COURSE OUTLINE: MPT233 - ELECTRIC/ELECTRON II

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Course Code: Title	MPT233: ELECTRICITY/ELECTRONIC II
Program Number: Name	4044: MOT POWER ADV REPAIR
Department:	MOTIVE POWER
Academic Year:	2024-2025
Course Description:	In this course you will diagnose and repair vehicle lighting and accessory systems following manufactures procedures. You will also perform diagnostic and troubleshooting processes on truck and heavy equipment module input and output circuits. Restraint systems will be studied with an emphasis on safe working practices. An introduction into multiplexing systems used in buses, trucks, heavy equipment and automobiles will be provided. 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:	4
Hours/Week:	5
Total Hours:	40
Prerequisites:	MPF103, MPT201
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4044 - MOT POWER ADV REPAIR** VLO 1 Analyse, diagnose, and solve various motive power system problems by using problem-solving and critical thinking skills and strategies and by applying fundamental knowledge of motor vehicle operation, components, and their interrelationships. VLO 4 Diagnose and repair electrical, electronic, personal safety, and emission components and systems in compliance with manufacturer's recommendations. VLO 7 Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices. VLO 8 Select and use a variety of troubleshooting techniques and test equipment to assess electronic circuits, vehicle systems, and subsystems. VLO 10 Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards. VLO 11 Use information technology and computer skills to support work in a motive power environment. VLO 16 Complete all assigned work in compliance with occupational, health, safety, and environmental law; established policies and procedures; codes and regulations; and in accordance with ethical principles.

Essential Employability Skills (EES) addressed in this course:	EES 3 Execute mathematical operations accurately. EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals. EES 10 Manage the use of time and other resources to complete projects. EES 11 Take responsibility for ones own actions, decisions, and consequences.
Course Evaluation:	Passing Grade: 50%, D A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
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.
Books and Required Resources:	Heavy Duty Truck Systems by Sean Bennet Publisher: Cengage Edition: 7th ISBN: 9781305686229 Automotive Technology a Systems Approach by Erjavec, Restole Publisher: Cengage Edition: 3rd ISBN: 9780176501679

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Explain the principles of operation of vehicle on board computers.	Describe and explain: • onboard computers • multiplexing

	• fibre optics • data bus communication lines • CAN bus • central processing unit (CPU) • random access memory (RAM) • read only memory (ROM)
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Perform data retrieval with appropriate test equipment.	• Utilize laptops and industry standard scan tool equipment • Operate oscilloscopes to measure voltage and current • Record, review and analyze vehicle data
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Perform analysis and diagnostic procedures using electronic service tools	• Extract wave form trace of fuel pump current using an oscilloscope • Interpret an oscilloscope voltage pattern from a hall effect and magnetic pulse generator • Observe CAN bus communication using an oscilloscope • Ping modules • Perform voltage drop testing and interpret results • Verify vehicle network integrity using a DVOM • Demonstrate proficiency with a DVOM • Utilize electronic service tools and manufactures service literature to diagnose accessory and lighting systems
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Inspect, test and explain safe handling procedures for restraint system components.	• safely disable restraint systems • perform system tests using scan tools, DVOM and specific test equipment
Course Outcome 5	**Learning Objectives for Course Outcome 5**
Identify, locate and test ignition system circuits and components.	Identify and test: • Coils • Modules • Sensors • Wiring • KV meter test • Scope testing

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Assignments	10%
Employability Skills	10%
Shop	45%
Tests	35%

Date: November 12, 2024

Addendum: Please refer to the course outline addendum on the Learning Management System for further

information.