Application for Ministerial Consent
Ontario Colleges of Applied Arts and Technology

Bachelor of Technology (Business Systems Development) (Honours)

ALGONQUIN COLLEGE | School of Advanced Technology

Submitted To: Postsecondary Education Quality Assessment Board

Submitted by: Algonquin College of Applied Arts and Technology

Date of Submission: March 2017

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Section 1: Introduction

Section 1.1: College and Program Information

Full Legal Name of Organization: **Algonquin College of Applied Arts and Technology**
Operating Name of Organization: **Algonquin College of Applied Arts and Technology**
Common Acronym of Organization (if applicable): **NA**
URL for Organization Homepage: **www.algonquincollege.com**
Proposed Degree Nomenclature: **Bachelor of Technology (Business Systems Development) (Honours)**
Location (specific address) where program is to be delivered (each location requires a location-specific consent from the Minister): **Algonquin College, 1385 Woodroffe Avenue, Ottawa, Ontario K2G 1V8**
Contact Information, Person Responsible for this Submission: **Margaret Cusson, Dean, Academic Development** **Algonquin College** **1385 Woodroffe Avenue** **Ottawa ON K2G 1V8** **Tel: 613-727-4723 ext 5345** **Fax: 613-727-7633** **Email: cussonm@algonquincollege.com**
Site Visit Coordinator (if different from above): **Jessica DeVries, Chair, Academic Development** **Algonquin College** **1385 Woodroffe Avenue** **Ottawa ON K2G 1V8** **Tel: 613-727-4723 ext 6057** **Fax: 613-727-7633** Devriej1@algonquincollege.com

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Section 1.2: Executive Summary

Proposed Credential Nomenclature:
Bachelor of Technology (Business Systems Development) (Honours)

Anticipated Program Start Date:
September 2019 – Year 1

Program Abstract

Today's global business environment requires students that have developed the ability to become technology professionals capable of creating and implementing information and communications technology solutions to achieve competitive advantages, productivity gains, and innovation. This four-year degree program prepares students for a career in business software systems development and technology management by providing skills and competencies in two closely related disciplines, technology and business. Our program curriculum provides the necessary key knowledge in software development and business technology management required by business and offers students the opportunity to use, develop, and research emerging business technologies such as mobile and wearable computing, artificial intelligence and agent technologies.

Students gain practical experience in technology project management, systems analysis and design, software development and implementation, data analysis, database technologies, operating systems, web applications and information security. When combined with knowledge of business principles, economics, accounting, internal audit and human resource management, students develop a unique skill set critical for strategic information and communications technology development environments.

Graduates have a unique blend of applied knowledge and skills in core competencies in software development and business, including the project management book of knowledge (PMBOK) and the business analysis book of knowledge (BABOK). Students gain significant hands-on experience through online, in-class, simulation-based learning experiences and experiential learning activities such as co-op work terms and interdisciplinary final year team-based projects. The combination of knowledge, skills and experience allows students to integrate quickly into the complex global technology and business workforce in entry level information communications technology positions.

The Bachelor of Technology (Business Systems Development) (Honours) program is aligned with the learning outcomes and competencies published by the Business Technology Management (BTM) standards. Algonquin College has initiated the accreditation process with BTM.

Program Learning Outcomes

1. Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.
2. Manage the process of evaluating, selecting and using business systems.
3. Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.
4. Manage data using appropriate methodologies and standards to improve business processes and decision-making.
5. Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.

6. Apply security principles and practices in systems development and the systems environment.
7. Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.
8. Apply quality assurance and quality management principles to business systems development projects.
9. Educate a diversity of clients in the use of business technology to support, promote and improve business processes.
10. Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.
11. Adhere to professional, ethical and legal codes and standards.
12. Conduct and evaluate research to contribute to evidence-based practice in business systems development.
13. Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.
14. Leverage artificial intelligence and agent technologies to support short and long term business decisions.

Curriculum Design

The curriculum has been designed to meet and exceed the honours degree level standard and provides the appropriate depth and breadth of knowledge, along with applied specialized preparation in the areas of critical thinking and scholarly research, problem solving and analysis, communications, leadership and professional capacity and autonomy within the field of Business Systems Development. The co-op work terms and culminating project courses provide further experiential learning opportunities.

The program of study is summarized below:

YEAR	SEMESTER	COURSE TITLE
YEAR 1	SEMESTER 1	MGT4102 - Business Fundamentals
		CST3100 - Introduction to Computer Programming
		CST3101 - Database Design Fundamentals
		MAT8003 - Mathematics for Programming
		ENL1100 - Communications and Academic Writing
	SEMESTER 2	ACC4101 - Financial Accounting
		CST3102 - Programming I
		CST3103 - Data Communications and Networking
		BUS0006 - Value Creation in Healthcare
		PHI1000 - Logic and Critical Thinking
YEAR 2	SEMESTER 3	ESC4300 - Basics of Supply Chain Management
		CST3104 - Introduction to Mobile Application Development
		CST3105 - Advanced Database Design and SQL
		CST3106 - Internet Architecture and Web Development
		ECO4201 - Macroeconomics
		CST3107 - Operating Systems

	SEMESTER 4	BUS0008 - Business Analytics and Advanced Business Intelligence
		QUA2000 - Statistics
		CST3109 - Business Systems Requirements Analysis
		CST3108 – Data Structures and Algorithms
		ACC4201 – Managerial Accounting
		ESC4503 - Technology Integration Using SAP
YEAR 3	**SEMESTER 5**	BUS0007 - Strategic Business Intelligence
		CST3110 - Enterprise Architecture
		CST3112 - Business Systems Design and Implementation
		CST3111 - Project Management for IT
		PSI2000 – Navigating Canada's Political Landscape
	SEMESTER 6	MGT0107 - Business Technology Management
		CST3113 – Enterprise Application Development
		CST3114 – Data Analytics
		BUS0009 – Risk Management and Strategies
		SOC2000 - Introduction to Sociology
Co-op Work Term I		
Co-op Work Term II (Optional)		
Co-op Work Term III (Optional)		
YEAR 4	**SEMESTER 7**	BUS0010 - Business Systems Security, Audit and Control
		CST3115 - Enterprise Mobile Application Development
		CST3119 – Wearable Computing
		CST3116 - Project I
		Elective
		Elective
	SEMESTER 8	MGT6120 - Entrepreneurship
		CST3118 – Business Software Agents and Artificial Intelligence
		CST3117 - Project II
		Elective
		Elective

Algonquin College's Strengths and Capacity to Deliver the Program

Algonquin College of Applied Arts and Technology was established in 1967 and was named after the First Nations people who lived in the area. Algonquin was formed from the merger of the Eastern Ontario Institute of Technology, established in 1957, and the Ontario Vocational Centre, established in 1965.

