Prepared: Jamie Schmidt Approved:

Course Code: Title	MPF123: ELECTRICAL II
Program Number: Name	4041: AUTOMOTIVE REPAIR
Department:	MOTIVE POWER
Semester/Term:	17F
Course Description:	In this course you will gain an understanding of automotive and heavy duty electrical circuits, wiring diagrams, electro-magnetism and the use of applied test equipment. Construction and operating principals of starters and alternators will be discussed. You will perform basic starting and charging system testing. Electronic ignition system operation and design will be studied including manufactures maintenance and diagnostic procedures. Students will be required to follow proper safety procedures when performing the above tasks according to both Sault College Motive Power Department Standards and Vehicle Manufacturers safety regulations and specifications.
Total Credits:	3
Hours/Week:	5
Total Hours:	40
Prerequisites:	MPF100, MPF103
This course is a pre-requisite for:	MPT201
Vocational Learning Outcomes (VLO's): **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4041 - AUTOMOTIVE REPAIR** #1. Identify basic motive power system problems by using critical thinking skills and strategies and by applying fundamental knowledge of motor vehicle operation, components, and their interrelationships. #3. Identify, inspect, and test basic electrical, electronic, and emission components and systems in compliance with manufacturers recommendations. #6. Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices. #7. Use a variety of test equipment to assess basic electronic circuits, vehicle systems, and subsystems. #9. Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.

	#10. Use information technology and computer skills to access data concerning repair procedures and manufacturer's updates. #11. Prepare logs, records, and documentation to appropriate standards. #12. Apply business practices and communication skills to improve customer service.
Essential Employability Skills (EES):	#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience. #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication. #3. Execute mathematical operations accurately. #4. Apply a systematic approach to solve problems. #5. Use a variety of thinking skills to anticipate and solve problems. #6. Locate, select, organize, and document information using appropriate technology and information systems. #7. Analyze, evaluate, and apply relevant information from a variety of sources. #9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. #10. Manage the use of time and other resources to complete projects. #11. Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 50%, D
Other Course Evaluation & Assessment Requirements:	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.
Evaluation Process and Grading System:	<table><tr><th>Evaluation Type</th><th>Evaluation Weight</th></tr><tr><td>Assignments</td><td>10%</td></tr><tr><td>Employability Skills</td><td>10%</td></tr><tr><td>Shop</td><td>45%</td></tr><tr><td>Tests</td><td>35%</td></tr></table>
Books and Required Resources:	Heavy Duty Truck Systems by Sean Bennet Edition: 6 ISBN: 9781305686229 Automotive Technology a Systems Approach by Erjavec, Restole ISBN: 9780176501679
Course Outcomes and	

Learning Objectives:

Course Outcome 1.

Outline the fundamentals of wiring diagrams

Learning Objectives 1.

- Prepare a valley forge style diagram for a relay controlled circuit
- Follow the path of current flow in a circuit using a wiring schematic
- Relate troubleshooting procedures for opens, shorts and high resistance faults to a wiring schematic

Course Outcome 2.

Connect and operate diagnostic test equipment

Learning Objectives 2.

- Use a test lamp to diagnose an open in a circuit
- Use a DVOM to diagnose an open in a circuit
- Locate unwanted resistance in a circuit using voltage drop testing
- Measure resistance in a circuit using a DVOM
- Measure parasitic drain
- Measure current flow using an inductive ammeter
- Remove and replace electrical components

Course Outcome 3.

Describe the principals of operation and construction of starting and charging systems.

Learning Objectives 3.

- Describe the construction and operation of an alternator
- Describe the construction and operation of a starter motor
- Explain the motor principle
- Describe electromagnetic induction

Course Outcome 4.

Test starting and charging system operation.

Learning Objectives 4.

- Perform charging system tests following manufactures recommended procedures
- Perform starting system tests following manufactures recommended procedures

Course Outcome 5.

Explain the construction, operation and maintenance of ignition systems.

	Learning Objectives 5. • Identify ignition system components • Describe the fundamental operation of a spark ignition system • Perform visual inspection of ignition system components • Perform a spark test • Measure secondary voltage using a KV meter
Date:	Monday, December 18, 2017
	Please refer to the course outline addendum on the Learning Management System for further information.