



Certificate in Software Development

Are you looking for a Career in Information Technology?

The certificate acts as a bridge to higher-level computing qualifications and provides a solid foundation in the concepts and techniques required for effective planning, design and development of software applications and systems, applied computer knowledge in networking and internet technologies. The program provides individuals with the knowledge and skills necessary to assume entry-level positions in the field of information technology, data entry operator, data center operations support, software development and maintenance specialist, network administrator, media technician, internet and web specialists, computer support consultant, help desk analyst, and technical support specialist.

Whether you are working in accounting, banking, health care, real estate, marketing or any other industry, information technology is an ever growing field and the career possibilities are endless.

Typical career opportunities include:

- Software Engineer/Developer
- QA Analyst/Test Engineer
- Web Designer/Web Developer
- Software Support Analyst
- Systems Administrator/Web Master
- Computer Operations Support
- IT Business Analyst
- Network Administrator
- Technical Consultant/Support
- Database Administrator
- Database Analyst
- Customer Service Representative
- Helpdesk Technician
- Systems Engineer/Analyst
- IT Support Analyst
- Interface Development Engineer

How Can a McGill Program help prepare you for a career in Information Technology?

- The Certificate in Systems Analysis and Design will provide you with a sound foundation in the concepts and techniques required for effective planning and design of software applications and systems.
- The Certificate in Software Development will provide you with a solid foundation in software application development. You will gain applied computer knowledge in the fundamentals of computer programming, networking and internet technologies.
- The Diploma in Internet Business Technology, the Diploma in Management (Internet Business concentration) and the Graduate Certificate in Internet Business are graduate-level programs for those who are interested in a career in internet business. These programs are structured to develop the knowledge and skills required as a business and web analyst to design, understand and analyse the internet data to be used in making insightful decisions about significant changes in their business and markets.

The Program

The Certificate in Software Development is a 30-credit program which consists of (one external pre-requisite,) 1 co-requisite course and 10 required courses.

Classes are offered once a week for 13 weeks and are generally from 6 p.m. to 9 p.m. Courses can be taken in the Fall, Winter, Spring and Summer sessions. Classes in the Spring and Summer sessions may be given in less than 13 weeks. Not all courses are offered every semester.

Note: CMSC 000 is an external pre-requisite to the program. CMSC 000 is a pre-requisite to CMSC 101 and must be completed (with a minimum grade of B-) before CMSC 101 can be taken. Students may apply for Advanced standing at the time of admission or they may take an Exemption by Examination Test².

The certificate's program requirements are:

Co-requisite¹ to the Program:

CMSC 101 Mathematical Tools for Management Professionals
(or the Exemption by Examination Test²)

10 Required courses (30 credits):

CCCS 300 Programming Techniques 1
CCCS 301 Programming Techniques 2
CCCS 310 Web Development
CCCS 315 Data Structures & Algorithms
CCCS 321 Operating Systems Administration
CCCS 325 Mobile Application Development
CCCS 330 Database Design & Business Application Development
CCCS 431 Networking Fundamentals
CMIS 422 Information Systems Security
MGCR 331 Information Systems

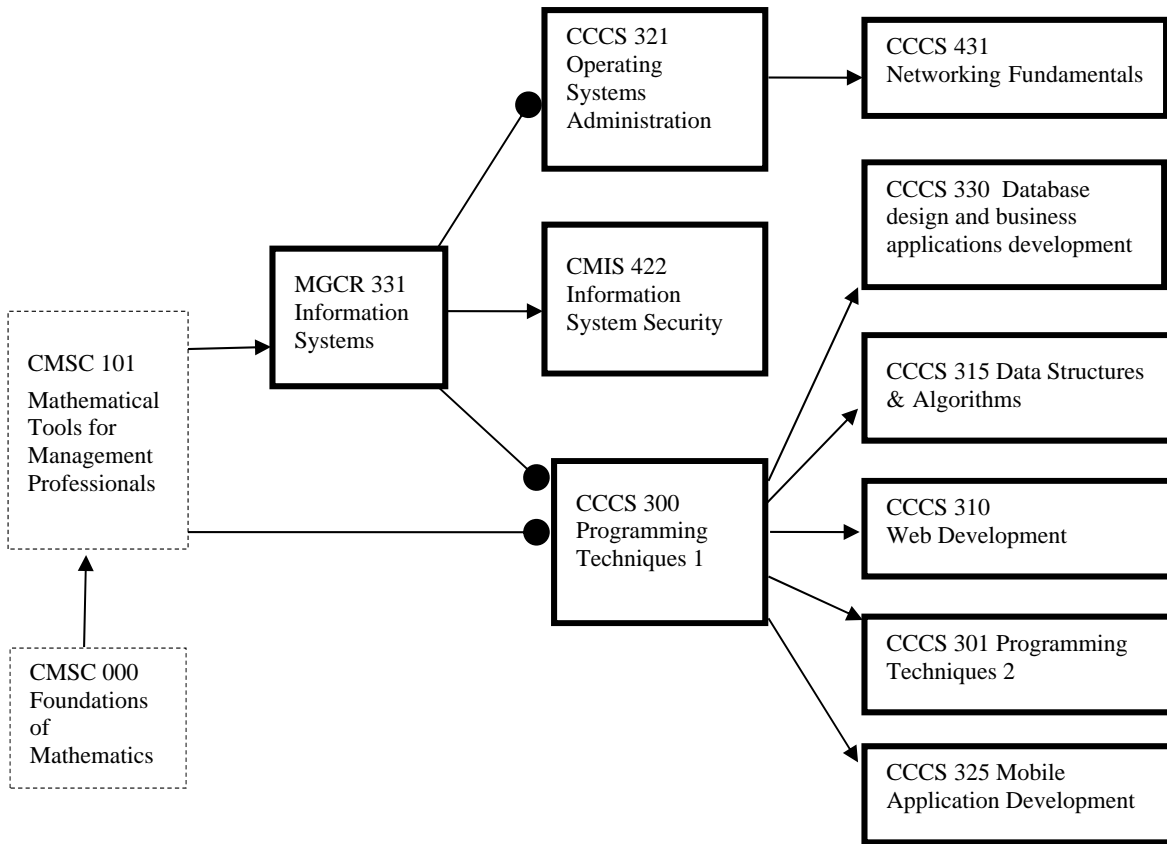
¹ Co-requisite: This refers to academic course requirements that must be completed in the first semester.

