Looking to transition careers or fill in the gaps to gain advanced blockchain development skills?

This unique Blockchain Development program at George Brown College in Toronto focuses on designing and implementing decentralized applications by leveraging blockchain technology. The three-semester program is designed to also thoroughly cover full stack development to give potential students all the tools they need to succeed in this emerging and exciting field.

This program has been developed with the support of blockchain industry professionals and is taught in a full-time executive format of approximately 20 hours per week of study over a 26-week time period. Co-op and work integrated learning opportunities are available during the third semester of the program. It is the first certificate in blockchain offered by a Canadian college.

The skills you’ll learn include:

- Smart contracts
- Design patterns for blockchain
- Distributed applications (dApps)
- Full stack development
- Blockchain architecture, security practices, laws and regulations, and more

**EXPERIENTIAL LEARNING**

Mandatory Co-op or Work Integrated Learning

**YOUR FIELD STUDY OPTIONS**

During the third semester of the program, students may choose whether to apply for a Co-op position or take a Work Integrated Learning course which includes an industry-sponsored project.

**THE INDUSTRY**

To support Toronto as a leading blockchain hub, George Brown College has partnered with ConsenSys³, ChainSafe Systems⁴ and other leaders in the industry to develop this program.

**PROGRAM STANDARDS AND LEARNING OUTCOMES**

The graduate has reliably demonstrated the ability to:

1. Communicate essential concepts related to blockchain technology and its industry applications.
2. Implement best security practices for blockchain solutions.
3. Design cryptoeconomic models to solve business problems.
4. Design the architecture of decentralized applications and systems.
5. Develop decentralized applications leveraging blockchain technology.
6. Explain the legal implications, regulations, and industry standards that are relevant to blockchain technology.
7. Apply IT project management principles and best practices.
8. Contribute to the field and blockchain community through various open source projects, partnerships, and community involvement.

**REQUIRED COURSES**
This is a three-semester program comprising case studies during which students will be engaged on an increasingly intense and independent basis with material of escalating complexity. Course-oriented delivery supports this learning process.

**SEMESTER 1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCDV 1001</td>
<td>Introduction to Blockchain</td>
</tr>
<tr>
<td>BCDV 1004</td>
<td>Laws and Regulations</td>
</tr>
<tr>
<td>BCDV 1016</td>
<td>Introduction To Smart Contracts</td>
</tr>
<tr>
<td>BCDV 1005</td>
<td>Industry Applications</td>
</tr>
<tr>
<td>BCDV 1002</td>
<td>Introduction to Blockchain Security Practices</td>
</tr>
<tr>
<td>BCDV 1006</td>
<td>Full Stack Development I</td>
</tr>
<tr>
<td>BCDV 1007</td>
<td>Full Stack Development II</td>
</tr>
<tr>
<td>BCDV 1008</td>
<td>Full Stack Development III</td>
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<tr>
<td>BCDV 1017</td>
<td>Full Stack Development IV</td>
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**SEMESTER 2**

<table>
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<tr>
<th>Code</th>
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<tr>
<td>BCDV 1009</td>
<td>Software Development Methodologies</td>
</tr>
<tr>
<td>BCDV 1010</td>
<td>Smart Contract Essentials</td>
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<tr>
<td>BCDV 1011</td>
<td>Design Patterns for Blockchain</td>
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<tr>
<td>BCDV 1012</td>
<td>DApp I</td>
</tr>
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<td>BCDV 1013</td>
<td>Advanced Smart Contracts</td>
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<tr>
<td>BCDV 1014</td>
<td>DApp II</td>
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<tr>
<td>BCDV 1018</td>
<td>Work Term Preparation</td>
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**SEMESTER 3**

<table>
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<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>TCOP 1006</td>
<td>Co-op Work Placement</td>
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<tr>
<td>OR</td>
<td></td>
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<tr>
<td>BCDV 1015</td>
<td>Work Integrated Project</td>
</tr>
</tbody>
</table>

**YOUR CAREER**

Graduates of this program may apply for positions that include:

- Blockchain Engineer
- Blockchain Developer
- Blockchain Architect
- Smart Contract Developer
- dApp Developer

**ADMISSION REQUIREMENTS**

Applicants are selected on the basis of their academic achievement, including the required courses, and any other selection criteria outlined below.

Two- or three-year Diploma or Bachelor’s Degree in Information Technology, Computer Science or a related field.

**ENGLISH LANGUAGE PROFICIENCY**

English language proficiency is essential. Applicants with international transcripts who do not provide English proficiency test results must test at the College level in the George Brown College English assessment to be considered for admission.

Please visit georgebrown.ca/englishproficiency for more details

**COURSE EXEMPTIONS**

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

**INTERNATIONAL STUDENTS**

Visit the International Admissions page for more information.

***Please note that applicants who are submitting International transcripts require a Canadian equivalency evaluation. This can be obtained through ICAS (International Credential Assessment Service) at icas.ca or WES (World Education Services) at wes.org/ca.

**COURSE EXEMPTIONS**

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

**INTERNATIONAL STUDENTS**

Visit the International Admissions page for more information.

**APPLY TO**

Domestic students should apply through Ontario Colleges.

**CONTACT US**

**School of Computer Technology**
Phone: 416-415-5000, ext. 4287
Email: computertechnology@georgebrown.ca
The office hours are:
Monday – Thursday: 8 a.m. – 7 p.m.
Friday: 8 a.m. – 4 p.m.

**Program Co-ordinator: Ceit Butler**
Email: Ceit.Butler@georgebrown.ca
Phone: 416-415-5000 x 3785

For more information about George Brown College, you may also call the Contact Centre at 416-415-2000 (TTY 1-877-515-5559) or long distance 1-800-265-2002.

**VISIT OUR CAMPUS**

The Blockchain Development program is offered through our School of Computer Technology from our Casa Loma Campus at 146 Kendal Avenue. Sign up for an Information Session or Campus Tour to learn more about George Brown College and the program. You can also explore our virtual tour.
George Brown College is continually striving to improve its programs and their delivery. The information contained in this calendar is subject to change without notice. It should not be viewed as a representation, offer or warranty. Students are responsible for verifying George Brown College admission, graduation, and fee requirements as well as any requirements of outside institutions, industry associations, or other bodies that may award additional designations concurrently with, or after completion of, a George Brown College program.
Today, few organizations make any significant plans without thoroughly understanding the Information Technology (IT) implications. IT professionals are a vital part of decision-making business teams. George Brown College answers this need with its three-year (six-semester) Computer Programmer Analyst program. The broad education in programming and IT analysis that it offers can provide you with a stable platform for career growth in the rapidly expanding and ever-changing world of information technology.

During the first two years of the program, you will develop the skills and techniques required for software application development and testing. The industry tells us they are looking for Computer Programmer Analysts with “the total package.” So the third year includes advanced technical skills in areas such as systems analysis and design techniques – and continues to develop communications, teamwork and other client service skills such as needs assessment, sales, and presentation methods.

George Brown offers other distinct advantages:

- Students are involved in project-based and experiential learning.
- In the third year, students are exposed to the fast-growing game development sector.
- Students are also exposed to mobile application development using the latest mobile devices.

*If you enrol in January, you must complete semester 2 in the summer, May to August, in the same year.

**Note:** In this rapidly changing industry, program improvements are being made on an ongoing basis, which may result in course changes. Changes are made in consultation with our Program Advisory Committee, which is composed of academic staff and industry representatives from small, medium-sized and large corporations.

**PROGRAM STANDARDS AND LEARNING OUTCOMES**

The graduate has reliably demonstrated the ability to:

1. Identify, analyze, design, develop, implement, verify and document the requirements for a computing environment.
2. Diagnose, troubleshoot, document and monitor technical problems using appropriate methodologies and tools.
3. Analyze, design, implement and maintain secure computing environments.
4. Analyze, develop and maintain robust computing system solutions through validation testing and industry best practices.
5. Communicate and collaborate with team members and stakeholders to ensure effective working relationships.
6. Select and apply strategies for personal and professional development to enhance work performance.
7. Apply project management principles and tools when responding to requirements and monitoring projects within a computing environment.
8. Adhere to ethical, social media, legal, regulatory and economic requirements and/or principles in the development and management of the computing solutions and systems.
9. Investigate emerging trends to respond to technical challenges.
10. Gather, analyze and define software system specifications based on functional and non-functional requirements.
11. Design, develop, document, implement, maintain and test software systems by using industry standard software development methodologies based on defined specifications and existing technologies/frameworks.
12. Select and apply object-oriented and other design concepts and principles, as well as business requirements, to the software development process.
13. Gather requirements and model, design, implement, optimize, and maintain data storage solutions.

**REQUIRED COURSES**

**SEMESTER 1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
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<tbody>
<tr>
<td>COMP1151</td>
<td>IT Essentials</td>
</tr>
<tr>
<td>COMP1176</td>
<td>Introduction to Networks - CCNA I</td>
</tr>
<tr>
<td>COMP1223</td>
<td>Web Development Fundamentals</td>
</tr>
<tr>
<td>GSSC1045</td>
<td>Business Applications for Information Technology</td>
</tr>
<tr>
<td>MATH1162</td>
<td>Mathematics for Computer Technology I</td>
</tr>
<tr>
<td>COMM1007</td>
<td>College English**</td>
</tr>
</tbody>
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**SEMESTER 2**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
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</thead>
<tbody>
<tr>
<td>COMP1168</td>
<td>Database Management</td>
</tr>
<tr>
<td>COMP1202</td>
<td>Object-Oriented Programming</td>
</tr>
<tr>
<td>COMP1231</td>
<td>Web Programming</td>
</tr>
<tr>
<td>COMP3044</td>
<td>UNIX Essentials</td>
</tr>
<tr>
<td>MATH1172</td>
<td>Mathematics for Computer Technology II</td>
</tr>
<tr>
<td>GSSC1027</td>
<td>Personal Finance</td>
</tr>
<tr>
<td>COMM1007</td>
<td>College English**</td>
</tr>
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</table>

**SEMESTER 3**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
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</thead>
<tbody>
<tr>
<td>COMP1230</td>
<td>Advanced Web Programming</td>
</tr>
<tr>
<td>COMP2129</td>
<td>Advanced Object-Oriented Programming</td>
</tr>
<tr>
<td>COMP2130</td>
<td>Application Development using Java</td>
</tr>
<tr>
<td>COMP2138</td>
<td>Advanced Database Development</td>
</tr>
<tr>
<td>COMP2147</td>
<td>System Analysis, Design And Testing</td>
</tr>
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<td>GNED</td>
<td>General Education Elective</td>
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**SEMESTER 4**

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<tr>
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<th>Course name</th>
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</thead>
<tbody>
<tr>
<td>COMP2080</td>
<td>Data Structures and Algorithms</td>
</tr>
<tr>
<td>COMP2139</td>
<td>Web Application Development</td>
</tr>
<tr>
<td>COMP2148</td>
<td>Professional Workplace Competencies</td>
</tr>
<tr>
<td>COMP2151</td>
<td>Agile Software Development</td>
</tr>
<tr>
<td>COMP2152</td>
<td>Open Source Development</td>
</tr>
<tr>
<td>GNED</td>
<td>General Education Elective</td>
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</table>

