

# COMPUTER PROGRAMMER

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## Program Outline

<b>Major:</b>	COPR
<b>Length:</b>	2 Years
<b>Delivery:</b>	4 Semesters, plus 2 work terms
<b>Credential:</b>	Ontario College Diploma, Co-op
<b>Effective:</b>	2014-2015
<b>Location:</b>	Barrie
<b>Start:</b>	Fall (Barrie), Winter (Barrie)

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### Description

This program is designed to meet the academic needs of all students, whether a recent secondary graduate, college or university graduate, or a mature student. As students progress through the two years, the courses they take will help them gain insight and experience in the fields in which they may choose to apply their computer skills after graduation. A structured approach to problem solving, effective oral and written communications, and attention to standards and documentation are stressed throughout. Industry trends and requirements are continually monitored to ensure curriculum remains current and relevant.

### Career Opportunities

Graduates with programming interests/skills will be prepared to work independently or as a member of a team to analyze, design, enhance, and maintain application systems, as well as participate in the management of the activities and personnel involved in an application development project in many types of organizations, including government. Graduates may be employed in related areas such as the marketing of computer products, information centers and help desks, business analysis, project management, operating systems support, education, computer operation, and database design/management.

### Program Learning Outcomes

The graduate has reliably demonstrated the ability to:

- communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience;
- interact with others in groups and teams, use critical thinking skills to evaluate and solve problems, communicate confidently in a variety of situations, and demonstrate technological fluency;
- analyze and resolve basic software-related problems through the application of systematic approaches;
- participate in analyzing and defining the specification of a system based on user requirements;
- develop, debug, and modify program code to design specifications;
- apply basic knowledge of the design, modeling, and implementation of a database;
- apply basic knowledge of connectivity issues to support the development and maintenance of application systems;
- use relevant methodologies to develop program code;
- participate as an effective individual and member of a team;
- interpret, produce, and present work-related documents and information effectively and accurately;
- identify and implement strategies to improve job performance and promote personal and professional growth;
- show a basic understanding of business concepts;
- utilize effective communication and interpersonal skills;
- employ generic skills for personal and professional growth;
- show an awareness of ethical issues within a multicultural and global business environment;
- describe technologies and techniques that can be used to reduce the impact of computer systems on the environment;
- participate in society as an informed citizen and pursue an enriched professional and personal life through life-long learning.
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- Curriculum objectives are achieved through a combination of lectures, labs, practical assignments, and co-op placements. Program Learning Outcomes are geared towards developing the skills necessary to design, develop, implement and audit computerized information systems, and toward developing initiative and self motivation.

### **Practical Experience:**

Co-operative Education is a mandatory component of all Co-op programs at Georgian College; it has been designed as a process by which students integrate their academic education with work experience related to their program of study. This integration affects much more than simply earning a salary, including the adjustment to the work environment and the development of professionalism. It also reinforces skills and theory learned during academic semesters, develops professional contacts, job knowledge and

career path, improves human relations and communication skills and promotes personal maturity and financial independence.

Students are requested to register, attend and participate in their scheduled co-operative education classes. These classes are scheduled for all first year students and are expected to be completed in order to proceed successfully to their first co-op work experience. To ensure students are eligible to proceed onto any co-op work experience students should refer to Promotional Status and Eligibility for Co-op as outlined in the College Calendar. Co-op policies and procedures can be located on our website:  
[www.georgianc.on.ca/careers/for-students/](http://www.georgianc.on.ca/careers/for-students/)

Georgian College follows the Co-operative Education guidelines set out by the Canadian Association for Co-operative Education (CAFCE) and Education at Work Ontario (EWO) by supporting the learning outcomes designed for the program specific graduate profile and curriculum as set out by the Ministry of Training, Colleges and Universities.

