



COURSE OUTLINE: MPT0235 - SUSPENSION SYSTEMS

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Course Code: Title	MPT0235: SUSPENSION SYSTEMS
Program Number: Name	1120: COMMUNITY INTEGRATN
Department:	C.I.C.E.
Semesters/Terms:	19W
Course Description:	<p>In this course, you will focus on the construction, repair and diagnosis of motive power suspension systems. Common sources of vehicle vibration related to suspension, driveline and tires will be outlined at this time. Power steering systems and wheel alignment on trucks and cars will also be covered including diagnosis and repair.</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:	3
Hours/Week:	6
Total Hours:	48
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Essential Employability Skills (EES) addressed in this course:	<p>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.</p> <p>EES 2 Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>EES 3 Execute mathematical operations accurately.</p> <p>EES 4 Apply a systematic approach to solve problems.</p> <p>EES 5 Use a variety of thinking skills to anticipate and solve problems.</p> <p>EES 6 Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>EES 7 Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>EES 8 Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>EES 10 Manage the use of time and other resources to complete projects.</p> <p>EES 11 Take responsibility for ones own actions, decisions, and consequences.</p>
Course Evaluation:	Passing Grade: 50%, D
Other Course Evaluation & Assessment Requirements:	<p>The final grade for this course will be based on the results of classroom, assignments and shop evaluations weighed as indicated:</p> <p>Classroom 35% of the final grade is comprised of term tests</p> <p>Assignments 10% of the final grade is comprised of a number of technical reports</p>



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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.

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:

Heavy Duty Truck Systems by Bennett
 Publisher: Thomson Nelson Learning Canada Edition: 6th ed

Automotive Technology: A Systems Approach by Erjavec
 Publisher: Thomson Nelson Learning Canada Edition: 3rd Canadian Edition

Course Outcomes and Learning Objectives:

Upon successful completion of this course, the CICE student, with the assistance of a Learning Specialist will acquire varying levels of skill development relevant to the following learning outcomes:

Course Outcome 1	Learning Objectives for Course Outcome 1
Explain the construction and operating principles of solid and independent suspension system components.	Potential Elements of the Performance: Compare and contrast independent suspension systems, short-long arm, twin I beam, McPherson strut and modified strut Evaluate the effectiveness of gas shocks vs. hydraulic Identify load and non-load-carrying ball joints State four types of springs Identify radius arms and strut rods
Course Outcome 2	Learning Objectives for Course Outcome 2
Dismantle, test, inspect and diagnose suspension system components.	Potential Elements of the Performance: Inspect control arm bushings Inspect torque rods and bushings Measure vehicle ride height Inspect and test shock absorbers Remove and replace McPherson struts Remove and replace truck springs Measure King Pins for maximum wear limits Remove and replace King Pins

	<p>Measure ball joint play using prescribed measuring equipment</p> <p>Measure and adjust air ride height</p> <p>Measure Truck spring pins and bushing clearance</p> <p>Inspect for broken leaves</p>
Course Outcome 3	Learning Objectives for Course Outcome 3
<p>Explain the construction, operating principles, testing and servicing of manual and power steering systems.</p>	<p>Potential Elements of the Performance:</p> <p>Adjust rack and pinion steering gear mesh load.</p> <p>Service manual steering gears.</p> <p>Identify power steering pumps, power racks, integral gear boxes, control valves, lines and hoses</p> <p>Describe the operation of power steering pumps, power gear boxes and control valves</p> <p>Test and inspect power steering pump for pressure and flow</p> <p>Analyze power steering system operation using prescribed tools & equipment</p>
Course Outcome 4	Learning Objectives for Course Outcome 4
<p>Explain the purpose and application of alignment angles and measurements.</p>	<p>Potential Elements of the Performance:</p> <p>Outline the need for wheel alignment</p> <p>Define alignment angles, camber, caster, toe, S.A.I., included angle, set back and thrust angle</p> <p>Compare alignment types, geometric center line, 2 wheel thrust line and total 4 wheel</p> <p>Observe and evaluate the measurement of a vehicle</p> <p>Explain the set up procedure of a 4 wheel alignment machine</p> <p>Describe 4 methods of adjusting alignment angles, shims, eccentrics, strut rod and slots</p> <p>Manually measure truck tracking</p> <p>Measure and adjust tandem axle scrub</p> <p>Check front axle setback</p> <p>Diagnose vehicle handling characteristics and alignment related tire wear.</p>

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight	Course Outcome Assessed
Assignments	10%	
Employability Skills	10%	
Shop	45%	
Theory Tests	35%	

CICE Modifications:

Preparation and Participation

1. A Learning Specialist will attend class with the student(s) to assist with inclusion in the class and to take notes.
2. Students will receive support in and outside of the classroom (i.e. tutoring, assistance with homework and assignments, preparation for exams, tests and quizzes.)
3. Study notes will be geared to test content and style which will match with modified learning outcomes.
4. Although the Learning Specialist may not attend all classes with the student(s), support will always be available. When the Learning Specialist does attend classes he/she will remain as inconspicuous as possible.

A. Further modifications may be required as needed as the semester progresses based on individual student(s) abilities and must be discussed with and agreed upon by the instructor.

B. Tests may be modified in the following ways:

1. Tests, which require essay answers, may be modified to short answers.
2. Short answer questions may be changed to multiple choice or the question may be simplified so the answer will reflect a basic understanding.
3. Tests, which use fill in the blank format, may be modified to include a few choices for each question, or a list of choices for all questions. This will allow the student to match or use visual clues.
4. Tests in the T/F or multiple choice format may be modified by rewording or clarifying statements into layman's or simplified terms. Multiple choice questions may have a reduced number of choices.

C. Tests will be written in CICE office with assistance from a Learning Specialist.

The Learning Specialist may:

1. Read the test question to the student.
2. Paraphrase the test question without revealing any key words or definitions.
3. Transcribe the student's verbal answer.
4. Test length may be reduced and time allowed to complete test may be increased.

D. Assignments may be modified in the following ways:

1. Assignments may be modified by reducing the amount of information required while maintaining general concepts.
2. Some assignments may be eliminated depending on the number of assignments required in the particular course.

The Learning Specialist may:

1. Use a question/answer format instead of essay/research format
2. Propose a reduction in the number of references required for an assignment
3. Assist with groups to ensure that student comprehends his/her role within the group
4. Require an extension on due dates due to the fact that some students may require additional time to process information
5. Formally summarize articles and assigned readings to isolate main points for the student
6. Use questioning techniques and paraphrasing to assist in student comprehension of an assignment

E. Evaluation:

Is reflective of modified learning outcomes.

NOTE: Due to the possibility of documented medical issues, CICE students may require alternate methods of evaluation to be able to acquire and demonstrate the modified learning outcomes

Date:

December 14, 2018

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