Dedication to student success is one of Algonquin College's primary guiding principles and is demonstrated in the quality of its programs, its staff, the continual expansion of its facilities, and by forging of strategic partnerships. Furthermore, the College strives to ensure students have access to

the education and skills training demanded by the marketplace to launch rewarding careers in their chosen fields.

With the success of thousands of alumni, an annual full-time enrolment of approximately 18,000 students, 40,000 part-time registrations and thousands of full-time and part-time employees, Algonquin makes a significant economic and social impact locally, regionally, nationally and internationally.

Algonquin continues to be committed to being one of the most comprehensive colleges in Ontario, offering a broad variety of programs, subject matter, delivery modes and program durations. Given that Algonquin is the only publicly-funded English-language college in Ottawa, Perth and Pembroke it services the needs of these areas and their surrounding communities. As a result, Algonquin will continue to expand its offerings which include a full range of programs including academic upgrading, apprenticeship, certificate, diploma, advanced diploma, graduate certificate and degree programs as well as corporate learning solutions and international education and projects. Algonquin's program mix evolves with the province's labour needs and this application for Ministerial Consent to offer a Bachelor of Technology (Business Systems Development) (Honours) is in response to the business sector's evolving labour needs. This application further aligns with the College's strategic direction detailed within its current Strategic Plan 2017-2022[1]. Furthermore, the program aligns with the Strategic Mandate Agreement in that 'Digital Technologies and Design' is an identified area of strength and proposed area of new program growth.

Business systems development is a new and emerging field with continuous and rapid innovation. The business sector is evolving its use of information and communication technologies (ICTs) ranging from very large and complex enterprise systems, to interactive information kiosks designed to engage and educate consumers. Strategically maximizing the benefits and use of these technologies, and the data they generate, is driving demand for a new kind of IT worker who has a solid practical understanding of software development and business technology management.

The proposed Bachelor of Technology (Business Systems Development) (Honours) program will build upon and expand Algonquin's existing strengths in advanced technology and business. The College has established a strong reputation in the delivery of high quality advanced technology and software development programming (e.g. Computer Programmer), and business (e.g. Business Intelligence System Infrastructure and the Bachelor of Commerce (e-Supply Chain Management)(Honours)). These programs are offered at various levels and through a variety of delivery modes. The proposed program complements these existing offerings and provides an opportunity for collaboration and interdisciplinary learning in these fields.

The Algonquin College School of Advanced Technology at the Ottawa Campus provides students with access to existing lab environments that will support the students' learning experience. This will provide students with an exceptional environment to engage in practical learning opportunities. The College's capacity to provide the human and physical resources required for an excellent educational experience is unsurpassed in the region. In addition, the College's ability to deliver bachelor-level education is evidenced by the success of both existing degree programs as well as collaborative degrees with local universities.

[1] http://www.algonquincollege.com/strategicplan/files/2017/01/AlgonquinStrat2017-Pages.pdf

This application details the rationale for offering the Bachelor of Technology (Business Systems Development) (Honours), the program of study to be undertaken, and Algonquin College's capacity to deliver this program with the availability of facilities, learning resources, and the technological infrastructure used to support learning. Additionally, the majority of faculty members associated with the development and proposed teaching of the program have the required terminal credentials in their respective fields. This program was developed in conjunction with Algonquin's proposed Bachelor of Technology (Digital Health) (Honours).

Opportunities for Graduates and Overview of Support and Recognition of the Program from the Profession and Other Postsecondary Institutions

During the course of developing the Bachelor of Technology (Business Systems Development) (Honours) program proposal, an in-depth labour market analysis was commissioned by the College to determine the need for the proposed program. This study concluded that there is a definite need for the degree program and that the credential will provide graduates with opportunities for advancement in the field, a field that encompasses software development, and business technology management.

Labour Market Analysis

Market Analysis: Bachelor of Technology in Business Systems Development
Prepared for Algonquin College
November 2013

In the following report, Hanover Research assesses the market for a proposed Bachelor of Technology in Business Systems Development program. The report examines student demand, labour market trends, and potential competition for the proposed program.

EXECUTIVE SUMMARY AND KEY FINDINGS
KEY FINDINGS

- **Data on current and future labour market needs suggest that Algonquin's program would succeed, though data on student demand present a more complex picture.** Indicators of labour market demand point to shortages in ICT workers who have business knowledge and experience. Thus, ICT program graduates who possess information technology competency, combined with business knowledge, will remain in high demand for the foreseeable future in Canada and Ontario. However, recent enrollment data for programs broadly related to ICT and business show only modest growth in student demand. Nonetheless, reports of rapid growth in applications to BTM programs may indicate rising demand for programs very similar to Algonquin's proposed offering.
- **Indicators of student demand show limited growth in broad business and computing fields, but stronger prospects for combined ICT/business programs.** Although recent enrolment growth in ICT programs and business programs is modest, there are limited enrolment data specifically for programs that provide thorough training in both. Emerging programs in BTM, which combine computing and business training, have seen student applications increase by 24 percent per year. Industry experts project that 12 current BTM programs will produce over 1,000 graduates per year total once mature.
- **ICT programs that provide business training will produce graduates with strong marketplace opportunities.** According to the Information and Communications Technology Council, there are "pervasive shortages" of employees with ICT backgrounds who are also familiar with business needs. Furthermore, many companies seeking to hire ICT

professionals require that candidates have previous practical experience. This demand for experience is in fact a demand for business and professional acumen that recent graduates from programs focusing only on ICT skills do not typically possess.

- **Programs that focus on ICT skills exclusively will find it increasingly difficult to place their graduates.** The supply of qualified workers for *entry-level* ICT jobs in Canada and Ontario is expected to outpace demand, even though the overall labour market demand for IT jobs is expected to grow strongly through 2016. Entry-level jobs will not be difficult for companies to fill. This is due to the popularity of computing programs and immigrant interest in related jobs.
- **Algonquin's proposed Business Systems Development program would be unique as a computing-based single degree program.** The only recognized BTM program with computing training as extensive as Algonquin's program is the University of Waterloo and Wilfrid Laurier University's double degree program in business administration and computer science. Other BTM programs tend to be based in schools or departments of business and have fewer computing requirements than Algonquin's proposed offering.
- **Algonquin's proposed co-op element would play an important role in the success of program graduates.** Since the market currently has demand for experienced ICT specialists, any ICT program should include opportunities for practical experience. Most BTM programs provide one year of co-op experience for each graduate.
- **Programs that combine business and ICT often contain individual courses that integrate business and ICT training**. Even though BTM programs draw from two different disciplines, courses may cover topics such as "E-Business Commerce," "Business Information Systems," and "Data and Knowledge Management," with a view to bringing both disciplines together in the classroom. Capstone projects or practical projects that demand the synthesis of ICT and business concepts are common.

