SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE:	AUTOMOTIVE DRIVE TRAINS		
CODE NO. :	MPT231	**SEMESTER:**	FOUR
PROGRAM:	MOTIVE POWER TECHNICIAN – ADVANCED REPAIR (4044)		
AUTHOR:	STEPHEN KENT		
DATE:	January 2013	**PREVIOUS OUTLINE DATED:**	January 2012
APPROVED:	*"Corey Meunier"* **CHAIR**		**DATE**
CREDITS:	THREE		
PREREQUISITE(S):	MPF103 and MPF127		
HOURS/WEEK:			

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I. COURSE DESCRIPTION:

In this course, you will be introduced to manual transaxles and front wheel drive axle assemblies. You will also disassemble and reassemble manual transaxles and CV shafts. Automatic transmissions will be introduced focusing on pump types, valves, torque converters, driving and holding devices and planetary gear sets both simple and compound. You will disassemble and trace power flows through an automatic transmission and perform pressure tests. You will also be introduced to four wheel drive and all wheel drive systems focusing on construction and operation.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Describe the functions, construction, types, styles and application of front wheel drive axle assemblies.

Potential Elements of the Performance:

Describe the following:

- front wheel drive axles
- half shafts
- constant velocity
- bearings
- constant velocity (CV) boots
- vibration damper
- front wheel drive axles
- torque steer
- inner and outer constant velocity joints
- vibration damper operation
- front wheel drive axles
- half shafts
- constant velocity
- bearings
- constant velocity (CV) boots
- vibration damper
- front wheel drive axles
- torque steer
- inner and outer constant velocity joints
- vibration damper operation

2. Describe the construction and operation of manual transaxles.

Potential Elements of the Performance:

- Compare and contrast front wheel drive vs. rear wheel drive.
- Trace power flows through a transaxle.
- Explain operation of the synchronizer hub assembly.
- Outline shift mechanisms.
- Disassemble and inspect a transaxle and perform assigned operations to determine gear ratio and final drive ratio.

3. Explain front wheel drive axle construction and operation.

Potential Elements of the Performance:

- State the difference between a plunge and a fixed CV joint.
- Remove and install axle assemblies from vehicles.
- Perform assigned operations to remove CV boots and joints from the half shafts.
- Explain the diagnostic sequence used to determine CV joint failure.

4. Explain the construction and operating principles of automatic transmissions.

Potential Elements of the Performance:

- Describe clutch pack and band operation.
- List three types of pumps.
- Outline control devices.
- Describe a compound planetary gear set.
- Explain torque converter operation.

5. Describe special tools required for servicing and repairing automatic transmission equipped vehicles.

Potential Elements of the Performance:

- Identify tools used for transmission repair.
- Explain how clutch packs are disassembled.

6. Describe the construction, types, styles and application of transfer case assemblies.

Potential Elements of the Performance:

- Outline shifting
- Describe ranges
- Explain internal operation of manual and automatic four wheel drive transfer cases.

III.

TOPICS:

1. Describe the functions, construction, types, styles and application of front wheel drive axle assemblies.
2. Describe the construction and operation of manual transaxles.
3. Explain front wheel drive axle construction and operation.
4. Explain the construction and operating principles of automatic transmissions.
5. Describe special tools required for servicing and repairing automatic transmission equipped vehicles.
6 Describe the construction, types, styles and application of transfer case assemblies.

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Title: Automotive Technology: A Systems Approach/AST Test Prep
Edition: 06 ed., 17810#
Author: Erjavec
Publisher: Thomson Nelson Learning Canada
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 – 40% of the final grade is comprised of term tests.
- Assignments – 10% of the final grade is comprised of a number of technical reports or assignments.
- Shop – 50% 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:

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.

Cell phones are not allowed to be on in the classrooms or shop areas.

VII. COURSE OUTLINE ADDENDUM:

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