



COURSE OUTLINE

MPF124

Prepared: Stephen Kent Approved: Corey Meunier

Course Code: Title	MPF124: FUEL SYSTEMS
Program Number: Name	4041: AUTOMOTIVE REPAIR
Department:	MOTIVE POWER
Semester/Term:	17F
Course Description:	<p>COURSE DESCRIPTION</p> <p>In this course, you will learn the construction, operating principles, testing and service techniques used in fuel systems including, fuel pumps, tanks , lines sub-systems intakes and exhaust. You will also be introduced to electronic gasoline fuel injection and diesel fuel injection systems including electronic diesel fuel injection systems.</p> <p>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.</p>
Total Credits:	5
Hours/Week:	7
Total Hours:	49
Prerequisites:	MPF103
This course is a pre-requisite for:	MPT200, MPT232
<p>Vocational Learning Outcomes (VLO's):</p> <p>Please refer to program web page for a complete listing of program outcomes where applicable.</p>	<p>4041 - AUTOMOTIVE REPAIR</p> <p>#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.</p> <p>#3. Identify, inspect, and test basic electrical, electronic, and emission components and systems in compliance with manufacturers recommendations.</p> <p>#6. Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices.</p> <p>#7. Use a variety of test equipment to assess basic electronic circuits, vehicle systems, and subsystems.</p> <p>#9. Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.</p>

	<p>#11. Prepare logs, records, and documentation to appropriate standards. #12. Apply business practices and communication skills to improve customer service.</p>				
Essential Employability Skills (EES):	<p>#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. #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.</p>				
Course Evaluation:	<p>Passing Grade: 50%, D</p>				
Other Course Evaluation & Assessment Requirements:	<p>V. EVALUATION PROCESS/GRADING SYSTEM: The final grade for this course will be based on the results of classroom, assignments and shop evaluations weighed as indicated: Classroom 35% of the final grade is comprised of term tests Assignments 10% of the final grade is comprised of a number of technical reports Shop 45% of the final grade is comprised of attendance, punctuality, preparedness, student ability, work organization and general attitude Employability Skills 10% of final grade is comprised of attendance, class participation, show ability to follow direction and being a team player.</p> <p>(Student will be given notice of test and assignment dates in advance)</p> <p>NOTE: All assignments will be in typed format. NO hand written assignments will be accepted.</p> <p>The following semester grades will be assigned to students:</p> <p>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</p> <p>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.</p>				
Evaluation Process and Grading System:	<table border="1"> <thead> <tr> <th>Evaluation Type</th> <th>Evaluation Weight</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Evaluation Type	Evaluation Weight		
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Assignments	10%
Employability Skills	10%
shop	45%
Theory Tests	35%

Books and Required Resources:

Automotive Technology: A Systems Approach by Erjavec
 Publisher: Thomson Nelson Learning Canada Edition: 3rd Canadian

Medium/Heavy Duty Truck Engines, Fuel and Computerized Management Systems by Bennet
 Publisher: Cengage Learning Edition: 5th edition

Course Outcomes and Learning Objectives:

Course Outcome 1.

Describe function composition and properties of fuels.

Learning Objectives 1.

Potential Elements of the Performance:

Gasoline fuel

- volatility
- octane rating
- additives
- hydrocarbons
- atomization heat energy / BTU's
- Check alcohol content

Diesel fuel

- volatility
- cetane number
- viscosity
- additives
- Sulfur content, etc.

Alternate fuels

- LPG
- LNG
- E85
- Ethanol
- Bio diesel
- CNG

Course Outcome 2.

Explain the combustion principles of fuels.

Learning Objectives 2.

Potential Elements of the Performance:

Describe:

- oxidation reactions
- products of combustion
- HC
- CO

- CO2
- NOX
- Particulates
- Measure exhaust emissions, gas and diesel
- thermal expansion and contraction
- air fuel ratios
- atomization / vaporization
- detonation
- pre-ignition

Course Outcome 3.

Define the purpose construction and operation of internal and external delivery components.

Learning Objectives 3.

Potential Elements of the Performance:

- Describe fuel delivery components
- Identify all components attached to the fuel tank

Course Outcome 4.

Identify inspect and test fuel delivery sub system and emission components

Learning Objectives 4.

Potential Elements of the Performance:

- Replace primary and secondary fuel filters on a diesel engine.
- Describe why we use different types of fuel filters and causes of defective filters
- Remove a fuel tank from a vehicle replacing a fuel pump.
- Fabricate, repair and replace fuel lines
- Test a fuel tank sending unit and the dash gauge manually and with a scan tool
- Perform fuel pressure testing on gasoline and diesel fuel injected engines.
- Operate fuel pump with scan tool
- Identify evaporative emission components

Course Outcome 5.

Intake and exhaust

Learning Objectives 5.

Potential Elements of the Performance:

Explain the purpose and fundamentals, inspect and test intake and exhaust systems:

- volumetric efficiency
- scavenging
- manifold vacuum, boost and exhaust back pressure
- Boyle's Law, Charles Law, and Bernoulli's Theorem
- Identify and inspect exhaust system components including the catalytic convertors
- Identify SCR and DPF components
- Identify EGR system components

- Identify secondary air components

Course Outcome 6.

Fuel injection introduction

Learning Objectives 6.

Potential Elements of the Performance:

- Identify fuel injection system types and the components of gas and diesel engines.
- Identify primary fuel metering sensing devices
- Access an OBDII Fuel related trouble code using scan tools as related to fuel system diagnosis.
- Access fuel system data with applicable scan tools and lap tops.

Date:

Monday, December 18, 2017

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