COURSE OUTLINE: MPT201 - ELECTRIC/ELECTRONICS

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Course Code: Title	MPT201: ELECTRICITY/ELECTRONICS
Program Number: Name	4044: MOT POWER ADV REPAIR
Department:	MOTIVE POWER
Academic Year:	2023-2024
Course Description:	In this course, you will be introduced to electronic components relating to the motive power industry. The student will diagnose and repair electrical and electronic systems. Use a variety of troubleshooting techniques and test equipment to access electronic circuits and vehicle subsystems such as distributor less ignition systems, restraint systems, charging systems, starting systems and accessories.
Total Credits:	3
Hours/Week:	5
Total Hours:	40
Prerequisites:	MPF103, MPF123
Corequisites:	There are no co-requisites for this course.
This course is a pre-requisite for:	MPT233
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	EES 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form

Skills (EES) addressed in this course:

that fulfills the purpose and meets the needs of the audience.

EES 2	Respond to written, spoken, or visual messages in a manner that ensures effective communication.
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 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
Edition: 7th
ISBN: 9781305686229

Automotive Technology a Systems Approach by Erjavec, Restole
Edition: 4th Canadian
ISBN: 9780176501679

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Describe the construction, operation, composition,	Describe the construction, operation and applications of: Diodes

types, style and applications of electronic and circuit devices.	• forward and reverse bias • current control Transistors • forward and reverse bias • PNP and NPN • switching • amplification Capacitors • ceramic and electrolytic Sensors • voltage generating • pulse generators • piezoelectric • galvanic • hall effect • optical • thermistors Variable resistor • rheostat • potentiometers • piezo resistive Circuit Devices • solenoids • relays
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Perform inspection, testing and diagnostic procedures for electronic and circuit devices following manufacturer`s recommendations.	Diodes • test the operation of a diode with a DVOM Transistors • verify the operation of a transitor in a power train control module Capacitors • measure capacitance Sensors • measure voltage output and resistance of magnetic pulse generators • measure voltage output of piezoelectric sensors • measure voltage output of galvanic sensors • perform resistance tests on potentiometers and thermistors Circuit Devices • perform electrical diagnosis on solenoids and relays
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Perform inspection testing and diagnostic procedures using manufacture`s wiring schematics.	• Diagnose faults, i.e., shorts, opens, grounds, high resistance • Perform circuit analysis following manufacturer`s troubleshooting charts • Interpret various types of manufacturer`s wiring diagrams
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Describe the construction, operation, types, styles and	• Computer-controlled starting and charging system • Alternator field

	application of computer-controlled starting systems, charging systems and electronic regulators.	• Ambient temperature sensing • Battery voltage sensing • Battery temperature sensing • Zener diode and voltage control transistors • Field current switching • Ignition switch input • Starter control relay • BCM controlled starter inputs and outputs
	Course Outcome 5	**Learning Objectives for Course Outcome 5**
	Perform inspection, testing and diagnostic procedures on starting and computer-controlled charging systems following manufacturer`s recommendations.	• Outline the recommended testing sequence to determine the overall condition of the charging and starting systems • Perform visual charging and starting system tests • Identify and isolate faulty charging and starting system components by utilizing the recommended troubleshooting procedures and test equipment

Evaluation Process and Grading System:

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

Date: August 21, 2023

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