### **The Program Progression:**

#### Fall Intake - Barrie

Sem 1	Sem 2	Work Term 1	Sem 3	Work Term 2	Sem 4
Fall 2014	Winter 2015	Summer 2015	Fall 2015	Winter 2016	Summer 2016

#### Winter Intake - Barrie

Sem 1	Sem 2	Work Term 1	Sem 3	Sem 4	Work Term 2
Winter 2015	Summer 2015	Fall 2015	Winter 2016	Summer 2016	Fall 2016

### **Articulation:**

A number of articulation agreements have been negotiated with universities and other institutions across Canada, North America and internationally. These agreements are assessed, revised and updated on a regular basis. Please contact the program co-ordinator for specific details if you are interested in pursuing such an option. Additional information can be found on our website at  
<http://www.georgianc.on.ca/academics/articulations/>

### **Admission Requirements:**

You must meet ONE of the following requirements to be eligible for admission to these programs:

Secondary school applicants:

- OSS Curriculum: OSSD or equivalent with Grade 12 English (C) or (U) (ENG 4C, ENG 4U); plus any Grade 12 College Mathematics (MAP 4C or MCT 4C), or any Grade 12 U University Mathematics

Non-Secondary school applicants (19 years or older):

- Any credit Communication course and most credit mathematics courses taken at Georgian College
- College preparatory programs including those taken at Georgian College: Business Foundations\*
- Equivalent courses in English and mathematics taken through secondary school or Independent Learning Centres (at the general, advanced, college or university level)
- Academic and Career Entrance Certificate (ACE) program with communications and business, apprentice or technical mathematics\*
- Mature student testing in English and mathematics that meets the minimum standards for admission (available through most testing services)\*
- Ontario High School Equivalency Certificate (GED)
- English, Literature or Communication credit courses and most mathematics credit courses from accredited colleges/universities

Home school applicants:

- Applicants can write the mature student testing in English and mathematics that meets the minimum standards for admission (available through testing services)\*

\* available from Georgian College. For a complete listing please contact the Office of the Registrar.

Non-secondary school applicants who are 19 years of age or over by the first day of classes, and who lack the academic entrance qualifications, may be considered for entrance to an appropriate post-secondary diploma or certificate program as mature applicants. Mature applicants must meet all program specific prerequisites including all selection criteria; equivalencies are stated above. Applicants who are unsure whether they meet admission requirements should contact the Office of the Registrar. In addition, those applying as mature students and having no documentation of Grade 12 education must supply, if required, proof of age, such as a copy of an official birth certificate or driver's licence. Refer to Section 2.5 and 2.6 of the Academic Calendar for further details.

Credit transfer and course exemptions:

Applicants who have taken courses from a recognized and accredited post-secondary institution and/or have relevant life/learning experience may be eligible for credit transfer/course exemptions. Courses/experience must match at least 80% of the learning outcomes of a Georgian College course with a minimum grade of 60% or C achieved in previous coursework; some program exceptions apply (see program

outline). For further information please visit the Credit Transfer Centre website:  
[georgiancollege.ca/admissions/credit-transfer/](http://georgiancollege.ca/admissions/credit-transfer/)

**Graduation Requirements:**

- 18 Mandatory Courses
- 2 Communications Courses
- 1 Optional Courses
- 3 General Education Courses
- 2 Co-op Work Terms

**Graduation Eligibility:**

To graduate from this program, the passing weighted average for promotion through each semester, from year to year and to graduate is 60%. Additionally, a student must attain a minimum of 50% or a letter grade of P (Pass) or S (Satisfactory) in each course in each semester.

**Mandatory Courses**

- BUSI1001 Introduction to Organizational Behaviour
- COMP1002 Web and Internet Fundamentals
- COMP1004 Rapid Application Development
- COMP1006 Introduction to Web Programming
- COMP1008 Introduction to Object Oriented Programming
- COMP1009 The Mainframe Environment
- COMP1011 Advanced Object Oriented Programming
- COMP1030 Programming Fundamentals
- COMP1035 Networking Essentials
- COMP1045 Computer Organization and Architecture
- COMP2003 Relational Database
- COMP2005 Systems Analysis
- COMP2007 Enterprise Computing
- COMP2068 Advanced Web Programming
- COMP2099 Business Intelligence Tools
- COMP3002 Advanced Database
- MATH1003 Math for the Computer Industry
- MGMT2008 Project Management for Information Technology

**Communications Courses**

To be selected at time of registration from the College list, as determined by testing.

#### Optional Courses

COMP1046 Windows System Administration  
COMP2018 Linux System Administration  
COMP2074 Routing Protocols  
COMP2098 Mainframe Utilities and Tools

#### General Education Courses

To be selected from College list

#### Co-op Work Terms

COOP1005 Computer Programmer Work Term 1  
COOP2002 Computer Programmer Work Term 2

#### **Course Descriptions:**

BUSI1001 Introduction to Organizational Behaviour 42.0 Hours

Organizational Behaviour is an introductory course which teaches social science theory as applied to the business world. It provides rich insights about working people in all kinds of organizations and also suggests how people may be motivated to work together more productively.