**SEMESTER 5**

<table>
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<tr>
<th>Code</th>
<th>Course name</th>
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<tbody>
<tr>
<td>COMP3059</td>
<td>Capstone Project I</td>
</tr>
<tr>
<td>COMP3074</td>
<td>Mobile Application Development I</td>
</tr>
<tr>
<td>COMP3095</td>
<td>Web Application Development Using Java</td>
</tr>
<tr>
<td>COMP3104</td>
<td>DevOps</td>
</tr>
<tr>
<td>COMP3122</td>
<td>AI with Python</td>
</tr>
<tr>
<td>COMP3123</td>
<td>Full Stack Development I</td>
</tr>
<tr>
<td>GNED</td>
<td>General Education Elective</td>
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**SEMESTER 6**

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<tr>
<th>Code</th>
<th>Course name</th>
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<tbody>
<tr>
<td>COMP3078</td>
<td>Capstone Project II</td>
</tr>
<tr>
<td>COMP3134</td>
<td>Introduction to Cyber Security</td>
</tr>
<tr>
<td>COMP3097</td>
<td>Mobile Application Development II</td>
</tr>
<tr>
<td>COMP3132</td>
<td>Machine Learning with Python</td>
</tr>
<tr>
<td>COMP3133</td>
<td>Full Stack Development II</td>
</tr>
</tbody>
</table>

**Based on the results of your placement test, you may be required to take COMM1003 (English Skills) or CESL1003 (English Skills – ESL) before progressing to COMM1007. COMM1003/CESL1003 does not count as a course required for graduation, and you will be charged for this extra course. Please visit georgebrown.ca/assessment for more information.**

**YOUR CAREER**

Graduates may find career opportunities in areas such as:

- Database administration
- Systems analysis and design
- Consulting
- Application design and development
- Web application design and development
- And many others

Opportunities exist for systems development for both corporate clients and smaller contract companies.

As programmer analysts, graduates will work in project teams responsible for the development of new applications and the maintenance of existing business systems.

**FUTURE STUDY OPTIONS**

Students who successfully complete this program may qualify for entry into Ontario college graduate certificate programs and university degree programs at institutions such as McMaster University, University of Guelph and Northern Alberta Institute of Technology.

For further information, see georgebrown.ca/transferguide

**EDUCATIONAL/DEGREE PATHWAY**

Opportunities to receive transfer credits toward further study to attain a degree are available.

**ADMISSION REQUIREMENTS**

Applicants are selected on the basis of their academic achievement, including the required courses, and any other selection criteria outlined below.

- Ontario Secondary School Diploma or equivalent**
- Grade 12 English (C or U)
- Grade 11 Math (M or U) or Grade 12 (C or U)

**MATURE STUDENT STATUS (19 YEARS OF AGE OR OLDER AND NO OSSD)**

Mature Students may take the Admissions Assessment³ for English and Math, OR may consider upgrading to achieve the credit(s) needed in English⁴ and Math⁵.
Please note that George Brown is committed to ensuring that applicants will succeed in their program of choice and meeting the minimum requirements does not guarantee admission to the program. Applicants may be required to have grades higher than the minimum requirements stated.

COURSE EXEMPTIONS

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

INTERNATIONAL STUDENTS

Visit the International Admissions page for more information.

APPLY TO

Domestic students should apply through Ontario Colleges

CONTACT US

School of Computer Technology
Phone: 416-415-5000, ext. 4287
Email: computertechnology@georgebrown.ca
The office hours are:
Monday – Thursday: 8 a.m. – 7 p.m.
Friday: 8 a.m. – 4 p.m.
Program Co-ordinator: Maziar Masoudi
Phone: 416-415-5000, ext. 3345
Email: mmasoudi@georgebrown.ca
For more information about George Brown College, you may also call the Contact Centre at 416-415-2000 (TTY 1-877-515-5559) or long distance 1-800-265-2002.

VISIT OUR CAMPUS

The Computer Programmer Analyst program is offered through our School of Computer Technology from our Casa Loma Campus at 146 Kendal Avenue. Sign up for an Information Session or Campus Tour to learn more about George Brown College and the program. You can also explore our virtual tour.

LINKS REFERENCE

1https://collegeapply.ontariocolleges.ca/?collegeCode=GBT&programCode=T177&lang=en
2https://www.georgebrown.ca/international/futurestudents/tuitionfees/
3https://www.georgebrown.ca/assessment/admi-pre/
4https://www.georgebrown.ca/upgrading-credits/english-diploma/
5https://www.georgebrown.ca/upgrading-credits/math-diploma/
6https://www.georgebrown.ca/international/futurestudents/howtoapply/
7https://collegeapply.ontariocolleges.ca/?collegeCode=GBT&programCode=T177&lang=en
8https://www.georgebrown.ca/computertechnology/
9https://www.georgebrown.ca/computertechnology/
10https://www.georgebrown.ca/campuses/casa-loma/
11https://www.google.ca/maps/place/146+Kendal+Ave,+Toronto,+ON+M5R+1M3/data=!4m2!3m1!1s0x882b349c7146b3f7:0x5edfd669564906?sa=X&ved=0ahUKEwjvpbuOybDbAhUB7oMKhKsYDNQQ8gEIKDAA
12https://www.georgebrown.ca/computertechnology_info/
13https://www.georgebrown.ca/campus_tours/
14https://vt.georgebrown.ca/
COMPUTER SYSTEMS TECHNICIAN PROGRAM (T141)

PROGRAM NAME
Computer Systems Technician

COURSE CODE
T141

SCHOOL
School of Computer Technology

CENTRE
Arts, Design and Information Technology

LOCATION
Casa Loma Campus

DURATION
2 years (4 semesters)

STARTING MONTH
September, January

CREDENTIAL
Ontario College Diploma

YEAR OF STUDY
2020-2021

METHOD OF STUDY
FT

APPLY TO
Ontario Colleges

TUITION
$3,978.00 *

ADDITIONAL COST

* Amounts listed are the total of tuition, materials, student service and ancillary fees for the first two semesters of programs starting in Fall 2019. Fees are subject to change for programs starting in Fall 2020 and at later dates.

International students: Visit the International Fees and Related Costs page for more information.

FINANCIAL ASSISTANCE

This program is approved for OSAP funding, provided the applicant meets OSAP eligibility criteria.

As the Information Technology (IT) sector continues to grow in Toronto and our industry partners report skills shortages, George Brown College is helping to meet employer demand by educating IT professionals who understand all aspects of computer systems. Our two-year Computer Systems Technician program provides students with a broad and in-depth technical base, through courses in the high-demand areas of system support, network administration and web technologies. The curriculum prepares graduates with the strong administration, troubleshooting and design skills they need for careers in IT.
George Brown continues to invest in up-to-date networking, wireless and security lab equipment to help students develop hands-on installation, configuration and troubleshooting skills. Students use the NetLab platform, which enables them with 24/7 remote access to Cisco Systems physical equipment. This investment, along with our hands-on teaching environment, was recognized by Cisco when the college was designated an Area Support Centre and Instructor Training Centre.

Graduates of the Computer Systems Technician program are prepared to write several industry certification exams that are in-demand by employers.

Note: Students who start the program in January (Winter term) will be required to attend classes during the summer months (May to August).

PROGRAM STANDARDS AND LEARNING OUTCOMES

The graduate has reliably demonstrated 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.
- Assist with the implementation of computer systems and cloud solutions.
- Install, configure, troubleshoot, maintain, upgrade and decommission computing system infrastructures.
- Automate routine tasks using scripting tools and programming languages.
- Install and monitor a database management system in response to specified requirements.
- Provide technical support for computing system infrastructures that aligns with industry best practice.

REQUIRED COURSES

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
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<tbody>
<tr>
<td></td>
<td>COMP1151</td>
<td>IT Essentials</td>
</tr>
<tr>
<td></td>
<td>COMP1176</td>
<td>Introduction to Networks - CCNA 1</td>
</tr>
<tr>
<td></td>
<td>COMP1223</td>
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<td>GSSC1045</td>
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<td>COMM1007</td>
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<tr>
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<th>Code</th>
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<tr>
<td></td>
<td>COMP1203</td>
<td>Routing and Switching Essentials - CCNA 2</td>
</tr>
<tr>
<td></td>
<td>COMP3044</td>
<td>UNIX Essentials</td>
</tr>
<tr>
<td></td>
<td>COMP1231</td>
<td>Web Programming</td>
</tr>
<tr>
<td></td>
<td>COMP3105</td>
<td>Desktop Operating Systems</td>
</tr>
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<td>MATH1172</td>
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<tr>
<th>SEMESTER 3</th>
<th>Code</th>
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<tr>
<td></td>
<td>COMP1196</td>
<td>Scaling Networks - CCNA 3</td>
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<tr>
<td></td>
<td>COMP2064</td>
<td>Windows Servers Active Directory Configuration</td>
</tr>
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<td></td>
<td>COMP2144</td>
<td>Web Server Administration</td>
</tr>
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<td></td>
<td>COMP2148</td>
<td>Professional Workplace Competencies</td>
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<tr>
<td></td>
<td>COMP3066</td>
<td>UNIX System Administration</td>
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<tr>
<td></td>
<td>COMP1197</td>
<td>Connecting Networks - CCNA 4</td>
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<tr>
<td></td>
<td>COMP2102</td>
<td>Wireless Technology Fundamentals</td>
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<td></td>
<td>COMP2141</td>
<td>Windows Server Network Infrastructure</td>
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<td>COMP2152</td>
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<td>COMP3061</td>
<td>Computer Security Fundamentals</td>
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**Based on the results of your placement test, you may be required to take COMM1003 (English Skills) or CESL1003 (English Skills – ESL) before progressing to COMM1007. COMM1003/CESL1003 does not count as a course required for graduation, and you will be charged for this extra course. Please visit georgebrown.ca/assessment for more information.

CAREER OPTIONS

Computer System Technicians establish, operate, maintain and co-ordinate the use of local and wide area networks (LANs and WANs), software services and related computer equipment. They set up and maintain Internet and Intranet websites and web-server technologies, and monitor and optimize network connectivity and performance. They are employed in Information Technology units throughout the private and public sectors. Supervisors of Computer Network Technicians are included in this group.
YOUR CAREER

Graduates can provide client support and network technical support in a wide variety of industries. Opportunities exist in companies that provide computer support services to other businesses, and in organizations that specialize in the sale and installation of computer systems and networks. Graduates may also find employment working directly with business clients, providing training services and ongoing support to assist them in using computer applications effectively.

The curriculum also prepares students to, after graduating from the program, write several of the examinations leading to industry certification in Network Administration and Support.

