

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**SAULT  
COLLEGE**

**COURSE OUTLINE**

**COURSE TITLE:** DRIVE TRAIN SYSTEMS

**CODE NO. :** AST605 **LEVEL:** ONE

**PROGRAM:** AUTOMOTIVE SERVICE TECHNICIAN  
APPRENTICESHIP (6067)

**AUTHOR:** STEPHEN KENT

**DATE:** SEPT 2010 **PREVIOUSLY UPDATED:** 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 be able to describe the construction, basic operating principles, servicing and testing techniques of the following gear train systems, clutch assemblies, manual transmission, differentials and drive shafts. The student will also demonstrate their ability to disassemble, test and inspect manual transmissions, differentials and drivelines including gear patterns, driveline angle measurement and phasing.

**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 service techniques required to repair single and double disc clutch assemblies.***

Potential Elements of the Performance:

- Compare & contrast static and sliding friction.
- State the effects of centrifugal force.
- Describe the construction of single and double disc clutch assemblies.
- Test and inspect clutch assemblies with prescribed service tools and equipment.
- Perform clutch adjustments following manufactures maintenance procedures.

2. ***Demonstrate a thorough understanding of the construction, operation, testing and servicing of rear wheel drive manual transmissions.***

Potential Elements of the Performance:

- Describe the basic operating principles of various manual shift gear boxes.
- Discuss the common customer complaints related to various power train component failures.
- Dismantle and trace power flows in manual shift transmissions.
- Inspect gears and synchronizers for wear and proper operation.
- Describe manufacturers' system maintenance procedures of manual transmission lubricating fluids.

3. ***Describe the function, composition and construction of differentials and drive shafts.***

Potential Elements of the Performance:

- Identify the differential and drive axle assemblies employed within the motive power field.
- Describe the function and interrelationship of the components of differentials and drive axle assemblies.
- Measure driveline angle and phasing using prescribed tools and equipment.
- Compare and contrast gears used in motive power drivelines (e.g.) bevel gear, spur gear, helical and hypoid.

**III. TOPICS:**

1. Clutches
2. Manual Transmissions
3. Differentials & Driveshafts

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

Automotive Technology – Text & Workbook  
Pen, pencils, calculator, and 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  
(Student will be given notice of test and assignment dates in advance)

The following semester grades will be assigned to students:

*Grade Point*

<b>Grade</b>	<b>Definition</b>	<i>Equivalent</i>
A+	90 – 100%	
A	80 – 89%	4.00
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.

## VII. COURSE OUTLINE ADDENDUM:

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