



COURSE OUTLINE: MPT203 - INTERN.COMB.ENG. II

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Approved: Corey Meunier, Chair, Technology and Skilled Trades

Course Code: Title	MPT203: INTERNAL COMBUSTION ENGINES II
Program Number: Name	4044: MOT POWER ADV REPAIR
Department:	MOTIVE POWER
Academic Year:	2023-2024
Course Description:	<p>In this course, you will be exposed to common machine shop and reconditioning operations for engine crankshafts, connecting rods, cylinder block and cylinder heads. You will have a sound understanding of engine lubrication and cooling system diagnosis. Emphasis will be placed on students acquiring practical skills for internal and external engine repair procedures such as: engine timing component replacement, valve train service, cylinder head and gasket repairs, cooling and lubrication system repair and engine accessory component diagnosis.</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:	4
Hours/Week:	8
Total Hours:	64
Prerequisites:	MPF101, MPF103
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course:	4044 - MOT POWER ADV REPAIR
Please refer to program web page for a complete listing of program outcomes where applicable.	<p>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.</p> <p>VLO 3 Diagnose and repair engine systems in compliance with manufacturer's recommendations.</p> <p>VLO 7 Disassemble and assemble components to required specifications by applying workshop skills and knowledge of basic shop practices.</p> <p>VLO 8 Select and use a variety of troubleshooting techniques and test equipment to assess electronic circuits, vehicle systems, and subsystems.</p> <p>VLO 10 Communicate information effectively, credibly, and accurately by producing supporting documentation to appropriate standards.</p> <p>VLO 11 Use information technology and computer skills to support work in a motive power environment.</p> <p>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.</p>



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: 4th Canadian Edition

Medium/Heavy Duty Truck Engines, Fuel and Computerized Management Systems by Bennet
 Publisher: Cengage Learning Edition: 6th edition

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
Discuss the purpose and fundamentals of camshaft and valve train assemblies.	<ul style="list-style-type: none"> • Define valve lead, lag, overlap, and duration • Explain the relationship of valves to position of pistons • Draw and interpret a valve timing events diagram • Describe lifters, solid, hydraulic and roller design • Outline rocker arms and push rods • Compare and contrast overhead valve to overhead camshaft design engines
Course Outcome 2	Learning Objectives for Course Outcome 2
Describe the types styles and application of valve trains.	<ul style="list-style-type: none"> • Outline different types of drive mechanisms chains, belts, gears and sprockets • Explain purpose of manufacturing engines with overhead camshafts • Describe in block camshaft engine operation including push rods, lifters and rocker arms
Course Outcome 3	Learning Objectives for Course Outcome 3
Perform recommended service operations.	<ul style="list-style-type: none"> • Remove and install timing belts and chains • Perform valve adjustment on a variety of styles • Compression test • Cylinder leakage test. • Measure valve lift and duration • Vacuum test • Check gear and pump timing on Diesel engines
Course Outcome 4	Learning Objectives for Course Outcome 4
Describe common engine machine shop reconditioning equipment and procedures.	<ul style="list-style-type: none"> • Inspect component gasket surfaces for nicks, burrs and warping • Outline proper gasket sealing techniques used in the motive power engine repair industry • Observe the reconditioning operations for: <ul style="list-style-type: none"> o cylinder blocks o crankshafts o connecting rods o cylinder heads



	Course Outcome 5	Learning Objectives for Course Outcome 5
	Diagnose cooling systems.	<ul style="list-style-type: none"> • Perform a leak test • Test thermostat for opening temperature • Test PH and freeze point • Flush system • Check for combustion signs in cooling system • Test and service SCAs in Diesel engines cooling systems • Have a clear understanding of the importance of testing PH & SCAs
	Course Outcome 6	Learning Objectives for Course Outcome 6
	Diagnose lubrication systems.	<ul style="list-style-type: none"> • Test oil pressure • Check for oil contamination • Check for leaks • Describe proper leak testing techniques • Replace oil and filters • Outline oil requirements, API ratings

Evaluation Process and Grading System:

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

Date:

August 21, 2023

Addendum:

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

