

Area of Interest: Advanced Technology

Web Development and Internet Applications (Co-op and Non Co-op Version)

Ontario College Diploma
2 Years
Ottawa Campus

Program Code: 3002X03FWO

Our Program

Pursue a career in the evolving world of web software application creation.

The two-year Web Development and Internet Applications Ontario College Diploma program prepares you to pursue a variety of different careers in the internet applications and web development industry.

This program is designed to teach you:

- internet technologies
- full stack web development
- the analysis, design and implementation of internet applications

Use modern computing facilities with a variety of software offered to help you during the program. The department's various vendor agreements gives you access to the most up-to-date technology.

During the program, you study a number of topics relevant to the field. You learn full stack web development, database programming and internetworking in a TCP/IP environment.

Additional topics include:

- client-side and server-side scripting
- programming languages
- systems and network security

In your last semester, you apply what you have learned throughout the program as a member of a team working on a multi-tiered internet application.

Students also have the option to gain real-world experience through a paid co-operative education (co-op) work term (see Additional Information for more details). Please note that places in the co-op work term are subject to availability and academic eligibility. Please note admission to the co-op program does not guarantee a co-op placement.

This program is designed to help you begin your career as an/a:

- full stack web developer
- web administrator
- internet application developer
- web application architect
- web programmer

SUCCESS FACTORS

This program is well-suited for students who:

- Have good problem-solving and analytical skills.
- Enjoy solving logic puzzles
- Are inquisitive and well-organized.
- Enjoy working with computers.
- Have an appreciation for the usefulness of the Internet
- Can work effectively in a teamwork environment.

Employment

Graduates may work as team members, to analyze business requirements, design, develop, and implement appropriate web solutions to the user community, assist with the acquisition, installation, use and troubleshooting of Internet applications and Internet services on a variety of platforms.

Typical occupations toward which the program is directed include web administrator, Internet application developer, web application architect, web programmer, full stack web developer.

Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Communicate and collaborate with team members and stakeholders to facilitate effective working relationships.
- Configure, document and maintain fundamental server requirements for the effective functioning of applications.
- Design, implement and maintain databases to store and retrieve data according to requirements.
- Design and implement a security plan based on best practices, techniques and strategies to minimize risks of hacking and/or data loss.
- Program and debug complex applications using a variety of development technologies and tools to optimize performance and minimize errors.
- Create internet applications that apply design best practices, techniques and strategies for a variety of development projects that comply with accessibility, web and other requirements.
- Develop internet applications reflective of business objectives and client needs.
- Adhere to ethical, legal, and regulatory requirements and/or principles in the development and management of internet applications.
- Participate as a member or leader of a team by applying project management concepts and strategies for the successful completion of a project.
- Select and apply strategies for personal and professional development to enhance work performance.
- Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.

Program of Study

Level: 01	Courses	Hours
CST8117	Cross-Platform Web Design	56.0
CST8209	Web Programming I	56.0
CST8260	Database System and Concepts	56.0
CST8279	Introduction Computer Programming Using Python	70.0
CST8300	Achieving Success in Changing Environments	42.0
MAT8001C	Technical Mathematics for Computer Science	56.0
Level: 02	Courses	Hours
CST8250	Database Design and Administration	70.0
CST8253	Web Programming II	70.0
CST8254	Network Operating Systems	70.0
CST8318	Graphics Technologies	42.0
ENL1813T	Communications I	42.0
GEP1001	Cooperative Education and Job Readiness	18.0
Choose one from equivalencies: Courses	Hours	
GED3002	General Education Elective	42.0
Level: 03	Courses	Hours
CST8256	Web Programming Languages I	70.0
CST8257	Web Applications Development	70.0
CST8258	Web Project Management	42.0
ENL8720	Technical Communication for Technicians	42.0
Choose one from equivalencies: Courses	Hours	
GED3002	General Education Elective	42.0
Co-op: 01	Courses	Hours
WKT8001	Work Term I	
Co-op: 02	Courses	Hours
WKT8002	Work Term II	
Level: 04	Courses	Hours
CST8259	Web Programming Languages II	70.0
CST8265	Web Security Basics	70.0
CST8268	Project	56.0
CST8325	Current Trends in Web Application Development	42.0

Estimator tool at <https://www.algonquincollege.com/fee-estimator> .

Further information on fees can be found by visiting the Registrar's Office website at <https://www.algonquincollege.com/ro> .

Fees are subject to change.

Additional program related expenses include:

- Books and supplies can be purchased from the campus store.
- For more information visit <https://www.algonquincollege.com/coursematerials> .

