SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

CICE COURSE OUTLINE

COURSE TITLE:	Internal Combustion Engines 1		
CODE NO. :	MPF101	**SEMESTER:**	Fall
MODIFIED CODE:	MPF0101		
PROGRAM:	Motive Power Fundamentals		
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MODIFIED BY:	Rachel Valois, Learning Specialist, CICE Program		
DATE:	Sept. 2010	**PREVIOUS OUTLINE DATED:**	Sept. 2009
APPROVED:	"Angelique Lemay"		Sept. 10
	CHAIR, COMMUNITY SERVICES		**DATE**
TOTAL CREDITS:	5		
PREREQUISITE(S):	none		
HOURS/WEEK:	10 hours		

I. COURSE DESCRIPTION:

The internal combustion engine course has been designed to give the CICE student a sound working knowledge of the construction, operating principles, testing and servicing of internal combustion engine assemblies. It will also give them the opportunity to dismantle short block assemblies for testing and inspection. Engine lubrication and cooling system construction and testing methods will also be discussed. An introduction to seals, sealant and gaskets will be given with their proper uses.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the CICE student, along with the assistance of a Learning Specialist, will demonstrate the basic ability to:

1. Discuss the construction, operating principles, testing and disassembly of internal combustion gasoline and diesel engines.

Potential Elements of the Performance:

- Dismantle, inspect, test and assemble engine short block assemblies.
- Measure cylinders to determine taper and out-of-round.
- Explain the construction and composition of cylinder blocks, crankshafts and cylinder heads.
- Demonstrate cylinder ridge removal and engine cleaning.
- Measure warpage, crankshaft wear, bearing wear, camshaft wear and piston wear using manufacturer specifications and precision measuring equipment.

2. Inspect and test engine lubrication systems.

Potential Elements of the Performance:

- Test engine oil pressure and compare to specification.
- Discuss the construction and operation of crescent and gear pump
- Check engine oil levels and condition
- Change engine oil and filter as per manufactures procedure
- Reset engine oil life reminders

3. Discuss the construction and testing methods of gasoline and diesel engine cooling systems.

Potential Elements of the Performance:

- Compare & contrast liquid cooled versus air-cooled engines.
- Discuss the effects of pressure on the boiling point of water.
- Describe cleaning and flushing the cooling systems taking into account proper handling and disposal of antifreeze.
- Test coolant freeze protection.

- Test PH levels of antifreeze
- Explain the necessity of coolant additives for diesel engines

4. Identify the proper seals, sealant and gaskets used in motive power engines.

Potential Elements of the Performance:

- Describe the proper seal, sealant and gasket selection process.
- Discuss proper removal and installation practices for seals, sealant and gaskets.
- Discuss the construction and operating principles of seals, sealant and gaskets.

III. TOPICS:

1. Construction, operating principles, testing and disassembly of internal combustion engines.
2. Diagnosis, inspection and testing of lubrication systems.
3. Construction and testing of cooling systems.
4. Identification of seals, sealant and gaskets.

IV. Automotive Technology – Text & Workbook:

Shop Coat or Coveralls
CSA approved steel toe boots (high top)
CSA approved safety glasses
(these items mandatory for shop)

Pens, pencils, calculator and 3-ring binder

V. EVALUATION PROCESS/GRADING SYSTEM:

The final grade for this course will be based on the results of classroom, assignments and shop evaluations weighed as indicated:

- Classroom – 60% of the final grade is comprised of term tests
- Assignments – 10% of the final grade is comprised of a number of technical reports
- Shop – 30% of the final grade is comprised of attendance, punctuality, preparedness, student ability, work organization and general attitude

(Student will be given notice of test and assignment dates in advance)

The following semester grades will be assigned to students:

Grade	**Definition**	*Grade Point Equivalent*
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:

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.

It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.

CICE Modifications:

Preparation and Participation

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

A. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

B. Tests will be written in CICE office with assistance from a Learning Specialist.

The Learning Specialist may:

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

C. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Learning Specialist may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

D. Evaluation:

Is reflective of modified learning outcomes.