Employer Demand Interest

The Bachelor of Technology (Business Systems Development) (Honours) Program Advisory Committee is very supportive of the proposed program and agrees with the employer demand predictions outlined in the labour market analysis. Business Systems Development is a new and emerging area of study providing unique and innovative opportunities for employers.

The labour market analysis provides the following specific references to indicators of employer interest and demand:

- According to the Information and Communications Technology Council, there are "pervasive shortages" of employees with ICT backgrounds who are also familiar with business needs. Furthermore, many companies seeking to hire ICT professionals require that candidates have previous practical experience. This demand for experience is in fact a demand for business and professional acumen that recent graduates from programs focusing only on ICT skills do not typically possess.
- Indicators of labour market demand point to shortages in ICT workers who have business knowledge and experience. Thus, ICT program graduates who possess information technology competency, combined with business knowledge, will remain in high demand for the foreseeable future in Canada and Ontario.

The Advisory Committee, as well as numerous other sector representatives, have endorsed the proposed degree. This application includes recent letters of support from prominent associations and sector affiliates, among them are Blockthrough, Curtiss Wright, CV Diagnostix, EION, Halogen, InitLive, CHEO-NSO, University of Ottawa – Health Services, Optelian, Ottawa Hospital, PCL,

Perley Rideau and Vocantas. Endorsements by the aforementioned sector affiliates provide testament to Algonquin's capacity to deliver quality programming in the field of business systems development.

Applicant Demand Interest

As noted within the labour market analysis, the proposed program provides a unique combination of knowledge and skills that is not easily comparable to other offerings. There is, however, one related college degree program that exists, Seneca's Bachelor of Technology – Software Development, which can be used to roughly assess the potential demand for this degree. The data provided in was obtained from the Ontario College Application Services.

	APPLICATION					REGISTRATION					ENROLMENT				
Applicant Year/Type	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
BOTH	286	376	404	437	460	76	75	84	99	71	81	80	88	97	65
DIRECT	136	189	226	234	208	37	34	41	46	36	39	34	39	44	31
NON-DIRECT	150	187	178	203	252	39	41	43	53	35	40	42	47	51	32

Additionally, surveys were conducted within students from Algonquin College's existing Computer Engineering Technology – Computing Science Ontario College Advanced Diploma program and the Computer Programmer Ontario College Diploma programs in 2015.

Student interest surveys were conducted to gauge how much interest Algonquin College 1st year computer science students might have in applying into the proposed Bachelor of Technology (Business Systems Development) (Honours) or (Digital Health) programs, which are being designed to share a significant percentage of courses throughout both programs. Of the 99 responses, 63 students expressed interest in the Business Systems Development program (Table 1), while 45 expressed interest in the Digital Health program (40 of those 45 students were interested in both programs). When asked, 53 students indicated that they would have enrolled in one of the two programs had it been offered when they were applying to Algonquin College. Sixty-three (63) students indicated that they plan to continue their studies at Algonquin upon completion of their current program.

The addition of the Bachelor of Technology (Business Systems Development) (Honours) to the College's existing programming would expand the educational opportunities for further academic study and lifelong learning. Graduates of the Bachelor of Technology (Business Systems Development) (Honours) program may receive consideration for admission to select graduate programs. Evidence of this is included in Section 13.

In summary, data from the labour market analysis, student surveys, and sector employers, along with trends within the ICT field affirm the need for a Bachelor of Technology (Business Systems Development) (Honours) degree program. There is strong support from community stakeholders for the proposed curriculum as well as a commitment to provide co-op placements, in-class project

experiences, and employment opportunities. It is anticipated that graduates of the Bachelor of Technology (Business Systems Development) (Honours) program will become future leaders within the ICT sector and will be sought by employers locally, provincially, nationally and internationally.

Section 1.3: Program Abstract

This four-year Bachelor of Technology (Business Systems Development) (Honours) program provides students with a foundation in both information technology development and business technology management equipping them with the knowledge and skills needed to perform in today's global business workforce. Graduates gain theoretical and practical knowledge through online, in-class, simulation-based and experiential learning activities to manage, analyze, design, develop, implement, and maintain business systems and/or components to support strategic business requirements in the global business environment. Graduates can evaluate and support key business technologies and apply standards to business systems development and technology management. Students graduate having further applied and refined their skills and knowledge while working as members of interdisciplinary teams during paid, co-operative work terms in industry. Graduates may choose to seek employment in business systems development-related roles within the private sector or government (municipal, provincial or federal) as members of the global business workforce. Graduates may also pursue further academic study in fields related to business, management information systems or information technology.

Section 2: Degree Level Summary

This section provides a summary of the program features and resources that ensure the proposed Bachelor of Technology (Business Systems Development) (Honours) program meets the Board's standard for a Baccalaureate/Bachelor Honours degree. Although the six categories are treated independently for the purposes of this discussion, the proposed degree level program integrates the elements of the standard in a holistic fashion, and creates opportunities for students to demonstrate more than one of the categories in any given performance. This alignment between the Board's standard, the proposed degree level program learning outcomes and the courses that make up the proposed Bachelor of Technology (Business Systems Development) (Honours) program was monitored throughout the development of the program (See Section 4.3: Learning Outcomes).

The outcomes of the Bachelor of Technology (Business Systems Development) (Honours) degree program are designed to deliver broadly-educated graduates who possess the general and specialized knowledge, interdisciplinary perspectives, competencies, skills and values required by industry, and who are well prepared to manage, deal with and adapt to the challenges of today's diverse and ever-changing professional work environments, within both domestic and global contexts.

For this summary, key points will be highlighted for each of the six categories of knowledge and skills that form the Board's standard for a Baccalaureate/Bachelor Honours degree.

Depth and Breadth of Knowledge

The proposed Bachelor of Technology (Business Systems Development) (Honours) is developed to provide students with the necessary knowledge and skills using a scaffolded approach to learning in a thoroughly interdisciplinary program. The program is designed with a series of curriculum components that provide a solid foundation followed by progressively multifaceted levels of knowledge, skills, competencies, and increasingly complex theory and its application to practice in the business systems development environment. While developing strong competencies in software development, strategic business thinking and business technology management is fundamental to the degree focus, the curriculum as a whole recognizes the critical requirement of ensuring that students develop a breadth of knowledge across a range of disciplines, including those outside of the core disciplines. While the core components of the curriculum allow students to gain significant depth in their specific area of study, students devote more than twenty percent (20%) of their studies to content outside of the discipline, through a combination of mandated and free elective non-core courses. This interaction with other fields of study provides students with a breadth of learning through which they continue to develop and exercise critical thinking and analytic skills. Moreover, students develop an appreciation and aptitude for a diversity of research methodologies that enable them to examine and interpret a greater array of hypotheses and assumptions beyond the specific discipline of business systems development. This ensures that graduates are cognizant of, and responsive to, their responsibilities as global citizens.

