



## COURSE OUTLINE: MPF0100 - BASIC ELECTRICITY

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Approved: Martha Irwin, Chair, Community Services and Interdisciplinary Studies

<b>Course Code: Title</b>	MPF0100: BASIC ELECTRICITY - CICE
<b>Program Number: Name</b>	1120: COMMUNITY INTEGRATN
<b>Department:</b>	C.I.C.E.
<b>Semesters/Terms:</b>	18F
<b>Course Description:</b>	<p>In this course, you will be introduced to the basics of electricity and how it can be applied to Heavy Equipment, Truck Coach and Automotive industry. You will be able to identify, inspect and test basic electrical circuits as well as inspect, test, service and replace batteries. You will learn to use digital multi-meters to perform basic electrical measurements and perform basic electrical repairs such as soldering, heat shrink installation and terminal installation.</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>	4
<b>Hours/Week:</b>	7
<b>Total Hours:</b>	49
<b>Prerequisites:</b>	There are no pre-requisites for this course.
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Essential Employability Skills (EES) addressed in this course:</b>	<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 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>
<b>Course Evaluation:</b>	Passing Grade: 50%, D
<b>Other Course Evaluation &amp; Assessment Requirements:</b>	<p>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:</p>



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Classroom 45% of the final grade is comprised of term tests  
 Assignments 10% of the final grade is comprised of a number of technical reports  
 Shop 35% 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)

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.

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

**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	Learning Objectives for Course Outcome 1
1. Define the purpose, fundamentals and principles of electricity.	1.1 Describe: - Atomic structure - Conductors and insulators - Magnetism - Electron and conventional theories - Sources of electricity

	<ul style="list-style-type: none"> <li>- Ohms Law, Kirchhoffs Law, Watts Law</li> <li>- Current flow, heat and resistance</li> <li>- Systems International (S.I.) System</li> <li>- Voltage</li> <li>- Amperage</li> <li>- resistance</li> <li>- Wattage</li> <li>- Series, Parallel and series parallel circuit characteristics</li> </ul>
<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
2. Perform basic electrical repairs.	<ul style="list-style-type: none"> <li>2.1 Cleaning</li> <li>2.2 Splicing</li> <li>2.3 Crimping</li> <li>2.4 Soldering</li> <li>2.5 Corrosion protection</li> <li>2.6 Weather proofing</li> <li>2.7 Terminal repair</li> </ul>
<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
3. Identify, inspect, and test basic electrical components and systems in compliance with manufacturers' recommendations.	<ul style="list-style-type: none"> <li>3.1 Identify circuit components and test circuit protection devices</li> <li>3.2 Demonstrate the ability to measure voltage, current and resistance using a DVOM (digital volt ohm meter)</li> <li>3.3 Perform maintenance on a DVOM including testing and replacing internal circuit protection and batteries</li> </ul>
<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
4. Describe the construction, operation, types, styles and application of electromagnetic devices.	<ul style="list-style-type: none"> <li>4.1 Describe the fundamentals of: <ul style="list-style-type: none"> <li>power generation</li> <li>- alternators</li> <li>- generators</li> <li>electric motors</li> <li>solenoids</li> <li>relays</li> <li>coils</li> <li>stepper motors</li> <li>switches</li> </ul> </li> </ul>
<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
5. Perform inspection and testing procedures on batteries following manufacturers recommendations.	<ul style="list-style-type: none"> <li>5.1 Identify and use appropriate personal protection when servicing batteries.</li> <li>5.2 Perform visual inspection on batteries</li> <li>5.3 Perform cleaning of battery terminals and battery case</li> <li>5.4 Perform state of charge, high rate discharge and conductance testing</li> <li>5.5 Describe the construction, operation, types, styles and application of batteries</li> <li>5.6 Charge batteries</li> </ul>

**Evaluation Process and Grading System:**

<b>Evaluation Type</b>	<b>Evaluation Weight</b>	<b>Course Outcome Assessed</b>
Assignments	10%	
Employability Skills	10%	

Shop	35%	
Tests	45%	

## 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:**

September 21, 2018

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

