Seneca POLYTECHNIC

2024-2025

BIOTECHNOLOGY – ADVANCED (BTA)

About the Program

In this three-year advanced diploma program, you will prepare for work as a research technologist in the life sciences field. You will study a range of topics, including molecular genetics, immunology, tissue culture, virology, biochemical techniques, histology, cell biology, biochemistry, computers, statistics and a common first year of basic biology, chemistry and mathematics. This program offers you theoretical knowledge of scientific methods and practical experience in performing precise experiments for research and development.

To guarantee a position in the third semester, you must maintain a GPA of at least 2.5.

Common First Semester

Students enrolled in the following programs may transfer to Biotechnology –Advanced before second year: Chemical Engineering Technology (https://www.senecapolytechnic.ca/programs/fulltime/CHY.html), Chemical Laboratory Technician (https://www.senecapolytechnic.ca/programs/fulltime/CLT.html) and Chemical Laboratory Technology – Pharmaceutical (https://www.senecapolytechnic.ca/programs/fulltime/CLP.html).

Credential Awarded

Ontario College Advanced Diploma

Duration

6 Semesters (3 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:

- How to perform assays
- Scientific method
- Experimental techniques
- Perform laboratory duties
- Quality control and quality assurance procedures
- Manage biological data

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:

- Research technologist in life sciences
- Laboratory technician
- Research assistant

Affiliations/Associations

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

Program of Study

Course Code	Course Name	Weekly Hours
Semester 1		
BIO173	Biology	5
CHM173	Chemistry	5
COM101	Communicating Across Contexts	3
or COM111	Communicating Across Contexts (Enriched)	
MTH171	Mathematics	6
SSA001	Science Survival	1
Semester 2		
ACA273	Advanced Computer Applications	3
BIO273	Biology	5
CHM273	Chemistry	5
MTH273	Mathematics	5
plus: General Education Course (1)		3
Semester 3		
BIC373	Biochemistry	3
BIT373	Biotechniques	5
CHO373	Chemistry - Organic	6
MBG353	Microbiology	5
SES391	Effective Technical Writing	3
WTP100	Work Term Preparation *	1
Work-Integrated Learning Term 1		
BTA441	Biotechnology Advanced, Work Term *	30
Semester 4		

AIN573	Analytical Instrumentation	5
BIT473	Biotechniques	6
PHY453	Physics	3
STA373	Statistics	4
plus: General Education Course (1)		3
Semester 5		
BNF573	Bioinformatics	5
IMU673	Immunology	5
MOB673	Molecular Genetics	5
or TIC673	Tissue Culture	
plus: Professional Options (1)		5-6
plus: General Education Course (1)		3
Work-Integrated Learning Term 2		
BTA442	Biotechnology Advanced, Work Term II *	30
Semester 6		
BPH633	Biopharmaceuticals	3
FMB573	Food Microbiology	5
MOB673	Molecular Genetics	5
or TIC673	Tissue Culture	
VIR673	Virology	5
plus: Professional Options (1)		5-6

Professional Options

Course Code	Course Name	Weekly Hours
ANH573	Anatomy and Histology	5
BIT573	Advanced Techniques in Biotechnology	5
CPY573	Cell Physiology	5
OCC433	Occupational Health and Chemistry I	5
PHA333	Pharmaceutical Analysis	6
PHM633	Pharmaceutical Microbiology	5

* Work-Integrated Learning option only

Note: The following course will not fulfil a General Education requirement: NAT280 The Body: Bits and Bites.

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:

- Perform laboratory duties independently and in compliance with pertinent legislation and regulations, as well as biotechnology standards and guidelines.
- Collaborate in implementing and evaluating quality control and quality assurance procedures to meet organizational standards and requirements.
- Select and implement best practices for sustainability.
- Complete complex biotechnological applications using advanced principles of chemistry, biology and biostatistics as well as basic principles of physics.
- Co-ordinate, implement and validate laboratory procedures to carry out quantitative and qualitative tests and analyses.
- Co-ordinate, implement and validate standard cell culture procedures under aseptic conditions.
- Co-ordinate, implement and validate molecular biology procedures.
- Manage biological data to support biological scientists and researchers in capturing, organizing/summarizing and storing their data.
- Prepare, analyze, interpret, maintain and communicate scientific data effectively.
- Develop and present a strategic plan for ongoing personal and professional development to enhance work performance.
- Apply basic business principles to biotechnology practices.

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
- Biology: Grade 11 C or U, or equivalent course
- Chemistry: Grade 11 U or Grade 12 C or U, 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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