Area of Interest: Construction and Skilled Trades

Electrical Techniques - Apprenticeship

Ontario College Certificate

Program Code: 0506X01FWO

35 Weeks

Ottawa Campus

Our Program

Learn the theoretical principles and trade skills required to becoming an electrician.

To enrol in the Electrical Techniques - Apprenticeship Ontario College Certificate program, applicants must:

- Be currently employed in the trade
- Be formally registered as apprentices with the Ministry of Labour, Immigration, Training and Skills Development (MLTSD)
- Have a valid Offer of Classroom Training from the Ministry of Labour, Immigration, Training and Skills Development that includes a Ministry Client ID and approved Class Number
- Eligibility is determined by the Ministry of Labour, Immigration, Training and Skills Development.
- The Electrician Construction and Maintenance trade is a compulsory trade in Ontario and requires certification.
- To learn more about apprenticeships, visit ontario.ca/page/skilled-trades for detailed information.
- For Registered Apprentices: This 28-week program fulfills all in-class requirements for your apprenticeship. It is divided into three levels (Beginner, Intermediate and Advanced) where you alternate between going to school and working in the field for 12 to 18 months.

You take courses on:

- The Canadian Electrical Code
- Electrical theory
- Electronics
- Instrumentation
- Installation methods

You also learn about prints, standards and electrical principles, practical installations and how to work in a variety of specialty areas.

At the end of this program, you are qualified to write the exam to earn a Certificate of Qualification in the Electrician Construction and Maintenance trade. To work outside of Ontario, you need to test for the Red Seal Endorsement (RSE) in Industrial or Construction specializations.

NOTE: Although a Grade 10 education is the minimum entry requirement for an electrical apprentice, the level of education required for success in today's electrical industry is constantly increasing; therefore, it is strongly recommended that electrical apprentices entering the in-school training program have a minimum equivalent of Grade 12 physics, chemistry, English and mathematics.

Employment

Graduates may find employment as electricians working closely with every trade area, including millwrights, heating and refrigeration technicians, stationary engineers and instrumentation technicians.

Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Assist in the interpretation and preparation of electrical drawings including other related documents and graphics.
- Analyze and solve simple technical problems related to basic electrical systems by applying mathematics and science principles.
- Use and maintain test and instrumentation equipment.
- Assemble basic electrical circuits and equipment to fulfill requirements and specifications under the supervision of a qualified person.
- Assist in the installation and troubleshooting of basic electrical machines and associated control systems under the supervision of a qualified person.
- Assist in testing and troubleshooting electrical and electronic circuits, equipment, and systems by using established procedures under the supervision of a qualified person.
- Assist in the troubleshooting of control systems under the supervision of a qualified person.
- Use computer skills and tools to solve basic electrical related problems.
- Assist in conducting quality assurance procedures under the supervision of a qualified person.
- Assist in the preparation and maintenance of records and documentation systems.
- Install and assist in testing telecommunication systems under the supervision of a qualified person.
- Apply health and safety standards and best practices to workplaces.
- Perform tasks in accordance with relevant legislation, policies, procedures, standards, regulations, and ethical principles.
- Apply basic electrical cabling requirements and install and test system grounding for a specified number of applications under the supervision of qualified person.
- Identify problems and troubleshoot electrical systems under the supervision of a qualified person.
- Assist in the selection of electrical equipment, systems and components to fulfill the requirements and specifications under the supervision of a qualified person.

