

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**SAULT  
COLLEGE**

**COURSE OUTLINE**

**COURSE TITLE:** ENGINES

**CODE NO. :** AST702 **LEVEL:** TWO

**PROGRAM:** AUTOMOTIVE SERVICE TECHNICIAN  
APPRENTICESHIP (6068)

**AUTHOR:** STEPHEN KENT

**DATE:** SEPT 2010 **PREVIOUS OUTLINE DATED:** MAY 2010

**APPROVED:** \_\_\_\_\_  
*“Corey Meunier”*  
CHAIR DATE

**TOTAL CREDITS:**

**PREREQUISITE(S):**

**HOURS/WEEK:**

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*For additional information, please contact Corey Meunier, Chair*  
*School of Technology & Skilled Trades*  
*(705) 759-2554, Ext. 2610*

**I. COURSE DESCRIPTION:**

In this course the student will demonstrate a working knowledge of the purpose, construction and principals of operation of cylinder block assemblies. The student will also perform inspection and testing on cylinder blocks and components. This course will also cover the purpose, construction and testing of camshafts and crankshafts

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

**1. *Define the purpose and fundamentals of cylinder block components***Potential Elements of the Performance:

- dismantle, inspect, test and assemble engine short block assemblies

**2. *Perform inspection and testing procedures on cylinder block and components following manufactures recommendations***Potential Elements of the Performance:

- demonstrate cylinder ridge removal and engine cleaning
- explain the effects of carbon buildup on pistons
- measure cylinders to determine taper and out of round
- measure warpage, crankshaft wear, bearing wear, piston wear using manufactures specs and precision measuring equipment

**3. *Describe the functions, construction, types, styles and application of engine crankshafts and bearings***Potential Elements of the Performance:

- visually inspect the crankshaft
- verify the disassembly procedure
- measure crankshaft endplay
- test crankshaft for warpage and alignment
- check crankshaft bearing wear and clearance

**4. *Discuss the purpose and fundamentals of camshaft and valve train assemblies***Potential Elements of the Performance:

- define valve lead, lag, overlap, and duration
- explain the relationship of valves to position of pistons

5. ***Describe the types styles and application of valve trains***

Potential Elements of the Performance:

- remove and replace camshafts from engine blocks
- inspect camshaft bearings for wear
- verify different types of drive mechanisms chains, belts, gears and sprockets
- perform valve lash adjustments on a variety of styles

**III. TOPICS:**

1. Cylinder Block Assemblies Theory
2. Cylinder Block Applications
3. Crankshafts Assemblies
4. Camshaft Assemblies
5. Valve Train Components and Drives

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Automotive Technology – Text & Workbook

Pens, pencils, calculator, 3-ring binder

Items mandatory for Shop:

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

**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:

<b>Grade</b>	<b><u>Definition</u></b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
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.

## **VII. COURSE OUTLINE ADDENDUM:**

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