COURSE OUTLINE: MPF101 - ENGINES

Prepared: George Parsons
Approved: Corey Meunier, Dean, Technology, Trades, and Apprenticeship

Course Code: Title	MPF101: ENGINES
Program Number: Name	4041: AUTOMOTIVE REPAIR 4044: MOT POWER ADV REPAIR 5085: HEAVY EQUIP/REPAIR
Department:	MOTIVE POWER
Academic Year:	2024-2025
Course Description:	The internal combustion engine course has been designed to give the student a sound working knowledge of the construction, operating principles, testing and servicing of internal combustion engine assemblies. It will also give them the opportunity to dismantle short block assemblies for testing and inspection. Engine lubrication and cooling system construction and testing methods will also be discussed. An introduction to seals, sealant and gaskets will be given with their proper uses. 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:	5
Hours/Week:	10
Total Hours:	70
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
This course is a pre-requisite for:	MPT203
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**4041 - AUTOMOTIVE REPAIR** VLO 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. VLO 2 Identify, inspect, and test basic engine components and systems in compliance with manufacturer's recommendations. VLO 6 Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices. VLO 9 Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards. VLO 10 Use information technology and computer skills to access data concerning repair procedures and manufacturer's updates. VLO 11 Prepare logs, records, and documentation to appropriate standards. VLO 12 Apply business practices and communication skills to improve customer service.

4044 - MOT POWER ADV REPAIR

VLO 3	Diagnose and repair engine 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 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.

5085 - HEAVY EQUIP/REPAIR

VLO 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.
VLO 2	Identify, inspect, and test basic engine components and systems in compliance with manufacturers' recommendations.
VLO 6	Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices.
VLO 9	Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.
VLO 10	Use information technology and computer skills to access data concerning repair procedures and manufacturers' updates.
VLO 11	Prepare logs, records, and documentation to appropriate standards.
VLO 12	Apply business practices and communication skills to improve customer service.

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 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:	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. (Student will be given notice of test and assignment dates in advance) NOTE: All assignments will be in typed format. NO hand written assignments will be accepted. 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 Publisher: Thomson Nelson Learning Canada Edition: 4rd Canadian Medium/Heavy Duty Truck Engines, Fuel and Computerized Management Systems by Bennett Publisher: Cengage Learning Edition: 6th edition

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Explain the construction, operating principles, testing and disassembly of internal combustion gasoline and diesel engines.	1.1 Explain the operational cycles of two and four stroke engines 1.2 Calculate engine displacement 1.3 Dismantle, inspect, test and assemble engine short block assemblies 1.4 Measure cylinders to determine taper and out-of-round. 1.5 Explain the construction and composition of cylinder blocks, crankshafts and cylinder heads. 1.6 Demonstrate cylinder ridge removal and engine cleaning. 1.7 Measure warpage, crankshaft wear, bearing wear, camshaft wear and piston wear using manufacturer specifications and precision measuring equipment.
Course Outcome 2	**Learning Objectives for Course Outcome 2**
3. Identify, test and inspect gasoline and diesel engine cooling systems.	3.1 Compare & contrast liquid cooled versus air-cooled engines. 3.2 Explain the effects of pressure on the boiling point of water. 3.3 Describe cleaning and flushing the cooling systems taking into account proper handling and disposal of antifreeze. 3.4 Test coolant freeze protection. 3.5 Test PH levels of antifreeze 3.6 Explain the necessity of coolant additives for diesel engines 3.7 Inspect hoses and coolant pipes 3.8 Perform coolant system pressure tests
Course Outcome 3	**Learning Objectives for Course Outcome 3**
4. Identify the proper seals, sealant and gaskets used in motive power engines.	4.1 Describe the proper seal, sealant and gasket selection process. 4.2 Discuss proper removal and installation practices for seals, sealant and gaskets. 4.3 Explain the construction and operating principles of seals, sealant and gaskets.
Course Outcome 4	**Learning Objectives for Course Outcome 4**
5. Identify, test and inspect accessory drive belts and pulleys.	5.1 Inspect drive belts and pulleys 5.2 Inspect belt tensioners 5.3 Remove and install belts 5.4 Check belt alignment 5.5 Access belt routing diagrams

Evaluation Process and Grading System:

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

Date:	June 4, 2024
Addendum:	Please refer to the course outline addendum on the Learning Management System for further information.