Program of Study

Level: 01 (Basic)	Courses	Hours
ELE1165	Communication and Documentation	27.0
ELE1166	Introduction to the Canadian Electrical Code	36.0
ELE1167	Trade Practices	36.0
ELE1168	Installation and Maintenance Methods	54.0
ELE1169	Electrical Fundamentals	81.0

ELE1170	Drawings, Specifications and Standards Fundamentals	36.0
Level: 02 (Intermediate)	**Courses**	**Hours**
ELE2271	Electrical Systems	72.0
ELE2272	Electronic Fundamentals	36.0
ELE2273	Drawings, Specifications and Standards 2	36.0
ELE2274	Motor Controls and Devices	45.0
ELE2275	Communications and Monitoring Systems	45.0
ELE2276	Canadian Electrical Code 2	36.0
Level: 03 (Advanced)	**Courses**	**Hours**
ELE3377	Renewable Energy Generating and Storage Systems	27.0
ELE3378	Electrical Theory and Applications	72.0
ELE3379	Plc Fundamentals	27.0
ELE3380	Power Electronics	36.0
ELE3381	Drawings, Specifications and Standards 3	36.0
ELE3382	Instrumentation Fundamentals	36.0
ELE3383	Canadian Electrical Code 3	36.0
Level: 04	**Courses**	**Hours**
ELE4484	Building Automation Systems	32.0
ELE4485	Professionalism and Ethics	16.0
ELE4486	Power Conditioning Systems	24.0
ELE4487	Advanced Motors and Generators	40.0
ELE4490	High Voltage Service and Operation	40.0
ELE4492	Specialty Installations	40.0
ELE4493	Canadian Electrical Code 4	48.0

Fees for the 2025/2026 Academic Year

Tuition Fees: $400 for Level 01.

Incidental Fee: $150 per level.

Information Technology Fee: $43.86 for Level 01.

Books and supplies can be purchased at the campus store.

Students are responsible for parking and locker fees, if applicable.

All students are responsible to supply and use their own personal protective equipment (such as CSA approved safety footwear, non-tinted protective eyewear, hearing protection, gloves, hard hat) as required in each lab environment.

Admission Requirements for the 2026/2027 Academic Year

College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent; OR

- Mature Student status (19 years of age or older and without a high school diploma at the start of the program). Eligibility may be determined by academic achievement testing, for which a fee will be charged.

Program Eligibility

- Prospective students must be registered apprentices with the Ministry of Labour, Training and Skills Development and must be a member in good standing with Skilled Trades Ontario (STO).

- Eligibility is determined by the Ministry of Labour,Immigration, Training and Skills Development.

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College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent; OR

- Mature Student status (19 years of age or older and without a high school diploma at the start of the program).

Program Eligibility

- Prospective students must be registered apprentices with the Ministry of Labour, Training and Skills Development and must be a member in good standing with Skilled Trades Ontario (STO).

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Application Information

ELECTRICAL TECHNIQUES - APPRENTICESHIP
Program Code 0506X01FWO

Registration for Apprenticeship programs takes place through the Ministry of Labour, Training, and Skills Development.

For further information, contact:

Ministry of Labour, Immigration, Training, and Skills Development 347 Preston Street 3rd Floor, Suite 310 Ottawa, ON K1S 3H8

https://www.skilledtradesontario.ca/apprenticeship/starting-your-apprenticeship/
Telephone: 613-731-7100
Toll-free: 1-877-221-1220

Contact Information

Program Coordinator(s)

- Andrew Meek, mailto:meeka@algonquincollege.com , 613-727-4723, ext. 6704

Course Descriptions

ELE1165 Communication and Documentation

Upon successful completion, the apprentice is able to demonstrate communication techniques, use communication tools and computer software applications as well as describe documentation requirements (sector specific), strategies for learning skills and attitudes/attributes that contribute

to on-the-job success.

Prerequisite(s): none
Corerequisite(s):none

ELE1166 Introduction to the Canadian Electrical Code

Upon successful completion, the apprentice is able to navigate and apply sections of the Canadian Electrical Code (CEC).

Prerequisite(s): none
Corerequisite(s):none

ELE1167 Trade Practices

Upon successful completion, the apprentice is able to summarize trade specific practices related to safety requirements and the use of tools and equipment. Note: The expectation for this reportable subject is that apprentices gain an awareness of safe work practices and jobsite hazards. It is not intended to provide apprentices with the related health and safety certifications.

