## SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

## SAULT STE. MARIE, ONTARIO

# COURSE OUTLINE

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| **COURSE TITLE:** | Introduction to Residential Wiring | | |
| **CODE NO. :** | HMI 111 | **SEMESTER:** | TWO |
| **PROGRAM:** | Home Inspection Technician | | |
| **AUTHOR:** | Rob McTaggart | | |
| **PROFESSOR:** | Gilbert Belair | | |
| **DATE:** | January 2013 | **PREVIOUS OUTLINE DATED:** | January 2012 |

**APPROVED:** *"Corey Meunier"*

**CHAIR** **DATE**

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| **TOTAL CREDITS:** | THREE |
| **PREREQUISITE(S):** | ELR130 - Electrical Fundamentals |
| **HOURS/WEEK:** | THREE |

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***For additional information, please contact Corey Meunier, Chair***
***School of Technology & Skilled Trades***
***(705) 759-2554, Ext. 2610***

## I. COURSE DESCRIPTION:

This course introduces students to the Canadian Electrical Code, which is covered in conjunction with interpretation of construction drawings and specifications for residential installations, and demonstrated by hands-on activities.

## 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 methods used to indicate code regulation changes for electrical equipment (other than heating) installed in an electrical equipment section of CEC.
   - Explain terms as listed in the “Object, Scope and Definitions” section and the special terminologies located in the general rule of other sections of CEC.
   - Interpret general rules (section 2) of CEC.

2. ***Interpret the Canadian Electrical Code requirements pertaining to residential installations.***
   Potential Elements of the Performance:
   - Use architectural, electrical and residential drawings and specifications to determine installation requirements for a residential home.
   - Identify and interpret the alphanumerical lines.
   - Demonstrate competency with metric scale and imperial scale and be able to convert between the two.
   - Read and apply residential specifications.
   - Determine conductor sizes and types, wiring methods, wire connections, voltage drop, neutral sizing for services.
   - Calculate ampacity and apply correction factors for conductors in a raceway or multi-conductor cable, including conductors in parallel.
   - Interpret the regulations of CEC regarding wiring methods (section 12) for installations operating at 750 volts or less.
   - 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 the maximum number of conductors sized # 14 to # 6 that is permitted in a box.
- Assess electrical outlets and fixtures needed in a single family dwelling, including junction boxes, non-metallic outlets and boxes for conduit wiring.
- Assess branch circuits for the bedrooms, study, hall, living room, front entry, bathrooms and kitchen.
- Identify special-purpose outlets for ranges, counter-mounted cooking units, wall mounted ovens, food waste disposal and dishwashers. This will also include laundry, washroom and attic.
- Determine electrical requirements for oil and gas heating systems, and electric heating and air conditioning.

***3. Use of personal, protective equipment.***

Potential Elements of the Performance:

- Select proper safety work boots, eye protection, clothing and gloves.

***4. Use of hand and power tools.***

Potential Elements of the Performance:

- Safe and correct use of the following:
  - hammers, chisels, pliers, screw drivers, cutters, wire strippers, etc.
- Hand benders, drills, saws and power actuated tools.

***5. Identify, select and use a variety of wiring and materials.***

Potential Elements of the Performance:

- Identify and select as required:
  - wiring, boxes and conduit

***6. Follow written and oral instruction necessary to perform required elements to complete an assigned practical task.***

Potential Elements of the Performance:

- Read and understand sketches provided:
  - use required formulas to calculate overall measurements
  - read and apply charts to obtain the correct materials

***7. Use a variety of methods required and materials to complete a specified practical assignment.***

Potential Elements of the Performance:

- Applying the skills of wiring:
  - panel boxes, wiring rooms, specialty outlets

## III. TOPICS:

1. Canadian Electrical Code
2. Interpretation of residential plans and specifications
3. Calculations required for residential homes

## IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

- Ontario Electrical Safety Code (current edition) or Canadian Electrical Code Part 1 (current edition).
- Electrical Wiring Residential (Fifth Canadian Edition published by Ray C. Mullen)

## V. EVALUATION PROCESS/GRADING SYSTEM:

**Theory 70%**

- Quizzes (may be unannounced) 1% each to a maximum of 10 %
- Completion of unit questions 20%
- Three tests equally weighted total of 40 – 50%

**Lab 30%**

- Assessment of practical lab assignments 30%

**PLEASE NOTE:**
Students must maintain a minimum average of 50% in quizzes and tests in order to pass the course.

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 |

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| 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:

Attendance:
Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

## VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.