COURSE OUTLINE: MPF120 - AUTO SUSPENSION

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Course Code: Title	MPF120: AUTOMOTIVE SUSPENSION
Program Number: Name	4041: AUTOMOTIVE REPAIR 4044: MOT POWER ADV REPAIR
Department:	MOTIVE POWER
Academic Year:	2024-2025
Course Description:	This course deals with the study and interrelationship of essential basic fundamentals, composition, construction and operating principles of automotive tires, suspension and steering linkage systems. You will inspect and test suspension and steering linkage assemblies using manufactures maintenance procedures. The student will also perform tire repair and rim inspections following Ministry Standards, along with performance of wheel balance and the reading of tire wear patterns. 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:	2
Hours/Week:	4
Total Hours:	32
Prerequisites:	MPF103
Corequisites:	There are no co-requisites for this course.
This course is a pre-requisite for:	MPT235
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 5 Identify, inspect, and test basic suspension, steering, and brake 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 7 Use a variety of test equipment to assess basic electronic circuits, vehicle systems, and subsystems. 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.

	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 6 Diagnose and repair suspension, steering, and brake components and 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.
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:	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: Cengage Learning Canada Edition: 4th Canadian

Course Outcomes and Learning Objectives:

Course Outcome 1	**Learning Objectives for Course Outcome 1**
Define the purpose and fundamentals of suspension systems.	Explain and describe the following: • centrifugal force • inertia • co-efficient • sliding & rolling friction • characteristics and applications of suspension materials • spring steel • tempered steel • synthetic rubber • fiber composites • pneumatics • hydraulics • dangers of heating suspension / steering components
Course Outcome 2	**Learning Objectives for Course Outcome 2**
Explain the construction and operating principles of solid and independent suspension system	• Identify independent suspension systems, short-long arm, twin I beam, McPherson strut and modified strut. • Compare gas shocks vs. hydraulic. • Identify load and non-load-carrying ball joints.

components.	• State four types of automotive springs. • Identify radius and strut rods. • Define camber, caster and toe.
Course Outcome 3	**Learning Objectives for Course Outcome 3**
Inspect and test suspension system components.	• Inspect control arm bushings. • Measure vehicle ride height. • Test shock absorbers. • Clean, repack and adjust wheel bearings. • Inspect springs
Course Outcome 4	**Learning Objectives for Course Outcome 4**
Explain the construction, operating principles, and servicing of steering linkage.	• Identify steering linkage components • Outline Ackerman`s principal • Dry park steering linkage. • Lubricate steering components following manufacturers` recommendations.
Course Outcome 5	**Learning Objectives for Course Outcome 5**
Outline the construction, testing and servicing of tires and rims.	• Define hydro-planning. • Explain static and dynamic wheel balance. • Describe the construction of radial tires. • Identify factors that offset tire wear. • Rotate tires following manufacturers` maintenance procedures. • Repair tires using prescribed tools and supplies. • Perform dynamic wheel balance using computer assisted balancer. • Identify, reset, calibrate and reprogram tire pressure monitor systems.

Evaluation Process and Grading System:

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

Date: November 12, 2024

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