COURSE OUTLINE: MPT200 - AUTO FUEL/EMISSIONS

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Course Code: Title	MPT200: AUTO ALTERNATE/CONVENT.FUEL & EMISSIONS
Program Number: Name	4044: MOT POWER ADV REPAIR
Department:	MOTIVE POWER
Academic Year:	2022-2023
Course Description:	This course will compare ethanol flex fuel systems to conventional gasoline fuel injection and other alternate hydrocarbon fuel systems. Emission testing will be performed, analyzed and compared to current legislated standards. Students will use industry standard electronic and mechanical test equipment. You will have a sound understanding of fuel injection and emission systems operation, diagnosis and repair.
Total Credits:	3
Hours/Week:	6
Total Hours:	45
Prerequisites:	MPF103, MPF124
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 1 Communicate clearly, concisely and correctly in the written, spoken, and visual form 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 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. 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:	Automotive Technology: A Systems Approach by Erjavec Restole Publisher: Thomson Nelson Learning Canada Edition: 4th Canadian Edition ISBN: 9780176501679

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
Describe the construction, operation, types, styles and application of gasoline fuel injection systems	• Describe the construction and operation of fuel delivery systems • Describe the construction and operation of multiport and direct injection systems • Describe the purpose, construction and operation of primary fuel metering input and output devices • Explain fuel metering modes of operation • Describe OBDII modes and trouble code structure
Course Outcome 2	**Learning Objectives for Course Outcome 2**

Perform diagnostic procedures on fuel delivery systems	• Identify and utilize appropriate personal protection and safety precautions when servicing automotive fuel systems • Perform testing procedures to isolate problems with fuel pumps, regulators, injectors, filters, tanks and lines • Perform injector balance testing • Perform testing procedures for water and alcohol fuel contamination
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Perform diagnostic procedures on fuel injection electronic control systems	• Use scan tools and computer based diagnostic equipment to access generic OBDII functions and manufacture specific information • Read, diagnose and clear OBDII trouble codes • Access and interpret live data stream information • Access non continuously monitored test results • Use bi-directional communications to operate and test output devices
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Identify and test emission control components	• Describe the construction and operation of emission control systems • Identify emission control devices • Use electronic test equipment to diagnose emission control system failures • Perform exhaust emissions testing • Perform catalytic convertor testing • Perform a smoke test on an evaporative emission system
Course Outcome 5	**Learning Objectives for Course Outcome 5**
Alternate fuels	• Describe fuel injection system requirements for E-85 flex fuel vehicles • Explain the difference in fuel metering requirements for ethanol fuel blends • Describe the construction and operation of propane and natural gas fueled fuel systems

Evaluation Process and Grading System:

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

Date: August 15, 2022

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