



**I. COURSE DESCRIPTION:**

This course develops awareness of basic electrical and electronic fundamentals. Emphasis is placed on basics of electrical measurement and devices. Practical lab exercises develop hands-on skills. Time permitting, basic splicing and soldering will be performed.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

**1. *Discuss and utilize fundamental Electrical/Electronic concepts at an introductory level.***Potential Elements of the Performance:

- Define or describe the meaning of the following terms: Potential, Potential Difference, Voltage, Current, Resistance, Power, Conductance, Insulator, Resistor, Capacitor, Inductor, Transformer, Capacitance, Inductance, Impedance, Direct Current, Alternating Current, Amplitude, Frequency, Period, Sine Wave, Square Wave, Triangle Wave, Ohm's Law, Kirchoff's Law
- Use Ohm's Law and Kirchoff's Law to analyze simple series and parallel circuits.
- Describe the characteristics of inductors and capacitors in DC and AC circuits
- Describe the characteristics of diodes, BJT's (Transistors) and LEDs (Light Emitting Diodes).

**2. *Use electronic test equipment to test simple electrical and electronic circuits.***Potential Elements of the Performance:

- Use a digital multimeter to measure voltage, resistance and current and calculate power dissipation in simple DC circuits
- Use an oscilloscope to measure amplitude, frequency and the period of periodic waveforms
- Use power supplies, function generators and test equipment to analyze simple AC and DC circuit operation.

**3. *Utilize soldering tools to complete basic soldering tasks.***Potential Elements of the Performance:

- Splice two wires together using a rat-tail and a western union splice.
- Solder the splices

**4. *To develop the student's basic knowledge concerning electrical safety.***

Potential Elements of the Performance:

- Understand the basic safety requirements needed to work with electrical equipment and electrical equipment installation.
- Understand the potential for electrical shock and the basic physical effects on the human body
- Understand the need to de-energize electrical equipment before commencing any work on equipment.
- Identify and understand the use of Fuses, Circuit Breakers and Ground fault circuit interrupters (GFCI) as they relate to electrical safety.

**5. *Understand and Identify the need for electrical standards and codes as required for basic electrical installation.***

Potential Elements of the Performance:

- Identify the recognized Certification associations and their Markings
- Identify the electrical CEC (Canadian Electrical Code) and Ontario Electrical Code Books
- Understand the basic differences between CEC and Ontario Electrical code books
- Understand the basic layout of sections of the electrical code books
- Understand the requirements for electrical inspection by ESA for basic electrical equipment installations.
- Understand the correct installation procedures and wiring connections for basic common residential electrical installations ensuring strict adherence to CEC (Canadian Electrical Code) and NBC (National Building Code) regulations.
- Understand and identify the proper installation procedures required for basic wiring methods in a residential installations ensuring strict adherence to CEC regulations.
- Understand the need for proper grounding in basic electrical installation

**6. *Identify basic electrical prints and understand basic electrical print reading.***

Potential Elements of the Performance:

- Identify Electrical Drawings Symbols
- Understand How to Reading Basic Electrical Drawings

**III. TOPICS:**

1. Electrical and Electronic Fundamentals
2. Soldering
3. Electrical Safety
4. Electrical Code
5. Electrical Prints

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Electrical/Electronic Fundamentals available at Campus Shop

**V. EVALUATION PROCESS/GRADING SYSTEM:**

4 Written Tests	60%
Lab Projects	25%
Quizzes/Assignments	15%

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%	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.

Attendance to scheduled lab activities is compulsory, unless permission has been granted by the instructor. Lab attendance and final grade are directly related. If a student arrives late for, or is not continuously present and actively participating at (scheduled breaks excepted), a scheduled lab class he/she will be considered absent for the entire class and will not be permitted to submit the associated lab report.

**Students must continuously wear all Sault College required personal protective equipment (PPE) during lab activities. Failure to do this will result in expulsion from the lab activity and a grade of zero being assigned. Students are expected to be wearing their required PPE prior to entering the lab. The instructor will advise what specific PPE is required. If a student repeatedly neglects to wear PPE as required he/she will be considered to be in violation of the Sault College Academic Code of Conduct and may be sanctioned accordingly (see Student Code of Conduct & Appeal Guidelines). For instance, first violation – verbal warning; second violation – written warning; and third violation – suspension from lab activities.**

**Students must complete a lab safety orientation prior to participating in lab activities. Successful completion of this orientation will be demonstrated by the student completing a quiz with a minimum grade of 100%.**

The student must maintain a minimum 50% average in **both** the **theory** portion **and lab** portion of the class in order to receive a passing grade. If a student misses a test/lab he/she must have a valid reason (i.e. medical or family emergency – documentation may be required). In addition, the instructor **must** be notified **prior** to the test or lab sitting. If this procedure is not followed the student will receive a mark of zero on the test/lab with no make-up option. Students may not submit lab reports for labs in which they were not in continuous attendance. Lab reports not submitted by the assigned deadline will receive a grade of 0.

**Students may not wear earphones of any kind (i.e. for play back of recorded music/voice) during lab activities or test sittings. This does not include hearing aids required for hearing impaired.**

**Cell Phones are to be put on vibrate or silent during lectures and placed out of site. During tests, Cell Phones are to be turned OFF and placed out of site. Cell Phones are not calculators and will not be allowed to be used as such in class. If your phone rings during class a deduction of 2% will be made from your final grade per event. If your phone rings during a test or exam, you will be asked to leave the class and a 0 Grade will be recorded for that test.**

**Please talk to instructor if special considerations are required to this policy!**

Students are expected to maintain an active Sault College email account. They are required to check this email account daily. The instructor may announce details of lab and test requirements and scheduling through the Sault College email system (as well as sharing other important information).

#### **VII. COURSE OUTLINE ADDENDUM:**

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