Admission Requirements for the 2024/2025 Academic Year

College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent. Applicants with an OSSD showing senior English and/or mathematics courses at the Basic Level, or with Workplace or Open courses, will be tested to determine their eligibility for admission; OR
- Academic and Career Entrance (ACE) certificate; OR
- General Educational Development (GED) certificate; OR
- Mature Student status (19 years of age or older and without a high school diploma at the start of the program). Eligibility may be determined by academic achievement testing for which a fee of \$50 (subject to change).

Program Eligibility

- English, Grade 12 (ENG4C or equivalent).
- Mathematics, (Grade 12 MCT4C) or (Grade 11 MCR3U) or equivalent; or (Grade 12 MAP4C with a grade of 80% or higher) or (Grade 11 MCF3M with a grade of 70% or higher).
- Applicants with international transcripts must provide proof of the subject-specific requirements noted above and may be required to provide proof of language proficiency. Domestic applicants with international transcripts must be evaluated through the International Credential Assessment Service of Canada (ICAS) or World Education Services (WES).
- IELTS-International English Language Testing Service (Academic) Overall band of 6.0 with a minimum of 5.5 in each band; OR TOEFL-Internet-based (iBT)-overall 80, with a minimum of 20 in each component: Reading 20; Listening 20; Speaking 20; Writing 20; OR Duolingo English Test (DET) Overall 110, minimum of 110 in Literacy and no score below 95.

Not sure if you meet all of the requirements? Academic Upgrading may be able to help with that: <https://www.algonquincollege.com/access/> .

Should the number of qualified applicants exceed the number of available places, applicants will be selected on the basis of their proficiency in English and mathematics.

Note: Applicants should have basic computer skills, such as keyboard proficiency, Internet browsing and searching, and proficiency with an office software suite (word processing, spreadsheets, etc.) prior to the start of the program. The Mobile Learning Center Coach (C102) offers training in these skills if needed. While programming experience is not a requirement to enter the program, aptitude for programming is necessary and would include strong language, problem solving and logic skills. This is often demonstrated by skill and enjoyment in solving word problems in math.

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Application Information

WEB DEVELOPMENT AND INTERNET APPLICATIONS (CO-OP AND NON CO-OP VERSION) **Program Code 3002X03FWO**

Applications to full-time day programs must be submitted with official transcripts showing completion of the academic admission requirements through:

ontariocolleges.ca
60 Corporate Court
Guelph, Ontario N1G 5J3
1-888-892-2228

Students currently enrolled in an Ontario secondary school should notify their Guidance Office prior to their online application at <http://www.ontariocolleges.ca/>.

Applications for Fall Term and Winter Term admission received by February 1 will be given equal consideration. Applications received after February 1 will be processed on a first-come, first-served basis as long as places are available.

International applicants please visit this link for application process information: <https://algonquincollege.force.com/myACint/>.

For further information on the admissions process, contact:

Registrar's Office
Algonquin College
1385 Woodroffe Ave
Ottawa, ON K2G 1V8

Telephone: 613-727-0002
Toll-free: 1-800-565-4723
TTY: 613-727-7766
Fax: 613-727-7632
Contact: <https://www.algonquincollege.com/ro>

Additional Information

CO-OP INFORMATION:

All applicants apply directly to the co-op version of this program through <http://www.ontariocolleges.ca/> or our International Application Portal. Applicants not wishing to pursue the co-op version will have the opportunity to opt-out after being admitted to the program but prior to the first co-op work term.

Co-operative education (Co-op) allows students to integrate their classroom learning with a real-world experience through paid work terms. Two academic terms prior to the cooperative education work term, students are required to actively participate in and successfully complete the self-directed co-op course, readiness activities and workshops.

Students must actively conduct a guided, self-directed job search and are responsible for securing approved program-related paid co-op employment. Students compete for co-op positions alongside students from Algonquin College and other Canadian and international colleges and universities. Algonquin College's Co-op Department provides assistance in developing co-op job opportunities and guides the overall process, but does not guarantee that a student will obtain employment in a co-op work term. Co-op students may be required to relocate to take part in the co-op employment opportunities available in their industry and must cover all associated expenses; e.g., travel, work permits, visa applications, accommodation and all other incurred expenses.

Co-op work terms are typically 14 weeks in duration and are completed during a term when students are not taking courses. For more information on your program's co-op level(s), visit the courses tab on your program's webpage.

International students enrolled in a co-op program are required by Immigration, Refugees and Citizenship Canada (IRCC) to have a valid Co-op/Internship Work Permit prior to commencing their work term. Without this document International students are not legally eligible to engage in work in Canada that is part of an academic program. The Co-op/Internship Work Permit does not authorize international students to work outside the requirements of their academic program.

For more information on co-op programs, the co-op work/study schedule, as well as general and program-specific co-op eligibility criteria, please visit <https://www.algonquincollege.com/coop>.

Curriculum is reviewed annually to reflect evolving industry standards in the information technology field.

