

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: ELECTRICAL SYSTEMS

CODE NO. : TCT713 **APP Level:** TWO

PROGRAM: TRUCK & COACH TECHNICIAN APPRENTICESHIP

AUTHOR: JOHN AVERY

DATE: October 2015 **PREVIOUS OUTLINE DATED:** May 2010

APPROVED:
“Corey Meunier”
CHAIR

TOTAL CREDITS: 5

PREREQUISITE(S): APPRENTICESHIP

HOURS/WEEK:

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I. COURSE DESCRIPTION:

Electrical Systems is designed to teach and enhance the student(s) theoretical and practical knowledge in automotive electrical and electronic systems and components used on-road truck and trailer, bus, and coach type vehicles. Students will be given an in depth in depth training on electrical circuits of the starting system learning how to follow the manufacturers' service procedure for electrical schematics, disassembly and assembly of the starting motor components and the correct method to properly test the system for starter current draw and volt drops across cables, switches and solenoids. Students will also be taught how to test and repair electronic control devices used for the truck and coach cab and chassis systems. The student(s) will be taught how to use various electrical test equipment applicable for diagnosing electrical and electronic management systems.

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 when working with electrical and electronic systems.
2. Define the differences between light and heavy duty batteries used for truck and coach systems.
3. Perform the inspection, testing of batteries with manual and electronic testing equipment according to manufacturer's specifications.
4. Define the purpose, construction and operation of both electrical and pneumatic starters used on light, medium, and heavy duty vehicles.
5. Disassemble starting motors and test the components for proper operation and faults.
6. Assemble the starting motor and perform a proper bench test to ensure proper operation according to the manufacturers specifications.
7. Perform an on-vehicle starter draw and volt drop test using the proper test equipment and service manual.
8. Interpret and trace electrical schematics for cab and chassis accessory and safety systems.
9. Perform testing and repairs to the electrical accessories, and auxiliary systems, such as lighting circuits, windshield wiper system and auxiliary cab convenience equipment.

10. Perform proper testing on electronic control devices used for cab and chassis electrical systems.

III. TOPICS:

1. Electrical and Electronic fundamentals
2. Heavy Duty Truck & Coach Batteries
3. Heavy Duty Truck and Coach Starting Systems
4. Truck & Coach Cab and Chassis Electrical Systems
5. Electronic Controls and Management Systems
6. Proper Testing Procedures for heavy Duty Batteries
7. Electronic Battery tests and Carbon Pile Battery Testers
8. Battery Cable Testing and Service

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	<i>Grade Point Equivalent</i>
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:

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 in D2L and on the portal form part of this course outline.