

## Course Outline

<b>Course Title:</b>	Geotechnical Drilling		
<b>Course Number:</b>	GEOL 16	<b>Approval Date:</b>	2025/1/4
<b>Course Hours:</b>	45 hours	<b>Academic Year:</b>	2024
<b>Academic School:</b>	School of Environmental & Natural Resource Sciences		
<b>Faculty:</b>	Charlie Morettie - <a href="mailto:Charlie.Morettie@flemingcollege.ca">Charlie.Morettie@flemingcollege.ca</a> Steve Wilkinson - <a href="mailto:steve.wilkinson@flemingcollege.ca">steve.wilkinson@flemingcollege.ca</a>		
<b>Program Co-ordinator or Equivalent:</b>	Jim Smith - <a href="mailto:jim.smith@flemingcollege.ca">jim.smith@flemingcollege.ca</a>		
<b>Dean (or Chair):</b>	Jennifer Hermer - <a href="mailto:jennifer.hermer@flemingcollege.ca">jennifer.hermer@flemingcollege.ca</a>		

## Course Description

This course introduces students to the soil testing and site investigation industry. Drill rig components, operation, servicing, maintenance and repair, drilling practices, and solving down-hole problems will be discussed. Standard procedures and safe work practices required to conduct the various sampling and testing techniques will be gained through hands-on experience in operating labs.

**Prerequisites:** None.

**Corequisites:** None.

**Experiential Learning:** Interactive Simulations

## Course Delivery Type

**Face to face.**

All course hours are delivered in person at the delivery location specified on the academic timetable.

## Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Recognize and react to unsafe working conditions, habits, and potential hazards in the work environment according to applicable codes, best practices, regulations and Industry standards.
2. Know the basic components and their functions on a geotechnical drill rig.

3. Competently operate drilling and associated equipment according to industry standards of operation.
4. Use standard soil sampling and testing procedures to obtain and record accurate information for geotechnical investigation.
5. Determine the necessary equipment and supplies required for geotechnical drilling
6. Competently install a piezometer
7. Competently size standard wireline coring equipment.

Demonstrate compliance with all related sections of the common core training modules

## Learning Resources

Australian Drilling Industry Association (ADIA). 2018. The Drilling Manual. Sixth Edition. 793 pp

Costs for learning resources can be found on the Campus Store website, using the links below, or by visiting the Campus Store location at your campus.

- Sutherland: <https://www.bkstr.com/sfleming-sutherlandstore/home>
- Frost: <https://www.bkstr.com/sfleming-froststore/home>

## Assessment Summary

Assessment Task	Percentage
Quizzes	10%
Tests	90%

## Student Success: Policies and Procedures

Mutually, faculty and learners will support and adhere to college Academic Regulations, and Student Rights and Responsibilities. The following policies and guidelines have been developed to support the learning process.

Please click on the link for information about:

- [Academic Integrity \(2-201A\)](#)  
(<https://department.flemingcollege.ca/hr/attachment/7750/download>)
- [Accessibility for Persons with Disabilities \(3-341\)](#)  
(<https://department.flemingcollege.ca/hr/attachment/5619/download>)
- [Grading and Academic Standing \(2-201C\)](#)  
(<https://department.flemingcollege.ca/hr/attachment/7752/download>)
- [Guidelines for Professional Practice: Students and Faculty](#)  
(<https://flemingcollege.ca/PDF/guidelines-for-professional-practice-students-faculty.pdf>)

- [Student Rights and Responsibilities \(5-506\)](#)

(<https://department.flemingcollege.ca/hr/attachment/269/download>)

If you will need academic accommodations (for example if you have a learning disability, mental health condition such as anxiety or depression or if you had an IEP in high school), please contact the [Accessible Education Services \(AES\)](#) department (<https://department.flemingcollege.ca/aes/>) to meet with a counsellor.

**Alternate accessible formats of learning resources and materials will be provided, on request.**

## Program Standards

The **Ministry of Colleges and Universities** oversees the development and the review of standards for programs of instruction. The **Ministry of Labour Training and Skills Development** oversees the development and the review of standards for programs of instruction for Apprenticeship training in the province of Ontario. Each college is required to ensure that its programs and program delivery are consistent with these standards, and must assist students to achieve these essential outcomes.

