

# OYAP: ELECTRICAL LEVEL 1



## ONTARIO YOUTH APPRENTICESHIP PROGRAM:

Students will be congregated with other high school apprentices to earn their Level 1 Apprenticeship.

**CAMPUS:** Kingston

**SEATS:** 15 students from surrounding high schools will participate

**DURATION:** 8 weeks from March until May

**SCHEDULE:** March 25<sup>th</sup> until May 17<sup>th</sup>

## CREDITS EARNED:

- MTCU LEVEL 1 APPRENTICESHIP – CODE: 309A
- 2 SECONDARY SCHOOL MINISTRY DUAL CREDITS – CODE: TNA4Y
- 6 COLLEGE CREDITS – TOTAL OF 216 HOURS

## COLLEGE CREDITS INCLUDE:

### ELEC 101 – CANADIAN ELECTRICAL CODE (48 HRS)

This course will introduce you to the Canadian Electrical Code. You will develop an understanding of the layout of the Canadian Electrical Code Book and apply this concept in locating specific Code rules. You will become proficient within the essential sections to interpret rules and tables and reference the appendices as necessary.

### ELEC 102 – PRINTS (32 HRS)

Upon completion of this course, you will be able to: obtain information from architectural, structural and electrical blueprints, specifications, building codes and the Canadian Electrical Code to complete an electrical installation for a single family dwelling. In addition, you will be able to identify and interpret alphanumeric lines and use the metric and imperial scales and be able to convert between them, draw and label a panel schematic for a single-family dwelling. You will prepare a material take off for a single-family dwelling using drawings, specifications and prepare sketches to solve and document construction problems and solutions.

### ELECT 103 – ELECTRICAL THEORY (64 HRS)

Upon successful completion of Theory – ELEC 103, the apprentice is able to understand the theories of current flow; define voltage, current and resistance, as well as electrical and mechanical power and energy; describe the effects of electricity on the human body; explain the principles of common sources of Electro-Motive Force (EMF); analyze series, parallel and combination DC circuits by applying Ohm's Law and Kirchoff's Laws; understand typical 3 wire distribution in residential circuit; understand the function of the Neutral; know the purpose and importance of Grounding and Bonding; describe magnetic lines of force and list their characteristics; describe the relationship between magnetism and EMF; understand the difference between Primary and Secondary cells.

### ELECT 104 – INSTALLATION METHODS (48 HRS)

Upon successful completion of ELEC 104 - Installation Methods, the apprentice is able to demonstrate the operation of common hand and power tools; install common switching devices, outlets and enclosures; correctly terminate conductors; demonstrate the installation procedures for non-metallic sheathed cable, armoured cable, mineral insulated cable, rigid conduits, flexible conduits, liquid-tight conduit, electrical metallic tubing, and electrical non-metallic tubing, including supports and tools required; install a 100 amp. residential consumer's service and associated branch circuits; layout a service mast installation; install door, signal and extra-low voltage lighting devices; identify and terminate copper communication and hard wired cables.

### **ELECT 105 – INSTRUMENTATION (24 HRS)**

Upon successful completion of Instrumentation – ELEC 105, the apprentice is able to explain common terms used in instrumentation systems; work with the SI and Imperial system of measurement for pressure and temperature; convert between the four temperature scales; describe the operation, applications and limitations of thermocouples, thermistors and RTD's; install, connect and test thermocouples, thermistors and RTD's; identify deformation elements of pressure measuring equipment; determine the accuracy of pressure measuring equipment; explain relationships between gauge and absolute pressure, and vacuum; explain the operation, construction and applications of typical industrial pressure sensors; identify ISA instrumentation symbols and draw basic process (P) and Instrumentation (I) diagrams for pressure and temperature devices; explain the operation of light and sound meters.

### **ELECT 106 – ELECTRONICS (32 HRS)**

The student will be able to identify schematic symbols for North American and European basic logic gates; describe the operation of basic logic gates; use basic logic gates to create digital logic circuits; state Boolean equations for simple logic gates; design and test combination logic circuits; describe the voltage requirements for TTL and CMOS logic circuits; demonstrate the use of R.S. and D type flip-flop; use a logic probe to troubleshoot a digital circuit; demonstrate procedures for soldering and de-soldering; state the standard resistor colour code; connect resistors in series, parallel and combination circuits; describe the properties of N and P type semiconductor materials; explain current, voltage and biasing requirements for silicon and germanium diodes and LED's; demonstrate the operation of a bipolar diode; identify the symbols for and describe the operation and biasing for NPN and PNP Bipolar transistors; demonstrate how a transistor can be used as a switch; demonstrate the common applications for an opto-coupler.

**PA DAYS:** During scheduled board PA days, St. Lawrence College classes are still in session.

You are expected to attend if you have an SLC class scheduled on this day.

### **SLC.ME – APPLYING TO GRADUATE:**

Students in Level 1 Apprenticeship programs must apply to graduate through SLC.me after successful completion of their college courses. If students apply to graduate they will receive a certificate from St. Lawrence College in the mail (*please ensure your address is current and correct with the Dual Credit/PASS office*). When students complete their Level 3, students can apply to graduate and attend the convocation ceremony.

### **FOR MORE INFORMATION:**

**Website:** [stlawrencecollege.ca/dualcredit](http://stlawrencecollege.ca/dualcredit)

**Email us at:** [DualCredit@sl.on.ca](mailto:DualCredit@sl.on.ca)

### **IN PARTNERSHIP WITH:**



*SCWI/PASS / St. Lawrence College / Algonquin Lakeshore Catholic District School Board / Catholic District School Board of Eastern Ontario / Limestone District School Board / Upper Canada District School Board*