

I. COURSE DESCRIPTION:

In this course, you will be introduced to the basics of electricity and how it can be applied to Heavy Equipment, Truck Coach and Automotive industry. You will get an introduction on how to identify, inspect and test basic electrical circuits as well as inspect, test, service and replace batteries. You will learn to use digital multi-meters to perform basic electrical measurements and perform basic electrical repairs such as soldering, heat shrink installation and terminal installation.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the CICE student, along with the assistance of a Learning Specialist, will demonstrate the basic ability to:

1. *Outline the purpose, fundamentals and principles of electricity.*Potential Elements of the Performance:

Describe:

- Atomic structure
- Conductors and insulators
- Magnetism
- Electron and conventional theories
- Sources of electricity
- Ohm's Law, Kirchhoff's Law, Watts Law
- Current flow, heat and resistance
- Systems International (S.I.) System
- Voltage
- Amperage
- resistance
- Wattage
- Series, Parallel and series parallel circuit characteristics

2. *Perform basic electrical repairs.*Potential Elements of the Performance:

- Cleaning
- Splicing
- Crimping
- Soldering
- Corrosion protection
- Weather proofing
- Terminal repair

3. *Identify, inspect, and test basic electrical components and systems in compliance with manufacturers' recommendations.*

Potential Elements of the Performance:

- Identify circuit components and test circuit protection devices
- Demonstrate the ability to measure voltage, current and resistance using a DVOM (digital volt ohm meter)
- Perform maintenance on a DVOM including testing and replacing internal circuit protection and batteries

4. *Discuss the construction, operation, types, styles and application of electromagnetic devices.*

Potential Elements of the Performance:

Outline the fundamentals of:

- power generation
 - alternators
 - generators
- electric motors
- solenoids
- relays
- coils
- stepper motors
- switches

5. *Perform inspection and testing procedures on batteries following manufacturers' recommendations.*

Potential Elements of the Performance:

- Identify and use appropriate personal protection when servicing batteries.
- Perform visual inspection on batteries
- Perform cleaning of battery terminals and battery case
- Perform state of charge, high rate discharge and conductance testing
- Describe the construction, operation, types, styles and application of batteries
- Charge batteries

III. TOPICS:

1. Basic Electricity
2. Diagnostic test equipment
3. Electromagnetic devices and circuit components
4. Battery Fundamentals
5. Circuit repair and protection

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**Title:** Heavy Duty Truck Systems**Edition:** 5th ed.,**Author:** Bennett**Publisher:** Thomson Nelson Learning Canada**Title:** Automotive Technology: A Systems Approach**Edition:** 2nd Canadian Ed.**Author:** Erjavec**Publisher:** Thomson Nelson Learning Canada

Pens, pencils, calculator, 3-ring binder

The following items are mandatory in the Shop:

- shop coat or coveralls
- CSA approved steel toe boots (high top)
- CSA approved safety glasses

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 – 50% of the final grade is comprised of term tests
- Assignments – 10% of the final grade is comprised of a number of technical reports
- Shop – 40% 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	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	

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.**

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources. The professor, in conjunction with a Learning Specialist, will periodically assess the necessity of any further modifications to the course outline.

VII. COURSE OUTLINE ADDENDUM:

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

CICE Modifications:**Preparation and Participation**

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

A. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

B. Tests will be written in CICE office with assistance from a Learning Specialist.***The Learning Specialist may:***

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

C. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Learning Specialist may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

D. Evaluation:

Is reflective of modified learning outcomes.