FUTURE STUDY OPTIONS

Graduates may continue directly into the third year of the Computer Systems Technology program (T147), and earn an Ontario College Advanced Diploma in two additional semesters.

Students who successfully complete this program may qualify for entry into university degree programs. This includes credit towards the Athabasca University BSc-CIS (PD).

For further information on future study options, see georgebrown.ca/transferguide.

EDUCATIONAL/DEGREE PATHWAY

Opportunities to receive transfer credits toward further study to attain a degree are available.

ADMISSION REQUIREMENTS

Applicants are selected on the basis of their academic achievement, including the required courses, and any other selection criteria outlined below.

- Ontario Secondary School Diploma or equivalent**
- Grade 12 English (C or U)
- Grade 11 Math (M or U) or Grade 12 (C or U)

** MATURE STUDENT STATUS (19 YEARS OF AGE OR OLDER AND NO OSSD)

Mature Students may take the Admissions Assessment for English and Math, OR may consider upgrading to achieve the credit(s) needed in English and Math.

Please note that George Brown is committed to ensuring that applicants will succeed in their program of choice and meeting the minimum requirements does not guarantee admission to the program. Applicants may be required to have grades higher than the minimum requirements stated.

COURSE EXEMPTIONS

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

INTernational STUDENTS

Visit the International Admissions page for more information.

APPLY TO

Domestic students should apply through Ontario Colleges.

CONTACT US

School of Computer Technology
Phone: 416-415-5000, ext. 4287
Email: computertechnology@georgebrown.ca
The office hours are:
Monday – Thursday: 8 a.m. – 7 p.m.
Friday: 8 a.m. – 4 p.m.
Program Co-ordinator: Stephan Caneff
Phone: 416-415-5000, ext. 6748
Email: scaneff@georgebrown.ca
For more information about George Brown College, you may also call the Contact Centre at 416-415-2000 (TTY 1-877-515-5559) or long distance 1-800-265-2002.

VISIT OUR CAMPUS

The Computer Systems Technician program is offered through our School of Computer Technology from our Casa Loma Campus at 146 Kendal Avenue. Sign up for an Information Session or Campus Tour to learn more about George Brown College and the program. You can also explore our virtual tour.

LINKS REFERENCE

2. https://www.georgebrown.ca/international/futurestudents/tuitionfees/
3. https://www.georgebrown.ca/programs/computer-systems-technology-program-t147/
5. https://www.georgebrown.ca/upgrading-credits/english-diploma/
7. https://www.georgebrown.ca/international/futurestudents/howtoapply/
10. https://www.georgebrown.ca/computertechnology/
12. https://www.google.ca/maps/place/146+Kendal+Ave,+Toronto,+ON+M5R+1M3/data=!4m2!3m1!1s0x882b349c7146b81f:0x6edb6695c6d4906f?sa=X&ved=0ahUKEwjvpbuOYbUdBwCzC8KHFsYDNOQ8gEIkDAA
13. https://www.georgebrown.ca/computertechnology_info/
15. https://vt.georgebrown.ca/
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The three-year Computer Systems Technology program is designed with extensive industry input and offers two optional specializations in its third year:

1. **The Networking specialization** focuses on network security, voice-over-IP (VoIP) and wireless LANs.
2. **The Systems specialization** focuses on mail server administration, content management systems (Collaboration), database administration and computer security.

Both specializations include core courses on infrastructure virtualization (through the VMWare IT Academy) and cloud computing, along with best practices in Information Technology (IT).

George Brown College continues to invest in up-to-date networking, wireless, radio frequency, VoIP and security lab equipment, so that all students gain hands-on experience in installation and configuration of equipment ranging from small offices all the way to enterprise-class hardware and software. This investment, along with the hands-on teaching environment, was recognized by Cisco when the college was designated an Area Support Centre and Instructor Training Centre, and became part of a very select group of Cisco Networking Academies in Canada.

In the third year of the program, students will be involved, hands-on, in real-life projects or case studies. These may be completed independently, in conjunction with an industry partner, or George Brown’s Office of Research and Innovation, and may include developing proposals and working in teams to plan, set schedules and achieve specific goals in the field of Information Technology. Through some of these projects, George Brown students have recently helped develop IT solutions for hospitals, large corporations and major IT and telecommunications service providers, including Bell Mobility, Rogers Communications, Cogeco Data Systems and many other well-known companies in the Greater Toronto Area.

This program covers all four courses of the official Cisco CCNA Routing & Switching curriculum. The curriculum also prepares students to write several other examinations leading to industry certifications, such as the Certified Wireless Network Administrator (CWNA) and Cisco’s CCNA Security.

**Note:** Students who start the program in January (Winter term) will be required to attend classes during the summer months (May to August).

**PROGRAM STANDARDS AND LEARNING OUTCOMES**

The graduate has reliably demonstrated the ability to:
- Identify, analyze, design, develop, implement, verify and document the requirements for a computing environment.
- Diagnose, troubleshoot, document and monitor technical problems using appropriate methodologies and tools.
- Analyze, design, implement and maintain secure computing environments.
- Analyze, develop and maintain robust computing system solutions through validation testing and industry best practices.
- Communicate and collaborate with team members and stakeholders to ensure effective working relationship.
- Select and apply strategies for personal and professional development to enhance work performance.
- Apply project management principles and tools when responding to requirements and monitoring projects within a computing environment.
- Adhere to ethical, social media, legal, regulatory and economic requirements and/or principles in the development and management of the computing solutions and systems.
- Investigate emerging trends to respond to technical challenges.
- Analyze, plan, design, implement and administer computer systems and cloud solutions.
• Research, design, deploy, configure, troubleshoot, maintain, upgrade, and decommission computing system infrastructures.
• Select and apply scripting tools and programming languages to automate routine tasks.
• Install, monitor, optimize and administer a database management system in response to specified requirements.
• Design, implement, and administer technical support processes for computing system infrastructures that aligns with industry best practice.

REQUIRED COURSES

SEMESTER 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1151</td>
<td>IT Essentials</td>
</tr>
<tr>
<td>COMP1176</td>
<td>Introduction to Networks - CCNA 1</td>
</tr>
<tr>
<td>COMP1223</td>
<td>Web Development Fundamentals</td>
</tr>
<tr>
<td>GSSC1045</td>
<td>Business Applications for Information Technology</td>
</tr>
<tr>
<td>MATH1162</td>
<td>Mathematics for Computer Technology I</td>
</tr>
<tr>
<td>COMM1007</td>
<td>College English**</td>
</tr>
</tbody>
</table>

SEMESTER 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1203</td>
<td>Routing and Switching Essentials - CCNA 2</td>
</tr>
<tr>
<td>COMP3044</td>
<td>UNIX Essentials</td>
</tr>
<tr>
<td>COMP1231</td>
<td>Web Programming</td>
</tr>
<tr>
<td>COMP3105</td>
<td>Desktop Operating Systems</td>
</tr>
<tr>
<td>MATH1172</td>
<td>Mathematics for Computer Technology II</td>
</tr>
<tr>
<td>GSSC1027</td>
<td>Personal Finance</td>
</tr>
</tbody>
</table>

SEMESTER 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1196</td>
<td>Scaling Networks - CCNA 3</td>
</tr>
<tr>
<td>COMP2064</td>
<td>Windows Servers Active Directory Configuration</td>
</tr>
<tr>
<td>COMP2144</td>
<td>Web Server Administration</td>
</tr>
<tr>
<td>COMP2148</td>
<td>Professional Workplace Competencies</td>
</tr>
<tr>
<td>COMP3066</td>
<td>UNIX System Administration</td>
</tr>
<tr>
<td>GNED</td>
<td>General Education Elective</td>
</tr>
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</table>

SEMESTER 4

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1197</td>
<td>Connecting Networks - CCNA 4</td>
</tr>
<tr>
<td>COMP2102</td>
<td>Wireless Technology Fundamentals</td>
</tr>
<tr>
<td>COMP2141</td>
<td>Windows Server Network Infrastructure</td>
</tr>
<tr>
<td>COMP2152</td>
<td>Open Source Development</td>
</tr>
<tr>
<td>COMP3061</td>
<td>Computer Security Fundamentals</td>
</tr>
<tr>
<td>GNED</td>
<td>General Education Elective</td>
</tr>
</tbody>
</table>

**Based on the results of your placement test, you may be required to take COMM1003 (English Skills) or CESL1003 (English Skills – ESL) before progressing to COMM1007. COMM1003/CESL1003 does not count as a course required for graduation, and you will be charged for this extra course. Please visit georgebrown.ca/assessment for more information.

PROGRAM SPECIALIZATION

CHOOSE ONE SET OF COURSES

Students are to pick a specialization in semester five and will be registered in the corresponding courses. Please note that once your specialization is picked in semester five, you will not be able to change in semester six.

NETWORKING SPECIALIZATION

SEMESTER 5

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP3076</td>
<td>Network Infrastructure Security</td>
</tr>
<tr>
<td>COMP3049</td>
<td>WLAN Administration</td>
</tr>
<tr>
<td>COMP3098</td>
<td>Enterprise Network and System Design</td>
</tr>
<tr>
<td>COMP3093</td>
<td>Infrastructure Virtualization</td>
</tr>
<tr>
<td>COMP3112</td>
<td>IP Telephony Services</td>
</tr>
<tr>
<td>COMP3115</td>
<td>Information Systems Project Management</td>
</tr>
</tbody>
</table>

SEMESTER 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP3094</td>
<td>ITIL Foundation</td>
</tr>
<tr>
<td>COMP3107</td>
<td>Enterprise Network Management</td>
</tr>
<tr>
<td>COMP3108</td>
<td>Cloud Computing Infrastructure</td>
</tr>
<tr>
<td>COMP3099</td>
<td>Capstone Project</td>
</tr>
<tr>
<td>COMP3111</td>
<td>Broadband and Data Communications</td>
</tr>
</tbody>
</table>

SYSTEMS SPECIALIZATION

SEMESTER 5

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP3102</td>
<td>Mail Server Administration</td>
</tr>
<tr>
<td>COMP3103</td>
<td>Power Shell Scripting</td>
</tr>
<tr>
<td>COMP3114</td>
<td>Database Administration</td>
</tr>
<tr>
<td>COMP3115</td>
<td>Information Systems Project Management</td>
</tr>
<tr>
<td>COMP3098</td>
<td>Enterprise Network and System Design</td>
</tr>
<tr>
<td>COMP3093</td>
<td>Infrastructure Virtualization</td>
</tr>
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</table>

SEMESTER 6

<table>
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<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>COMP3094</td>
<td>ITIL Foundation</td>
</tr>
<tr>
<td>COMP3108</td>
<td>Cloud Computing Infrastructure</td>
</tr>
<tr>
<td>COMP3099</td>
<td>Capstone Project</td>
</tr>
<tr>
<td>COMP3113</td>
<td>Advanced Computer System Security</td>
</tr>
<tr>
<td>COMP3121</td>
<td>System Data Collaboration</td>
</tr>
</tbody>
</table>

YOUR CAREER

This program prepares graduates for jobs in a wide variety of positions, including:

• systems administrators connected with wireless LAN support
• wireless service providers
• cellular and broadband providers

Opportunities also exist in companies that provide computer support services to other businesses, and in organizations that specialize in the sale and installation of computer systems and networks.
Graduates may also find employment working directly with business clients, providing training services and ongoing support to assist them in using computer applications effectively. Graduates will be prepared to write several of the examinations leading to industry certification in Network Administration and Support.

