

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



**SAULT
COLLEGE**

COURSE OUTLINE

COURSE TITLE: AUTOMOTIVE SUSPENSION

CODE NO. MPF120 **SEMESTER:** TWO

PROGRAMS: Motive Power Fundamentals – Automotive Repair
Motive Power Technician – Advanced Repair

AUTHOR: Group 2014

INSTRUCTOR:

DATE: January 2017 **PREVIOUS OUTLINE DATED:** January 2015

APPROVED: *“Corey Meunier”* Dec ‘16
CHAIR **DATE**

TOTAL CREDITS: TWO

PREREQUISITE(S): MPF103

HOURS/WEEK: FOUR

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For additional information, please contact Corey Meunier, Chair
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I. 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.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. *Define the purpose and fundamentals of suspension systems.*Potential Elements of the Performance:

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

2. *Explain the construction and operating principles of solid and independent suspension system components.*Potential Elements of the Performance:

- 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.
- State four types of automotive springs.

- Identify radius and strut rods.
- Define camber, caster and toe.

3. *Inspect and test suspension system components.*

Potential Elements of the Performance:

- Inspect control arm bushings.
- Measure vehicle ride height.
- Test shock absorbers.
- Clean, repack and adjust wheel bearings.
- Inspect springs

4. *Explain the construction, operating principles, and servicing of steering linkage.*

Potential Elements of the Performance:

- Identify steering linkage components
- Outline Ackerman's principal
- Dry park steering linkage.
- Lubricate steering components following manufacturers' recommendations.

5. *Outline the construction, testing and servicing of tires and rims.*

Potential Elements of the Performance:

- Define hydro-planing.
- 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.

III. TOPICS:

1. Suspension systems.
2. Solid and independent suspension system components.
3. Inspect suspension system components.
4. Steering linkage.
5. Tires and rims.

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Title: Automotive Technology: A Systems Approach

Edition: 3rd Canadian Ed.

Author: Erjavec

Publisher: Thomson Nelson Learning Canada

Pens, pencils, calculator, 3-ring binder

The following items are mandatory in the Shop:

- CSA approved steel toe boots (high top)
- CSA approved safety glasses
- Approved coveralls

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	<u>Definition</u>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	

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.

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

It is the departmental policy that once the classroom door has been closed, the learning process has begun. Late arrivers will not be granted admission to the room.

**Cell phones are not allowed to be on
in the classrooms or shop areas.**

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.