There are three areas of emphasis that will be reflected throughout the program: 1) accepted principles and methodologies of business systems software development; 2) accepted principles and methodologies of business technology management; and 3) the principles and methodologies of academic research.

The program exposes students to a spectrum of current research in the field of business systems development and engages them in faculty-mentored research through a range of applied projects, a capstone project and assignments. The first year of study provides a broad introduction to a range of current topics, methodologies and principles in business and software development that are more

fully developed throughout the program. Courses such as Business Fundamentals, Programming I, Value Creation in Healthcare, and Logic and Critical Thinking provide students with foundational principles and concepts that will be built upon throughout the program of study. The second and third years of study include a strong focus on strategic business analysis and intelligence, and advanced software development principles and techniques. The fourth year allows students to explore advanced topics in business systems development and apply their learning through research and applied work on capstone projects.

The applied nature of the program allows for an increasing depth and expectation of discussion, critical thinking, ethical problem solving and review of evidence in all of the courses. Combined with one (1) mandatory co-op work experience, and up to two (2) additional optional co-op work experiences, students develop the essential research skills to undertake the capstone research project in the final year of the program. This project will allow students to showcase their critical thinking and analytical skills within the context of the knowledge acquired throughout the program.

Conceptual and Methodological Awareness/Research and Scholarship

In the first year, students engage the building blocks of business systems development including an introduction to value creation, business fundamentals, mathematics, problem-solving, computer programming, as well as practical skills related to business, communication and critical thinking. Courses in the first year of study lay the conceptual and practical foundations students require for a thorough understanding of the complex relationship between software development and strategic business needs.

Beginning in the second year and carrying through the third year of the program, students gain further exposure to strategic business thinking and analysis, and advanced software development techniques and methodologies. Students move beyond theory to engage software development and strategic business thinking in the context of business practice. At this point in the program, problems arise and are being analyzed and solved as theoretical knowledge makes its transition into practical applications within business systems development. Through the use of varying methods of enquiry and application of current research, methodologies and practices in the discipline, students connect the pieces while designing, developing, implementing and maintaining business systems. Additionally, the core business systems development conceptual and methodological awareness is reinforced by the non-core curriculum, including a course in statistical methods, as well as upper level electives, that require students to further broaden and develop their intellectual toolbox and advance their approach to scholarly activity. Thus, non-core courses improve students' ability to develop and sustain arguments, and problem solve in and outside of the core Business Systems Development context.

The coursework in the final year of the program complements the final capstone project and introduces a number of advanced topics including entrepreneurship, software agents and artificial intelligence, as well as business systems security, audit and control. Students are also able to select two professional options courses, which will allow them to specialize in topics of interest delivered at an advanced level. The students' abilities further evolve as they are exposed to real-world business systems environments through participation in work-integrated learning experiences in co-operative education. The fourth-year project culminates much of students' acquired skills and knowledge, allowing them the opportunity to engage in much of the full spectrum of business systems development, including integration and maintenance planning and entrepreneurial activities related to their chosen projects.

The learning environment in which the students collaborate with faculty will encourage the development of logical and sustained arguments, but also the appropriate use of research. As they progress through the program, students develop a greater level of autonomy, and it is the combination of astute commentary on, and use of, scholarship in the discipline and demonstrated academic integrity in the documentation of their research that provides evidence of their intellectual growth during their studies.

Communication Skills

Within the business systems development context, communication skills are an essential foundation for success. The importance of effective communication with a variety of stakeholders representing various sectors (e.g. business, high-tech, public sector), and their related professions, has been captured throughout many of the degree level program learning outcomes. In order to prepare students for the work experiences that are part of the program, but also for employment upon graduation, the development of written and oral communication skills is threaded throughout the program with progressive levels of difficulty and exposure to discipline-, and sector-specific techniques.

Beginning with non-core courses offered during the first year of study, students examine fundamental communication and critical thinking skills that apply across a wide range of disciplines and ensure the ability to make meaningful connections with non-specialist audiences on topics of increasing complexity. Core courses like Value Creation in Healthcare, Strategic Business Intelligence, Managerial Accounting, Risk Management and Strategies, and Enterprise Architecture help students to appreciate the role of a diverse set of stakeholders. They also allow students to further develop techniques for communicating with specialists, while providing some familiarity with the issues that could arise during co-op work term(s) and applied project experiences. Advanced courses like Business Analytics and Advanced BI, Project Management for IT, Project I and II, and Entrepreneurship focus on the ability to communicate both strategically and tactically, each of which is an integral part of obtaining and maintaining employment. These courses provide students with additional techniques and concepts to help them meet the expectations they will encounter in the workforce.

Beyond specific courses that address communication skills, the need for effective communication of structured and coherent arguments is built into many of the courses through the assignments. Whether in the form of presentations, lab reports, technical reports, or seminars, students are expected to present and document their research findings in a manner that is consistent with the professional requirements of the discipline.

Application of Knowledge

The proposed Bachelor of Technology (Business Systems Development) (Honours) program integrates theoretical knowledge with practical applications throughout the program. The curriculum is designed to provide numerous opportunities for students to demonstrate the practical integration and application of understanding, knowledge, skills and competencies acquired throughout the program to help them develop a strong foundation in the profession. For example, the program includes the integration of practical lab components in several courses. This provides students with multiple opportunities to apply their skills in real-world settings. Applied research opportunities, guest speakers, case studies and collaborative partnerships are major learning strategies integrated into the program to encourage the application of higher-level learning via the application of knowledge.

Technology plays a crucial role in the program as a tool for the collection, interpretation, storage, communication, and presentation of ideas and data. Students begin with common tools that are used across a number of disciplines and continue to develop expertise with software development tools and applications in a variety of contexts. In subsequent years, students work with more discipline-specific tools and software as they evaluate increasingly complex business systems that can involve an integrated array of business systems components. Students demonstrate the culmination of knowledge and applied learning in a full year capstone project that provides them with in-depth learning experiences.

Moreover, the program is structured to prepare students for progressive levels of responsibility in their work experiences. The mandatory co-op work experience allows students to bring together the knowledge and skills developed over the first three years of the program. It exposes students to the real life work environment to help develop professional communication skills, technical problem-solving abilities and a respect and understanding of project delivery timelines. Through the lens of real-world experience, the application of concepts and principles from within and outside the discipline is understood as a necessary component of success in the workplace. Two additional optional work-terms are possible following the completion of the mandatory co-op work-term, providing further opportunities to reinforce the application of knowledge. Over the fourth year of the program, work experience merges with more advanced theories and concepts to prepare students for increased responsibility and leadership development, as determined by their more developed ability to make sound judgments, propose solutions, and solve problems. Fourth-year project courses challenge students to apply their accumulated knowledge and skills to real-world projects in business systems development.