² For more information on how to obtain course exemption by the means of a challenge exam, please consult the Exemption by Examination form available on our website at:

<http://www.mcgill.ca/continuingstudies/current-students/student-services-and-resources/forms>

Course Sequence

Certificate in Software Development



Note:

→ Prerequisite for courses

—● Co-requisite for courses

To obtain information on course offerings, please refer to the timetable at:
<http://www.mcgill.ca/continuingstudies/programs-and-courses>

Course Descriptions

CCCS 300 Programming Techniques 1

(3 credits)

Co-requisite: MGCR 331 Information Systems & CMSC 101 Mathematical Tools for Management Professionals

Fundamental programming techniques, concepts, and data structures, including modularization and maintainability. Emphasis on facilitating communication and understanding between systems analysts and programmers to support decision-making.

CCCS 301 Programming Techniques 2

(3 credits)

Pre-requisite: CCCS 300 Programming Techniques 1

Object oriented design, modeling (UML) and programming techniques, including the creation of classes, the use of objects, inheritance and other object oriented principles. Strong focus on problem solving techniques and ways in which programmers can support decision-making within an organization.

CCCS 310 Web Development

(3 credits)

Pre-requisite: CCCS 300 Programming Techniques 1

Development of web sites and web-based applications using page markup, style sheets, and client-side scripting. Emphasis will be placed on developing pages that support current standards and accessibility requirements, as well as multimedia, cross-platform development, and site deployment.

CCCS 315 Data Structures and Algorithms

(3 credits)

Pre-requisite: CCCS 300 Programming Techniques 1

Programming techniques used to implement algorithms on computers with an object oriented programming language through the careful design of data structures which support the efficient manipulation of data.

CCCS 321 Operating Systems Administration

(3 credits)

Co-requisite: MGCR 331 Information Systems

Operating systems such as Windows and LINUX/UNIX environments, administration of computer servers, usage of script languages and in various operating systems, back up procedures and remote access, communication protocol used among different systems, managing information, and system security.

CCCS 325 Mobile Application Development

(3 credits)

Pre-requisite: CCCS 300 Programming Techniques 1

Examines the limitations and technical challenges of current mobile devices and wireless communications by using up-to-date software development tools and application programming interfaces. Develop small realistic applications for mobile devices by using a standard software development environment.

CCCS 330 Database Design & Business App Development

(3 credits)

Pre-requisites: CCCS 300 Programming Techniques 1

Design and implement applications that make use of different database management systems. Simple and complex Structured Query Language (SQL) used in manipulation of information, data design, querying, and programming. Connectivity to different databases through programming languages to implement web applications.

CCCS 431 Networking Fundamentals

(3 credits)

Pre-requisite: CCCS 321 Operating Systems Administration

Fundamental concepts and practices of network principles, technical and managerial aspects of data communications, overview of local area and wide-area networks, network topology, network protocols, Internet/intranet, client/server communication and file sharing.

CMIS 422 Information Systems Security

(3 credits)

Pre-requisite: MGCR 331 Information Systems

Fundamental concepts relating to the design of secure information systems. Identification and assessment of security risks and the application, network, and physical levels. Use of cryptography and other techniques to provide necessary level of security.

CMSC 000 Foundations of Mathematics

(12 CE Units)

Pre-requisites: None

First-degree equations and applied word problems, polynomials, factoring, fractions, exponents, roots and radicals, inequalities, quadratic equations and functions, composite and inverse functions, arithmetic and geometric sequences and series.

Please note that the minimum grade of 65 is required to successfully complete this course. Any grade below 65 is considered to be a failure.

CMSC 101 Mathematical Tools for Management Professionals

(3 credits)

Pre-requisite: CMSC 000 Foundations of Mathematics with minimum grade B– or the Exemption by Examination Test

Exponential and logarithmic functions and equations, mathematics of finance, permutations and combinations, introduction to probability, limits and derivatives with applications, matrices and systems of linear equations.

