SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE:	Electrical/ Electronic and Emission Systems
CODE NO. :	AST608 **LEVEL:** 1
PROGRAM:	Automotive Service Technician Apprenticeship (6067)
AUTHOR:	Jamie Schmidt
DATE:	June 2008 **PREVIOUS OUTLINE DATED:** Aug 07
APPROVED:	**"Corey Meunier"** **CHAIR** **DATE**
TOTAL CREDITS:	12
PREREQUISITE(S):	
HOURS/WEEK:	

I. COURSE DESCRIPTION:

Students completing this course will gain a working knowledge of the purpose, principles of operation and applications of electrical and electronic concepts. Students will be introduced to electrical diagnostic equipment and procedures.

Intake and exhaust systems will be covered as well as an introduction to gasoline and diesel fuel systems. Vehicle emissions and emission control systems will be studied.

The curriculum for AST Level I apprenticeship training and has been approved by the Ministry of Training, Colleges and Universities.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Demonstrate a working knowledge of the purpose, principles of operation and applications of electrical concepts.

Demonstrate a working knowledge of the purpose, construction and principles of operation of electromagnetic devices.

Demonstrate a working knowledge of the purpose, construction and applications of electronic devices.

Potential Elements of the Performance:

- Define the purpose, fundamentals and principles of electricity.
- Describe the application of electrical concepts.
- Define the purpose and fundamentals of electromagnetic devices.
- Describe the construction, types, styles and application of electromagnetic devices.
- Explain the principles of operation of electromagnetic devices.

2. Demonstrate a working knowledge of the purpose, construction, principles of operation, performing inspection and testing of diagnostic test equipment.

Potential Elements of the Performance:

- Define the purpose and fundamentals of diagnostic test equipment
- Describe the construction, types and application of diagnostic test equipment.
- Explain the principles of operation of diagnostic test equipment.
- Perform inspection and testing procedures using diagnostic

test equipment following manufacturers' recommendations.
- Define the purpose and fundamentals of electronics.
- Describe the function, construction and application of electronic devices.

3. Demonstrate a working knowledge of the purpose, construction, principles of operation, inspection and testing for batteries.

Potential Elements of the Performance:

- Define the purpose and fundamentals of batteries.
- Describe the construction, types, styles and application of batteries.
- Explain the principles of operation of batteries.
- Perform inspection and testing procedures on batteries following manufacturers' recommendations.
- Perform assigned operations on batteries following manufacturers' recommendations.

4. Demonstrate a working knowledge of performing circuit calculations to verify Ohm's, Watts and Kirchhoff's Laws.

Potential Elements of the Performance:

- Define the purpose and fundamentals of electrical circuits.
- Describe the function, construction and application of electrical circuits.
- Perform circuit calculations to verify Ohm's, Watts and Kirchhoff's Laws.
- Perform assigned operations with meters for voltage, amperage and resistance tests.

5. Demonstrate a working knowledge of the application of wiring schematics, locating electrical components and tracing electrical circuits.

Demonstrate a working knowledge of the purpose, construction, principles of operation of circuit protection devices and their inspection and testing.

Potential Elements of the Performance:

- Define the purpose and fundamentals of electrical wiring schematics.
- Describe the function, construction, styles and application of manufacturers' wiring diagrams.
- Locate electrical components and trace electrical circuits of vehicle systems with the prescribed manufacturers' wiring diagrams.
- Describe the construction, types and application of circuit repair and protection devices.
- Explain the principles of operation of circuit protection devices.

- Perform inspection and testing procedures on circuit repair and protection devices with the prescribed service tools and equipment following manufacturers' recommendations.

6. Demonstrate a working knowledge of the purpose, function and properties of fuels and the combustion of fuels.
Demonstrate a working knowledge of the purpose, construction, principles of operation, inspection and testing for intake and exhaust systems.
Demonstrate a working knowledge of the purpose, construction, applications of emission control systems. Locate and identify emission control components.

Potential Elements of the Performance:

- Define the purpose and fundamentals of fuels.
- Describe the function, composition and properties of fuels.
- Explain the combustion principles of fuels.

III. TOPICS:

1. ELECTRICAL FUNDAMENTALS, ELECTROMAGNETIC DEVICE FUNDAMENTALS, ELECTRICAL / ELECTRONIC DIAGNOSTIC TEST EQUIPMENT, ELECTRICAL CIRCUIT CALCULATION
2. BATTERY FUNDAMENTALS, AND TESTING
3. APPLIED ELECTRICAL SCHEMATICS
4. CIRCUIT REPAIR AND PROTECTION DEVICES
5. FUEL SYSTEM FUNDAMENTALS, INTAKE AND EXHAUST SYSTEMS, EMISSION CONTROL SYSTEMS
6. DIESEL FUEL SYSTEMS

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Automotive Technology
A Systems Approach

V. EVALUATION PROCESS/GRADING SYSTEM:

Theory Testing	60%
Practical Application Exercises	30%
Notebook and Organizational Skills	10%

The following semester grades will be assigned to students:

Grade	Definition	*Grade Point Equivalent*
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:

Special Needs:
If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Retention of Course Outlines:
It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Communication:
The College considers ***WebCT/LMS*** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the ***Learning Management System*** communication tool.

Plagiarism:
Students should refer to the definition of "academic dishonesty" in *Student Code of Conduct*. Students who engage in academic dishonesty will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

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.

Substitute course information is available in the Registrar's office.

VII. PRIOR LEARNING ASSESSMENT:

Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. ADVANCE CREDIT TRANSFER:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question.