SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

SAULT COLLEGE

COURSE OUTLINE

COURSE TITLE: Drive Train Systems

CODE NO. : TCT816   **APP Level:** THREE

PROGRAM: Truck and Coach Technician – Level 3 Apprenticeship

AUTHOR: John Avery

DATE: February 2016   **PREVIOUS OUTLINE DATED:** New

APPROVED: *"Corey Meunier"*
                           CHAIR

TOTAL CREDITS: 5

PREREQUISITE(S): Truck and Coach Technician – Level 2

HOURS/WEEK: 42 hours/week for eight weeks

I.   COURSE DESCRIPTION:
Gear Train Systems is designed for the advanced level training in Heavy Duty Transmissions used in On Highway Commercial Vehicles commonly School & City Buses, Highway Coach, and specialized delivery vehicles for city refuse vehicles. Students will be taught the purpose, construction and operation of the Automatic Transmissions and transmission control devices used for these applications. Students will learn the theory of operation of torque converters both single and double stage and how they develop the power and torque to power the automatic transmissions. Students will also learn the construction, and operation of the internal components and controls of the manual automatic transmissions and the newer electronically controlled transmission. They will be taught how to diagnose and test the external manual and electronic controls as well as the internal manual hydraulic and electronic hydraulically controlled systems. A hands on disassemble and assemble component is also included in the course to give students experience in the intricate design of planetary gearing systems used to achieve multiple gear ratios, speeds and torque output for the appropriate vehicle task.

II.   LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1.   Define the fundamentals of safe practices and procedures when working with electrical-/hydraulic systems.

2.   Define the purpose, construction and operation of the torque converter

3.   Define the construction, and operation of the Planetary Gearing used in automatic transmissions for medium & heavy duty commercial vehicles.

4.   Explain the different types of Automatic Transmission Fluid and suggested lubrication service procedures for the automatic transmission according to application and Manufacturer's model.

5.   Describe the purpose, construction and operation of the electronic control systems of the automatic transmissions.

6.   Perform hydraulic and electronic testing for automatic transmissions using Electronic Testing equipment according to Vehicle and Transmission Manufacturer's Specifications.

7.   Perform proper disassembly and internal component inspection of the components according to Manufacturer's Service Manuals and Specifications.

8.   Perform proper reassembly and adjustment procedures to the automatic transmissions according to the Manufacturer's Service Manual and Specifications.

III.   TOPICS:

1.   Electrical and Electronic fundamentals
2.   Heavy Duty Torque Converters
3.   Heavy Duty Transmission Power Flow Schematics
4.   Planetary Gearing and Hydraulic Control Devices
5.   Hydraulically and Electro-Hydraulically Controlled Valve body Assemblies
6.   Manual and Electronic testing and diagnosis of Automatic transmissions, and drive train assemblies and components

IV.   REQUIRED RESOURCES/TEXTS/MATERIALS:
Hand outs provided by instructor as well as text books requested by department as per booklist.

V.   EVALUATION PROCESS/GRADING SYSTEM:
Students will be tested on the material covered per apprenticeship curriculum by multiple choice questions, assignments, and practical tests. The weigh factor for each area of testing will be as follows:

- Theory Tests   50 %
- Practical Tests   30 %
- Assignments   20 %

This evaluation can change depending on the emphasis placed on each of the above testing procedures.

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.	

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

VI.   SPECIAL NOTES:

<u>Attendance:</u>
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 in D2L and on the portal form part of this course outline.