Contact Information

Program Coordinator(s)

- Jérôme Mizon, <mailto:mizonj@algonquincollege.com>, 613-727-4723, ext. 3446

Course Descriptions

CST8117 Cross-Platform Web Design

Technologies on the web evolve quickly. Every year brings new devices and with them new capabilities. These devices present many challenges and opportunities to web developers. Fundamentals of web development using hypertext markup language (HTML), and cascading style sheets (CSS) are reviewed, with a focus on developing responsive and mobile websites. Multiple IDEs are introduced and used to complete hands-on projects.

Prerequisite(s): none
Corerequisite(s): none

CST8209 Web Programming I

Emphasis is on client-side browser scripting using JavaScript. Students focus on the theory behind

client-side web scripting and how to manage interactive sites that use JavaScript to generate and manipulate a page's HTML and CSS. Topics include object detection, DOM manipulation, timers and animation, event handling, functions, jQuery introduction, form validation, timers and simple animations.

Prerequisite(s): none
Corerequisite(s):none

CST8250 Database Design and Administration

A solid theoretical and practical understanding of database design and database administration is provided. The material is dealt with from the point of view of the user, the database designer and the database administrator. Topics to be covered include relational database design (e.g., data modelling, normalization, ER diagrams, integrity constraints) and database administration (e.g., user management, backups and restores, database security).

Prerequisite(s): CST8260
Corerequisite(s):none

CST8253 Web Programming II

Through the study of C# and ASP.net, students learn the concepts of object-oriented programming as applied to the design, the development and the debugging of ASP.net web. Object-oriented concepts, such as encapsulation, inheritance, abstraction and polymorphism are covered and reinforced with practical applications. The course also continues the development of Web Programming concepts by examining and using HTML form elements, web server controls, the ASP.NET Page class, its inherent Page, Request, Response and Cookies objects.

Prerequisite(s): CST8209 and CST8279 and MAT8001C
Corerequisite(s):none

CST8254 Network Operating Systems

Students are introduced to the concepts behind implementing network operating systems in a multiple user, computer and Internet Protocol (IP) networked environment. Topics include managing and updating user accounts, access rights to files and directories, Transmission Control Protocol/Internet Protocol (TCP/IP) and TCP/IP services: Domain Name System (DNS), Hyper Text Transfer Protocol (HTTP/HTTPS) and File Transfer Protocol (FTP/SFTP). Theory and practical lab assignments are reinforced to install and configure a network operating system and the services mentioned.

Prerequisite(s): CST8279 and MAT8001C
Corerequisite(s):none

CST8256 Web Programming Languages I

Emphasis is placed on ways of moving data between web pages and databases using the .NET platform: C#, ASP.NET, (as well as ASP.NET Core), Microsoft Entity (as well as Microsoft Entity Framework core) and the .NET Framework (as well as .NET Framework core). Students focus on how web applications can interact with databases through Entity Framework or other technologies. Server-side methods and the advantages of multi-tiered and MVC (Model View Controller) application architecture are explored.

Prerequisite(s): CST8253 and CST8260
Corerequisite(s):none

CST8257 Web Applications Development

Students are introduced to PHP and how this technology is used to create dynamic server-side web applications. Students learn how to build database-driven Web applications using PHP. Students learn techniques to access and process data, manage state information, upload and download files, interact with the file system and manipulate pictures through the study of examples. The course concludes with a mini-project to develop a social media network with

emphasis on sharing and managing picture albums.

Prerequisite(s): CST8209 and CST8260

Corerequisite(s):none

CST8258 Web Project Management

This course introduces students to the software engineering process. System engineering, design, software quality assurance and testing are explored in detail. The course consists of lectures, case studies and practical lab group work. Project teams are provided with the opportunity to apply sound software engineering principles in the scoping and analysis of web-related projects. Students must produce appropriate documentation to support the project progression to the fourth level Project course.

Prerequisite(s): CST8253

Corerequisite(s):none

CST8259 Web Programming Languages II

The concepts and use of high level tools and current web programming languages used in web development, such as XML and JSON, Content Management Systems Web Services and JavaScript frameworks are addressed.

Prerequisite(s): CST8256 and CST8257 and CST8258

Corerequisite(s):none

CST8260 Database System and Concepts

A solid theoretical and practical understanding of database systems is provided. Topics covered include relational database design, data definition and manipulation using the Structured Query Language (SQL). Participants practise designing a database, and extracting information from a database using SQL.

Prerequisite(s): none

Corerequisite(s):none

CST8265 Web Security Basics

Students explore how to secure website and web applications. Tools and techniques for understanding basic web environment security and web application security are also explored. Common web application vulnerabilities and the mechanisms/tools to detect and prevent them are investigated. This may include such things as encryption, secure socket layers (SSL), authentication and authorization.

