

# BUILDING SYSTEMS ENGINEERING TECHNICIAN (BTS)

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## About the Program

Are you looking to make your mark on the world? Gain the hands-on experience required to make a difference, while learning how to manage buildings successfully and sustainably in a multitude of sectors. The Building Systems Engineering Technician program is a two-year diploma program that prepares you with the skills and knowledge required to work in the building systems industry. Throughout this two-year program, you will learn to use various software tools, including AutoCAD and Revit, to model and design building systems. You will also be introduced to energy modelling software which is used to analyze building energy performance and efficiency.

In addition to practical skills, you will also learn about heating, air conditioning, refrigeration, air handling and control systems. You will gain an understanding of the principles of energy efficiency, including how to recommend energy-efficient solutions, as well as the exploration of emerging renewable energy technologies, which are a key component of the program.

Upon completion of the program, you will be equipped with the practical skills and theoretical knowledge necessary to excel in the field of building systems engineering and be prepared for a variety of career paths in the industry.

## Computer Requirements

This program has a bring your own device policy (<https://www.senecapolytechnic.ca/programs/fulltime/BTS/costs.html#menu>). While laptops are not a mandatory purchase, it is recommended that all students have access to a laptop prior to their course start date in order to effectively complete the course materials.

## Credential Awarded

Ontario College Diploma

## Duration

4 Semesters (2 Years)

## Starts

January, 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:

- Energy efficiency principles
- Renewable energy technologies
- Building design software including AutoCAD, Revit
- Building control systems
- Instrumentation and troubleshooting
- Critical thinking
- Communication skills
- Building systems operations management

## Work Experience

### Optional Work Term

Students meeting all academic requirements may have the opportunity to complete an optional work term(s) in a formal work environment. The work term(s) is similar in length to an academic semester and typically involves full-time work hours that may be paid or unpaid. In programs with limited work term 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 work term 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:

- Energy systems operator
- Energy efficiency technician
- Sustainable energy technician
- Revit and building CAD specialist
- Building operator
- Building systems engineering technician
- Facility maintenance technician
- HVAC technician
- Building automation systems technician
- Building commissioning agent
- Building systems water treatment technician

## Professional Certifications

You will be eligible to pursue certificates in:

- Building Environmental System (BES™) Operator Class II
- BES™ Operator Class I

In one of the following areas:

- Pipe system design
- Air system design
- Hospital building systems

These certificates are recognized by the Toronto Building Managers and Operators Association (TBMOA). The Operator Class I certificate is recognized by the Building Owners and Managers Association (BOMA).

The program is accredited by Technology Accreditation Canada (TAC)

## Program of Study

Course Code	Course Name	Weekly Hours
<b>Semester 1</b>		
BES700	Building Systems: Overview	3
BGD117	CAD Fundamentals	4
BGS161	Building a Sustainable Future	3
COM101	Communicating Across Contexts	3
or COM111	Communicating Across Contexts (Enriched)	
EBE161	Intro. to Engineering and the Built Environment	3
MTH147	Mathematics with Foundations	6
<b>Semester 2</b>		
BES221	Applied Heating	4
BES222	Applied Air Conditioning and Refrigeration	4
BES802	Site Management and Building Safety	3
BGL261	Electricity Fundamentals	4
IPS255	Interpersonal Skills in the Engineering Workplace	3
MTH217	Mathematics II	3
WTP100	Work Term Preparation *	1
<b>Work-Integrated Learning Term</b>		
BTS441	Building Systems Engineering Technology, Work Term *	30
<b>Semester 3</b>		
BES703	Air Handling	3
BES704	Electrical	3
BES706	Water Treatment	3
BGD361	Building Systems CAD	4
BGM361	Codes and Regulations	3
BGP361	Plumbing and Pipe Systems	2
plus: General Education Course (1)		3
<b>Semester 4</b>		
BES705	Controls	3
BES709	Hospital Building Systems	3
BES710	Energy Efficiency - Large Buildings	3
BES910	Energy Auditing - Large Buildings	3
BGB561	Fire Protection Systems and Procedures	3
TEC400	Technical Communications	3
plus: General Education Course (1)		3

\* 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 and solve complex technical problems related to mechanical environments through the application of engineering principles.
- Analyze and prepare graphics and other technical documents to appropriate engineering standards.
- Use computer hardware and software to support the engineering environment.
- Apply knowledge of manufacturing processes to the design of components
- Apply knowledge of materials and engineering principles to manufacturing operations and processes.
- Apply knowledge of machinery, tools, and other equipment used in manufacturing processes.
- Specify, coordinate, and conduct quality control and quality assurance procedures.
- Use and maintain documentation, inventory, and records systems.
- Participate in the management of an engineering project.

## 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)) (<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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