Seneca POLYTECHNIC

2024-2025

ELECTRONICS ENGINEERING TECHNICIAN (EEN)

About the Program

In this two-year diploma program, you will learn the fundamentals of digital and analog electronics, combined with a foundation in computer technology and engineering software applications. This program provides relevant hands-on laboratory work to give you modern practical experience, as well as theoretical knowledge of electronic devices, computer programming and diagnostic techniques that the electronics industry values.

This curriculum incorporates content from many widely recognized companies and organizations, including Keysight, Autodesk, Siemens and EXFO, which provides you with the hands-on skills and theoretical knowledge required to begin a technician career in the industry.

Common First Semester

Four programs within the School of Electronics & Mechanical Engineering Technology (https://www.senecapolytechnic.ca/school/electronics-and-mechanical-engineering-technology.html) have a common first semester, which allows you to transfer easily between programs before your second semester. The other programs are: Electronics Engineering Technology (https://www.senecapolytechnic.ca/programs/fulltime/EET.html), Computer Engineering Technology (https://www.senecapolytechnic.ca/programs/fulltime/ECT.html)#and Electromechanical Engineering Technology - Automation (https://www.senecapolytechnic.ca/programs/fulltime/EMA.html).

Computer Requirements

- operating system: Windows 10 or 11, 64 bit
- processor: 3.3 GHz (or faster)
- memory: 16 GB (or larger)
- solid-state drive: 128 GB (or larger)
- second display screen (recommended)

Credential Awarded

Ontario College Diploma

Duration

4 Semesters (2 Years)

Starts

January, May, September

Program and Course Delivery

This program is offered in Seneca's hybrid delivery format with some courses available in Seneca's flexible delivery format. Some coursework is online and some must be completed in person. Students will need to come on campus to complete in-person learning requirements. For courses offered in the flexible delivery format, professors use innovative learning spaces and technology to teach students in a classroom or lab and broadcast in real time to students attending remotely. In flexible courses, students have the choice of coming on campus or learning online.

Skills

Throughout this program you will develop the following skills:

- Analyze, interpret, modify and prepare electrical and electronics drawings, layouts and reports
- Operate industry-specific electronic hardware devices, equipment and bench technician tools
- Perform testing procedures to troubleshoot and maintain equipment and electronic systems, including mechatronics and robotics assemblies, control systems, and telecommunication systems
- Troubleshoot and analyze technical engineering problems by applying practical measurement techniques and calculations
- Construct and test digital logic circuits, embedded systems, programmable logic devices, and digital signal processing applications
- Create electrical circuit simulations, printed circuit boards, mechanical designs and project assemblies using EDA and CAD design software suites
- Communicate technical information according to operational guidelines, codes, policies, standards and regulations, task requirements, and functional specifications
- Comply with health and safety guidelines and procedures
- Work in compliance with sustainability best practices and ethical principles

Optional Co-op

This program offers the option to complete a co-op work term, providing valuable hands-on experience in your field of study.

Students who select the co-op stream will have the opportunity to participate in a co-op term(s) if eligibility requirements are maintained. Students will have the flexibility to transfer to the non co-op stream at any time. The co-op term(s) is typically a full-time paid position completed between two academic semesters. The co-op search is student-driven and participation in the co-op stream does not guarantee that a work position will be secured. However, students will receive guidance and support through in-class career workshops and one-on-one coaching to help prepare for the co-op term.

Review eligibility requirements for work-integrated learning (https://www.senecapolytechnic.ca/employers/seneca-works/work-integrated-learning/eligibility.html)

Your Career

Graduates of the program can explore the following career options:

- Electronics engineering technician
- Bench/field technician
- Telecommunication service technician

- Appliance assembly & repair technician
- Audio visual service technician
- Medical equipment service technician
- Security system installation technician
- Surface Mount Technology (SMT) operator
- Robotics control engineering technician
- Equipment testing technician

Industry and Professional Certification

While passing specific courses, students are directly granted global industry certificates or an opportunity to pass comprehensive industry certifications such as:

- Keysight Basic Instrument User Certification Program
- EXFO Fiber Optic Certified Partners Program

Affiliations/Associations

- Ontario Association of Certified Engineering Technicians and Technologists (OACETT)
- Institute of Electrical and Electronics Engineers (IEEE)
- Keysight Technologies
- EXFO Fiber Optics
- Autodesk
- Cisco
- Siemens
- Microsoft
- Association Connecting Electronics Industries (IPC)
- Canadian Wireless Telecommunications Association (CWTA)