This course contributes to Program Standards as defined by the [Ministry of Colleges and Universities](#) (MCU). Program standards apply to all similar programs of instruction offered by colleges across the province. Each program standard for a postsecondary program includes the following elements:

- **Vocational standards** (the vocationally specific learning outcomes which apply to the program of instruction in question);
- **Essential employability skills** (the essential employability skills learning outcomes which apply to all programs of instruction); and
- **General education requirement** (the requirement for general education in postsecondary programs of instruction that contribute to the development of citizens who are conscious of the diversity, complexity and richness of the human experience; and, the society in which they live and work).

Collectively, these elements outline the essential skills and knowledge that a student must reliably demonstrate in order to graduate from the program. For further information on the standards for your program, follow the MCU link ([www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/](http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/)).

## Detail Plan

<b>Term:</b>	2025 Spring
<b>Faculty:</b>	Jim Smith - <a href="mailto:jim.smith@flemingcollege.ca">jim.smith@flemingcollege.ca</a>
<b>Program Co-ordinator or Equivalent:</b>	Jim Smith - <a href="mailto:jim.smith@flemingcollege.ca">jim.smith@flemingcollege.ca</a>
<b>Dean (or Chair):</b>	Jennifer Hermer - <a href="mailto:jennifer.hermer@flemingcollege.ca">jennifer.hermer@flemingcollege.ca</a>

## Learning Plan

<b>Wks/Hrs Units</b>	<b>Topics, Resources, Learning, Activities</b>	<b>Learning Outcomes</b>	<b>Assessment</b>
Week 1	LECTURE 1 Introduction to Geotechnical Drilling LAB 1 Safety Assignment Reading & Video review	1, 2 & 5	Weekly Drill Records Total of 15%
Week 1	LECTURE 2 Drill Rig Characteristics of a soils rig LAB 2 Components, Controls, Circle Check & Greasing of the Mobile B-37 drill	1,2,3 & 5	Weekly Lecture Quiz 15% Common Core Surface Miner U5031.02
Week2	LECTURE 3 Augers - Types and uses LAB 3 Drill set up Safe use of Hoisting Equipment.	1, 2, 3 & 5	Common Core S.D.Driller 0652.01 0652.04 Surface Miner U5030.05 U5030.06
Week 2	LECTURE 4 Reports and Records LAB 4 Safety during drill operations. Set up, Collaring and Use of Continuous Flight Augers	1, 2, 3, 4 & 5	
Week 3	LECTURE 5 Drilling Personnel LAB 5 Set up and safe use of Safety Hammer during a SPT	1, 2, 3, 4 & 5	
Week 3	LECTURE 6 Drill Rods, Casing and Subs LAB 6 Set up, Safety & Collaring Using Hollow Stem augers.	1, 2, 3, 4 & 5	Lab Test #1 Rig Component ID and Hollow Stem Auger Components 15%
Week 4	LECTURE 7 LAB 7 Drill Rods, Casing and Sub Identification	1, 2, 3, 4 & 5	
Week4	LECTURE 8 Tools & Safe operation LAB 8 Penetration Tests	1, 2, 3, 4 & 5	
Week 5	LECTURE 9 Sampling and Testing tools. LAB 9 Piezometer Installation	1, 2, 3, 5 & 7	
Week 5	LECTURE 10 Shelby Tube Sampling and Vane Tests Lab 10 Shelby Tube Sampling and Vane Tests	1 2, 3, 4 & 5	
Week 6	LECTURE 11 Piezometers, Observation Wells Packer Testing Lab 11 Test Casing, rods and hand tool identification. Penetration Cone	1, 3 & 6	Lab Test #2 15%
Week 6	LECTURE 12 CPT LAB 12 Geotechnical Drilling	1, 3 & 6	
Week 7	LECTURE 13 Hydro static Problems and Flowing Formations LAB 13 Drill Operation Test	1, 2, 3, 4, 5	Lab Test #3 Operations Test15%
Week 7	LECTURE 14 Final Exam LAB14 Drill Operation Test	1, 2, 3, 4, 5, 6 & 7	Lab Test #3 Operations Test15% Final 25%

