



# COURSE OUTLINE

## MPF0120

Prepared: Stephen Kent    Approved: Corey Meunier

<b>Course Code: Title</b>	MPF0120: AUTOMOTIVE SUSPENSION FOR CIE
<b>Program Number: Name</b>	1120: COMMUNITY INTEGRATN
<b>Department:</b>	C.I.C.E.
<b>Semester/Term:</b>	17F
<b>Course Description:</b>	<p><b>COURSE DESCRIPTION:</b>                      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.</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>
<b>Total Credits:</b>	2
<b>Hours/Week:</b>	4
<b>Total Hours:</b>	32
<b>Essential Employability Skills (EES):</b>	<p>#1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.                      #2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.                      #3. Execute mathematical operations accurately.                      #4. Apply a systematic approach to solve problems.                      #5. Use a variety of thinking skills to anticipate and solve problems.                      #6. Locate, select, organize, and document information using appropriate technology and information systems.                      #7. Analyze, evaluate, and apply relevant information from a variety of sources.                      #8. Show respect for the diverse opinions, values, belief systems, and contributions of others.                      #9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.                      #10. Manage the use of time and other resources to complete projects.                      #11. Take responsibility for ones own actions, decisions, and consequences.</p>



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<b>Course Evaluation:</b>	Passing Grade: 50%, D						
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p><b>EVALUATION PROCESS/GRADING SYSTEM:</b>  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.</p> <p>(Student will be given notice of test and assignment dates in advance)</p> <p>NOTE: All assignments will be in typed format. NO hand written assignments will be accepted.</p> <p>The following semester grades will be assigned to students:</p> <p>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</p> <p>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.</p>						
<b>Evaluation Process and Grading System:</b>	<table border="1"> <thead> <tr> <th>Evaluation Type</th> <th>Evaluation Weight</th> </tr> </thead> <tbody> <tr> <td>Assignments</td> <td>10%</td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	Evaluation Type	Evaluation Weight	Assignments	10%		
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	Employability Skills	10%
	shop	45%
	Theory Tests	35%

### Books and Required Resources:

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

### 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.

Define the purpose and fundamentals of suspension systems.

#### Learning Objectives 1.

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

#### Course Outcome 2.

Explain the construction and operating principles of solid and independent suspension system components.



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### **Learning Objectives 2.**

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.

### **Course Outcome 3.**

Inspect and test suspension system components.

### **Learning Objectives 3.**

Potential Elements of the Performance:

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

### **Course Outcome 4.**

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

### **Learning Objectives 4.**

Potential Elements of the Performance:

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



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### Course Outcome 5.

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

### Learning Objectives 5.

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.

#### 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



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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:**

Wednesday, September 6, 2017



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