Seneca POLYTECHNIC

2024-2025

HONOURS BACHELOR OF TECHNOLOGY - SOFTWARE DEVELOPMENT (BSD)

About the Program

This four-year honours bachelor degree will provide you with extensive knowledge and technical skills in software development languages. This program also covers topics in operating systems, web applications, multimedia interfaces, information security, databases, system analysis and design principles. You will also develop communication skills to effectively present technical ideas.

This program features a mandatory work term that helps you understand how to apply theoretical and practical knowledge in the software industry.

Open Source and Seneca

Seneca has connections with top tier open-source companies such as Mozilla, creators of the Firefox web browser, and Red Hat, maker of the most successful commercial Linux operating system. In a variety of courses, you will have the opportunity to work with top tier developers on such projects.

Credential Awarded

Honours Bachelor Degree

Duration

8 Semesters (4 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:

- Communicate and manage projects in a team and individually
- Program algorithms and software languages
- Operate system architectures
- Web application design and deployment
- Network and information security
- Database design and development
- System methodologies and project management
- Business principles and management
- Research and problem-solving

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:

- Client application developer
- Server application developer
- Database application specialist
- Web developer
- Information security analyst
- Project manager
- Software engineer and designer
- System software programmer
- Interactive media developer
- Information systems testing technician
- Application developer
- iOS developer
- iOS software engineer
- Full stack web developer
- Data analyst
- Cloud services analyst
- Business technology designer

Program of Study

Course Code	Course Name	Weekly Hours
Semester 1		
BAB100	Introduction to Canadian Business	3
BTL100	Computer Foundations for Developers	4
BTO125	Introduction to Operating Systems	4
BTP100	Programming Fundamentals Using C	6
ENG106	Writing Strategies	3
Semester 2		
BTC240	Interpersonal Communications in Organizations	3
BTD210	Database Design Principles	4
BTI225	Web Programming Principles	4
BTL200	Mathematics for Developers	4
BTP200	The Object-Oriented Paradigm Using C++	4
plus: Liberal Studies Course (1)		3
Semester 3		

BTD315	Advanced Database Technologies	4
BTI325	Web Programming Tools and Frameworks	4
BTL300	Statistics for Developers	4
BTP305	Object-Oriented Software Development Using C++	4
BTS330	Business Requirements Analysis Using OO Models	4
LSP400	Presentation Skills	3
Semester 4		
BTC440	Business and Technical Writing	3
BTI425	Web Programming for Apps and Services	4
BTN415	Data Communications Programming	4
BTP405	System Development and Design	4
BTS435	System Analysis and Design	4
Semester 5		
BAB235	Introduction to Marketing	3
BTH545	Principles of GUI Design and Programming	4
BTP500	Data Structures and Algorithms	4
BTS535	Software Project Management	4
WTP200	Work Term Preparation	1
plus: Professional Options (1)		3-4
Semester 6		
BTH650	Advanced User Interface Design	4
BTP610	Mobile Applications	4
BTS530	Major Project - Planning and Design	4
plus: Liberal Studies Course (1)		3
plus: Professional Options (1)		3-4
Work-Integrated Learning Term 1		
BSD771	Software Development, Co-op	35
Semester 7		
BTE620	Law, Ethics and Social Responsibility	4
BTH745	Human-Computer Interaction	4
BTN710	Information Security	3
BTS630	Major Project - Implementation	4
BTP605	Design Patterns in the Enterprise	4
Work-Integrated Learning Term 2		
BSD772	Software Development, Co-op II	2
Semester 8		
BTM710	Research Methods	3
BTM800	Technology Planning and Acquisition	3
plus: Liberal Studies Course (1)		3
plus: Professional Options (2)		6-8

Professional Options

Course Code	Course Name	Weekly Hours
BDA420	High Performance Computing	3
BTP610	Mobile Applications	4
DPI910	Web Application Security Assessment	4
DPI912	Python for Programmers: Sockets and Security	4
DPS530	Cross-platform App Development	3
DPS909	Topics in Open Source Development	4
DPS911	Open Source Project	4
DPS912	Topics in UNIX Systems Programming	4
DPS920	Computer Vision	4
DPS921	Parallel Algorithms And Programming Techniques	4
DPS923	Mobile App Development - iOS	4
DPS924	Mobile App Development - Android	4
DPS931	Game Engine Foundations	4
DPS936	Game Content Creation	4
DPS937	Game Development Fundamentals	4
DPS941	Mobile Robotics Software Design	4
DPS955	Cloud Computing for Programmers	4
DPS970	AI for Software Developers	4
SEP700	Compiler Design	4

Seneca has been granted a consent by the Minister of Colleges and Universities to offer this degree for a seven-year term starting Apr. 9, 2021. 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:

- Solve problems by designing, coding, testing, and implementing programs using several programming languages, at least one to a professional language-specific standard.
- Develop integrated systems of hardware and software, using current system development methodologies to fulfil the processing needs of a client.
- Use and configure several operating systems in the development and deployment of software at a professional level.
- Develop and deploy Internet-based applications using current technologies to meet client needs.
- Design databases and develop applications that process database contents using a DBMS and various programming languages, to current industry standards.
- Apply data communications, networking, and security concepts to the development of multi-site, multi-user systems, following relevant industry standards.
- Use effective written, oral, and visual communication skills to communicate with technical and non-technical audiences, at levels appropriate for a variety of business settings.

- Apply project management theory and techniques to the development of automated systems, using a basic understanding of business principles and practices.
- Work effectively and cooperatively as a team member in different roles and settings using appropriate technical and interpersonal skills, in the development of automated systems.
- Continue the life-long learning process of acquiring new skills and knowledge through formal and self-directed means using information and learning resources.
- Incorporate knowledge of organizational structure, management functions, business objects, and established practices in the design of business systems and software, including strategic planning and corporate objectives, administrative processes, human resources, accounting, marketing, and e-business.

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: any Grade 12 U

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)

Advanced Entry

Advanced entry offers a pathway for graduates from the following diploma/advanced diploma programs with a GPA of 70% or higher:

- Computer Programming and Analysis (https://www.senecapolytechnic.ca/programs/fulltime/CPA.html) (Seneca Polytechnic)
- Computer Programming (https://www.senecapolytechnic.ca/programs/fulltime/CPP.html) (Seneca Polytechnic)
- Computer Programming (Humber College)

Learn more about advanced entry (https://www.senecapolytechnic.ca/programs/fulltime/BSD/pathways.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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