Professional Capacity/Autonomy

As a discipline driven by professional reputation, and one that relies heavily on the autonomy and integrity of its practitioners, this category of the Board's standard has been deeply integrated into the program of study as indicated by the following degree level program learning outcomes:

1. Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.
2. Manage the process of evaluating, selecting and using business systems.
3. Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.
4. Manage data using appropriate methodologies and standards to improve business processes and decision-making.
5. Apply the Project Management Institute’s Body of Knowledge to business systems software engineering projects.
6. Apply security principles and practices in systems development and the systems environment.
7. Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.
8. Apply quality assurance and quality management principles to business systems development projects.
9. Educate a diversity of clients in the use of business technology to support, promote and improve business processes.
10. Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.
11. Adhere to professional, ethical and legal codes and standards.

12. Conduct and evaluate research to contribute to evidence-based practice in business systems development.
13. Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.
14. Leverage artificial intelligence and agent technologies to support short and long term business decisions.

While certain courses within the program play a much stronger role in supporting these program learning outcomes, they are threaded throughout the program of study and are integral to the co-op work term and culminating project courses in the final year. In addition, teamwork is an important part of the program from the very beginning, and problem-based learning is used as an instructional methodology throughout the four years of the program. Both of these approaches support qualities and transferable skills, such as the ability to solve problems and make decisions in complex contexts, which will position graduates to contribute in and beyond their employment.

Finally, non-core courses for the program have been included to support and encourage a broader intellectual engagement with not only the local community, but also the global community as it continues to grow and evolve. Students develop a sense of personal responsibility and accountability within an inclusive, reflexive and critical civic discourse that is the hallmark of a bachelor's degree level education.

Awareness of Limits of Knowledge

From the beginning of the program, students are faced with the uncertainty, ambiguity, and limits of knowledge due to the constantly evolving nature of the field. In order to deal with change effectively and professionally, students develop a firm awareness of their roles within an integrated educational or project-oriented team. Moreover, the program of study takes into account the continuous pace of change and its impact on the increasing complexity of problems in business systems development by encouraging open-minded and creative thinking.

Courses are structured to introduce students to a number of core learning principles, legislative and regulatory guidelines, professional values, and theoretical perspectives that influence the business systems profession. Though widely used, there are varying degrees of certainty surrounding the use and application of these principles, guidelines, values and perspectives. Uncertainty is then connected to real world applications, through case studies and simulation activities that are embedded throughout the program as a means of assessing, interpreting and ultimately adapting approaches to problem solving. Students are made aware of the uncertainty, ambiguity, and limits of knowledge when interpreting others' research, and also when designing and undertaking their own research activities. Working in both a people and technology-oriented profession imposes additional levels of ambiguity and unpredictability. Students must be aware of these conditions of knowledge so that they can develop strategies to address the various challenges they introduce in practice.

Through iteration and a gradual increase in problem solving complexity, the Bachelor of Technology (Business Systems Development) (Honours) program presents students with learning opportunities that reinforce the many ways that knowledge is limited, ambiguous and uncertain. Students develop an appreciation that each problem must be faced as a unique challenge, often requiring the development of new research, theories and methodologies, new interpretations of old data, and new appreciations for the complex interactions typical of interdisciplinary knowledge use environments.

Section 3: Admission, Promotion, and Graduation

The requirements for admission are appropriate to the learning outcomes of the program and the degree level standard. The Bachelor of Technology (Business Systems Development) (Honours) meets the minimum admission requirements stipulated for a bachelor's program. An Ontario Secondary School Diploma or equivalent and six university or university/college courses are required at the Grade 12 level with a minimum overall average of 65% as per the benchmark, along with a minimum grade of 60% for the required Grade 12 (U) or (M) courses. Should the number of qualified applicants exceed the number of available places, applicants will be selected based on academic achievement on the basis of their proficiency in English and Mathematics. Admission procedures are further outlined in Policy AA04: Admissions.

Section 3.1: Admission Requirements for Direct Entry

	Program Admission Requirements

Academic	• Ontario Secondary School Diploma (OSSD) or equivalent.
	• A minimum of six (6) Grade 12 U or M courses including two (2) required U or M level courses and four additional U or M level courses
	  • The following Grade 12 courses, or equivalent, are required:
	  • one Grade 12 U or M English course
	  • one Grade 12 U or M Math course
	  • Four (4) other Grade 12 U or M courses
	  • A grade of 60% in the required courses and an overall average of 65% in the six Grade 12 U or M courses. (Ontario Academic Courses (OAC) can replace or be used in combination with U or M courses.)
	• Applicants with International transcripts must provide proof of either: IELTS-International English Language Testing Service-Overall band of 6.5 with a minimum of 6.0 in each band; OR TOEFL-Internet-based (iBT)-overall 90, with the minimum in each component: Reading: 22; Listening: 22; Speaking: 24, Writing: 22
	• Applicants who do not possess the required English credit (ENG 12U or equivalent) with a minimum of 60% will be considered for admission upon registration in a preparatory English course to be offered by Algonquin College prior to the start of the program. Students must achieve a minimum of 60% final mark in the course prior to the start of the program.
	• Should the number of qualified applicants exceed the number of available places, applicants will be selected on the basis of their proficiency in English and Mathematics.

Related work/volunteer experience	N/A
Other (e.g., portfolio, specialized testing, interview, G.R.E., etc.)	N/A

Section 3.2: Admission Policies and Procedures for Mature Students

Mature student admission requirements are as follows:

Mature student admission requirements are noted below: Requirements for mature students *(19 years of age or older and without a high school diploma at the start of the program)*	• Mature students are applicants who have not achieved the Ontario Secondary School Diploma (OSSD) or its equivalent and who are at least 19 years of age on or before the commencement of the program in which they intend to enroll. Mature students have demonstrated academic abilities equivalent to those of Ontario high school graduates, verified by successful completion of courses at the postsecondary level and meeting the following criteria: • Grade 12 U or M English • Grade 12 U or M Mathematics • Four additional Grade 12 U or M courses • A minimum grade of 60% required in each course and an overall average of 65% in the six Grade 12 U or M courses. (Ontario Academic Courses (OAC) can replace or be used in combination with U or M courses.)