COMP1002 Web and Internet Fundamentals 42.0 Hours

This course covers HTML, client-side scripting and design issues for the World Wide Web. Students will learn how to use HTML source tags, build websites, manage a website's directories, and publish a website. The creation of web pages that conform to web standards and that use cascading style sheets for presentation will be emphasized. Students will work in groups to build mock commercial, institutional, government or educational websites. More advanced topics, such as bandwidth, aesthetics, human-interface and future developments will also be covered.

COMP1004 Rapid Application Development 42.0 Hours

This course introduces programming techniques supported by a visual rapid application development environment (such as Visual Basic) including forms, controls, user-defined classes and objects. The packages provided by the platform that support visual programming, data files and Graphical User Interfaces (GUI) are studied. The skills learned in this course can be applied to such diverse system capabilities as e-commerce and database manipulation.

COMP1006 Introduction to Web Programming 42.0 Hours

This course is designed to provide the student with foundational programming knowledge and skills for application development on the Internet. The student will learn about the Web as a development platform through the use of popular representative languages (such as PHP). The student will learn to plan, design, construct, and integrate basic server-side components of modern web applications including databases and scripts.

#### COMP1008 Introduction to Object Oriented Programming 42.0 Hours

In this course, students will learn to program using an object oriented programming language. It is assumed students have already learned to design and outline the logic and structure of a program. Upon that foundation, this course will build skills in creating application programs that use object oriented programming concepts, API classes, and user-defined classes. Throughout the course, proper program documentation using class diagrams and comments will be stressed. Unit tests will be used to verify correctness and ensure program quality.

#### COMP1009 The Mainframe Environment 42.0 Hours

This course introduces students to the key concepts and principles that are applicable to a variety of mainframe operating systems. Mainframe operating systems will be discussed in relationship to specific hardware architectures and applications. In the lab, user interfaces, tools and utilities, application development, and the runtime environment will be explored. The emphasis of this course is to develop an understanding of the complex relationships required in a mainframe operating system to support user processes. The impact of the use of mainframe systems in reducing power consumption in data centers will also be discussed.

#### COMP1011 Advanced Object Oriented Programming 42.0 Hours

Building on the concepts from Introduction to Object-Oriented Programming, this course introduces techniques that lend themselves to the creation of sophisticated applications. The skills learned in this course can be applied to such diverse system capabilities as e-commerce, database manipulation, and network connectivity. Graphical user interface design and construction will also be covered in detail.

P- COMP1008 Introduction to Object Oriented Programming

#### COMP1030 Programming Fundamentals 42.0 Hours

In this course the student will gain a broad understanding of modern computer programming. The student will acquire introductory skills in problem analysis, solution design, and program construction. Through practical programming activities, the student will gain an appreciation of the nature and history of computer programming.

#### COMP1035 Networking Essentials 42.0 Hours

Network systems interconnect computer related resources, services and users. This course provides the student with a fundamental knowledge of networking concepts and technologies. There is a strong emphasis on terminology, protocols, error

detection/correction and network security. This course assists in developing the necessary skills to plan and implement small networks across a range of applications.

#### COMP1045 Computer Organization and Architecture 42.0 Hours

We use computers every day, from small scale embedded systems, to workstation systems to mainframe systems and server farms. This course examines how these machines work. It analyzes the operation of computer hardware and examines the interaction between hardware and software. Through a series of hands-on exercises students will work with the low level operations of a computer, and learn how to program these operations in order to gain insight into the computer's internal workings.

#### COMP1046 Windows System Administration 42.0 Hours

The Windows operating system is the most widely deployed desktop operating system. This course focuses on the principles of workstation administration by teaching students how to deploy, configure, and troubleshoot a Windows System. By the end of this course students will be expected to demonstrate the ability to manage a Windows computer system.

#### COMP2003 Relational Database 42.0 Hours

In this course, the student is introduced to the process of creating and managing a relational database using Structured Query Language (SQL) statements. The emphasis of this course is data manipulation and extraction.

#### COMP2005 Systems Analysis 42.0 Hours

This course covers the analysis of existing business systems for the purpose of enhancing or replacing these systems. The justification for a formalized systems development life cycle is stressed throughout. The Systems Planning and Systems Analysis steps, the first two steps of the Systems Development Life Cycle are applied to a number of cases and assignments.