FUTURE STUDY OPTIONS

Students who successfully complete this program may qualify for entry into Ontario college graduate certificate and university degree programs. George Brown currently has articulation agreements with various other post-secondary institutions such as the University of Ontario Institute of Technology, McMaster University and the Northern Alberta Institute of Technology. For further information on future study options, see georgebrown.ca/transferguide.

EDUCATIONAL/DEGREE PATHWAY

Opportunities to receive transfer credits toward further study to attain a degree are available.

ADMISSION REQUIREMENTS

Applicants are selected on the basis of their academic achievement, including the required courses, and any other selection criteria outlined below.

• Ontario Secondary School Diploma or equivalent**
• Grade 12 English (C or U)
• Grade 11 Math (M or U) or Grade 12 (C or U)

** MATURE STUDENT STATUS (19 YEARS OF AGE OR OLDER AND NO OSSD)

Mature Students may take the Admissions Assessment3 for English and Math, OR may consider upgrading to achieve the credit(s) needed in English4 and Math5.

Please note that George Brown is committed to ensuring that applicants will succeed in their program of choice and meeting the minimum requirements does not guarantee admission to the program. Applicants may be required to have grades higher than the minimum requirements stated.

COURSE EXEMPTIONS

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

INTERNATIONAL STUDENTS

Visit the International Admissions6 page for more information.

APPLY TO

Domestic students should apply through Ontario Colleges7

CONTACT US

SCHOOL OF COMPUTER TECHNOLOGY8

Phone: 416-415-5000, ext. 4287

Email: computertechnology@georgebrown.ca
The office hours are:
Monday – Thursday: 8 a.m. – 7 p.m.
Friday: 8 a.m. – 4 p.m.

Program Co-ordinator: Jacky Min
Phone: 416-415-5000, ext. 6691
Email: jmin@georgebrown.ca

For more information about George Brown College, you may also call the Contact Centre at 416-415-2000 (TTY 1-877-515-5559) or long distance 1-800-265-2002.

VISIT OUR CAMPUS

The Computer Systems Technology program is offered through our School of Computer Technology9 from our Casa Loma Campus10 at 146 Kendal Avenue11, Toronto. Sign up for an Information Session12 or Campus Tour13 to learn more about George Brown College and the program. You can also explore our virtual tour.14

LINKS REFERENCE

1https://collegeapply.ontariocolleges.ca/?collegeCode=GBTC&programCode=T147&lang=en
2https://www.georgebrown.ca/international/futurestudents/tuitionfees/
3https://www.georgebrown.ca/assessment/admi-pre/
4https://www.georgebrown.ca/upgrading-credits/english-diploma/
5https://www.georgebrown.ca/upgrading-credits/math-diploma/
6https://www.georgebrown.ca/international/futurestudents/howtoapply/
7https://collegeapply.ontariocolleges.ca/?collegeCode=GBTC&programCode=T147&lang=en
8https://www.georgebrown.ca/computertechnology/
9https://www.georgebrown.ca/computertechnology/
10https://www.georgebrown.ca/campuses/casa-loma/
11https://www.google.ca/maps/place/146+Kendal+Ave,+Toronto,+ON+M5R+1M3/data=!4m2!3m1!1s0x882b349c7146b3f7:0x6edb6695c6d490f6?sa=X&ved=0ahUKEwjvpbuOybDbAhUB7oMKHfsYDIKDAAAhIwCAc
12https://www.georgebrown.ca/computertechnology_info/
13https://www.georgebrown.ca/campus_tours/
14https://vt.georgebrown.ca/

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The Network and System Security Analysis (NaSSA) graduate certificate program at George Brown College is designed to meet the high demand for information system security analysts and related IT security professionals across multiple sectors – including high-demand sectors such as consulting services, finance and healthcare.

Students graduating from this program will enter into a specialized information and communication technology (ICT) field. They will have the capabilities to assess and evaluate security risks and threats to physical and digital infrastructure, develop and implement security contingency planning, and lead the development of policies and procedures to ensure that security risk is minimized.

DELIVERY

- This full-time program is delivered in a blended format, combining face-to-face sessions with online delivery.
- This delivery format is designed to accommodate those who wish to work while taking this program.
- This schedule will require that learners attend classes, generally in the late afternoons and evenings through the week, plus all day Saturday.

THE SECURITY INNOVATIONS LABORATORY (SILO)

Casa Loma Campus, as part of a $20-million expansion, is home to George Brown College’s Security Innovations LabOratory (SILO) – a new learning space to support collaboration between our industry partners and students. SILO will be a standalone lab/sandbox intended to replicate live environments that can be configured to include firewalls, switches, routers, access points and mobile hardware for testing. This space is intended to be the home of the NaSSA program, as well as to be commercially available to our partner organizations, bringing industry into the learning environment. In addition to SILO, George Brown College has invested over $1.5 million to create up-to-date wireless, security, VoIP and RF labs so that all students gain individual hands-on experience.

PROGRAM STANDARDS AND LEARNING OUTCOMES

The graduate has reliably demonstrated the ability to:

1. Develop and implement cyber security solutions considering the affordances and limitations of the computer operating systems, networks, application software, and packages available.
2. Develop best practices to protect business resources through the application of knowledge of vulnerabilities and exploits.
3. Develop cyber security strategies for the deployment of security procedures and protective devices.
4. Integrate cyber security strategies that support business functions by employing knowledge of best practices of business processes and systems.
5. Develop cyber security strategies and processes for business communications that respond to the needs of all the internal stakeholders.
6. Develop cyber security solutions and strategies that ensure the integrity of information in compliance with best practices, relevant policies, standards and regulations.
7. Plan, implement, and evaluate cyber security policies and strategies using project management principles to effectively respond to the needs of the organization’s information security requirements.
8. Perform security audits to ensure risk mitigation and compliance with security plans, policies, standards, regulations and best practices.
9. Develop and deliver a corporate training program to communicate both orally and in writing the cybersecurity requirements for compliance with security policies.
10. Communicate cyber security protocols, policies, and audit results and related documentation to any level of the organization.
### REQUIRED COURSES

#### SEMESTER 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1154</td>
<td>Equipment Deployment Interconnectivity and Wiring</td>
</tr>
<tr>
<td>COMP4041</td>
<td>Operating Systems Security I</td>
</tr>
<tr>
<td>COMP4043</td>
<td>Data Governance for Private, Confidentiality, and Regulatory Compliance</td>
</tr>
<tr>
<td>COMP4044</td>
<td>Introduction to Cyberspace Security and Ethical Hacking</td>
</tr>
<tr>
<td>COMP4046</td>
<td>Network and Computer Security Fundamentals</td>
</tr>
<tr>
<td>COMP4047</td>
<td>ICT Competencies</td>
</tr>
</tbody>
</table>

#### SEMESTER 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP4053</td>
<td>Advanced Data Network Security</td>
</tr>
<tr>
<td>COMP4054</td>
<td>Operating Systems Security II</td>
</tr>
<tr>
<td>COMP4055</td>
<td>Cryptography and Network Security</td>
</tr>
<tr>
<td>COMP4056</td>
<td>Secure Network Architecture</td>
</tr>
<tr>
<td>COMP4057</td>
<td>Advanced Ethical Hacking and Penetration Testing</td>
</tr>
<tr>
<td>COMP4058</td>
<td>Security Trends and Issues</td>
</tr>
</tbody>
</table>

#### SEMESTER 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP4061</td>
<td>Contingency Planning and Disaster Recovery</td>
</tr>
<tr>
<td>COMP4060</td>
<td>Advanced Risk Analysis</td>
</tr>
<tr>
<td>COMP4063</td>
<td>Capstone Industry Project</td>
</tr>
<tr>
<td>COMP4071</td>
<td>Advanced Security Management and Auditing</td>
</tr>
<tr>
<td>COMP4073</td>
<td>Advanced Firewall, IDS/IPS and Virtual Private Networks(VPNs) Technology</td>
</tr>
<tr>
<td>COMP4074</td>
<td>Securing Wireless and Mobile Networks Access</td>
</tr>
</tbody>
</table>

### FUTURE STUDY OPTIONS

Students who successfully complete this program may qualify for entry into Ontario college graduate certificate and university degree programs.

For further information, see georgebrown.ca/transferguide.

### ADMISSION REQUIREMENTS

- Three-year College Diploma or Bachelor's Degree in Information Technology, Computer Sciences, or a related field
- One year related work experience (resume required)

### ENGLISH LANGUAGE PROFICIENCY

English language proficiency is essential. Applicants with international transcripts who do not provide English proficiency test results must test at the College level in the George Brown College English assessment to be considered for admission.

Please visit georgebrown.ca/englishproficiency for more details.

### COURSE EXEMPTIONS

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

### INTERNATIONAL STUDENTS

Visit the International Admissions page for more information.

### APPLY TO

Domestic students should apply through Ontario Colleges.

### CONTACT US

**SCHOOL OF COMPUTER TECHNOLOGY**

Phone: 416-415-5000, ext. 4287

Email: computertechnology@georgebrown.ca

The office hours are:
Monday – Thursday: 8 a.m. – 7 p.m.
Friday: 8 a.m. – 4 p.m.

Program coordinator: Jeffrey Lubetsky
Phone: 416-4155000 x 3796
Email: Jeffrey.Lubetsky@georgebrown.ca

For more information about George Brown College, you may also call the Contact Centre at 416-415-2000 (TTY 1-877-515-5559) or long distance 1-800-265-2002.
VISIT OUR CAMPUS

The Network and System Security Analysis program is offered through our School of Computer Technology from our Casa Loma Campus at 146 Kendal Avenue in Toronto. Sign up for an Information Session or Campus Tour to learn more about George Brown College and the program. You can also explore our virtual tour.

