



# COURSE OUTLINE

## MPT200

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Prepared: Jamie Schmidt Approved:

<b>Course Code: Title</b>	MPT200: AUTO ALTERNATE/CONVENT.FUEL & EMISSIONS
<b>Program Number: Name</b>	4044: MOT POWER ADV REPAIR
<b>Department:</b>	MOTIVE POWER
<b>Semester/Term:</b>	17F
<b>Course Description:</b>	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.
<b>Total Credits:</b>	3
<b>Hours/Week:</b>	6
<b>Total Hours:</b>	48
<b>Prerequisites:</b>	MPF103, MPF124
<b>Vocational Learning Outcomes (VLO's):</b>  Please refer to program web page for a complete listing of program outcomes where applicable.	#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. #11. Use information technology and computer skills to support work in a motive power environment.
<b>Essential Employability Skills (EES):</b>	#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.
<b>Course Evaluation:</b>	Passing Grade: 50%, D
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	The following semester grades will be assigned to students:  Grade



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### 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:

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

### Books and Required Resources:

Automotive Technology: A Systems Approach by Erjavec Restole

Publisher: Thomson Nelson Learning Canada

ISBN: 9780176501679

### Course Outcomes and Learning Objectives:

## Course Outcome 1.

Describe the construction, operation, types, styles and application of gasoline fuel injection systems

## Learning Objectives 1.

- 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



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devices

- Explain fuel metering modes of operation
- Describe OBDII modes and trouble code structure

### Course Outcome 2.

Perform diagnostic procedures on fuel delivery systems

### Learning Objectives 2.

- 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.

Perform diagnostic procedures on fuel injection electronic control systems

### Learning Objectives 3.

- 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.

Identify and test emission control components

### Learning Objectives 4.



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- 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 converter testing
- Perform a smoke test on an evaporative emission system

### Course Outcome 5.

Alternate fuels

### Learning Objectives 5.

- 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

**Date:**

Friday, September 1, 2017

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