Program of Study

Course Code	Course Name	Weekly Hours
Semester 1		
COM101	Communicating Across Contexts	3
or COM111	Communicating Across Contexts (Enriched)	
ETY155	Electricity	5
ICO155	Introduction to Computers	2
LIN155	Electronic Lab Instrumentation and Techniques	3
MTH147	Mathematics with Foundations	6
PRG155	Programming Fundamentals Using "C	4
Semester 2		
CAD266	Computer Aided Design for Electronics	4
DGS266	Digital Electronics and Introduction to PLC	4
ECR255	AC Circuit Principles	4
IPS255	Interpersonal Skills in the Engineering Workplace	3
MEC355	Mechatronics: Pneumatics and Hydraulic	4
MTH255	Mathematics	4
Semester 3		
CAD366	Advanced Computer Aided Design for Electronics	4
COM455	Communications Fundamentals	4
CSF453	Control Systems Fundamentals	4
ELD255	Semiconductor Devices	4
HSI266	Hardware Software Integration	4
MIR355	Microcomputer Repair	4
WTP100	Work Term Preparation *	1
Work-Integrated Learning Term		
EEN331	Electronics Engineering Technician, Co-op *	30
Semester 4		
ECP455	Engineering Codes and Practices	4
MCO455	Microcontroller Concepts	4
TEC400	Technical Communications	3
TPJ452	Electronics Technician Senior Project	4
plus: General Education Course (2)		6

* Work-Integrated Learning option only

Program Learning Outcomes

This Seneca program has been validated by the Credential Validation Service as an Ontario College Credential as required by the Ministry of Colleges and Universities.

As a graduate, you will be prepared to reliably demonstrate the ability to:

- Analyze, interpret, modify and prepare electrical and electronics drawings, layouts and reports, with guidance as required.
- Analyze and solve routine technical problems related to electronics engineering by applying fundamental concepts of mathematics and science.
- Apply appropriate troubleshooting techniques to electronic circuits or systems and perform test procedures.
- Assemble, modify, test and troubleshoot electronic circuits, equipment and systems in accordance with job requirements, functional specifications and relevant standards, with guidance as required.
- Maintain and repair electronic equipment and systems in accordance with relevant operational guidelines.
- Provide justification for the purchase of electronic equipment, components and systems in accordance with code, standards and job requirements, and functional specifications.

- Analyze and troubleshoot logic and digital circuits, as well as embedded microprocessor-based and microcontroller-based systems, including assembly and high-level language programs.
- Analyze and troubleshoot circuits consisting of passive components by applying appropriate measurement techniques.
- Analyze and troubleshoot circuits consisting of low power, high power, active and electromechanical components, and analog integrated circuits.
- Analyze and troubleshoot control systems.
- Troubleshoot, maintain and repair analog and digital communication systems.
- Apply relevant shop practices in compliance with safety policies and current regulations for electronics engineering workplaces.
- Assist in implementing and conducting quality control and quality assurance programs and procedures.
- Complete work in compliance with relevant legislation, established standards, policies, procedures and regulations, and ethical principles.

Admission Requirements

- Ontario Secondary School Diploma (OSSD), or equivalent, or a mature applicant (https://www.senecapolytechnic.ca/registrar/canadian-applicants/admission-requirements/mature-applicants.html)
- English: Grade 12 C or U, or equivalent course
- Mathematics: Grade 12 C or U, or Grade 11 Functions (MCR3U), or equivalent course

Canadian citizens and permanent residents may satisfy the English and/or mathematics requirements for this program through successful Seneca pre-admission testing. (https://www.senecapolytechnic.ca/registrar/canadian-applicants/admission-requirements/mature-applicants.html)

Recommended upgrading for applicants who do not meet academic subject requirements (https://www.senecapolytechnic.ca/registrar/canadian-applicants/admission-requirements/upgrading-options.html).

International Student Information

International admissions requirements vary by program and in addition to English requirements (https://www.senecapolytechnic.ca/international/apply/how-to-apply/admission-requirements/english-requirements.html), programs may require credits in mathematics, biology, and chemistry at a level equivalent to Ontario's curriculum, or a postsecondary degree or diploma, equivalent to an Ontario university or college. Program-specific pre-requisite courses and credentials are listed with the admission requirements on each program page. To review the academic requirements please visit: Academic Requirements - Seneca, Toronto, Canada (senecapolytechnic.ca) (https://www.senecapolytechnic.ca/international/apply/how-to-apply/admission-requirements/academic-requirements.html).

Pathways

As a leader in academic pathways, we offer a range of options that will allow you to take your credential further in another Seneca program or a program at a partner institution.

To learn more about your eligibility, visit the Academic Pathways (https://www.senecapolytechnic.ca/pathways.html) web page.

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