



**I. COURSE DESCRIPTION:**

This course introduces the student to electrical installation methods. The Canadian Electrical Code is covered in conjunction with interpretation of construction drawings and specifications for a residential installation.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

1. State the purpose of the Canadian Electrical Code and identify which sections apply to a given electrical installation.

Potential Elements of the Performance

- State the objective, scope, and general arrangement of the Canadian Electrical Code (CEC).
  - Identify the method used to indicate code regulation changes in new editions of the CEC. Identify installation requirements for electrical equipment (other than heating) installed in residential occupancies as specified in the Installation of Electrical Equipment section of the CEC.
  - Explain terms as listed in the "Object, Scope and Definitions" section and the Special Terminologies located in the general rules of other sections of the CEC.
  - Interpret general rules (Section 2) of the CEC.
2. Interpret rules of the Canadian Electrical Code which apply to residential installations.

Potential Elements of the Performance:

- Explain the CEC regulations regarding grounding and bonding (Section 10) of electrical systems and circuits operating at 750 volts or less.
- Interpret the regulations of the CEC regarding wiring methods (Section 12) for installations operating at 750 volts or less.
- Explain the general regulations regarding Class 1 and Class 2 signal and remote control Circuits (Section 16) of the CEC.
- Interpret the CEC regulations for Pools, Tubs, Spas (Section 68).

- Identify temporary wiring installation requirements for buildings or projects under construction or demolition (Section 76) of the CEC.
- Calculate conduit fill where all conductors are the same size and have the same insulation type.
- Calculate conduit fill where the conductors have different sizes and/or different insulation types.
- Calculate raceway fill for the raceway types listed in Section 12 where all conductors are the same size and have the same insulation type.
- Calculate raceway fill for the raceway types listed in Section 12 where the conductors have different sizes and/or different insulation types.
- Calculate the maximum number of conductors sized #14 to #6 that are permitted in a box.
- Calculate the minimum size of pull boxes for straight, angle and u-pulls for conductors larger than #6.
- Calculate ampacity and apply correction factors for single conductors in free air, including conductors in parallel.
- Calculate ampacity and apply correction factors for conductors in a raceway or multi-conductor cable, including conductors in parallel.
- Calculate ampacity and apply correction factors for flexible cords and equipment wires.
- Calculate ampacity and apply correction factors for underground conductor installations using IEEE Standard 835.
- Calculate the size of service equipment for single dwelling units.
- Identify installation requirements for electrical equipment (other than electric heating) including: lighting, receptacles,

heating, and appliances installed in single dwelling occupancies as specified in the Installation of Electrical Equipment Section 26 and 30 of the CEC.

- Interpret the CEC regulations regarding the installation of fire alarms located in dwelling units.
  - Explain requirements for the installation and wiring of Fixed Electric Surface and Space Heating Systems located in residential occupancies.
3. Interpret and revise specifications and drawings for a single dwelling construction project.
- Potential Elements of the Performance:
- Identify and interpret the alphanumeric lines.
  - Demonstrate competency with metric scale and imperial scale and be able to convert between the two.
  - Read and apply residential specifications.
  - Use a set of drawings of a single dwelling to apply the information from the architectural, structural and mechanical drawings in relation to an electrical installation.
  - Draw and label a panel schematic for a single dwelling.
  - Prepare an electrical material take-off for a single dwelling.
  - Apply specifications, Building and Electrical Codes to single dwellings.
  - State procedures for inspecting an installation by the appropriate authority.

### III. TOPICS:

1. Canadian Electrical Code, Layout and General Rules
2. Canadian Electrical Code, Residential Rules
3. Residential electrical installation methods.

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

Canadian Electrical Code, Part I 2006(CSA Standard C22.1-06)  
ISBN 1-55436-023-4

Electrical Wiring Residential, Fourth Canadian Edition  
ISBN # 0-17-625248-7

**V. EVALUATION PROCESS/GRADING SYSTEM:**

Quizzes (may be unannounced) 1% each to  
A maximum of 20% 0 to 20%

4 Tests\* 80 to 100%

\* 1 test (the test with the lowest mark) will have ½ the weighting of the other 3. This test will be determined on an individual basis.

**Be sure to read section VI of this outline.**

The following semester grades will be assigned to students:

<b>Grade</b>	<b>Definition</b>	<i>Grade Point Equivalent</i>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
F (Fail)	49% and below	
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.

### Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Students are expected to maintain an active Sault College email account. They are further required to check this email account daily. The instructor may announce details of test requirements and scheduling through the Sault College email system (as well as sharing other important information).

### Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. 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.

If a student misses a test he/she must have a valid reason (i.e. medical or family emergency – documentation may be required). In addition, the instructor **must** be notified **prior** to the test sitting. If this procedure is not followed the student will receive a mark of zero on the test/lab with no make-up option.

Although attendance of the lectures is not mandatory it is strongly encouraged. Quizzes may be used as an incentive to attend classes and as an indicator of class participation and attendance. As such there will be no makeup of missed quizzes.

Codebooks are to be brought to class. Quizzes and tests will require the use of a code book and students are responsible for bringing a copy to each class. Sections of the course textbooks may be highlighted however they are not to be written in. Tests and quizzes will be 'open book' as far as the codebook is concerned and may be 'open book' for the prints text as well. However, use of a book containing markings other than the aforementioned highlights is not permitted and will be considered as academic dishonesty. Students are responsible for supplying their own texts for tests and quizzes. Sharing books and or drawings during a test or quiz is not permitted.

#### **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.