classes. Labs will be graded. Completion of the labs and a passing grade on that component of the course are considered mandatory to pass ENVT 165. The labs will run 3 hours per week. Attendance is mandatory.

### Protocol for Marking Lab Reports and Other Assignments

- Unless specified differently by instructor, labs, reports, and assignments will be submitted electronically via Moodle.
- Students may submit completed lab reports and other assignments at the end of the particular lab or class, or before the Due Date, with no penalty.
- The Due Date will be one week following the particular lab or class.
- *The Due Date may be extended another 7 days for reasonable cause approved by instructor.*
- If submitted past the Due Date, but within 31 calendar days after the lab or class, 50% of the regular mark will be given.
- After 31 calendar days, no reports or assignments will be accepted, and a mark of zero will be given.
- Any changes due to special circumstances will be communicated to students by the instructor via Moodle.

**Grading System**

<b>Descriptor</b>	<b>Alpha Grade</b>	<b>4.0 Scale</b>	<b>Percent</b>	<b>Rubric for Letter Grades</b>
Excellent	A+	4.0	> 92.9	Work shows in-depth and critical analysis, well developed ideas, creativity, excellent writing, clarity and proper format.
	A	4.0	85 – 92.9	
	A-	3.7	80 – 84.9	
Good	B+	3.3	77 – 79.9	Work is generally of high quality, well developed, well written, has clarity, and uses proper format.
	B	3.0	74 – 76.9	
	B-	2.7	70 – 73.9	
Satisfactory <b>Progression</b>	C+	2.3	67 – 69.9	Work has some developed ideas but needs more attention to clarity, style and formatting.
	C	2.0	64 – 66.9	
	C-	1.7	60 – 63.9	
Poor <b>Minimum Pass</b>	D+	1.3	55 – 59.9	Work is completed in a general way with minimal support, or is poorly written or did not use proper format.
	D	1.0	50 – 54.9	
Failure	F	0.0	< 50	Responses fail to demonstrate appropriate understanding or are fundamentally incomplete.

**Proposed Schedule of Topics (Lectures)**

Week 01	Groundwater & Mass wasting Review from EAS 100.
Week 02	Unit 1 : Geotechnology
Week 03	Unit 2 : Soil Behaviour
Week 04	Unit 2 : Soil Behaviour (continued)
Week 05	Unit 3 : Materials (possible Guest Lecturer)
Week 06	Unit 4 : Construction
Week 07	Mid-Term Quiz No.1
Week 08	Reading Week (February 27 – March 3, 2017)
Week 09	Unit 5 : Site Investigation
Week 10	Unit 6 : Groundwater Fundamentals
Week 11	Unit 7 : Geoenvironmental Issues
Week 12	Unit 8 : Slope Stability
Week 13	Mid-Term Quiz No.2
Week 14	Course Review and Summary
Week 15	Final Exams

**Proposed Schedule of Laboratory classes Winter 2017**

Ensure all students have Keyano-specific WHMIS certification.

Week 1.	Lab Assignment – Rocks, Soil Formation
Week 2.	Lab Report Groundwater Observation Well
Weeks 3 & 4.	Lab - Sieve Analysis (2-weeks)
Week 5.	Lab Assignment - Grain Curve Problems
Week 6.	Lab - 6 Hydrometer Analysis
Week 7.	Lab - Excavation and Fill
Week 8.	NO LAB. NO CLASSES. Reading Week.
Week 9.	Lab – Earthquakes and Volcanoes (geotechnical aspects)
Week 10.	Field trips to geotechnical Labs
Week 11.	Site Evaluation problems
Weeks 12 & 13.	Keyano STC Geotechnical Site Investigation Lab
Week 14.	NO NEW LAB. Review session for lab topics.
Week 15.	Final Exams

**Please Note:**

Date and time allotted to each topic is subject to change.

**Performance Requirements****Student Responsibilities**

It is your responsibility as a student to contact the Office of the Registrar to complete the forms for Withdrawal or Change of Registration, and any other forms. Please refer to the list of important dates as noted in the Academic Schedule in the Keyano College credit calendar.

More specific details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

**Laboratory Safety**

In the science laboratories, safety is important.

Students must complete the *WHMIS for Students* online training course on Moodle before entering the science laboratories.

Students must comply with the mandatory laboratory safety rules for this course as provided in the laboratory manual. Failure to do so will result in progressive discipline such as a verbal warning, refused entry into the laboratory, or suspension from the College.

**Student Attendance**

Class attendance is useful for two reasons. First, class attendance maximizes a students' learning experience. Second, attending class is a good way to keep informed of matters relating to the administration of the course (e.g., the timing of assignments and exams). Ultimately, you are responsible for your own learning and performance in this course.

It is the responsibility of each student to be prepared for all classes. Students who miss classes are responsible for the material covered in those classes and for ensuring that they are prepared for the next class, including the completion of any assignments and / or notes that may be due.

**Academic Misconduct**

Students are considered to be responsible adults and should adhere to principles of intellectual integrity. Intellectual dishonesty may take many forms, such as:

- Plagiarism or the submission of another person's work as one's own
- The use of unauthorized aids in assignments or examinations (cheating)
- Collusion or the unauthorized collaboration with others in preparing work
- The deliberate misrepresentation of qualifications
- The willful distortion of results or data
- Substitution in an examination by another person
- Handing in the same unchanged work as submitted for another assignment
- Breach of confidentiality.

The consequences for academic misconduct range from a verbal reprimand to expulsion from the College. More specific descriptions and details are found in the Student Rights and Student Code of Conduct section of the Keyano College credit calendar. It is the responsibility of each student to be aware of the guidelines outlined in the Student Rights and Student Code of Conduct Policies.

In order to ensure your understanding of the concept of plagiarism, you must successfully complete the online tutorial found on [ilearn.keyano.ca](http://ilearn.keyano.ca). Then print the certificate, sign it, and show it to each of your instructors. Your course work will not be graded until you show this signed certificate.

**Specialized Supports****Counselling and Accessibility Services**

Counselling Services provides a wide range of specialized counselling services to prospective and registered students, including personal, career and academic counselling.

**SKILL Centre**

The SKILL Centre is a learning space in the Clearwater Campus at Keyano College where students can gather to share ideas, collaborate on projects and get new perspectives on learning from our tutorial staff.

The SKILL Centre, through a variety of delivery methods, provides assistance in skill development to Keyano students. Assistance is provided by instructors, staff and student tutors. Individuals wishing to improve their mathematics, writing, grammar, study, or other skills, can take advantage of this unique service.

**Authorization**

This course outline has been reviewed and approved by the Program Chair.

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Neil O'Donnell, Instructor

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Louis Dingley, Chair

Date Authorized

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Vincella Thompson, Dean

Date Authorized

**Signed copies to be delivered to:**

Instructor

Registrar's Office