LINKS REFERENCE

2 https://www.georgebrown.ca/international/futurestudents/tuitionfees/
3 https://www.georgebrown.ca/international/futurestudents/howtoapply/
5 https://www.georgebrown.ca/computertechnology/
6 https://www.georgebrown.ca/computertechnology_info/
7 https://www.google.ca/maps/place/146+Kendal+Ave,+Toronto,+ON+M5R+1M3/data=!4m2!3m1!1s0x882b349c7146b3f7:0x6edb6695c6d490f6?sa=X&ved=0ahUKEwjvpbuOybDbAhUB7oMKHFsYDNQQ8gEIKDAA
8 https://www.georgebrown.ca/computertechnology_info/
9 https://www.georgebrown.ca/computertechnology_info/
10 https://www.georgebrown.ca/campus_tours/
11 https://vt.georgebrown.ca/

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GAME – PROGRAMMING PROGRAM (T163)

PROGRAM NAME: Game – Programming

COURSE CODE: T163

SCHOOL: School of Computer Technology

CENTRE: Arts, Design and Information Technology

LOCATION: Waterfront Campus

DURATION: 3 years (6 semesters)

STARTING MONTH: September, January

CREDENTIAL: Ontario College Advanced Diploma

YEAR OF STUDY: 2020-2021

METHOD OF STUDY: FT

APPLY TO: Ontario Colleges

TUITION:

$3,994.00 *

ADDITIONAL COST:

* Amounts listed are the total of tuition, materials, student service and ancillary fees for the first two semesters of programs starting in Fall 2019. Fees are subject to change for programs starting in Fall 2020 and at later dates.

International students: Visit the International Fees and Related Costs page for more information.

FINANCIAL ASSISTANCE:

This program is approved for OSAP funding, provided the applicant meets OSAP eligibility criteria.

Whether it’s online or console, cell phone or PC-based, the game industry in Canada is large and growing rapidly. Game developers and publishers in the Greater Toronto Area range from small specialized units to mid-sized companies to Microsoft, Nintendo and other industry leaders.

Computer and game programmers are the fundamental resource for companies that develop, produce, distribute and market computer-based games. In fact, our industry advisors tell us it is the technical skills that are most in demand – a demand that this George Brown program is focused on meeting.

Students in George Brown’s three-year Game – Programming advanced diploma program will learn the technical skills they need to be successful in the job market by learning “the language of gaming” (C and C++), as well as artificial intelligence, 3D graphics and much more.

The added advantage of this program is that students will also be taught by George Brown’s School of Design faculty throughout the program, working closely with design students to create games, explore all aspects of the game industry, and learn to work in teams, just as they will in industry. Classes take place at George Brown’s Casa Loma and St. James Campuses. Some courses are offered online, and in some semesters, evening courses may be required.

Note: Students who start the program in January (Winter term) will be required to attend classes during the summer months (May to August).

THE INDUSTRY

"Canada’s video game industry is recognized as a global powerhouse for game development and has played a significant role in shifting what was once a 'niche industry' into a blockbuster industry and driver of innovation. In 2015, the industry contributed more than $3 billion to the Canadian economy and provided 20,400 full-time equivalent (FTE) jobs across the country, representing an increase of 31 percent and 24 percent respectively since 2013.

"Industry growth both globally and in Canada has been explosive and is expected to continue into the future. Canada’s video game industry crosses the country with 472 active studios that develop, publish, and distribute video games. The sector is mainly concentrated in the provinces of Quebec (29.4 percent), British Columbia (27.1 percent), and Ontario (22.9 percent)."

Entertainment Software Association of Canada

PROGRAM STANDARDS AND LEARNING OUTCOMES

The graduate has reliably demonstrated the ability to:

1. Analyze the differences in game genres in order to develop games that meet the needs of specific markets.
2. Analyze the history of video games to compare various approaches to game development.
3. Support the development of games by identifying and relating concepts from a range of industry roles – programming, design, and art.
4. Contribute as an individual and a member of a game development team to the effective completion of a game development project.
5. Develop strategies for ongoing personal and professional development to enhance work performance in the games industry.
6. Perform all work in compliance with relevant statutes, regulations, legislation, industry standards and codes of ethics.

**REQUIRED COURSES**

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GAME 1001</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td></td>
<td>GAME 1007</td>
<td>Game Fundamentals I</td>
</tr>
<tr>
<td></td>
<td>GAME 1005</td>
<td>Game Production I</td>
</tr>
<tr>
<td></td>
<td>GSSC 1045</td>
<td>Business Applications for Information Technology</td>
</tr>
<tr>
<td></td>
<td>MATH 1180</td>
<td>Math for Game Development</td>
</tr>
<tr>
<td></td>
<td>COMM 1007^</td>
<td>College English</td>
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<tr>
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<th>Code</th>
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<tr>
<td></td>
<td>GAME 1011</td>
<td>Advanced Programming</td>
</tr>
<tr>
<td></td>
<td>GAME 1017</td>
<td>Game Fundamentals II</td>
</tr>
<tr>
<td></td>
<td>GAME 3001</td>
<td>Artificial Intelligence</td>
</tr>
<tr>
<td></td>
<td>GAME 1014</td>
<td>Game Production II</td>
</tr>
<tr>
<td></td>
<td>MATH 1107</td>
<td>Linear Algebra and Geometry</td>
</tr>
<tr>
<td></td>
<td>GSSC 1027</td>
<td>Personal Finance</td>
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<table>
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<th>SEMESTER 3</th>
<th>Code</th>
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<tr>
<td></td>
<td>GAME 2020</td>
<td>Game Production III</td>
</tr>
<tr>
<td></td>
<td>GAME 2001</td>
<td>Data Structures &amp; Algorithms</td>
</tr>
<tr>
<td></td>
<td>GAME 2005</td>
<td>Game Physics</td>
</tr>
<tr>
<td></td>
<td>GAME 2012</td>
<td>3D Graphics Programming</td>
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<tr>
<td></td>
<td>GAME 2013</td>
<td>Game Engine I</td>
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<td>GNED</td>
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<tr>
<td></td>
<td>GAME 2030</td>
<td>Game Production IV</td>
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<tr>
<td></td>
<td>GAME 2031</td>
<td>Advanced Topics in Programming Languages</td>
</tr>
<tr>
<td></td>
<td>GAME 3111</td>
<td>Advanced Graphics Programming</td>
</tr>
<tr>
<td></td>
<td>GAME 3002</td>
<td>Physics Engines</td>
</tr>
<tr>
<td></td>
<td>GAME 2023</td>
<td>Game Engines II</td>
</tr>
<tr>
<td></td>
<td>COMP 2148</td>
<td>Professional workplace competencies</td>
</tr>
<tr>
<td></td>
<td>GNED</td>
<td>General Education Elective (Select One)</td>
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<table>
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<tr>
<th>SEMESTER 5</th>
<th>Code</th>
<th>Course name</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>GAME 3020</td>
<td>Game Production V</td>
</tr>
<tr>
<td></td>
<td>GAME 2014</td>
<td>Android Game Development</td>
</tr>
<tr>
<td></td>
<td>GAME 3111</td>
<td>Advanced Graphics Programming</td>
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<tr>
<td></td>
<td>GAME 3003</td>
<td>Console Game Development I</td>
</tr>
<tr>
<td></td>
<td>GAME 3002</td>
<td>Physics - Engines</td>
</tr>
<tr>
<td></td>
<td>GAME 3121</td>
<td>Game Engine Development I</td>
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</table>

<table>
<thead>
<tr>
<th>SEMESTER 6</th>
<th>Code</th>
<th>Course name</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>GAME 3030</td>
<td>Game Production VI</td>
</tr>
<tr>
<td></td>
<td>GAME 3004</td>
<td>IOS Game Development</td>
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<td>GAME 3011</td>
<td>Advanced Game Programming</td>
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<td></td>
<td>GAME 3015</td>
<td>Game Engine Development II</td>
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<tr>
<td></td>
<td>GAME 3110</td>
<td>Multiplayer Systems</td>
</tr>
<tr>
<td></td>
<td>GAME 3112</td>
<td>Console Game Development II</td>
</tr>
</tbody>
</table>

†Based on the results of your placement test, you may be required to take COMM1003 (English Skills) or CESL1003 (English Skills – ESL) before progressing to COMM1007. COMM1003/CESL1003 does not count as a course required for graduation, and you will be charged for this extra course. Please visit georgebrown.ca/assessment for more information.

**ELECTIVES**

**ALTERNATIVE STUDY OPTIONS**

Students looking to focus more on the art/asset development aspect of game development may be more interested in our Game – Art advanced diploma program (G119), which is centred in the George Brown School of Design. Even though several courses are co-delivered in both programs, we encourage you to consider which program most closely suits your goals prior to making a final decision.

**YOUR CAREER**

Our graduates will be able to work in many areas of the digital game industry, including:

- software or hardware development
- publisher
- ISP and game portal development and maintenance
- website development
- distribution middleware and tool provider
- production service
- content/IP owner

**EDUCATIONAL/DEGREE PATHWAY**

Graduates of Game – Programming have the opportunity to apply to the BSc (Honours) Computer Games Design program at the University of Gloucestershire, beginning in level 6. For more information about this program, visit www.glos.ac.uk/courses/undergraduate/cgs/pages/computer-games-design-bsc.aspx.
ADMISSION REQUIREMENTS

Applicants are selected on the basis of their academic achievement, including the required courses, and any other selection criteria outlined below.

- Ontario Secondary School Diploma or equivalent**
- Grade 12 English (C or U)
- Grade 11 Math (M or U) or Grade 12 (C or U)
- Attending a Program Information Session is highly recommended

** MATURE STUDENT STATUS (19 YEARS OF AGE OR OLDER AND NO OSSD)

Mature Students may take the Admissions Assessment for English and Math, OR may consider upgrading to achieve the credit(s) needed in English and Math.

Please note that George Brown is committed to ensuring that applicants will succeed in their program of choice and meeting the minimum requirements does not guarantee admission to the program. Applicants may be required to have grades higher than the minimum requirements stated.

COURSE EXEMPTIONS

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

INTERNATIONAL STUDENTS

Visit the International Admissions page for more information.

APPLY TO

Domestic students should apply through Ontario Colleges.
CONTACT US

School of Computer Technology
Location: 3 Lower Jarvis St., Room 260
Phone: 416-415-5000, ext. 4287 or 3129
Email: computertechnology@georgebrown.ca or game@georgebrown.ca
Office hours: Monday - Friday: 9 a.m. – 3 p.m.
Program Co-ordinator: Alexander Richard
Phone: 416-415-5000, ext. 4232
Email: arichard6@georgebrown.ca
For more information about George Brown College, you may also call the Contact Centre at 416-415-2000 (TTY 1-877-515-5559) or long distance 1-800-265-2002.

VISIT OUR CAMPUS

Classes in the Game – Programming program take place at our Casa Loma and St. James Campuses. Sign up for an Information Session or Campus Tour to learn more about George Brown College and the program. You can also explore our virtual tour.

