

I. COURSE DESCRIPTION:

Engine Systems covers the basic engine fundamentals and operation associated with the internal combustion engines of the 2 stroke and 4 stroke cycle. Students will be able to identify and describe the external and internal working components of each type of engine and perform routine maintenance and repairs associated with various types of diesel engines used in the commercial vehicle and heavy equipment market. Students will perform maintenance and tests on the cooling systems, lubrication systems, intake and exhaust systems and the fuel systems of various types and models of diesel engines.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. **Define the fundamentals of internal combustion engines.**
2. **Identify and describe the components of the diesel engine cylinder head and valve train.**
3. **Identify and describe the construction theory and operation of the diesel engine cylinder block assemblies.**
4. **Define the purpose and fundamentals of the intake system the exhaust system and the accessory drive system associated with both the 4-stroke cycle diesel and the 2-stroke cycle diesel engine.**
5. **Describe the purpose, construction and operation of the lubrication system, the types of engine oils, the molecular structure of engine oils, and the importance of the API and the SAE ratings for engine oils.**
6. **Describe the purpose, construction and operation of the different types of cooling systems used for diesel engines. The students will also be able to describe the different types of coolants used for liquid cooled diesel engines, the environmental concerns around such coolants and precautions that should be taken for environmental and personal safety while handling these coolants.**

7. **Perform disassembly and assembly procedures of the engine for the purpose of measuring the internal components of the engine block assembly according to manufacturer specifications.**
8. **Demonstrate proper engine lubrication service procedures for diesel engines used in commercial vehicles and equipment and perform engine oil pressure testing according to manufacturer specifications.**
9. **Perform cooling system service on diesel engines to determine the condition and operation the coolant and the operation of the components of the cooling system according to manufacturer specifications.**

III. TOPICS:

1. **Engine Fundamentals**
2. **Diesel Cylinder Head and Valve Train**
3. **Diesel Engine Block Assemblies**
4. **Diesel Engine Intake, Exhaust and Accessory Drive Systems**
5. **Diesel Engine Lubrication Systems**
6. **Diesel Engine Coolant and Cooling Systems**

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Hand outs provided by instructor as well as text books requested by department as per booklist.

V. EVALUATION PROCESS/GRADING SYSTEM:

Students will be tested on the material covered per apprenticeship curriculum by multiple choice questions, assignments, and practical tests. The weigh factor for each area of testing will be as follows:

Theory Tests	50 %
Practical Tests	30 %
Assignments	20 %

This evaluation can change depending on the emphasis placed on each of the above testing procedures.

The following semester grades will be assigned to students:

Grade	Definition	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field /clinical placement or non-graded subject area.	
U	Unsatisfactory achievement in field/clinical placement or non-graded subject area.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

VI. SPECIAL NOTES:

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade “C”, (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations. Announcements, news, the academic calendar of events, class cancellations, your learning management system (LMS), and much more are also accessible through the student portal. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.