



**I. COURSE DESCRIPTION:**

The Electrical Systems course is designed to teach and enhance the student(s) theoretical and practical knowledge in automotive electrical and electronic systems and components used in on-road truck, trailer, bus, and coach type vehicles. Students will be given in depth training on electrical & electronic components and controls of the charging system learn how to follow Manufacturers service procedure for electrical schematics, disassembly and assembly of the alternator and the correct method to properly test the system for Alternator output, parasitic draw and volt drops across cables, switches and solenoids. Students will also be taught how to test and repair electronic control devices used for multiplexing of the truck and coach cab and chassis and engine systems. The student(s) will be taught how to use the electrical testing equipment applicable for diagnosing the electrical and electronic management systems. Medium Duty Vehicle Electronic Ignition Systems for gasoline engines will be taught at an introductory level and students will be show how to check and trouble shoot ignition and combustion problems.

**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 and electronic systems.
2. Define the differences between light and heavy duty charging systems used for truck and coach systems.
3. Perform the inspection, testing and repairs to the charging systems with manual and electronic testing equipment according to manufacturers specifications.
4. Define the purpose, construction and operation of the electronic cab and chassis multiplexing systems
5. Disassemble, bench test internal components, reassemble and dynamically test the alternator according to Manufacturer Specifications
6. Perform testing and repairs to light duty electronic ignition systems and components used on gasoline fuel type vehicles used in the light duty truck application

7. Perform testing and repairs to the electrical accessories, and auxiliary systems, such as lighting circuits, windshield wiper system and auxiliary cab convenience equipment.

### III. TOPICS:

1. Electrical and Electronic fundamentals
2. Heavy Duty Truck & Coach Electrical Schematics
3. Heavy Duty Truck and Coach Charging Systems
4. Truck & Coach Cab and Chassis Electrical Systems
5. Electronic Controls and Systems testing and diagnosis
6. Light duty truck ignition systems

### 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:

| <b>Grade</b> | <b><u>Definition</u></b>   | <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.

***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.