SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO

Sault College

COURSE OUTLINE

COURSE TITLE: SUSPENSION, STEERING, & BRAKES I

CODE NO. : ASM 116 **SEMESTER:** 2

PROGRAM: MOTIVE POWER FUNDAMENTALS – PARTS & COUNTER PERSONAL

AUTHOR: DAN TREGONNING

DATE: MARCH 07 **PREVIOUS OUTLINE DATED:** FEB. 06

APPROVED:

_____ _____

DEAN **DATE**

TOTAL CREDITS: 3

PREREQUISITE(S): ASM101 – BASIC AUTOMOTIVE SKILLS

HOURS/WEEK: TAUGHT IN BLOCK FORMAT

I. COURSE DESCRIPTION:

This course deals with the study and interrelationship of essential basic fundamentals, composition, construction and operating principles of suspension, steering and brake systems. The student will also inspect and test suspension, steering and braking assemblies using manufacture maintenance procedures.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. 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.

2. Inspect 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.

3. Explain the construction, operating principles, and servicing of manual steering systems.
   Potential Elements of the Performance:
   - Identify types of manual steering gears, rack and pinion and recirculating ball.
   - Test and inspect steering gear adjustment.
   - Dry park steering linkage.
   - Lubricate steering components following manufacturers recommendations.

4. Outline the construction, testing and servicing of tires and rims.
   Potential Elements of the Performance:
   - 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.

5. Explain the construction and operation of brake lines, cylinders, shoes, pads, drums, discs, combination valve and cables.
   Potential Elements of the Performance:
   - Identify materials used to make brake pads and shoes.
   - Describe master cylinders, wheel cylinders and calipers.
   - List and describe the three valves in the combination valve.
   - Inspect brake lines and flex hoses.
   - Inspect parking brake mechanisms to verify operation.
   - Measure brake drums and rotors using precision measurement equipment.
   - Machine brake disc's and drums.
   - Service calipers and drum brake assemblies using proper brake tools and lubricants.

III. TOPICS:

1. Construction and operating principles of solid and independent suspension systems.
2. Inspect suspension system components.
3. Explain the construction, operating principles, and servicing of manual steering systems.

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Modern Automotive Technology – Text & Workbook
Pens, pencils, calculator, and 3-ring binder

Shop coat or coveralls.
CSA approved steel toe boots (high top).
CSA approved safety glasses.
(these items mandatory for shop).

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 – 60% of the final grade is comprised of term tests.
Assignments – 10% of the final grade is comprised of a number of technical reports.
Shop – 30% of the final grade is comprised of attendance, punctuality, preparedness, student ability, work organization and general attitude.
(Student will be given notice of test and assignment dates in advance)

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.

VI. SPECIAL NOTES:

Special Needs:
If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Special Needs office. Visit Room E1101 or call Extension 703 so that support services can be arranged for you.

Retention of Course Outlines:
It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism:
Students should refer to the definition of "academic dishonesty" in *Student Rights and Responsibilities*. Students who engage in "academic dishonesty" will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course/program, as may be decided by the professor/dean. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Course Outline Amendments:
The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

<*include any other special notes appropriate to your course*>

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the professor. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.