Seneca POLYTECHNIC

2024-2025

COMPUTER PROGRAMMING & ANALYSIS (CPA)

About the Program

This three-year advanced diploma program provides you with the skills and knowledge to begin your career as a software developer. You will learn programming languages, program design and system analysis. Web concepts are integrated into all courses to develop active database web programs on a variety of operating systems. Advanced techniques are taught through professional option courses.

You will demonstrate skills through a capstone project for an industry partner in your final year to demonstrate your skills and preparedness for a career in the industry. Graduates of this program will enter the industry with highly employable programming, database, software development and communications skills.

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.

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

Credential Awarded

Ontario College Advanced Diploma

Duration

6 Semesters (3 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:

- Programming languages
- System methodologies
- Client and server side development
- Design and maintenance of database systems
- Data communication

Work Experience

Optional Co-op

Students meeting all academic requirements may have the opportunity to complete an optional co-op work term(s) in a formal work environment. In most cases the work term(s) is a full-time paid position completed between two academic semesters. In programs with limited co-op 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 co-op 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:

- Software developer
- System analyst
- Information systems specialist
- Database administrator
- Web application developer
- Client/server applications developer
- Systems programmer
- UNIX/Linux system administrator
- Net developer
- Android java programmer
- Application developer
- Application support 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)		3
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
WTP100	Work Term Preparation *	1
plus: General Education Course (1)		3
Work-Integrated Learning Term 1		
CPA331	Computer Programming and Analysis, Co-op *	30
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
SYD466	Software Analysis and Design - II	4
WEB422	Web Programming for Apps and Services	4
Work-Integrated Learning Term 2		
CPA332	Computer Programming and Analysis, Co-op II *	30
Semester 5		
APD545	Application Development	4
PRJ566	Project Planning and Management	4
plus: Professional Options (2)		6-8
plus: General Education Course (1)		3
Semester 6		
PRJ666	Project Implementation	3
plus: Professional Options (4)		12-16

Professional Options

Course Code	Course Name	Weekly Hours
BCI433	IBM Business Computing	4
CCP555	Cloud Computing for Programmers	4
CVI620	Computer Vision	4
DBA625	Database Administration	3
DBS501	Stored Procedures Using Oracles PL/SQL	4
DBW624	Introduction to Datawarehousing	3
DEN502	Digital Entrepreneurship for Programmers	4
DSA566	Data Structures and Algorithms II	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
SDR520	Software Design for Robotics Applications	4
SPO600	Software Portability and Optimization	4
TEC702	Technician as an Entrepreneur	4
UNX510	UNIX BASH Shell Scripting	4
UNX511	UNIX Systems Programming	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:

- Troubleshoot and document problems associated with software installation and customization.
- Analyze and define the specifications of a system based on requirements.
- Design, test, document, and deploy programs based on specifications
- Apply knowledge of the design, modelling, implementation, and maintenance of a database.
- Apply knowledge of networking concepts to develop, deploy, and maintain programs.
- Propose and justify the design and development of an integrated solution based on an analysis of the business environment.
- Use relevant methodologies, policies, and standards to develop integrated solutions.
- Apply knowledge of security issues in the analysis, design, and implementation of integrated solutions.
- Develop and maintain effective working relationships with clients.
- Articulate, defend, and conform to workplace expectations found in information technology (IT) environments.
- Contribute to the successful completion of the project applying the project management principles in use.

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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