

## Course Outline

<b>Course Title:</b>	Horizontal Directional Drilling		
<b>Course Number:</b>	GEOL18	<b>Approval Date:</b>	2018/6/25
<b>Course Hours:</b>	45 hours	<b>Academic Year:</b>	2018
<b>Academic School:</b>	School of Environmental & Natural Resource Sciences		
<b>Faculty:</b>	Jim Smith - jim.smith@flemingcollege.ca		
<b>Program Co-ordinator or Equivalent:</b>	Steve Wilkinson - steve.wilkinson@flemingcollege.ca		
<b>Dean (or Chair):</b>	Rick Gray - Rick.Gray@flemingcollege.ca		

## Course Description

This course introduces students to the horizontal directional drilling industry. Topics will include safety, planning, tracking electronics, and drill fluids. Techniques to maximize boring and back-reaming will be presented in both theoretical and practical learning situations.

**Prerequisites:** None.

**Corequisites:** None.

## Learning Outcomes

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

1. Recognize unsafe working habits and conditions present on a directional drill and directional drilling site.
2. Demonstrate competence in drilling, tracking to successfully complete a directional bore.
3. Lay out a Horizontal directional drill bore path and set up the drill with the correct set back distance .
4. Identify the components of a Horizontal Directional Drill and associated equipment in the field and in the lecture.
5. Calibrate the locating equipment and identify the drill heads accurate position in the bore path.
6. Calculate and identify types of drilling fluid products and their use as well as drilling fluid volumes required and pull back speeds on a simulated and applied learning back reaming exercises.

7. Steer the drill head in the ground and log drill rod position in a drill log while maintaining the correct bend limits and underground utility separation distances.
8. Use other trenchless technology ( underground piercing tool ) to bore a path for underground infrastructure.
9. Operate the rod handling system to add and remove drill rods.
10. Document drilling operation on a drill log

## Learning Resources

Course Handouts

## Assessment Summary

Assessment Task	Percentage
Quizzes	15%
Assignments	25%
Applied Learning	15%
Tests	45%

## 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)  
(https://department.flemingcollege.ca/hr/attachment/7750/download)
- [Accessibility for Persons with Disabilities \(3-341\)](https://department.flemingcollege.ca/hr/attachment/5619/download)  
(https://department.flemingcollege.ca/hr/attachment/5619/download)
- [Grading and Academic Standing \(2-201C\)](https://department.flemingcollege.ca/hr/attachment/7752/download)  
(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)  
(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)  
(https://department.flemingcollege.ca/hr/attachment/269/download)

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

## Program Standards

The Ministry of Training, Colleges and Universities oversees the development and the review of standards for programs of instruction. 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 Training, Colleges and Universities](#) (MTCU). 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 MTCU link ([www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/](http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/))

## Detail Plan

**Term:** 2018 Fall **Session Code:** RDB

**Faculty:** Jim Smith - jim.smith@flemingcollege.ca

**Program Co-ordinator or Equivalent:** Steve Wilkinson - steve.wilkinson@flemingcollege.ca

**Dean (or Chair):** Rick Gray - Rick.Gray@flemingcollege.ca

## Learning Plan

Wks/Hrs Units	Topics, Resources, Learning, Activities	Learning Outcomes	Assessment
Module 1	On-line Ditch witch operator training , Pre-planning the bore, Drilling Fluids #1, introduction to HDD Drilling with videos, electrical safety, Preparation and setup of Drill, locator and support equipment	1,4,6,3,5,10	I-clicker, drill logs, On-line ditch witch training completion pass/fail

<b>Wks/Hrs Units</b>	<b>Topics, Resources, Learning, Activities</b>	<b>Learning Outcomes</b>	<b>Assessment</b>
Module 2	Drilling Fluids #2, Rod handling systems, starting the hole, Rod handling systems, starting the hole, Tracking Electronics, Bend radius and steering, Drill Strings, Thread Types & Maintenance, Locating/tracking assignment explained.	1,3,5,6,7,9,10	i-clicker, Drill logs, safety and components test
Module 3	Tracking Calculations explained, Pre reaming (assignment explanation), Tracking Calculation and rod handling steps Evaluation, Drilling to the box and Off set Locating, Evaluation Down hole Tools, Drill Operations and Maintenance	1,2,3,5,6,7,9,10	I-clicker, drill logs, Tracking Calculations Evaluation and rod handling steps test
Module 4	Maintenance, Operating Techniques, Drill Pipe & Bend Radius, Fluids calculations and Pipe Pullback, The Drilling square and Problem Solving Questions, Introduction to other trench-less technology, Pipe Fusion, Tracking and Drill Operations Evaluation.	1,2,5,6,7,8,9,10	I-clicker, drill log, Tracking and Drill Operations Evaluation, Final Exam, Locating/tracking assignment

## Assessment Requirements

<b>Assessment Task</b>	<b>Date/Weeks</b>	<b>Course Learning Outcome</b>	<b>Percentage</b>
Final Exam: questions to be answered on all lecture and lab material	Refer to course schedule	1,5,6,7,9	20%
Weekly drill log: All information from labs recorded / submitted on drill log D2L Quiz within 24 hours from the end of your Lab.	Refer to course schedule	10	10%
Lab Test Safety, components ,function & set-up.	Refer to course schedule	1,4	10%
Tracking Calculations and rod handling steps evaluation: Use experience to explain best approach to crossing over or under existing utilities and list steps in order for adding and removing drill rods on the ditch witch 20x20.	Refer to course schedule	2	15%

<b>Assessment Task</b>	<b>Date/Weeks</b>	<b>Course Learning Outcome</b>	<b>Percentage</b>
locating/Tracking Assignment :Use locator to obtain required information in student groups of three. Independently plot the info onto a graph and submit in a memo.	Refer to course schedule	1,2,5	15%
Operations test: Demonstrate the operation of locating equipment and Ditch Witch Directional drill.	Refer to course schedule	1,2,5,7,9	15%
i-clicker lecture tests will test previous weeks learning (must be present during test to obtain marks)	Refer to course schedule	1,3,4	15%

Assignment due dates are detailed in the course schedule, handed out in week 1. Changes in due dates may occur due to scheduling requirements, public holidays, or other circumstances. Refer to the most recent information provided by your professor in class and on the LMS

## Exemption Contact

Jim Smith/ Steve Wilkinson

## 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.

Mutually, faculty and learners will support and adhere to college Academic Regulations and Student Rights and Responsibilities. In addition, the following guidelines have been developed to support the

learning process.

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 13 out of 15 labs offered. This policy supports a safe learning environment for all individuals. Any exceptions will be dealt with on an individual bases 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 typewritten and the sole work of each individual. A student may not write up a lab assignment unless he/she has documentation 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 into 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.

The Learning Sequence is subject to change.

#### 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 safely glasses must have side sheilds, CSA Approved 8 inch work boots, Overalls or Coveralls c/w reflective striping, Work Gloves, folding 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 !