The electronic policies file (Section 16: Policies) includes policies and procedures pertaining to the admission of mature students within the following:

Policy AA04: Admissions

Section 3.3: Promotion and Graduation Requirements

Policies governing academic remediation, sanctions and suspension for students who do not meet minimum achievement requirements are detailed broadly in Policy AA39: Program Progression and Graduation Requirements. Individual course outlines specify course and/or program specific promotion requirements as well as requirements for supplemental exams where available. Policy AA14 provides details on the College's Grading System that are easily understandable, meaningful and convertible to other postsecondary institutions and employers through the use of designated percent, letter and numeric grade equivalents. The Grading System also allows for a Grade Point Average (GPA) calculation here described:

The grade point average is a weighted average. It is calculated as follows:

Each course is designated as having normative total instructional hours that is the designated number of hours within which the course learning requirements may be achieved, regardless of variations in delivery. The number of grade points per course is determined by multiplying the normative total instructional hours of the course by the numeric value of the grade earned in that course. The resulting number is called the grade point total. The grade point total is divided by the total number of normative instructional hours for courses with grades having numeric value. For the purpose of this calculation, a grade of "F" has a value of "0". The resulting quotient is the grade point average.

$$\frac{\text{Grade Point Total}}{\text{Total Normative Hours}} = \text{Grade Point Average (G.P.A.)}$$

Policy AA26: Course Outlines and Course Section Information, includes provisions to ensure that regardless of the grading scheme, grades for acceptable performance correspond to student work that demonstrates the degree level standard has been achieved through alignment with degree level program outcomes and course learning requirements. Furthermore, the evaluation methods or instruments are linked directly to the course learning requirements being addressed in the course.

The proposed Bachelor of Technology (Business Systems Development) (Honours) program promotion and graduation requirements have been aligned to meet the benchmark requirements depicted in the following table:

Program Requirement	Level of Achievement	
	Promotion	Graduation
Minimum overall average acceptable achievement in non-core requirements	**C- (60-62%)**	**C- (60-62%)**
Level of overall achievement expected in the core discipline(s) of study	**C (63-66%)**	**C (63-66%)**
Co-op Work Terms	**Pass**	**Pass**
Minimum overall acceptable achievement for progression (across all degree requirements, including the breadth and discipline-related requirements)	**C- (60-62%)**	**C- (60-62%)**

Several policies govern promotion and graduation requirements. The electronic policies file (Section 16: Policies), includes policies and procedures pertaining to the promotion and graduation requirements within the following:

Policy AA13: Evaluation of Student Learning
Policy AA14: Grading System
Policy AA26: Course Outlines and Course Section Information
Policy AA39: Program Progression and Graduation Requirements
Policy AA40: Academic Advising

Section 3.4: Advanced Standing Policies and Requirements

Options for advanced standing and credit recognition, with well-established policies available to detail procedures and eligibility requirements, are available to students.

Degree Completion Arrangements

Numerous pathways were examined with diploma and advanced diploma programs related to the degree program. After close scrutiny of affiliated programs, it was determined that there are two main reasons that pathway options are limited for this program. First, the Bachelor of Technology (Business Systems Development) (Honours) degree is a mix of business technology management and software development. In order to provide a balanced program of study, and to properly align courses to account for the overall learning objectives, both of those knowledge areas is spread throughout the four years, rather than by semester. Second, this program was developed in conjunction with another proposed degree program at Algonquin College, namely the Bachelor of Technology (Digital Health) (Honours). In the development of both proposed degree programs, it was felt that there was significant overlap in the early parts of program and the development encouraged a common first year, as well as additional shared courses throughout the remainder of the program. The results limit pathway options for anyone entering from a “single knowledge domain” program, such as computer science. This is because equivalent credits tend to be recognized for courses throughout the four years of our program of study. Additional pathways and articulations may be explored and created, as appropriate, throughout the period of consent of Bachelor of Technology (Business Systems Development) (Honours).

Graduates from the Computer Engineering Technology – Computing Science Ontario College Advanced Diploma program would receive credit for 14 courses towards advanced standing within the proposed degree. The positioning of the courses do not allow for a smooth entry point into the degree program. Instead, a customized program of study, including a combination of reach back and reach forward courses, would be designed for graduates of this program.

Graduates from the Computer Programmer Ontario College Diploma program would receive credit for 14 courses towards advanced standing within the proposed degree. The positioning of the courses do not allow for a smooth entry point into the degree program. Instead, a customized program of study, including a combination of reach back and reach forward courses, would be designed for graduates of this program.

Students entering from either of these programs will be able to complete the degree program in approximately 2.5-3 years.

Graduates from other technology or business credentials will be also considered for advanced standings based on a program-by-program assessment.

Table: Admission Details for Degree Completion Arrangements

Program Of Non-Degree Study	Courses Students Receive Towards the Degree	Special Requirements For Entry Into Arrangement	Point of Entry Into the Degree Program
1. **Computer Engineering Technology – Computing Science** Ontario College Advanced Diploma	14	An overall GPA of 2.7 (70%) minimum	*
2. **Computer Programmer** Ontario College Diploma	14	An overall GPA of 2.7 (70%) minimum	*

* As noted above, the sequencing of courses did not allow for a smooth point of entry.

The gap analysis (See Section 4.10: Gap Analysis) for each program of prior study demonstrates the means by which the degree program learning outcomes are met.

Advanced placement based on prior learning assessment is feasible with the understanding that degree program Prior Learning Assessment and Recognition (PLAR) candidates can be awarded no more than fifty percent (50%) of the total number of hours of the program of study based on PLAR. The eligibility criteria and procedures for PLAR are detailed in Policy AA06: Prior Learning Assessment and Recognition (PLAR).

The electronic policies file (Section 16: Policies) includes policies and procedures pertaining to advanced standing within the following:

Policy AA 05: Advanced Standing
Policy AA 06: Prior Learning Assessment and Recognition (PLAR)
Policy AA 09: Transfer of Academic Credit (Internal)
Policy AA 10: Transfer of Academic Credit (External)

Section 4: Program Content

This section, with its subsequent sub-sections of supporting material, demonstrates the rigor, breadth and depth that have been built into the proposed Bachelor of Technology (Business Systems Development) (Honours) program to ensure that the program is consistent with the degree level standard. The supporting materials speak to all twelve (12) of the Board's benchmarks for program content.

Throughout the development of the program, the degree level standard and the Board's benchmarks have been a constant reference point. In fact, the decision to undertake the development of the proposed Bachelor of Technology (Business Systems Development) (Honours) program was based not only on the employer demand for graduates in this discipline, but also on the natural alignment between the field of practice and the degree level standard. Business systems development, as a discipline, is based on a balance of interdisciplinary theory and practice therefore the program needs to follow suit in order for graduates to be prepared for employment. The development has also adopted a layered approach where each consecutive year of study adds complexity to the knowledge and skills from previous years. Each year of the program includes at least one course from each of the two knowledge domains that contribute to the overall business systems development knowledge and skill base—business systems software development, and business technology management—ensuring students obtain a balanced focus on each domain, and integrate the nature of current knowledge in these areas.

The fourteen program learning outcomes are based on research examining various postsecondary institutions within North America, and core competencies identified by professional organizations (e.g. CIPS), as well as feedback from industry partners through our Program Advisory Committee (PAC). During focus group activities PAC members identified the skills, knowledge and attributes desirable in graduates.

As a discipline, there currently are no accreditation or certification bodies required for entry to practice for the degree program graduates. However, we are seeking accreditation for the program from the Canadian Information Processing Society (CIPS), under their Business Technology Management designation (see Section 4.2 for more details).