Prerequisite(s): CST8256 and CST8257 and CST8258

Corerequisite(s):none

CST8268 Project

Students apply sound software engineering principles in the design and implementation of a major web-related project. Students work in teams under the direction of a staff advisor. The projects undertaken are conceived either internally (by the College) or externally (local industry or organizations). In the case of external projects, the industry professionals act as customers. Students must produce appropriate documentation to support the project progression. A formal project presentation to peers, faculty, staff and invited guests is required at the end of the course.

Prerequisite(s): CST8257 and CST8258

Corerequisite(s):none

CST8279 Introduction Computer Programming Using Python

Emphasis is on principles of software development, style and testing. Students learn the basics of

robust computer programming, with emphasis on correctness, structure, style and documentation using Python. Theory is reinforced with application by means of practical laboratory assignments.

Prerequisite(s): none
Corerequisite(s):none

CST8300 Achieving Success in Changing Environments

Rapid changes in technology have created personal and employment choices that challenge each of us to find our place as contributing citizens in the emerging society. Life in the 21st century presents significant opportunities, but it also creates potential hazards and ethical problems that demand responsible solutions. Students explore the possibilities ahead, assess their own aptitudes and strengths, and apply critical thinking and decision-making tools to help resolve some of the important issues in our complex society with its competing interests.

Prerequisite(s): none
Corerequisite(s):none

CST8318 Graphics Technologies

Students are introduced to graphics and illustration programs in the computer environment. Students also learn skills and production techniques which help to design effective interfaces for websites, mobile websites and mobile applications. Focus is placed on hands-on learning of software, such as Adobe Photoshop and Illustrator. Basic design concepts are covered within the context of becoming productive with the software packages.

Prerequisite(s): none
Corerequisite(s):none

CST8325 Current Trends in Web Application Development

The field of web development is dynamic and constantly changing with new tools, workflows and best practices for constructing usable application. Students explore current trends in Web Application Development through guest speakers' presentations, case studies and hands-on exercises. Topics like eCommerce, eGovernment, eHR, Development frameworks and Content Management Systems are explored.

Prerequisite(s): CST8256 and CST8257 and CST8258
Corerequisite(s):none

ENL1813T Communications I

Communication remains an essential skill sought by employers, regardless of discipline or field of study. Using a practical, vocation-oriented approach, students focus on meeting the requirements of effective communication. Through a combination of lectures, exercises, and independent learning, students practise writing, speaking, reading, listening, locating and documenting information and using technology to communicate professionally. Students develop and strengthen communication skills that contribute to success in both educational and workplace environments.

Prerequisite(s): none
Corerequisite(s):none

ENL8720 Technical Communication for Technicians

Clear, concise and detailed communication is essential for technical workplaces. Students plan and execute a variety of formal and informal visual, oral and written communication tasks. Exercises and activities foster confidence and competence in workplace communication.

Prerequisite(s): ENL1813T
Corerequisite(s):none

GED3002 General Education Elective

Students choose one course, from a group of general education electives, which meets one of the following four theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, and Science and Technology.

Prerequisite(s): none
Corerequisite(s):none

GED3002 General Education Elective

Students choose one course, from a group of general education electives, which meets one of the following four theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, and Science and Technology.

Prerequisite(s): none
Corerequisite(s):none

GEP1001 Cooperative Education and Job Readiness

Students are guided through a series of activities that prepare them to conduct a professional job search and succeed in the workplace. Through a detailed orientation students learn the cooperative education program policies and procedures related to searching and securing a work term opportunity. Students identify their strengths and transferable skills and participate in workshop-style sessions that focus on cover letter and resume development, interview techniques and job search strategies. Students learn how to navigate a web-based resource centre, which is used to post employment and cooperative education job opportunities. Students reflect on workplace success, ethics and responsibilities.

Prerequisite(s): none
Corerequisite(s):none

MAT8001C Technical Mathematics for Computer Science

The study of algebraic and transcendental functions is an essential prerequisite to Calculus. Students manipulate algebraic expressions, solve algebraic equations and linear systems and learn the properties of and graph algebraic and transcendental functions. Students investigate computer number systems in addition to Boolean algebra and logic to help solve problems involving computer systems. Students also study the addition and subtraction of vectors using vector components. Delivered in a modular format, this course is equivalent to the completion of all of the following math modules MAT8100 - A, B, C, D, E, F, and L.

Prerequisite(s): none
Corerequisite(s):none

WKT8001 Work Term I

Students complete a cooperative work term, and submit a written report which documents the location of employment and the duties performed.

Prerequisite(s): none
Corerequisite(s):none

WKT8002 Work Term II

Students complete a cooperative work term, and submit a written report which documents the location of employment and the duties performed.

Prerequisite(s): WKT8001
Corerequisite(s):none