Prerequisite(s): none
Corerequisite(s):none

ELE1168 Installation and Maintenance Methods

Upon successful completion, the apprentice is able to demonstrate the installation and maintenance of single-phase service, distribution and branch circuit equipment as well as develop electrical schematics.

Prerequisite(s): none
Corerequisite(s):none

ELE1169 Electrical Fundamentals

Upon successful completion, the apprentice is able to apply electrical principles, concepts and associated calculations as well as demonstrate the following; how to measure circuit parameters, how to build series, parallel and combination circuits and the relationship between work, power and energy.

Prerequisite(s): none
Corerequisite(s):none

ELE1170 Drawings, Specifications and Standards Fundamentals

Upon successful completion, the apprentice is able to interpret and use information provided from drawings, specifications and standards for electrical installation and maintenance (single-phase). The apprentice is also able to create drawings and schedules.

Prerequisite(s): none
Corerequisite(s):none

ELE2271 Electrical Systems

Upon successful completion, the apprentice is able to describe the construction, characteristics, operation and maintenance requirements for DC motors, DC generators and generating systems, describe the application of cathodic protection systems, apply the principles of single-phase AC theory as well as demonstrate procedures to connect single-phase AC RLC circuits and series, shunt and compound DC motors.

Prerequisite(s): none
Corerequisite(s):none

ELE2272 Electronic Fundamentals

Upon successful completion, the apprentice is able to demonstrate the operation and application of solid-state components that control AC and DC wave forms.

Prerequisite(s): none
Corerequisite(s):none

ELE2273 Drawings, Specifications and Standards 2

Upon successful completion, the apprentice is able to navigate, use and apply drawings and specifications, prepare as-built sketches as well as explain the processes to install and maintain electric heating, HVAC systems, luminaires, wiring devices and exit and emergency lighting systems.

Prerequisite(s): none
Corerequisite(s):none

ELE2274 Motor Controls and Devices

Upon successful completion, the apprentice is able to demonstrate how to install motor control circuits, starters and controllers, demonstrate the development of ladder diagrams (power and control), demonstrate diagnostic, commissioning and troubleshooting methods for motor control circuits and components as well as explain the installation, connection and maintenance procedures for motor starters.

Prerequisite(s): none
Corerequisite(s):none

ELE2275 Communications and Monitoring Systems

Upon successful completion, the apprentice is able to demonstrate the installation, operation, testing, verification and troubleshooting of security and surveillance systems, fire alarm systems and communication systems and their components.

Prerequisite(s): none
Corerequisite(s):none

ELE2276 Canadian Electrical Code 2

Upon successful completion, the apprentice is able to determine code requirements and perform calculations for maximum circuit loading, continuous and non-continuous duty motor branch circuits (single motor), lighting branch circuits, electric heating branch circuits, emergency systems, fire alarm systems and fire pumps, protection and control devices, fibre optics and communication cables and equipment, service and feeders for apartments and row housing, and patient care areas.

Prerequisite(s): none
Corerequisite(s):none

ELE3377 Renewable Energy Generating and Storage Systems

Upon successful completion, the apprentice is able to explain the installation and maintenance requirements and procedures for renewable energy generating and storage systems as well as demonstrate the connection of renewable energy generating and storage system components for the creation of a stand-alone system.

Prerequisite(s): none
Corerequisite(s):none

ELE3378 Electrical Theory and Applications

Upon successful completion, the apprentice is able to describe the characteristics and applications of single and three-phase transformers and motors, explain the procedures for installing and maintaining transformers and AC motors, perform measurements to verify the connection and operation of transformers, motors and RLC circuits and to determine and verify polarity, impedance, winding ratio and insulation resistance of transformers as well as perform calculations for three-phase systems including voltage, current, power and AC RLC circuit performance.