#### COMP2007 Enterprise Computing 42.0 Hours

Students will learn about the protocols and applications that make possible the simultaneous and seamless interaction of millions of computers through the internet and enterprise networks. In order to design and implement enterprise class applications, the student will undertake an in depth study of the Java Enterprise Edition application programming interface (Java EE API). To understand the practical aspect of enterprise computing, the student will build a working example of a dynamic, secure web enterprise application. Topics that will be covered include Service Oriented Architecture (SOA) and Service Component Architecture (SCA).

P- COMP1008 Introduction to Object Oriented Programming and P- COMP2003 Relational Database

#### COMP2018 Linux System Administration 42.0 Hours



The Linux operating system is commonly found powering Internet and network servers. This course explores different ways that Linux can be deployed within an organization. With a strong emphasis on command line administration, students will learn how to manage user accounts, file systems, and processes while gaining hands-on experience installing, configuring, and administering a Linux system.

#### COMP2068 Advanced Web Programming 42.0 Hours

This course is designed to give students the opportunity to enhance and enrich their skills in Web programming. Students will learn to develop Web applications that use three-tier architecture, session management, object-oriented techniques, and advance database interactions. Concepts such as advanced CSS concepts, rich interactive Web environments, authentication, and security will also be explored.

P- COMP1006 Introduction to Web Programming

#### COMP2074 Routing Protocols 42.0 Hours

This course introduces the student to the concept of dynamic routing protocols, describes the classes of dynamic routing protocols, and gives examples of protocols in each class. A student will learn to choose a dynamic routing protocol based upon many considerations; these include the size of the network, the bandwidth of available links, the processing power of the routers, the brands and models of the routers, and the protocols that are used in the network.

#### COMP2098 Mainframe Utilities and Tools 42.0 Hours

This course introduces the student to utilities and tools that are used to support, monitor, and maintain the operations in a mainframe environment. The student will develop skills in using various programs and modules used by system operators, administrators, and programmers to support the mainframe components, subsystems, and workloads. Topics such as user management and security will also be explored.

#### COMP2099 Business Intelligence Tools 42.0 Hours

The student will be introduced to Business Intelligence (BI) and the benefits of BI to an organization. The student will gain skills in tools used for extracting data from sources of various formats, manipulating this data, combining with other data, and producing and saving meaningful output for management in various formats. A combination of different software products will be used to develop applications. The student will gain some basic skills in business analysis. This course is designed for students with a background in structured programming, SQL, and HTML.

#### COMP3002 Advanced Database 42.0 Hours

The Structured Query Language, SQL, is used at an advanced level with emphasis on real world commercial SQLs. A relational database is created and maintained using SQL and SQL procedural language.

P- COMP2003 Relational Database or P- COMP2064 Database Fundamentals (ODE)

**COOP1005 Computer Programmer Work Term 1 560.0 Hours**

Co-operative Education is a mandatory component of all Co-op programs at Georgian College. Students are required to attend and participate in their scheduled semester co-op classes CPHR0001 (12 sessions) in order to proceed successfully to their first co-op work experience.

**COOP2002 Computer Programmer Work Term 2 560.0 Hours**

After completion of co-op work experience 1, students are required to attend a scheduled debriefing session. This session will be scheduled in the first month for all returning co-op students and is intended to prepare students for work term 2. This session will also allow the student to validate and submit supporting documentation for work term I credit. This must be achieved before proceeding to co-op work experience 2.

**P- COOP1005 Computer Programmer Work Term 1**

**MATH1003 Math for the Computer Industry 42.0 Hours**

This course provides students with the practical knowledge and skills in the use of mathematics in relation to computers. Alternate number bases, set theory, logic, and Boolean algebra are the foundation of this course. In addition, students use basic statistical concepts to understand challenges in information technology.

**MGMT2008 Project Management for Information Technology 42.0 Hours**

This course introduces the fundamental principles necessary for successful management of Information Technology (IT) projects. Project planning, management and control techniques will be discussed and the application of computers in project management will be studied.

**Course Description Legend**

P = Prerequisite; C = Concurrent prerequisite; CO= Corequisite

*Information contained in College documents respecting programs is correct at the time of publication. Academic content of programs and courses is revised on an ongoing basis to ensure relevance to changing educational objectives and employment market needs. The college reserves the right to add or delete programs, options, courses, timetables or campus locations subject to sufficient enrolment, and the availability of courses.*