# COMPUTER PROGRAMMING (CPP)

## About the Program

This two-year diploma program prepares you with the skills and knowledge to begin your career as a programmer. As a leader in developing relevant programs, we have the largest offering of computer studies programs in the province. Through a variety of practical and theoretical courses, you will gain skills in mobile development, web development and distributed programming techniques and database administration. You will also learn about security and a variety of operating systems including Windows, UNIX, Linux and IBM Business Computing. Graduates of this program will enter their industry with programming and communications skills suitable for employment.

Part-time option is available > (http://www.senecapolytechnic.ca/ce/technology/application-development/computer-cpo.html)

## Open Sources 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

Ontario College Diploma

## Duration

4 Semesters (2 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:

- Computer programming
- Operating systems
- Database and web technology
- Data communication
- Security
- Advanced programming languages
- System methodologies
- Internet client and server-side development
- Database system design and maintenance
- Solve problems associated with software installation

## Your Career

Graduates of the program can explore the following career options:

- Software developer
- Information systems specialist
- Personal Computer specialist
- International Business Machines programmer
- UNIX/Linux programmer
- Computer application programmer
- Interactive developer
- Junior software engineer
- Program analyst

### Program of Study

| Course Code | Course Name | Weekly Hours |
|---|---|---|
| **Semester 1** | | |
| APS145 | Applied Problem Solving | 3 |
| COM101 | Communicating Across Contexts | 3 |
| or COM111 | Communicating Across Contexts (Enriched) | |
| CPR101 | Computer Principles for Programmers | 3 |
| IPC144 | Introduction to Programming Using C | 4 |
| OPS102 | Operating Systems for Programmers | 4 |
| **Semester 2** | | |
| DBS211 | Introduction to Database Systems | 4 |
| OOP244 | Introduction to Object Oriented Programming | 4 |
| SFT221 | Software Testing | 3 |
| WEB222 | Web Programming Principles | 4 |
| plus: General Education Course (1) | | |
| **Semester 3** | | |
| DBS311 | Advanced Database Services | 4 |
| OOP345 | Object-Oriented Software Development Using C++ | 4 |
| SYD366 | Software Analysis and Design - I | 4 |
| WEB322 | Web Programming Tools and Frameworks | 4 |
| plus: General Education Course (1) | | 3 |
| **Semester 4** | | |
| DSA456 | Data Structures and Algorithms | 4 |
| EAC594 | Business Communication for the Digital Workplace | 3 |
| PMC444 | IT Project Management Fundamentals Tools and Techniques | 4 |
| plus: General Education Course (1) | | 3 |
| plus: Professional Option Course (1) | | |

## Professional Options

| Course Code | Course Name | Weekly Hours |
|---|---|---|
| APD545 | Application Development | 4 |
| BCI433 | IBM Business Computing | 4 |
| CCP555 | Cloud Computing for Programmers | 4 |
| DBA625 | Database Administration | 3 |
| DBS501 | Stored Procedures Using Oracles PL/SQL | 4 |
| DBW624 | Introduction to Datawarehousing | 3 |
| DEN502 | Digital Entrepreneurship for Programmers | 4 |
| ELA521 | Ethics, Law and Application Development | 4 |
| GAM531 | Game Engine Foundations | 4 |
| GAM532 | Game Engine Techniques | 4 |
| GAM536 | Game Content Creation | 4 |
| GAM537 | Game Development Fundamentals | 4 |
| GPU621 | Parallel Algorithms and Programming Techniques | 4 |
| MAP523 | Mobile App Development - iOS | 4 |
| MAP524 | Mobile App Development - Android | 4 |
| MAP526 | Mobile App Development - Cross Platform | 4 |
| MST300 | Introduction to Microsoft Cloud Technologies | 4 |
| OSD600 | Open Source Development | 4 |
| OSD700 | Open Source Development Project | 4 |
| RPG544 | Business Application Using RPG | 3 |
| SPO600 | Software Portability and Optimization | 4 |
| SYD466 | Software Analysis and Design - II | 4 |
| TEC702 | Technician as an Entrepreneur | 4 |
| UNX510 | UNIX BASH Shell Scripting | 4 |
| UNX511 | UNIX Systems Programming | 4 |
| WEB422 | Web Programming for Apps and Services | 4 |
| WEB524 | Web Programming Using ASP.NET | 4 |
| WEB530 | Cross-platform App Development | 3 |

# 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:

- identify, analyze, develop, implement, verify and document the requirements for a computing environment.
- contribute to the diagnostics, troubleshooting, documenting and monitoring of technical problems using appropriate methodologies and tools.
- implement and maintain secure computing environments.
- implement robust computing system solutions through validation testing that aligns with industry best practices.
- communicate and collaborate with team members and stakeholders to ensure effective working relationships.
- select and apply strategies for personal and professional development to enhance work performance.
- apply project management principles and tools when working on projects within a computing environment.
- adhere to ethical, legal, and regulatory requirements and/or principles in the development and management of computing solutions and systems.
- support the analysis and definition of software system specifications based on functional and non-functional requirements.
- contribute to the development, documentation, implementation, maintenance and testing of software systems by using industry standard software development methodologies based on defined specifications and existing technologies/frameworks.
- apply one or more programming paradigms such as object-oriented, structured or functional programming, and design principles, as well as documented requirements, to the software development process.
- model, design, implement, and maintain basic data storage solutions.
- contribute to the integration of network communications into software solutions by adhering to protocol standards.

# 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 U or M, 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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