



# COURSE OUTLINE

## MPF0122

Prepared: Dan Tregonning    Approved: Corey Meunier

| <b>Course Code: Title</b>                     | MPF0122: BRAKES FOR CICE   |                 |                   |             |     |                     |     |
|---|--|-----------------|-------------------|-------------|-----|---------------------|-----|
| <b>Program Number: Name</b>                   | 1120: COMMUNITY INTEGRATN  |                 |                   |             |     |                     |     |
| <b>Department:</b>                            | C.I.C.E.   |                 |                   |             |     |                     |     |
| <b>Semester/Term:</b>                         | 18W  |                 |                   |             |     |                     |     |
| <b>Course Description:</b>                    | This course deals with the study and interrelationship of essential basic fundamentals, composition, construction and operating principles of hydraulic and pneumatic brake systems. You will also inspect and service hydraulic and pneumatic brake assemblies using manufacturer`s maintenance procedures.   |                 |                   |             |     |                     |     |
| <b>Total Credits:</b>                         | 4  |                 |                   |             |     |                     |     |
| <b>Hours/Week:</b>                            | 8  |                 |                   |             |     |                     |     |
| <b>Total Hours:</b>                           | 56   |                 |                   |             |     |                     |     |
| <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.</p> <p>#2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.</p> <p>#3. Execute mathematical operations accurately.</p> <p>#4. Apply a systematic approach to solve problems.</p> <p>#5. Use a variety of thinking skills to anticipate and solve problems.</p> <p>#6. Locate, select, organize, and document information using appropriate technology and information systems.</p> <p>#7. Analyze, evaluate, and apply relevant information from a variety of sources.</p> <p>#8. Show respect for the diverse opinions, values, belief systems, and contributions of others.</p> <p>#9. Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.</p> <p>#10. Manage the use of time and other resources to complete projects.</p> <p>#11. Take responsibility for ones own actions, decisions, and consequences.</p> |                 |                   |             |     |                     |     |
| <b>Course Evaluation:</b>                     | Passing Grade: 50%, D  |                 |                   |             |     |                     |     |
| <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>Assighments</td> <td>10%</td> </tr> <tr> <td>Employabilty Skills</td> <td>10%</td> </tr> </tbody> </table>   | Evaluation Type | Evaluation Weight | Assighments | 10% | Employabilty Skills | 10% |
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| Assighments                                   | 10%  |                 |                   |             |     |                     |     |
| Employabilty Skills                           | 10%  |                 |                   |             |     |                     |     |



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|       |     |
|-------|-----|
| Shop  | 35% |
| Tests | 45% |

### Books and Required Resources:

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

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

### 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 essential basic information and fundamentals of standard hydraulic and air brake systems.

#### Learning Objectives 1.

Potential Elements of the Performance

- Pascal's Law, mechanical advantage
- Effect of heat co-efficient of friction
- Brake fluid composition
- Self –energization
- Weight transfer affecting brake designs for light and heavy-duty off road equipment brakes
- Laws of levers
- Pressure volume relationships
- Boyles and Charles law

#### Course Outcome 2.

Explain the basic function, composition and construction of drum and disc brake system assemblies as applied to hydraulic and air brakes.



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### **Learning Objectives 2.**

Potential Elements of the Performance:

- Master cylinder, drum, shoes, wheel cylinders, discs, pads, calipers, lines and hoses
- Slack adjusters
- Air brake chambers
- Control valves
- Lines and hoses
- SAHR
- Multi disc wet brakes
- Driveline brakes
- Parking brakes

### **Course Outcome 3.**

Explain the basic principals of operation of drum and disc brake system assemblies as applied to hydraulic and air brakes.

### **Learning Objectives 3.**

Potential Elements of the Performance:

- Master cylinder, drums and shoes
- Wheel cylinders, discs, pads ,caliper
- Control devices
- Air supply system and subsystems
- Air brake chambers
- Slack adjusters
- Parking brakes

### **Course Outcome 4.**

Identify, inspect and service drum and disc brake system assemblies as applied to hydraulic and air brakes.

### **Learning Objectives 4.**



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### Potential Elements of the Performance:

- Clean, lubricate and adjust hydraulic drum brake assemblies
- Clean, lubricate and adjust air drum and disc brake assemblies
- Inspect and test disc brake assemblies
- Service caliper slides and bushings
- Perform steel brake line fabrication, ISO and double inverted
- Bleed and flush hydraulic brake systems
- Inspect and adjust parking brakes
- Functional tests of air brake supply systems
- Inspect Heavy Duty wet multi disc brake assemblies

### 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.**



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***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

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