## Assessment Requirements

Assessment Task	Date/Weeks	Course Learning Outcome	Percentage
Weekly drill logs and soil logs	Weekly Drill Report	1 & 4	15%
Weekly Lecture quiz Previous Lecture and lab material	Weekly Lecture Quiz	1-7	15%
I.D. Drill components, control functions and augers components	Lab Test #1 Week 3	2	15%
Dual Credit research assignment	Lab Test #2 Week 6	2, 3 & 7	15%
Operating of Mobile B-37	Lab Test #3 Operations Test Week 7	1-5	15%
Covers material from weeks 1-7 Lectures and Labs	Final Exam Week 7	1-7	25%

Safety infractions will result in a 5% deduction from final grade

## Artificial Intelligence (AI) Statement

**NO USE.** Use of generative AI tools (like ChatGPT) is not permitted in this course.

It is the responsibility of students to maintain a history of records and supporting documentation to demonstrate their efforts in all academic submissions, even if submission of these is not part of the final academic deliverable.

## Turnitin Statement

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com in support of academic integrity. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

If students choose to opt out of using the software, they must inform their faculty member at the time of the assignment, of their refusal and meet with the faculty to discuss their options. For further information on the use of Turnitin, please refer to the [Operating Procedure 2-201E](https://department.flemingcollege.ca/hr/attachment/10233/download) (<https://department.flemingcollege.ca/hr/attachment/10233/download>)

## Respondus Monitor Statement

This course will use Respondus Monitor as a remote proctoring tool to support the administration of electronic examinations and assessments. Fleming College has an institutional license to use Respondus Monitor, a cloud-

based service and software that captures video, audio, and other data during student assessment sessions for use in monitoring students. This data is accessible to, and may be used by, authorized individuals at the college to administer student assessments and manage the academic integrity of such assessments. The Student Terms of Use for Respondus Monitor must be agreed to by users (e.g. students) prior to each use of the Respondus Monitor, available at: <https://web.respondus.com/tou-monitor-student/>

By accessing and using Respondus Monitor, you agree to the collection, use, disclosure and retention of your personal information (including personal images) by Respondus Inc. in accordance with its Privacy Policy, available at: <https://web.respondus.com/privacy-policy/>

If you have questions about the collection of your personal information, please contact the Privacy and Policy Officer at [freedomofinformation@flemingcollege.ca](mailto:freedomofinformation@flemingcollege.ca), or visit Fleming College's [Privacy Statement](https://flemingcollege.ca/privacy-statement) (<https://flemingcollege.ca/privacy-statement>) for more information.

If students choose to opt out of using Respondus Monitor, they must inform their faculty member prior to the scheduled assessment, of their refusal and meet with the faculty to discuss their options.

## Exemption Contact

Jim Smith

## Prior Learning and Assessment and Recognition (PLAR)

PLAR uses tools to help learners reflect on, identify, articulate, and demonstrate past learning which has been acquired through study, work and other life experiences and which is not recognized through formal transfer of credit mechanisms. PLAR options include authentic assessment activities designed by faculty that may include challenge exams, portfolio presentations, interviews, and written assignments. Learners may also be encouraged and supported to design an individual documentation package that would meet the learning requirements of the course. Any student who wishes to have any prior learning acquired through life and work experience assessed, so as to translate it into a college credit, may initiate the process by applying through the Registrar's office. For more information please click on the following link: <http://flemingcollege.ca/admissions/prior-learning-assessment-and-recognition>

## Course Specific Policies and Procedures

It is the responsibility of the student to retain this course outline for future reference. Course outlines may be required to support applications for advanced standing and credit transfer to other educational institutions, portfolio development, PLAR and accreditation with professional associations.

**Synchronous sessions may be recorded. As a result, your image, voice, name, personal views and opinions, and course work may be collected under legal authority of section 2 of the Ontario Colleges of Applied Arts and Technology Act, 2002. This information will be used for the purpose of supporting student**

**learning. Any questions about this collection can be directed to the Privacy and Policy Officer at [freedomofinformation@flamingcollege.ca](mailto:freedomofinformation@flamingcollege.ca) or by mail to 599 Brealey Drive, Peterborough, ON K9J 7B1.**

No recording (audio or visual) of classes is permitted without permission from the appropriate faculty member.

It is important to submit assignments and projects at a specified time and location. The faculty member(s) for this course will provide the detail. It should be noted that the Academic Planning & Operations Office, Student Services, and Admissions and Records, will not accept any assignments or projects.

