Fleming College

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Course Outline

Course Title:	Rig Maintenance and Repair		
Course Number:	MECH50	**Approval Date:**	2018/1/25
Course Hours:	45 hours	**Academic Year:**	2017
Academic School:	School of Environmental& Natural Resource Sciences		
Faculty:	Joel Harvey - Joel.Harvey@flemingcollege.ca Steve Wilkinson - steve.wilkinson@flemingcollege.ca		
Program Co-ordinator or Equivalent:	Steve Wilkinson - steve.wilkinson@flemingcollege.ca		
Dean (or Chair):	Rick Gray - Rick.Gray@flemingcollege.ca		

Course Description

This course introduces students to the operating characteristics, maintenance schedules, and repair of the many types of gasoline and diesel engines, pumps and air compressors found on drilling and accessory equipment. Particular emphasis will be placed on safety when working around equipment, and the proper selection and safe use of hand tools. Documentation of labs is encouraged through the use of a daily log or notebook.

Prerequisites: None.

Corequisites: None.

Learning Outcomes

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

1. Identify and explain system components.
2. Explain gasoline and diesel engine operation and design.
3. Explain in general terms the basic operation of rig systems.
4. Show proficiency in rig maintenance and repair by applying knowledge obtained through formal lectures/labs and assigned readings to practical learning situations.
5. Identify, without the aid of notes, the purpose and name of drill rig components.
6. Demonstrate some of the mechanical skills neccessary to maintain, troubleshoot and repair rig engines.

7. Demonstrate a safe battery boosting procedure.
8. Recognize and be able to react to unsafe working conditions and potential hazards in the work environment.
9. Understand and implement the basic minimum safety requirements, guidelines and procedures involved with rigging used in the drilling industry.
10. Understand and troubleshoot small engines incorporated within various basic drilling operations.

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

Learning Resources

1)DRILLING:The Manual of Methods, Applications and Management 1997. New York: Lewis Publishers, 615pp.
2)Rig Maintenance and Repair Lecture Notes: Photocopies, Bookstore
3)Preventative Maintenance Fundamentals of Machine Operations

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:

- Student Rights and Responsibilities (flemingcollege.ca/PDF/Student-Rights-And-Responsibilities.pdf)
- Grading and Academic Standing (https://department.flemingcollege.ca/hr/attachment/7752/download)
- Academic Integrity (http://department.flemingcollege.ca/hr/attachment/7750/download)
- Guidelines for Professional Practice: Students and Faculty (flemingcollege.ca/PDF/guidelines-for-professional-practice-students-faculty.pdf)

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

Program Standards

The Ministry of Advanced Education and Skills Development 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 Advanced Education and Skills Development (MAESD). 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 MAESD link (www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/)

Detail Plan

Term:	2018 Spring
Faculty:	Charlie Morettie - Charlie.Morettie@flemingcollege.ca Joel Harvey - Joel.Harvey@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

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Week 8 Classes Begin	LEC#1 :Importance of Equipment Maintenance and Tool ID. / LAB#1: Shop orientation, over head crane operation, tool ID and use. / LEC#2: Fasteners and hardware. / LAB#2: Practical use of fasteners and extractors.	1,8,9	Surface Diamond Driller U0653.01 U0653.03 U0669.01 U0669.02 U0669.03 U0652.04 U0652.05 U0652.06 U0652.14 U0653.02
Week 9	LEC#3: Fluid ID and motor oil rating. / LAB#3: ID fluids and where they go on equipment. / LEC#4: Greasing and lubrication systems. / LAB#4: Grease and fluid checks on various equipment.	1,2,8,9	Hand Tool and Fastener ID Test (10%)
Week 10	LEC#5: Engine Components & Systems. 2 & 4 -Cycle Principles. / LAB#5: Examination, tear down and reassembly of a diesel engine and ID components. / LEC#6: Powertrains and mechanical advantage. LAB#6: Look at drill powertrains. Use mechanical advantage.	1,2,5,7,8,9	Fluid ID Test (10%)
Week 11	LEC #7: Rig cooling system types, and maintenance. / LAB #7: Cooling system ID and maintenance. Checking fluids on various drill rigs. / LEC#8: Starting and charging systems. / LAB#8: Identify starting and charging system components. Perform checks on starting and alternator systems.	1,2,4,5,6,7,8,9,10	MIDTERM Exam (20%),Engine Component ID Test (10%)
Week 12	LEC#9: Battery construction, maintenance and boosting. / LAB#9: Battery installation, terminal and cable maintenance. 24v/12v battery hook up. Proper boosting and charging procedures. / LEC#10: Rigging. / LAB#10: Rigging.	1,3,4,5,8,9,10	

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Week 13	LEC#11: Gasoline engine fuel system (Carburetors). / LAB#11: Small engine carburetor tear down. / LEC#12: Tune ups. / LAB#12: Tune up on an engine.	1,3,5,8,9,10	Carburetor Test (5%), Battery Test (10%), Surface Diamond Driller U0655.01 U0655.02 U0655.03 U0655.04 U0655.05
Week 14	LEC#13: Problem solving and troubleshooting techniques. / LAB#13: Troubleshooting diagnostics and problem solving on small engines. / LEC#14: Inspection reports, log books and review. / LAB#14: Shop clean up, maintenance projects and review.	1,3,4,6,8,9,10	Semester Logs (10%), FINAL Exam (25%)

Assessment Requirements

Assessment Task	Date/Weeks	Course Learning Outcome	Percentage
Lab Tests and Class Participation	weeks 8,9,10,11,12,13,14	1-10	55%
Midterm Evaluation	Week 11	1,4,7,8,9,10	20%
Final Evaluation	Week 14	1-10	25%

Exemption Contact

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.

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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 type-written and the sole work of each individual. A student may not write up a lab assignment unless he/she has documentated 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 recieve 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 responsiblity to obtain the material and information from those lectures and labs.

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, 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 you 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 disiplinary 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 !