LINKS REFERENCE

2https://www.georgebrown.ca/international/futuresstudents/tuitionfees/
3http://www.glos.ac.uk/courses/undergraduate/cgs/pages/computer-games-design-bsc.aspx
4https://www.georgebrown.ca/assessment/admi-pre/
5https://www.georgebrown.ca/upgrading-credits/english-diploma/
6https://www.georgebrown.ca/upgrading-credits/math-diploma/
7https://www.georgebrown.ca/international/futuresstudents/howtoapply/
9https://www.georgebrown.ca/computertechnology/
10https://www.georgebrown.ca/campsues/casa-loma/
11https://www.georgebrown.ca/campsues/st-james/
12https://www.georgebrown.ca/computertechnology_info/
13https://www.georgebrown.ca/campus_tours/
14https://vt.georgebrown.ca/

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The evolution of information and communication technologies is transforming the health-care system and creating new ways of accessing and exchanging information that will impact the health-care sector. Health-care and information systems professionals currently employed or with experience in a health-care or technology environment, or who have an interest in the advancement of information technologies in the health-care delivery sector, will be interested in this program. The **Health Informatics** graduate certificate program brings together professionals in health-related and information technology sectors to develop specialists in health informatics who can respond to the current and emerging needs of health-care systems. This intensive program is designed for IT, health-care or related professionals who aspire to enter into a health informatician/analyst role, or practitioners who wish to enhance their experience with formal education. Participants will be engaged and supported by a team of health informatician/business system analyst professionals and faculty in developing critical skills and competencies in the areas of:

- Health-care systems, technologies and trends
- Ethical, professional, legal and policy implications of health information systems technologies and health information standards
- Problem identification and analysis
- Documenting and analyzing health-care organization, health-user and solution requirements
- Process, workflow and system/solution modelling
- Project management
- Technical writing
- Leadership and management
- Business and system analysis techniques and core-professional competencies such as analytical thinking and problem solving, communication and facilitation, and interactional skills.

The Health Informatics program provides breadth and depth of applied knowledge in the field of health informatics. A key characteristic that sets this graduate certificate program apart is the applied nature of the curriculum. Students will be immersed in the process of health informatics/analysis through case studies, industry projects, and practical work experience, and will be responsible for developing solutions. The uniqueness of this program is in creating graduates with work-ready skills built through applied, hands-on experience.

Graduates of the program will have acquired knowledge, skills and competencies relevant to professional certification programs in Health Informatics/Information and Management Systems.

Graduates will be able to:

- Formulate change strategies to implement appropriate health information systems technologies (HIST) within the health-care setting.
- Apply business and system analysis techniques to evaluate the effectiveness of health information systems technologies within a health-related setting.
- Integrate relevant standards and professional, ethical and legislative requirements with the appropriate health information system technologies.
- Design training and education for the effective use of HIST.

**Partnerships with International Institute of Business Analysis (IIBA®)**

Academic Membership offers colleges and universities that have Business Analyst curriculums and who care about advancing the Business Analyst profession within their student population to participate in IIBA® membership and benefit from IIBA®’s other products and services.
The Academic recognition programs offer the students of business analyst-related programs the opportunity to receive recognition from the IIBA.

About the IIBA® Academic Certificate

The T402 Health Informatics program integrates core foundational concepts, techniques, and professional competencies as defined within the Business Analysis Body of Knowledge (BABOK®). Graduates of this program with an average of at least 77% will be eligible to receive the IIBA® Academic Certificate in Business Analysis. The IIBA® Academic Certificate in Business Analysis provides an opportunity for anyone considering a career in business analysis with the ability to gain a comprehensive understanding of the fundamentals of the business analyst practice.

To learn more about the IIBA® Academic Certificate in Business Analysis, please visit the IIBA’s website.

EXPERIENTIAL LEARNING

Work Integrated Learning Semester

YOUR FIELD STUDY OPTIONS

Practicums in a health-care environment take place in semester 3.

PROGRAM STANDARDS AND LEARNING OUTCOMES

The graduate has reliably demonstrated the ability to:

1. Assess organizational requirements for health information system technologies (HIST).
2. Formulate strategies for the selection and implementation of HIST.
3. Design and deliver educational/training strategies for end-users.
4. Evaluate the impact of HIST on business/clinical processes, and on health services delivery.

REQUIRED COURSES

SEMMESTER 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS4051</td>
<td>Foundations of Business Analysis</td>
</tr>
<tr>
<td>BUS4053</td>
<td>Business Analysis Competencies and Techniques I</td>
</tr>
<tr>
<td>BUS4054</td>
<td>I.T. Project Management</td>
</tr>
<tr>
<td>BUS4065</td>
<td>Advanced Communications</td>
</tr>
<tr>
<td>COMP4014</td>
<td>Health-Care System</td>
</tr>
<tr>
<td>COMP4015</td>
<td>Health-Care Information Technology</td>
</tr>
<tr>
<td>COMP4080</td>
<td>Knowledge Management and Clinical Decision-Making</td>
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SEMMESTER 2

<table>
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<tr>
<th>Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>BUS4072</td>
<td>Portfolio Development and Work Search Preparation</td>
</tr>
<tr>
<td>COMP4024</td>
<td>Health Data Standards</td>
</tr>
<tr>
<td>COMP4033</td>
<td>Health Information Systems Analysis and Evaluation</td>
</tr>
<tr>
<td>COMP4081</td>
<td>Health Business and Systems Analysis Case I</td>
</tr>
<tr>
<td>COMP4082</td>
<td>The Cutting Edge of Health Informatics Technology and Impact on Clinical Practice</td>
</tr>
<tr>
<td>COMP4083</td>
<td>Health Information Legislation, Privacy and Security</td>
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SEMMESTER 3

<table>
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<th>Code</th>
<th>Course Name</th>
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<tr>
<td>TCOP4002</td>
<td>Co-op Work Placement</td>
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<tr>
<td>OR</td>
<td></td>
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<tr>
<td>BUS4081</td>
<td>Work Integrated Project</td>
</tr>
</tbody>
</table>

YOUR CAREER

Upon completion of the program, graduates will be able to meet the requirements for positions such as:

- Clinical/IT Project Manager/Project Coordinator
- Product Support Specialist
- Clinical Informatics/Applications Specialist
- Data Governance Analyst
- Health Technology Education/Training Specialist

ADMISSION REQUIREMENTS

- Minimum two-year Diploma or Bachelor's Degree* in Health Sciences or related field from an accredited institution

OR

- Minimum three-year Diploma in Information Technology* or related field from an accredited institution

PLUS:

- Minimum one year of work experience as a health-care professional or an IT professional, or equivalent (resume required)

Candidates will be accepted based on the combination of relevant education and work experience.

* Please note that Domestic applicants who are submitting International transcripts require a Canadian equivalency evaluation. This can be obtained through ICAS (International Credential Assessment Service) at icascanada.ca or WES (World Education Services) at wes.org/ca.

ENGLISH LANGUAGE PROFICIENCY

Applicants with international transcripts who do not provide English language proficiency test results must test at the College level in the George Brown College English assessment to be considered for admission.
Please visit georgebrown.ca/englishproficiency for more details.

COURSE EXEMPTIONS

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

APPLY TO

Domestic students should apply through Ontario Colleges6

“I received quality Health Informatics and business analysis training during the course of this program. Besides the amazing faculty that helped me to move forward and excel in different aspects of HI, I had the opportunity to work with prominent technical and business managers that I got to know through the college. The Health Informatics program at George Brown College is perfectly designed to give you hands-on experience in the industry and is a path to success.”

Rachel Malaeke (Graduate 2018, Health Informatics)
Senior Business Analyst, Clinical Working Group Lead, SE Health

CONTACT US

School of Computer Technology7
Phone: 416-415-5000, ext. 4287
Email: computertechnology@georgebrown.ca
The office hours are:
Monday – Thursday: 8 a.m. – 7 p.m.
Friday: 8 a.m. – 4 p.m.

Program Co-ordinator: Thérèse Bernier
Email: Therese.Bernier@georgebrown.ca
Phone: 416-415-5000 x 3744
Office hours: Friday, 10 a.m. – noon
For more information about George Brown College, you may also call the Contact Centre at 416-415-2000 (TTY 1-877-515-5559) or long distance 1-800-265-2002.

VISIT OUR CAMPUS

The Health Informatics program is offered through our School of Computer Technology7 from our Casa Loma Campus9 at 146 Kendal Avenue10. Sign up for an Information Session11 or Campus Tour12 to learn more about George Brown College and the program. You can also explore our virtual tour.13

George Brown College is continually striving to improve its programs and their delivery. The information contained in this calendar is subject to change without notice. It should not be viewed as a representation, offer or warranty. Students are responsible for verifying George Brown College admission, graduation, and fee requirements as well as any requirements of outside institutions, industry associations, or other bodies that may award additional designations concurrently with, or after completion of, a George Brown College program.

LINKS REFERENCE

2https://www.georgebrown.ca/international/futurestudents/howtoapply/
3https://www.iiba.org/certification/core-business-analysis-certifications/
4http://www.wes.org/ca/
5https://www.georgebrown.ca/englishproficiency/
7https://www.georgebrown.ca/computertechnology/
8https://www.georgebrown.ca/computertechnology/
9https://www.georgebrown.ca/campuses/casa-loma/
10https://www.google.ca/maps/place/146+Kendal+Ave,+Toronto,+ON+M5R+1M3/data=!4m2!3m1!1s0x882b349c7146b3f7:0x6edb6695c6d490f6?sa=X&ved=0ahUKEwjvpbuOybDbAhUB7oMKHfsYDNQ8gEIKDAA
11https://www.georgebrown.ca/computertechnology_info/
12https://www.georgebrown.ca/campus_tours/
13https://vt.georgebrown.ca/
The Information Systems Business Analysis graduate certificate program at George Brown College is designed to meet the urgent need for professionals who can be the key liaison between business and information technology functions within an organization. Further, George Brown is recognized by the International Institute of Business Analysis as an Academic Member, and is proud to offer the IIBA® Academic Diploma.

This intensive program is designed for IT or business professionals who aspire to enter into a business analyst role, or practitioners who wish to enhance their experience with formal education. A deeper level of understanding of the business analyst role will be developed through unique learning techniques and invaluable practical experience. Participants will be engaged and supported by a team of business analyst consultants and faculty in developing critical skills and competencies in the areas of:

- problem identification
- documenting and analyzing user requirements
- process and workflow modelling
- communication and facilitation
- project management
- technical writing
- leadership and management
- decision-making

A key characteristic of this program is the applied nature of the curriculum. Students are immersed in the process of business analysis through case histories of real-world business issues, and are responsible for developing solutions. The uniqueness of this program is in creating a practicing business analyst rather than creating someone who knows how to do it. This program creates work-ready graduates who can do, and have done, the business analysis process through applied, hands-on experience.

DELIVERY
- This full-time program is delivered in a blended format, combining face-to-face sessions with online delivery.
- You will generally meet late afternoons, evenings, and weekends. This delivery format accommodates those who wish to work while taking this program.

IIBA ACADEMIC MEMBERSHIP
Academic Membership in the International Institute of Business Analysis (IIBA) offers colleges and universities that have Business Analyst curriculums and care about advancing the BA profession within their student population the opportunity to participate in IIBA membership and benefit from IIBA’s other products and services. The Academic recognition programs offer the students of Business Analyst-related programs the opportunity to receive recognition from the IIBA.

