SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: **INTERNAL COMBUSTION ENGINES I**

CODE NO. : **ASMII3** **SEMESTER: 2**

PROGRAM: **AUTOMOTIVE TECHNICIAN – SERVICE & MANAGEMENT**

AUTHOR: **STEPHEN KENT**

DATE: **DECEMBER 99** **PREVIOUS OUTLINE DATED: N/A**

APPROVED:

_____ _____

DEAN **DATE**

TOTAL CREDITS: 2

PREREQUISITE(S): N/A

LENGTH OF COURSE: 6 weeks **TOTAL CREDIT HOURS:** 32

I. COURSE DESCRIPTION:

The internal combustion engine course has been designed to give the 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 student will demonstrate the ability to:

1. Explain the construction, operating principles, testing and disassembly of internal combustion gasoline 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. Diagnose, inspect and test engine lubrication systems.
   Potential Elements of the Performance:
   - Test engine oil pressure and compare to specification.
   - Explain the construction and operation of crescent and gear pumps.
3. Discuss the construction and testing methods of gasoline engine cooling systems.
   Potential Elements of the Performance:
   - Compare & contrast liquid cooled versus air-cooled engines.
   - Explain 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.

LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE CONTINUED…….

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.
   - Explain 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. REQUIRED RESOURCES/TEXTS/MATERIALS:

Modern Automotive Technology

Pens, pencils, calculator, 3-ring binder

*shop coat or coveralls
*CSA approved steel toe boots (high top)
*CSA approved safety glasses

*these items mandatory for shop

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

The following semester grades will be assigned to students in postsecondary courses:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field placement or non-graded subject areas.	
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see *Policies & Procedures Manual - Deferred Grades and Make-up*).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has been impossible for the faculty member to report grades.	

VI. SPECIAL NOTES:

Special Needs:
If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

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.

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.

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

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following:

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.