

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



**SAULT  
COLLEGE**

**COURSE OUTLINE**

**COURSE TITLE:** Electrical and Electronic Systems

**CODE NO. :** MSE140 and MSE618      **SEMESTER:** ONE

**PROGRAM:** Motive Power Fundamentals – Small Engine Repair (5084)  
Small Engine Mechanic – Level 1 Apprenticeship (6090)

**AUTHOR:** Gord Strachan

**DATE:** October 2014      **PREVIOUS OUTLINE DATED:** October 2013

**APPROVED:**

*“Corey Meunier”*

**CHAIR**      **DATE**

**TOTAL CREDITS:** THREE

**PREREQUISITE(S):**

**HOURS/WEEK:**

**Copyright ©2014 The Sault College of Applied Arts & Technology**  
*Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.*  
**For additional information, please contact Corey Meunier, Chair**  
**Technology & Skilled Trades**  
**(705) 759-2554, Ext. 2610**

**I. COURSE DESCRIPTION:**

Upon successful completion of the reportable subject, the student will be able to recommend repair, identify and describe of electrical and electronic systems, test and diagnose lead acid batteries and interpret electrical wiring diagrams in accordance with government safety regulations, approved industry standards and equipment manufactures' recommendations and specifications.

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

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

**1. *Identify and Describe Electrical and Electronic Systems*****Potential Elements of the Performance:**

- Define the essential basic information and fundamentals of electrical and electronic systems.
- Describe the construction features of mechanical breaker ignition (MBI,) capacitor discharge ignition (CDI), transistor controlled ignition (TCI) and charging systems.
- Explain the basic principles of operation of ignition and charging systems.
- Identify, test and diagnose ignition and magneto charging systems and components common to the industry.
- Perform repairs on ignition and magneto charging systems.

**2. *Test and Diagnose Lead Acid Batteries*****Potential Elements of the Performance:**

- Define the essential basic information and fundamentals of lead acid batteries.
- Describe the basic function, composition, and construction of lead acid battery components.
- Explain the basic principles of operation of lead acid battery components, charging, temperature resistance and ratings effects.
- Inspect and test batteries with the prescribed service tools and equipment.
- Describe manufacturers' system maintenance procedures of batteries and perform assigned operation.

### 3. ***Interpret Electrical Wiring Diagrams***

#### Potential Elements of the Performance:

- Define the essential basic information and fundamentals of electrical wiring diagrams.
- Explain the basic design, layout, and interpretation techniques of manufacturers' wiring diagrams.
- Locate electrical components and trace circuits of systems with the prescribed manufacturers' wiring diagram.

### III. **TOPICS:**

1. Electrical and Electronic Systems
2. Electrical and Electronic Systems Fundamentals
3. Lead Acid Batteries
4. Electrical Wiring Diagrams

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

**Title:** Understanding the Outboard Motor

**Edition:** 3rd

**Author:** Stagner

**Publisher:** Pearson Education

**Title:** Boat Owner's Mechanical and Electrical Manual

**Edition:** 3rd

**Author:** Calder

**Publisher:** McGraw Hill

**Title:** Small Gas Engines

**Edition:** 10<sup>th</sup>

**Author:** Roth

**Publisher:** Goodheart-Willcox

**Title:** Small Gas Engines (workbook)

**Edition:** 10th

**Author:** Roth

**Publisher:** Goodheart-Willcox

**CSA Certified 6 inch Leather Safety Boots**  
**CSA Certified & Impact Resistant Safety Glasses**  
**Coveralls (non-flammable material - i.e. cotton)**  
**Shop Coat (optional)**

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

Theory Testing	30%
Application Experiences	40%
Final Assessment	30%

The following semester grades will be assigned to students:

<b>Grade</b>	<b>Definition</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.	

**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 is mandatory except with a valid excuse. If late you will be marked absent for the whole hour. For every unexcused absence you will be deducted 1% per class period. Previous notification or a call the day of absence is required for excusal.

If you miss a test with an unexcused absence you will not be allowed to write that test.

If a class is missed or going to be missed it is your responsibility to notify your instructor and make arrangements for handouts and notes taken while you were away.

CSA approved safety glasses and safety boots must be worn in the shop at all times. Please have safety boots and safety glasses available because you may not have a lot of warning when going into the shop.

**CELL PHONES OR PAGERS MUST BE TURNED OFF IN ANY CLASS.**

**VII. COURSE OUTLINE ADDENDUM:**

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