NEW – GRADUATES RECEIVE THE IIBA ACADEMIC DIPLOMA
Students who successfully graduate from the program with an average of at least 77% will receive a second credential – the IIBA® Academic Diploma. Accredited directly from the International Institute of Business Analysis, this diploma recognizes the student’s theoretical understanding of the Business Analyst Body of Knowledge (BABOK), as well as a minimum number of hours of practical experience received through the duration of the program.

ABOUT THE IIBA ACADEMIC DIPLOMA
The IIBA® Academic Diploma in Business Analysis is designed for students who have chosen business analysis and the role of the business analyst as their desired profession.
The multi-course business analysis diploma program provides both foundational and applied knowledge in business analysis by offering hands-on experience to practice and demonstrate an understanding of the classroom concepts through co-ops, internships or progressive case studies. The business analysis diploma program also provides course work in supporting disciplines to ensure students can interact effectively across an organization.

PART TIME STUDY OPTIONS

Courses are primarily offered evenings and weekends, which is designed to support those who may wish to continue working while studying.

EXPERIENTIAL LEARNING

Work Integrated Learning semester

YOUR FIELD STUDY OPTIONS

CO-OP/WORK INTEGRATED LEARNING INDUSTRY EXPERIENCE

Upon completion of semester two, students will begin their final academic semester of study – the Work Integrated Learning semester. This will enable students to engage in industry work experience through their final semester while meeting the program’s academic requirements.

Our many industry partners and applied research project partners benefit greatly from this program’s non-standard delivery format. It allows our students to engage in authentic, real-world work settings throughout the week while learning! Opportunities to complete this semester now include engaging in formal co-op placements, internships and applied research to provide students with the most opportunities possible to create relevant learning experiences. These industry opportunities also contribute to students receiving the IIBA® Academic Diploma.

THE INDUSTRY

INDUSTRY FEEDBACK

“I wanted to thank you for sending such great candidates to our attention. The top two people interviewed for our IT analyst position were from George Brown.”

Catherine Commins, General Manager, Advanced Chemistry Development, Inc. (ACD/Labs)

“Porter Airlines has utilized George Brown College’s business analyst students within our IT Division for over two years with great success. The Information Systems Business Analysis program’s flexibility in allowing its students to work with industry partners, like Porter Airlines, while learning is invaluable for learners, and for industry. The business analysts come to us well trained, are keen to add value to projects, and blend well in our business environment. This year, we even hired one full-time before he graduated! Thank you!”

Lynda Neil, PMP Manager, Project Management Office, Porter Airlines Inc.

“By having students from the Information Systems Business Analysis program work with us, we were able to ensure quality work was accomplished on a very important project. These students were able to gain significant experience working in the field with a large team, dealing with various employees and stakeholders. Everyone involved was able to walk away having gained important experience and achieved positive results, and we look forward to continuing a relationship with George Brown College.”

Amos Adler, President, MEMOTEXT Inc.

PROGRAM STANDARDS AND LEARNING OUTCOMES

The graduate has reliably demonstrated the ability to:

1. Document business processes using effective and established research and documentation methods and business improvement procedures.
2. Manage the requirements elicitation and analysis activities throughout the requirements process for changes to a business system.
3. Analyze the information collected during the requirements elicitation to identify gaps and define the capabilities of an acceptable solution using appropriate methods, tools, techniques and documentation.
4. Document business requirements in accordance with standard business practices.
5. Communicate the results of business requirements analysis and documentation to a broad and diverse audience using appropriate communication tools and styles.
6. Develop test strategies to ensure that business requirements and stakeholder objectives for changes to a business system are met.
7. Apply negotiation and problem-solving skills to build effective stakeholder alignment.

REQUIRED COURSES

This is a three-semester program comprising case studies during which students will be engaged on an increasingly intense and independent basis with material of escalating complexity. Course-oriented delivery supports this learning process.

SEMESTER 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>BUS4051</td>
<td>Foundations of Business Analysis</td>
</tr>
<tr>
<td>BUS4053</td>
<td>Business Analysis Competencies and Techniques 1</td>
</tr>
<tr>
<td>BUS4054</td>
<td>I. T. Project Management</td>
</tr>
<tr>
<td>BUS4055</td>
<td>Quantitative Research/Qualitative Research</td>
</tr>
<tr>
<td>BUS4061</td>
<td>Business Analyst Case Study 1</td>
</tr>
<tr>
<td>BUS4065</td>
<td>Advanced Communications</td>
</tr>
<tr>
<td>COMP4017</td>
<td>Introduction to Information Systems</td>
</tr>
</tbody>
</table>
SEASON 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS4062</td>
<td>Business Analyst Case Study 2</td>
</tr>
<tr>
<td>BUS4063</td>
<td>Business Analysis Competencies and Techniques 2</td>
</tr>
<tr>
<td>BUS4064</td>
<td>Business Analyst Software Tools</td>
</tr>
<tr>
<td>BUS4072</td>
<td>Portfolio Development and Work Search Preparation</td>
</tr>
<tr>
<td>BUS4078</td>
<td>Trends and Perspectives in Business Analysis</td>
</tr>
</tbody>
</table>

ANALYSIS AND ANALYTICS SPECIALIZATION

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUS4066</td>
<td>Introduction to Analytics Systems</td>
</tr>
<tr>
<td>BUS4067</td>
<td>User Interface Design/ User Experience</td>
</tr>
</tbody>
</table>

FINANCE SPECIALIZATION

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIN1003</td>
<td>Financial Systems in Canada</td>
</tr>
<tr>
<td>FIN4015</td>
<td>Canadian Securities I</td>
</tr>
</tbody>
</table>

SEASON 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOP4002</td>
<td>Co-op Work Placement</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>BUS4081</td>
<td>Work Integrated Project</td>
</tr>
</tbody>
</table>

YOUR CAREER

According to the Information and Communications Technology Council (2011), “the most rapidly growing information and communication technology (ICT) occupations are those which combine ICT skills with an understanding of business needs.”

- There are approximately 150,000 Business Analysts and related professionals in Canada.
- BA roles have been the fastest-growing ICT employment occupation in Canada from 2000 to 2010, growing approximately 120 per cent in that time.

Common job titles include:

- Business Analyst
- Business Systems Analyst
- Computer Systems Analyst
- Informatics Consultant
- Information Systems Business Analyst
- Information Systems Quality Assurance Analyst
- Management Information Systems (MIS) Analyst

ADMISSION REQUIREMENTS

- Two-year or three-year College Diploma or Bachelor's Degree in Computer Science, Commerce, Engineering or related field from an accredited institution*.
- Minimum one year of relevant work experience (resumé required).
- Candidates will be accepted based on the combination of relevant education and work experience.

* Please note that Domestic applicants who are submitting International transcripts require a Canadian equivalency evaluation. This can be obtained through ICAS (International Credential Assessment Service) at icascanada.ca or WES (World Education Services) at wes.org/ca.

ENGLISH LANGUAGE PROFICIENCY

- Applicants with international transcripts who do not provide English proficiency test results must test at the College level in the George Brown College English assessment to be considered for admission.

Please visit georgebrown.ca/englishproficiency for more information.

COURSE EXEMPTIONS

College or university credits may qualify you for course exemptions. Please visit georgebrown.ca/transferguide for more information.

INTERNATIONAL STUDENTS

Visit the International Admissions page for more information.

APPLY TO

Domestic students should apply through Ontario Colleges.
“The Information Systems Business Analysis program taught me business analysis best practices for a variety of industries, which increased my marketability and gave me the experience I needed to successfully fulfill the responsibilities of my current business analyst role. The year-long program let me practice and apply my skills in-depth to a real-life project, while the faculty provided me with excellent support that allowed me to excel as a business analyst.”

Carol Chung (Graduate 2009, Information Systems Business Analysis)

“The Information Systems Business Analysis postgraduate program has been one of the biggest cornerstones of my career. From this program, I was not only able to learn about business analysis, but also work with industry partners to apply the knowledge and skills I attained in the program. This has opened up more doors and opportunities and challenged me to perform and grow as a business analyst. Through this program, I have been able to work as a business analyst for CIBC’s Wholesale Banking Technology and TD Canada Trust on projects that require extensive knowledge and application of business analysis tools and skills. The program explores very important aspects which include enterprise analysis, business planning and monitoring, and other requirement management techniques, which have helped me apply myself and become a better business analyst. I would definitely recommend this program to anyone who seeks to enter or needs to advance in the field of business analysis.”

Moses Wamambo (Graduate 2011, Information Systems Business Analysis) Business Analyst, TD Canada Trust

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MOBILE APPLICATION DEVELOPMENT AND STRATEGY PROGRAM (T430)

**Program Name**: Mobile Application Development and Strategy

**Course Code**: T430

**School**: School of Computer Technology

**Centre**: Arts, Design and Information Technology

**Location**: Casa Loma Campus

**Duration**: 1 year (3 semesters)

**Starting Month**: September, January

**Credential**: George Brown College Certificate

**Year of Study**: 2020-2021

**Method of Study**: FT

**Apply To**: Ontario Colleges

---

**Tuition**

$7,211.00* ‡

**Additional Cost**

*Amounts listed are the total of tuition, materials, student service and ancillary fees for the first two semesters of the program starting in Fall 2019. Fees are subject to change for programs starting in Fall 2020 and at later dates.

‡ Semester 3 fees will consist of a flat fee of $500.00 for Co-op Placement and for the Work Integrated Project fees will vary and are to be paid separately, both of which is not included in the total above.

**International Students**: Visit the International Fees and Related Costs page for more information.

**Financial Assistance**

This program is not eligible for OSAP funding.

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Mobile application development is one of the fastest growing sectors of information technology. This three-semester program will help students develop a wide variety of skills related to developing, testing and deploying applications for mobile phones and tablets. The main focus of the program is the two leading platforms in mobile devices: iOS and Android.

Java and Swift programming languages are covered in this program so students have an easier transition in developing mobile applications. Client-side development tools such as HTML 5, CSS3 and JavaScript are covered, as well as aspects of server-side programming to complement mobile application development. To synthesize all learning outcomes, students will participate in either a co-op work term or applied project that will provide the experience necessary to improve graduate employability.

Students will learn strategies related to the development of mobile applications from a business perspective such as performing competitive research and exploring revenue-generating approaches. They will also be exposed to the process of App Store and Android Market submissions.

**Your Field Study Options**

During the third semester of the program, students may choose whether to apply for a Co-op position or take a Work Integrated Learning course that includes an industry-sponsored project.

**Experiential Learning**

Mandatory Co-op or Work Integrated Learning

---

**Program Standards and Learning Outcomes**

1. Create meaningful design artifacts using modern software engineering methodologies and project management principles.
2. Implement native mobile applications for different mobile platforms.
3. Develop solution architectures to support mobile applications by applying enterprise architecture principles and best practices.
4. Develop creative concepts for mobile applications that meet innovation, entrepreneurship and social enterprise objectives.
5. Develop secure mobile applications by implementing the security principles, standards and best practices of mobile application development.
6. Develop usable, friendly, fast and reliable mobile applications by applying the principles and best practices of User Interface design and experience (UI/UX).
7. Work independently and as a team member to develop mobile application solutions for a business.
8. Use industry standard testing methodologies to ensure software quality and improve software performance.
9. Apply various strategies for developing competitive mobile applications.