Final grades in this course are assigned based on the level of academic achievement which corresponds to the assessment components as cited in this course outline. It is important to note that faculty member(s) will not offer additional evaluation activities beyond those cited in this course outline.

Whatever the reason, missed evaluations and due dates for assignments, including those missed due to illness, will be dealt with by your faculty member.

Lab activities in this course support skill and knowledge development. In order to be eligible for 100% of the marks associated with this course, attendance and participation is required. Students are eligible to participate in lab activities if they have not missed consecutive labs and are present for 6 out of 7 labs offered. This policy supports a safe learning environment for all individuals. Any exceptions will be dealt with on an individual basis with your instructor.

Cell phone use is NOT allowed in lecture/lab; cell phones must be turned off as they are a distraction to the class. Cell phones are not allowed during testing.

Each student has the responsibility to support academic integrity. Students are expected to work individually on assignments. If group work is permitted, each student in the group is expected to contribute an equitable amount of effort. Reports must be type-written and the sole work of each individual. A student may not write up a lab assignment unless he/she has documented authorization. Assignments that are submitted below a minimum level of competence as determined by the professor will be returned as incomplete. Assignments must be handed in to the professor no later than the beginning of the scheduled lab on the assigned due date. Any assignment handed in after the due date will receive a mark of ZERO.

Make-up arrangements for tests and assignments are normally not allowed. In the event of documented illness or circumstances that prohibit the student from completing work, make-up provisions may be provided. All requests must be received in writing.

Classes will begin on time! Those students arriving late may be refused admission.

If a student misses a lecture or lab, it is the student's responsibility to obtain the material and information from those lectures and labs.

LABS are subject to change due to Weather and Equipment availability.

#### MANDATORY REQUIREMENTS (As per course)

All listed below safety equipment is required any time students are in labs or in any drilling and blasting training area.

- 1) CSA Approved Hard Hat (Class E), Hearing protection, appropriate Safety Glasses, Prescription safety glasses

must have side shields, CSA Approved 8 inch work boots, Overalls or Coveralls c/w reflective striping, Work Gloves, Jack Knife, Tape Measure, Book, Pencil, Calculator, Watch

#### STUDENTS MUST HAVE ALL MANDATORY EQUIPMENT FOR LABS!

- 2) A professional work environment will be stressed at all times, locations and activities. This includes attitude, communication skills, ability to work in teams or groups, safety and appearance.
- 3) Any student who has any restrictions on his or her ability to participate or perform any aspect of the Resources Drilling Program, must contact Program Co-ordinator at the beginning of the semester.
- 4) Operating Resources Drilling vehicles in an unsafe manner or, even worse, unlawful manner, will result in ejection from the lab, plus possible disciplinary action.
- 5) Any student considered by the instructor to be abusive to the equipment, fellow students or the instructor, will be ejected from the course.
- 6) Students not actively participating in assignments must keep safely away from equipment in operation.
- 7) Before using any drills or vehicle, a complete circle check must be performed.
- 8) The shop must be left clean at all times before leaving lab. Failure to do so may result not being able to participate in future lab activities.
- 9) At the end of each lab period, tools and equipment must be cleaned and returned to their proper places. Failure to do so may result not being able to participate in future lab activities.
- 10) Stealing tools is unlawful; missing equipment affects all users of the R/D shop.
- 11) Any student arriving late without a valid reason will be considered absent.
- 12) When a vehicle is moving or backing up, another student should be present to supervise the operation.
- 13) There is no student parking at the RD&B shop. Walk or ride your bicycle.
- 14) Any person found in possession of, using or still under the influence of intoxicating beverages or stimulants, will be ejected from the lab and could face disciplinary action.
- 15) Student room will be cleaned and maintained by the students on a daily basis.
- 16) Dry baskets shall be used for overnight drying of work clothing only. Any clothing left, may be removed at any time by the faculty only.
- 17) All exposed jewellery to be removed prior to labs.
- 18) Long hair must be tied back to the base of the neck and tucked under coveralls.
- 19) No hoodies or loose fitting clothing
- 20) Only MOL approved safety equipment and apparel will be allowed during class
- 21) The best safety tool is your own common sense. USE IT !