MGCR 331 Information Systems

(3 credits)

Co-requisites: CMSC 101 Mathematical Tools for Management Professionals or Exemption by Examination Test

Introduction to principles and concepts of information systems in organizations. Topics include information technology, transaction processing systems, decision support systems, database and systems development. Students are required to have background preparation on basic micro computer skills including spreadsheet and word-processing.

Admission Requirements

To be admitted to an Undergraduate Certificate in Software Development:

- Applicants must hold a CEGEP diploma (DCS, DEC or equivalent) OR
- Applicants who do not have the normal academic background for admission but are 21 years of age and older may be admitted as mature students OR
- Applicants between 18 and 21 years of age who do not have a CEGEP diploma but have at least a high school leaving certificate may be accepted into a qualifying program (a copy of the certificate must be provided).

Admission Procedures

To Apply to the *Certificate in Software Development Online* Please Follow The Steps Listed Below:

Please follow the steps below:

STEP 1:

- Go to <http://www.mcgill.ca/continuingstudies/>
Click on “Apply”
Click on “Undergraduate Programs”

STEP 2:

Verify on the “**Apply for Admission to a Program**” page, the “Application Deadlines” for Canadian/Permanent Residents or International Students to ensure that you submit your application before the term deadline.

STEP 3:

- **Review your Admission Requirements:** Once you have checked your application against all the requirements, you will be ready to apply to the program.
- Before you proceed you will need:
A valid **email address** and a **credit card** (Visa, MasterCard or American Express).

STEP 4:

- Once you are ready to apply online:
Click on “**Click here now**” to bring you to the Application for Admission page.
- Click on the red bold “**Apply Now**” on the Application for Admission page.
(Do **not** apply through “uApply” link).
- Fill in the login information on the “Admissions Login” page and the Biographical Information.
- On the “Apply for Admission” page, fill in the information requested.
NOTE: When asked: “What are you applying for at McGill”, click on “Continuing Studies”
- Select the program you are applying to on the “Program Choice Selection” page.
- Continue to fill in the remainder of the application. (All sections to be completed are indicated in the textbox on the left hand side of the screen).

STEP 5:

- Once you have applied online, you will receive a confirmation email providing you with a McGill ID number and a 6-character **PIN (Personal Identification Number)**.
- You will need to use this information to **log into MINERVA** (www.mcgill.ca/minerva) (McGill’s web-based information system for students) so that you can upload documents required for admission and follow-up on your status of your application.

STEP 6:

- Please refer to the website for additional information.
www.mcgill.ca/continuingstudies

Language Requirements

The language of instruction for most courses and programs at McGill is English; however, students may submit any written work that is to be graded in English or French, except in cases where knowledge of the language is one of the objectives of the course. Applicants must demonstrate an adequate level of proficiency in English **prior to admission**, regardless of citizenship status or country of origin. McGill University has this language requirement in place to ensure that all students are provided with the opportunity to succeed in their chosen program. In all cases, the University reserves the right to require proof of English proficiency if it is deemed necessary. For additional information, please click on the link below.

<http://www.mcgill.ca/continuingstudies/current-students/academic-policies/language-policy>

Exemption by Examination

Students admitted to a Certificate, Graduate Certificate or Diploma program requiring a pre-requisite or co-requisite course must provide proof that they have taken an equivalent 3 credit course, at the appropriate level elsewhere or successfully pass the Exemption by Examination test. Otherwise the student must register for the course.

Please note that the Exemption by Examination test is not applicable to required or complementary course(s) within a program. You cannot take the Exemption by Examination test if you have already attempted the course (a grade of W is considered as have attempted the course). If you are unsuccessful in the Exemption by Examination test(s) you will not be permitted to repeat the test(s) and must instead enroll in the course(s) for which the particular test(s) was taken.

You must be admitted into a program or have applied to a program to be eligible to write the Exemption by Examination test. The test is optional. For more information on how to obtain a course exemption by means of a challenge exam, please consults the Exemption by Examination form available on our website at: <http://www.mcgill.ca/continuingstudies/prospective-students/apply/exemption-examination>

Student Awards and Financial Aid

Note: The amount and number of McGill University's School of Continuing Studies Bursaries, Scholarships, and Graduating Prizes issued varies from year to year, depending on funds received and donor specifications.

McGill SCS Bursaries

For a list of McGill Bursaries, please consult the McGill School of Continuing Studies website by clicking on the link below.

<http://www.mcgill.ca/continuingstudies/current-students/fees/student-awards-and-financial-aid>

McGill SCS Scholarships

For a list of McGill Scholarships, please consult the McGill School of Continuing Studies website by clicking on the link below.

<http://www.mcgill.ca/continuingstudies/current-students/fees/student-awards-and-financial-aid>

McGill SCS Graduating Prizes

For a list of McGill SCS Graduating Prizes, please consult the McGill School of Continuing Studies website by clicking on the link below.

<http://www.mcgill.ca/continuingstudies/current-students/graduating-students/awards>