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

Prepared: Stephen Kent
Approved: Corey Meunier, Dean, Technology, Trades, and Apprenticeship

Course Code: Title	MPT203: INTERNAL COMBUSTION ENGINES II
Program Number: Name	4044: MOT POWER ADV REPAIR
Department:	MOTIVE POWER
Academic Year:	2024-2025
Course Description:	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. 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:	4
Hours/Week:	8
Total Hours:	56
Prerequisites:	MPF101, MPF103
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 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 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 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.	• 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.	• 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.	• 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.	• 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: o cylinder blocks o crankshafts o connecting rods o cylinder heads

Course Outcome 5	Learning Objectives for Course Outcome 5
Diagnose cooling systems.	• 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.	• 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 9, 2024

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