Prerequisite(s): none
Corerequisite(s):none

ELE3379 Plc Fundamentals

Upon successful completion, the apprentice is able to describe basic PLC functions including numbering systems, programming and addressing requirements as well as perform testing of PLC inputs and outputs and demonstrate basic programming capacity.

Prerequisite(s): none
Corerequisite(s):none

ELE3380 Power Electronics

Upon successful completion, the apprentice is able to demonstrate the use of a transistor in analog and digital modes, demonstrate the operation of an Op-Amp, explain the considerations and process for installing and maintain AC and DC drives and confirm the operation of AC drives.

Prerequisite(s): none
Corerequisite(s):none

ELE3381 Drawings, Specifications and Standards 3

Upon successful completion, the apprentice is able to use and apply drawings and specifications related to industrial electrical installations, describe installation and maintenance procedures for three-phase consumer supply services and metering equipment as well as describe the considerations for connecting single and three-phase branch circuits to three-phase electrical distribution equipment.

Prerequisite(s): none
Corerequisite(s):none

ELE3382 Instrumentation Fundamentals

Upon successful completion, the apprentice is able to explain the principles and considerations related to pressure, temperature, level and flow measurement in instrumentation, interpret Process (P) and Instrumentation (I) diagrams using ISA instrumentation symbols, perform the procedures to connect and verify the operation of pressure, temperature, flow and level measuring equipment/ devices, perform calculations related to signal transmission, describe the operation of PIDs and describe instrumentation control voltage and current loop circuits.

Prerequisite(s): none
Corerequisite(s):none

ELE3383 Canadian Electrical Code 3

Upon successful completion, the apprentice is able to determine code requirements and perform calculations (as applicable) for hazardous locations, motors, transformers, welders, capacitors, renewable energy and storage systems, and three-phase consumer supply service and metering equipment.

Prerequisite(s): none
Corerequisite(s):none

ELE4484 Building Automation Systems

Upon successful completion, the apprentice is able to describe the considerations for installing and maintaining building automation systems and components and demonstrate the connection of building automation equipment.

Prerequisite(s): none
Corerequisite(s):none

ELE4485 Professionalism and Ethics

Upon successful completion, the apprentice is able to explain the importance of professional codes of ethics, conduct and standards of practice, describe how personal health and well being impact professional practice and healthy work environments, explain the purpose of personal and professional development plans as well as identify mentoring strategies.

Prerequisite(s): none
Corerequisite(s):none

ELE4486 Power Conditioning Systems

Upon successful completion, the apprentice is able to explain the causes and effects of power quality issues in AC systems, the applications of power conditioning and uninterruptable power supply (UPS) systems as well as describe the considerations and methods for installing and testing surge suppression/protection equipment.

Prerequisite(s): none
Corerequisite(s):none

ELE4487 Advanced Motors and Generators

Upon successful completion, the apprentice is able to demonstrate the operation of DC and AC generating systems, explain the considerations for installing DC generating systems, explain the considerations for installing, connecting and maintaining AC generating systems, explain the process for installing three-phase AC motors as well as perform measurements to verify the operation and connection of three-phase AC motors.

Prerequisite(s): none
Corerequisite(s):none

ELE4490 High Voltage Service and Operation

Upon successful completion, the apprentice is able to explain the considerations for installing, modifying, replacing, testing and maintaining high voltage installations, explain the considerations for installing, replacing, maintaining, troubleshooting and upgrading high voltage transformers and components as well as calculate minimum conductor size maximum overcurrent protection for high voltage transformers.

Prerequisite(s): none
Corerequisite(s):none

ELE4492 Specialty Installations

Upon successful completion, the apprentice is able to explain the process to install and maintain specialty installations using drawings and specifications as well as interpret related documents and diagrams.

Prerequisite(s): none
Corerequisite(s):none

ELE4493 Canadian Electrical Code 4

Upon successful completion, the apprentice is able to determine code requirements for specialty installations.

Prerequisite(s): none
Corerequisite(s):none