**Required Courses**

**Semester 1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADS 4000</td>
<td>Object Oriented Development Using Java</td>
</tr>
<tr>
<td>MADS 4001</td>
<td>Introduction to Android Development</td>
</tr>
<tr>
<td>MADS 4002</td>
<td>Swift Fundamentals</td>
</tr>
<tr>
<td>MADS 4003</td>
<td>Introduction to IOS Development</td>
</tr>
<tr>
<td>MADS 4004</td>
<td>Introduction to Databases</td>
</tr>
</tbody>
</table>
SEMESTER 2

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>MADS 4005</td>
<td>Advanced IOS Development</td>
</tr>
<tr>
<td>MADS 4006</td>
<td>Advanced Android Development</td>
</tr>
<tr>
<td>MADS 4007</td>
<td>Web Development Fundamentals</td>
</tr>
<tr>
<td>MADS 4008</td>
<td>Advanced Web Development</td>
</tr>
<tr>
<td>MADS 4009</td>
<td>Mobile Application Strategy</td>
</tr>
<tr>
<td>MADS 4011</td>
<td>Work Term Preparation</td>
</tr>
</tbody>
</table>

SEMESTER 3

<table>
<thead>
<tr>
<th>Code</th>
<th>Course name</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCOP 4010</td>
<td>Co-op</td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>MADS 4010</td>
<td>Work Integrated Project</td>
</tr>
</tbody>
</table>

YOUR CAREER

GRADUATES OF THIS PROGRAM MAY APPLY FOR POSITIONS THAT INCLUDE:
- Mobile Developer
- iOS Developer
- Android Developer
- Front-end Developer
- Software Developer
- Mobile Engineer
- Software Engineer

ADMISSION REQUIREMENTS

Two- or three-year College Diploma or Bachelor's Degree in Information Technology, Computer Science or a related field.

ENGLISH LANGUAGE PROFICIENCY

English language proficiency is essential. Applicants with international transcripts who do not provide English proficiency test results must test at the College level in the George Brown College English assessment to be considered for admission.

Please visit georgebrown.ca/englishproficiency for more details

COURSE EXEMPTIONS

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APPLY TO

Domestic students should apply through Ontario Colleges

CONTACT US

School of Computer Technology
Phone: 416-415-5000, ext. 4287

Email: computertechnology@georgebrown.ca
The office hours are: Monday - Thursday: 8 a.m. - 7 p.m.
Friday: 8 a.m. - 4 p.m.
Program Coordinator: Maziar Masoudi
Phone: 416-415-5000, ext. 3345
Email: mmasoudi@georgebrown.ca
For more information about George Brown College, you may also call the Contact Centre at 416-415-2000 (TTY 1-877-515-5559) or long distance 1-800-265-2002.

VISIT OUR CAMPUS

The Mobile Application Development and Strategy is offered through our School of Computer Technology from our Casa Loma Campus at 146 Kendal Avenue. Sign up for an Information Session or Campus Tour to learn more about George Brown College and the program. You can also explore our virtual tour.

LINKS REFERENCE

2. https://www.georgebrown.ca/international/futurestudents/tuitionfees/
3. https://www.georgebrown.ca/international/futurestudents/howtoapply/
5. https://www.georgebrown.ca/computertechnology/
6. https://www.georgebrown.ca/computertechnology_info/
7. https://www.google.ca/maps/place/146+Kendal+Ave,+Toronto,+ON+M5R+1M3/data=!4m2!3m1!1s0x882b349c7146b3f7:0x6edb6695c6d490f6?sa=X&ved=0ahUKEwjvpbuOybDbAhUB7oMKHfsYDNQQ8gEIKDAA
8. https://www.georgebrown.ca/computertechnology_info/
10. https://vt.georgebrown.ca/

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Wireless communications are pervasive in our lives. They have grown in recent years to include everything from personal communications networks to governments, hospitals and neighbourhood businesses. And there’s no end in sight to the growth of our wireless world.

George Brown College’s leading-edge Wireless Networking postgraduate program is designed to put you at the centre of this exciting world by giving you high-demand skills in radio frequency (RF), cellular, broadband and advanced data communications.

We offer you a unique choice of career direction. You can specialize in:

- Long Term Evolution (LTE) and Broadband Technologies
- Advanced Network Security
- Voice over Internet Protocol (VoIP) Technologies

Other program advantages:

- We have departed from the traditional lecture-based course structure. Students learn in labs by practicing on the equipment that they will use when they enter the workforce.
- In conjunction with our corporate partners, students may be involved in real-world projects for one or two days per week, making proposals and then working in teams to plan projects, set schedules and achieve goals.
- George Brown has created up-to-date wireless, security, VoIP, RF and LTE labs so that all students gain individual hands-on experience.
- Students will have access to NETLAB, giving them remote access to the Cisco Academy and VMWare labs.

• After finishing the program, students will have bridging options to other post-secondary and postgraduate programs in the School of Computer Technology.

Note: In this rapidly changing industry, program improvements are being made on an ongoing basis, which may result in course changes. Changes are made in consultation with our Program Advisory Committee, which is composed of academic staff and industry representatives from small, medium-sized and large corporations.

Please note: Students who start the program in January (Winter term) will be required to attend classes during the summer months (May to August).

PROGRAM STANDARDS AND LEARNING OUTCOMES

The graduate has reliably demonstrated the ability to:

1. Test and measure RF (radio frequency) signals, attenuation and antenna systems.
2. Assist with the preparation and execution of wireless site surveys.
3. Build a wired and/or wireless computer network using system design documentation.
4. Measure performance of both wired and wireless network components and applications using a variety of basic and advanced network management tools.
5. Produce documentation and reports related to network components and applications performance.
6. Troubleshoot and resolve technical problems related to both wired and wireless networks using standardized approaches and methodologies.
7. Install and upgrade network hardware (e.g. workstations, servers, wireless access points, routers, switches, firewalls) and related components and software according to best practices in the industry.
8. Monitor and evaluate network security issues and perform basic security audits on both wired and wireless networks.
9. Assist in the collection and analysis of user requirements related to wired and wireless networks.
10. Utilize change control, issue documentation and problem escalation procedures and processes as per industry best practices.
11. Generate and maintain “as built” network documentation following industry best practices.
12. Compare network performance against service levels and assist in the development of action plans as required against service level agreements.
13. Employ concepts and practices as defined in ITIL (IT Infrastructure Library) to manage IT services and operation, including project management tools and techniques.

REQUIRED COURSES

**SEMESTER 1**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1153</td>
<td>Introduction to RF/Wireless Communication Principles</td>
</tr>
<tr>
<td>COMP1154</td>
<td>Equipment Deployment, Interconnectivity and Wiring</td>
</tr>
<tr>
<td>COMP1156</td>
<td>Introduction to UNIX</td>
</tr>
<tr>
<td>COMP1201</td>
<td>Wireless Networking Service and Applications</td>
</tr>
<tr>
<td>COMP1205</td>
<td>IT Best Practices</td>
</tr>
<tr>
<td>COMP1219</td>
<td>Data Communications Fundamentals</td>
</tr>
</tbody>
</table>

**SEMESTER 2**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1159</td>
<td>Introduction to Voice Network Technology and Techniques</td>
</tr>
<tr>
<td>COMP1160</td>
<td>RF/Wireless Techniques</td>
</tr>
<tr>
<td>COMP1161</td>
<td>Security and Advanced Data Network Technologies</td>
</tr>
<tr>
<td>COMP1207</td>
<td>Data Centre and Virtualization Technology</td>
</tr>
<tr>
<td>COMP1208</td>
<td>Server Operating System Technologies</td>
</tr>
</tbody>
</table>

**SEMESTER 3**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP2105</td>
<td>Advanced Network Analysis</td>
</tr>
<tr>
<td>COMP2106</td>
<td>Advanced Network Management</td>
</tr>
<tr>
<td>COMP4063</td>
<td>Capstone Industry Project</td>
</tr>
</tbody>
</table>

For the field projects, students will work in teams supervised by our industry partners. Students in the third semester are required to choose one set of program specialization courses. Minimum enrolment and grade point averages are required for each option to be offered.

**SET 1 – LONG TERM EVOLUTION (LTE) AND BROADBAND TECHNOLOGIES.**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>COMP2145</td>
<td>LTE and 4G Technologies</td>
</tr>
<tr>
<td>COMP2146</td>
<td>LTE Core and IMS Deployment</td>
</tr>
</tbody>
</table>

**SET 2 – ADVANCED NETWORK SECURITY**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP1214</td>
<td>Advanced Security Infrastructure and Deployment Technologies</td>
</tr>
<tr>
<td>COMP4074</td>
<td>Securing Wireless and Mobile Network Access</td>
</tr>
</tbody>
</table>

**SET 3 – VOICE OVER INTERNET PROTOCOL**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP2118</td>
<td>VoIP Network Technologies</td>
</tr>
<tr>
<td>COMP2119</td>
<td>VoIP Network Deployment and Maintenance</td>
</tr>
</tbody>
</table>

**YOUR CAREER**

The specialized education in this program helps graduates get jobs in a wide variety of positions connected with:

- wireless LAN support
- wireless service providers
- cellular and broadband providers
- data centres
- enterprise system support

**ADMISSION REQUIREMENTS**

- Three-year College Diploma or Bachelor's Degree*
- Please note that Domestic applicants who are submitting International transcripts require a Canadian equivalency evaluation. This can be obtained through ICAS (International Credential Assessment Service) at icascanada.ca or WES (World Education Services) at wes.org/ca

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**INTERNATIONAL STUDENTS**

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**APPLY TO**

Domestic students should apply through Ontario Colleges.
“George Brown College allowed me to gain hands-on experience and develop networks with people in the field. Every day I use the concepts and skills I gained in the program.”

Nancy Nangia (Graduate 2008, Wireless Networking); IT Service Delivery Lead-eHealth Ontario

CONTACT US

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4 https://www.georgebrown.ca/international/futurestudents/howtoapply/
5 https://collegeapply.ontariocolleges.ca/?collegeCode=GBTC&programCode=T411&lang=en
6 https://www.georgebrown.ca/computertechnology/
7 https://www.georgebrown.ca/computertechnology/
8 https://www.georgebrown.ca/campuses/casa-loma/
9 https://www.google.ca/maps/place/146+Kendal+Ave,+Toronto,+ON+M5R+1M3/data=!4m2!3m1!1s0x882b349c7146b3f7:0x6edb6695c6d4906?sa=X&ved=0ahUKEwjvpbuOybDbAhUB7oMKHFsYDNQQ8gEikDAA
10 https://www.georgebrown.ca/computertechnology_info/
11 https://www.georgebrown.ca/campus_tours/
12 https://vt.georgebrown.ca/

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