Seneca POLYTECHNIC

2024-2025

ELECTRONICS ENGINEERING TECHNOLOGY (EET)

About the Program

This three-year advanced diploma program introduces you to a broad background in analog and digital electronics, software development, modern communications and control systems. Topics covered include electronic circuitry, diagnostic techniques, microcontrollers, CAD design, automation process control and computer systems, along with digital communications, embedded systems and mechatronics. During the final year, you will focus on applying the principles you have learned to design, construct and test more advanced electronic projects, including a final semester capstone technical project.

The focus of this program is a balanced blend of theory and practice. The theory provides a depth of understanding that can be applied to relevant hands-on experience in our well-equipped labs.

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 or technologist 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 Technician (https://www.senecapolytechnic.ca/programs/fulltime/EEN.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 Advanced Diploma

Duration

6 Semesters (3 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
- Select and operate industry-specific electronic hardware devices, equipment and bench technologist tools
- Perform testing procedures to troubleshoot and maintain electronic equipment and systems, including mechatronics and robotics assemblies, control systems, and telecommunication systems
- Troubleshoot and analyze technical engineering problems by applying practical measurement techniques and calculations
- Evaluate, construct, and test digital logic circuits, microcontrollers and embedded systems, automated technologies, programmable logic devices, and digital signal processing applications
- Design and interface Internet of Things (IoT) hardware devices with software applications and code
- Create electrical circuit simulations, printed circuit boards, mechanical designs and project assemblies using EDA and CAD design software suites
- Apply project management principles and tools to ensure the timely completion of projects
- 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, and assist in implementing and conducting quality control and assurance programs
- Work in compliance with sustainability best practices and ethical principles

Work Experience

Optional Co-op

Students meeting all academic requirements may have the opportunity to complete an optional co-op work term(s) in a formal work environment. In most cases the work term(s) is a full-time paid position completed between two academic semesters. In programs with limited co-op opportunities, additional academic requirements and a passing grade on a communication assessment may be required for eligibility. Eligibility for participation does not guarantee a work position will be secured. Additional fees are required for those participating in the optional co-op stream regardless of success in securing a work position.

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 technologist
- Product service & support technologist
- Telecommunications technologist
- Power systems engineering technologist
- Automation testing & design technologist
- Bench/field services technologist
- RF communications technologist
- Robotics control engineering technologist
- Internet of Things (IoT) automation technologist
- EV charging electrical design technologist
- Control systems technologist
- Instrumentation calibration & repair technologist

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
- Siemens Mechatronics Systems Certification Program
- Kuka Robotics Programming Certification 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 1		
EET331	Electronics Engineering Technology, Co-op *	30
Semester 4		
ECP455	Engineering Codes and Practices	4
ECR353	Electronic Circuits	4
MCO455	Microcontroller Concepts	4
MTH356	Mathematics - Introductory Calculus and Statistics	4
TEC400	Technical Communications	3
plus: General Education Course (2)		6
Work-Integrated Learning Term 2		
EET332	Electronics Engineering Technology, Co-op II *	30
Semester 5		
COM556	Wireless and Satellite Communication Systems	4
DGS355	Digital Systems	4
ETD555	Engineering Technology and Design	4
MCO556	ARM Microcontroller for Real-time Embedded Applications	4

PHY354	Physics for Electronics	4
plus: Professional Options (1)		
Semester 6		
AMT453	Advanced Mathematics	4
ELM453	Motors and Transformers	4
TPJ655	Technical Project	4
TRN553	Transmission Theory	4
plus: General Education Course (1)		3
plus: Professional Options (1)		

Professional Options

Course Code	Course Name	Weekly Hours
ACC106	Accounting I	3
BAM101	Introduction to Business Administration	3
MEC455	Mechatronics Concepts	4
MOM555	Manufacturing Operations Management	4
PCS455	Process Control	4
PPE655	Engineering Ethics and Professional Practice	5
ROB555	Robotics Basics	4
TIA555	Totally Integrated Automation	4

* 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, design and produce electrical and electronics drawings, layouts and reports.
- Analyze and solve technical problems related to electronics engineering by applying principles of advanced mathematics and science.
- Apply appropriate troubleshooting techniques to electronic circuits or systems and generate and perform test procedures.
- Design, build, test and troubleshoot electronic circuits, equipment, systems and subsystems in accordance with job requirements, functional specifications and relevant standards.
- Modify, maintain, repair and recommend electronic equipment and systems in accordance with relevant operational guidelines.
- Determine, select, recommend and justify the purchase of electronic equipment, components and systems in accordance with code, standards and job requirements and functional specifications.
- Design, modify, analyze and troubleshoot logic and digital circuits, and embedded microprocessor-based and microcontroller-based systems, including assembly and high-level language programs.
- Design, analyze and troubleshoot circuits consisting of passive components by applying appropriate measurement techniques.
- Design, analyze and troubleshoot circuits consisting of low power, high power, active and electromechanical components, and analog integrated circuits.
- Design, analyze and troubleshoot control systems.
- Design, analyze, troubleshoot and repair analog and digital communication systems.
- Apply relevant shop practices in compliance with safety policies and current regulations for electronics engineering workplaces.
- Collaborate in selecting, co-ordinating 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.
- Contribute to the planning, implementation, management and evaluation of team projects by applying project management 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.