Seneca POLYTECHNIC

2024-2025

HONOURS BACHELOR OF SCIENCE - BIOTECHNOLOGY (BBTA)

About the Program

In this four-year degree program, you will prepare for work as a biological technologist, research and development associate, microbiology quality control technologist and more. The program combines in-depth theoretical knowledge and practical application to prepare you for success in a laboratory environment. You will also learn how to design and implement the latest experimental techniques, and use tools required in several fields of biotechnology including molecular genetics, immunology, virology and pharmaceuticals.

Through this program, you will have the opportunity to gain industry experience through two industry focussed capstone projects designed to mirror the research, methodology, and commercialization process in industry. Using the latest equipment, you will have the opportunity to work with your peers, faculty and potentially with industry collaborators to develop your unique capstone experience.

You will also incorporate bioinformatics, computer applications and statistics. In the lab environment, you will manage biotechnological data and develop intricate knowledge of quality control and assurance procedures suitable to industrial and research biotechnological applications.

This full-time program will be delivered at the Seneca @York Campus and features small class sizes and will be offered in a flexible, hybrid format from semester three onward, allowing students to experience both a hands-on, in-class learning approach, as well as a virtual learning environment. In addition, students must complete a mandatory, work-integrated learning placement. Students also have the option to sign up for an optional four-month work term. In the final year of the program, students will apply practical and theoretical concepts to design a large-scale, industry-based capstone project.

Credential Awarded

Honours Bachelor Degree

Duration

8 semesters (4 years)

Starts

September

Program and Course Delivery

This program is offered in Seneca's hybrid 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.

Skills

Throughout this program you will develop the following skills:

- applying the scientific method
- gain experience with state-of-the-art techniques and equipment
- documentation skills
- managing/processing biotechnological data
- knowledge of quality control and quality assurance procedures
- technical communications

Work Experience

Mandatory Degree Co-op

A work experience that includes at least one term in a formal work environment. In most cases the work term(s) is a paid position that is completed between two academic semesters and requires a minimum of 420 hours of work. Students must be in good standing and meet all identified requirements prior to participating in the work experience. The successful completion of the co-op work term(s) is required for graduation. Eligibility for participation does not guarantee that a work position will be secured. Additional fees are required for those participating in the mandatory co-op stream regardless of success in securing a work position.

Your Career

Graduates of the program can explore the following career options:

- Bacteriological Technician
- Biological Laboratory Technologist
- Botanical Technician
- Food Bacteriological Technician
- Environmental Monitoring Microbiologist
- Microbiology Quality Control Technologist
- Quality Control Technician
- Research and Development Associate
- Biotechnology Research Technician

Affiliations/Associations

- Canadian Society of Microbiologists (CSM)
- Chemical Institute of Canada (CIC)

Program of Study

Course Code	Course Name	Weekly Hours
Semester 1		
BIO110	Biotechnology I	3
CHM110	Chemistry I	3
LAB100	Introductory Methods in Biotechnology I	0
LSP105	Computers and Data	4

MTH011	Math I	4
Semester 2		
BIO200	Human Biology	3
CHM200	Chemistry II	3
ENG106	Writing Strategies	3
LAB200	Introductory Methods in Biotechnology II	0
MTH205	Mathematics II	3
Semester 3		
ACA300	Computer Applications and Bioinformatics	3
BIO300	Human Biology	3
BIO310	Microbiology	3
BIO320	Cell Physiology	3
LAB300	Integrated Methods in Biotechnology I	3
LSP305	Research and Statistics	4
Semester 4		
BIO410	Molecular Biology and Genetics	3
CHM400	Analytical Chemistry	3
LAB410	Integrated Methods in Biotechnology II	3
PHY400	Introductory Physics for Life Sciences	3
plus: Liberal Studies Course (2)		6
Semester 5		
BIO510	Current Concepts in Industrial Biotechnology	3
BIO511	Biomedical Physiology and Cellular Ultrastructure	3
CHM500	Analytical Instrumentation for Biotechnology	3
LAB500	Advanced Techniques n Biotechnology I	6
plus: Liberal Studies Course (1)		3
Semester 6		
BIO600	Tissue Culture	3
BIO610	Immunology Fundamentals	3
BIO620	Virology	3
BIO630	Biotechnological Regulations and Quality	3
LAB610	Advanced Methods in Biotechnology II	6
WTP200	Work Term Preparation	1
Work-Integrated Learning Term		
BBT771	Biotechnology, Co-op	35
Semester 7		
BIO700	Advanced Microbiology for Human Health and Welfare	3
BIO710	Advanced Molecular Biotechnology	3
CAP788	Capstone I	6
LSP705	Introductory Programming and Bioinformatics	4
plus: Liberal Studies Course (1)		3
Semester 8		
BIO800	Biopharmaceuticals	3
BIO810	Emerging Concepts in Biotechnology	3
CAP888	Capstone II	6
plus: Liberal Studies Course (1)		3

Seneca has been granted a consent by the Minister of Colleges and Universities to offer this degree for a seven-year term starting May 9, 2022. In conformity with the Minister's criteria and requirements, Seneca will submit an application for the renewal of the consent for this program 12 months prior to the expiration of the consent. Seneca shall ensure that all students admitted to the above-named program during the period of consent will have the opportunity to complete the program within a reasonable time frame.

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:

- Apply advanced biological and chemical laboratory skills with interdisciplinary theories to improve and produce biotechnological processes and products in industrial and research settings.
- Incorporate acquired skills and applied knowledge to implement advanced biotechnological processes such as tissue culture, genetic engineering, and analytical instrumentation.
- Integrate and validate appropriate and emerging biotechnological procedures and instrumentation to achieve complex research objectives.
- Design feasible multidisciplinary strategies to solve research inquires utilizing project management principles.
- Adhere to regulatory standards and ethical principles in professional practice to safeguard personal, societal and environmental welfare.
- Evaluate the philosophical perspectives and approaches of academic and industrial partners to enhance professional practice.
- Implement computational technology to generate and assess scientific data acquired through practical and literary research.
- Communicate information using a variety of formats in a manner accessible to general and specific audiences.
- Employ basic business and entrepreneurial principles to develop strategic plans to manage project goals.

Admission Requirements

- Ontario Secondary School Diploma (OSSD) or equivalent, including six grade 12 U or M courses with a minimum overall average of 65%, or a mature applicant (https://www.senecapolytechnic.ca/registrar/canadian-applicants/admission-requirements/mature-applicants.html).
- Required courses with minimum final grade of 65% in each:
  - English: Grade 12 ENG4U
  - Mathematics ONE of:
    - Calculus and Vectors: Grade 12 MCV4U
    - Advanced Functions: Grade 12 MHF4U
  - Biology: Grade 12 SBI4U
  - Chemistry: Grade 12 SCH4U

Learn about Seneca's free English upgrading course (https://www.senecapolytechnic.ca/registrar/canadian-applicants/admission-requirements/upgrading-options/english-12u-equivalency.html) and math upgrading course (https://www.senecapolytechnic.ca/registrar/canadian-applicants/admission-requirements/upgrading-options/math-12u-equivalency.html) for applicants who don't meet the high school requirements, as well as recommended upgrading for applicants who don't meet their 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.

Last updated: August 5, 2025 at 7:00 p.m.