The program of study has been designed for the achievement and demonstration of the learning outcomes that describe the knowledge and skills of graduates. The proposed program strikes a realistic balance for the time spent on content that is appropriate to the stated learning outcomes. No single knowledge domain within the discipline takes precedence over another and as students move through the co-op work experience(s) and into the final year of study, there is increased emphasis placed on using a variety of knowledge, skills and attitudes to solve current and emerging problems in the discipline. To further prepare students for their work experience and future employment, a wide range of assessments are built into the courses that are a part of the proposed program of study. These assessments are aligned with the outcomes for each course (See Section 4.7: Course Outlines) to ensure that there is ample demonstration of stated outcomes and that students have consistent, regular, and meaningful feedback on their achievement levels.

It is, however, the co-op work experience(s) and fourth-year capstone project that provides students with the most information about their ability to apply knowledge and skills in practice and their direction for future studies both within and beyond the program. The fourteen-week co-op work term and two (2) additional optional co-op work terms, situated between the third and fourth years of

study (See Section 4.6: Work Experience) allows students to connect their expanding knowledge and skills to the workplace. The capstone project allows students to continue building on that work-integrated learning approach by defining and developing a substantial piece of work in student teams. The articulated outcomes for the co-op work experience(s) and capstone project speak to a progression in responsibility and performance as students move towards graduation. At the same time, the assessment methods that are in place call upon the knowledge from both the core courses and the substantive and current content presented in the non-core curriculum.

The breadth requirement for the proposed Bachelor of Technology (Business Systems Development) (Honours) program adheres to the Board's benchmarks for balancing core and non-core studies, but it also benefits the graduates and the broader community of which the graduates will be a part. This is possible through the development of detailed, focused, non-core courses that, in addition to providing elective choices, demonstrate a serious commitment to the transferable skills found in a variety of modes of analysis outside the core field of study. Students have access to breadth and depth in their non-core studies. The learning opportunities in mandatory non-core courses ensure that students develop more than an introductory knowledge in a range of disciplines. Beginning in the first year, communication skills, quantitative reasoning and critical thinking are addressed in discrete courses, and the development of this knowledge and these skills are encouraged throughout the program. Using these skills, students have the opportunity through other mandatory non-core courses (e.g., Introduction to Sociology) and free electives to develop an understanding of a variety of content areas that will further enhance their future work in diverse settings. Content related to Ontario and Canada will play a substantial role in content area examination, but the realities of a global marketplace are also a part of the current knowledge in the breadth studies.

The Program Advisory Committee has provided additional assurance that the appropriate levels of Ontario and Canadian content are in place throughout the entire program, in core, non-core and the co-op work term. These experts in the field, employers and sector representatives have confirmed the currency of the curriculum and its relevance to the field. Moreover, they have unanimously endorsed the program (See Section 4.1: Program Advisory Committee).

Section 4.1: Program Advisory Committee

The Bachelor of Technology (Business Systems Development) (Honours) Program Advisory Committee (PAC) met three times between June 2014 and March 2015. The following table contains the membership of the Bachelor of Technology (Business Systems Development) (Honours) PAC.

Name, Occupation	Employer	Related Credentials	Professional Affiliations
Alain Cadieux	Manager, New Initiatives Team, Shared Services Canada	Bachelor of Business Administration	Supply Chain Expert Community
Andy Zeitz	Business Technical Consultant, Kinaxis	CPIM, CSCP	Leadership Think Tank, APICS CSCP
Bill Wark	Account Manager, Cisco Systems	Bachelor of Commerce	Ottawa Technology Network
Bruce Shepley	Director, Operations and Maintenance, PWGSC	Bachelor of Arts, Business	IKM Executive Network, The Enterprise Architecture Network
Kathleen Iwaskow	Manager, ITMS, Information Technology Services Branch 819-956-4959 MKathleen.Iwaskow@tpsgc-pwgsc.gc.ca	B.A Hons Cmmn, P.M.C., ITIL, CMM, I.S.P.	N/A
Matthew Colwell	Manager, Address and Delivery Systems, Canada Post (613) 734-6618	Bachelor of Science, Computer Science	N/A
Phil Dana	Business Development Director, Global Government Customer Solutions	Project Management Office Certified (PMOC)	DAMA International
Russell Trigg	Director, Enterprise Business Systems Operations, Nordion 613-592-3400	Bachelor of Science, Mathematics	N/A

Language for formal motion of support:

RESOLUTION: There was definite support from the PAC. MOVED and SECONDED: Bruce Shepley and Bill Wark that the Bachelor of Technology – Business System Development Advisory Committee has reviewed the curriculum as presented for the Bachelor of Technology – Business System Development Program, supports the need for this program in the community, and recommends this program for approval to the President's Council and to the Board of Governors.

Information and Communications Technology Department
Program Advisory Committee (PAC) for
Bachelor of Technology Business Systems Development

WEDNESDAY, JUNE 11, 2014, 4:00-6:00P.M. ROOM T106

Committee Members:

		Present	Regrets
Alain Cadieux	Manager, New Initiatives Team, Shared Services Canada		x
Andy Zeitz	Business Technical Consultant, Kinaxis	x	
Bill Wark	Account Manager, Cisco Systems	x	
Bruce Shepley	Director, Operations and Maintenance, PWGSC	x	
Kathleen Iwaskow	Manager, ITMS, Information Technology Services Branch	x	
Matthew Colwell	Manager, Address and Delivery Systems, Canada Post	x	
Phil Dana	Vice President, Marketing, BMB Data Consulting	x	
Russell Trigg	Director, Enterprise Business Systems Operations, Nordion	x	

Algonquin staff:

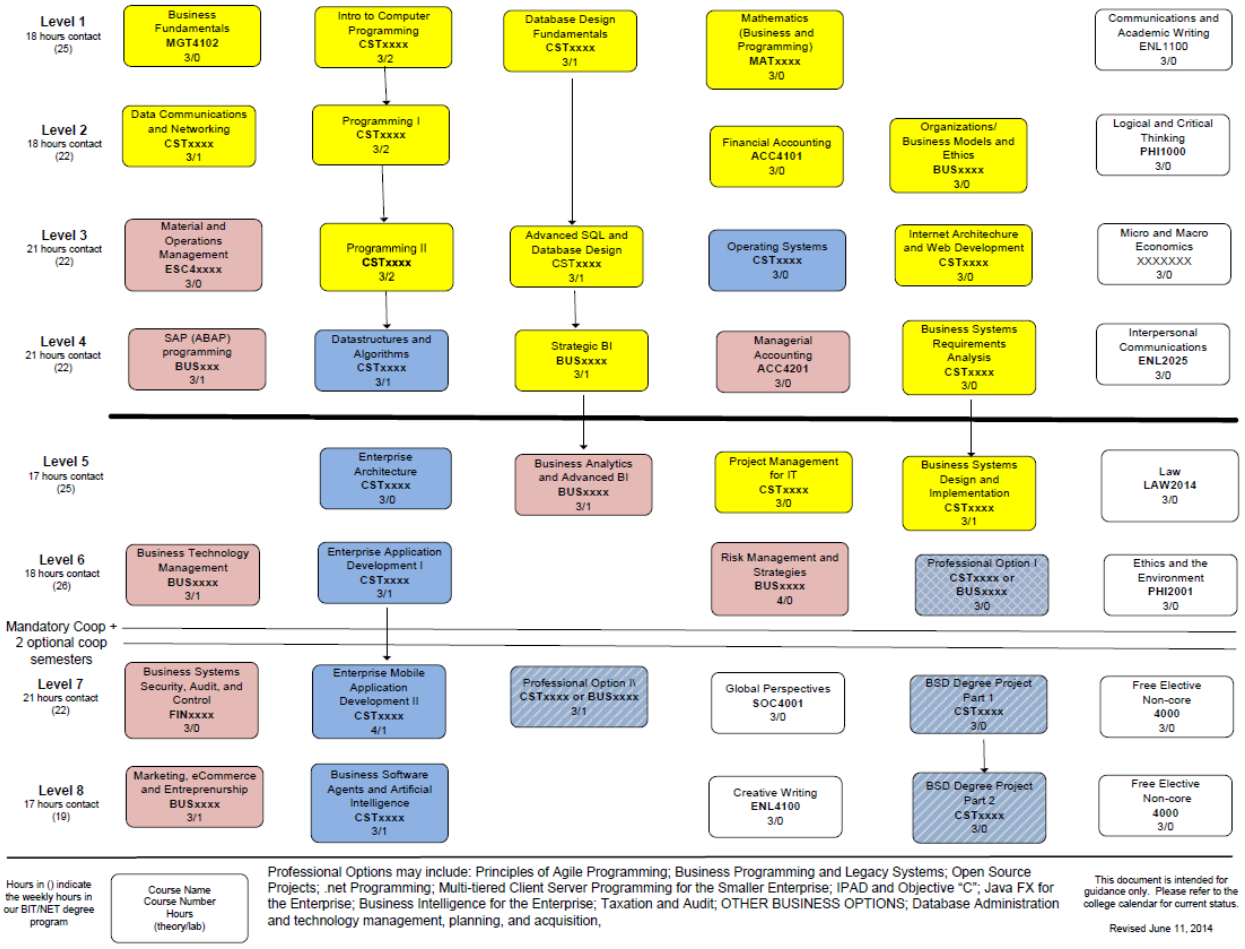
		Present	Regrets
Andy Pridham	Chair, ICT Department	x	
Jason Millar	Content Expert, Digital Health	x	
Jo-Ann Aubut	Dean, Academic Development		x
Lisa Taylor	Chair, Financial, Office and Legal Studies		x
Margaret Cusson	Chair, Academic Development		x
Marlene Tosh	Chair, Specialty Nursing	x	
Peter Fortura	Acting Dean, Business Administration	x	
Reg Dyer	Program Coordinator, Computer Programmer	x	
Stephen Murphy	Curriculum Support Services		
Victoria Guitard	ICT Dept. Secretary	x	

	KEY POINTS/ACTION REQUIRED
1.	**Welcome and Introductions:** Round table introductions were given by all. A. Pridham thanked everyone for attending and serving on the committee.
2.	**Purpose of PAC and Objectives:** A. Pridham gave an overview of the program. Bachelor of Technology Business Systems Development is a four year degree program. It is collaborative with the ICT and Business Departments, and has a proposed degree in Digital Health. The objective of the meeting was to consult with external members and have them provide input to the College about program content.
3.	**Overview of Market Need:** The College is continuously looking at the needs of the market. R. Dyer shared that a market study indicated a significant desire for a graduate with an information technology and business background. There are other educational institutes in this marketplace; however Algonquin stands unique due to the strong programming curriculum and focusing mainly on business systems development.
4.	**Degree Requirements:** Post-Secondary Education Quality Assessment Board (PEQAB) requirements: • Breadth and depth at an "Honours" Bachelor Degree level • Minimum of 1800 hours (40 courses @ 45/hrs.) • Minimum 50% of the faculty must have PhDs • Minimum 20% of the program of study must be in non-core/breadth courses • Minimum of one mandatory Co-op education experience • Benchmarks (Content, credential recognition, non-duplication, economic need, etc.) • Degree Level Learning (Breadth and depth of knowledge, communication skills, etc.) The degree approval process is two years in development. The proposed timeline for delivery is September 2017. Factors that evaluate program viability include employer demand, student demand, and cost (space, equipment, staff, licensing). **Action: The PAC is encouraged to recommend subject matter experts with a PhD for input on course development and delivering courses. Course development would begin in September – December 2014 timeframe.**
5.	**Proposed Curriculum:** Please see Appendix 1- Program Progression Chart. The first four semesters build a solid technical background in basics of programming, database management, and starting the foundation of a business skill set. Building a strong technical foundation can potentially lead to a security stream. The curriculum shares a close relationship with the Digital Health degree development program (in-process parallel to BT-BSD) which may lead to a common first year or shared courses. • 70% face-to-face delivery and 30% online/hybrid delivery • Delivery will consist of hands-on learning, teamwork, and practical experiences.

	• Will be delivered in a mobile learning environment. BYOD – Bring Your Own Device. • One project course spanning two semesters - vision is implementing through Applied Research. • Strong focus on programming, analysis design, and business terminology and knowledge. • Hardware/software include: Oracle, My SQL, Enterprise Architecture, typical business programming languages, etc. • Co-op (paid): One mandatory semester after semester 6, plus two optional semesters. • Initial intake: 48-60 students. Intake will increase as demand grows. • Suggestions to the curriculum were made such as incorporating Social Media and Human Resources software. All PAC members agreed there was a strong need for a graduate with this skill set. **Action: Future role for PAC members is to foster co-op opportunities and review the POS for program content (course descriptions).**
6.	**Next steps:** It is expected that this Fall we will require further PAC involvement and discussions. The Final PRC in February/March 2015 will require a motion by the PAC to endorse the program. The next meeting will be scheduled in November 2014. In the meantime, the PAC will be encouraged to partake on a discussion forum. In the next meeting, an election for a Chair of the Committee will be held. The role will be nominated to an external member, and consist of conducting meetings, creating an agenda, reviewing minutes, and producing an annual report. **Action: A. Pridham is to create a discussion forum for all PAC members to use.** **Action: PAC to host an election for a Chair of the Committee in the next meeting.**

Appendix 1

Bachelor of Technology (Business Systems Development) - 9999X 2016-2017



Information and Communications Technology Department
Program Advisory Committee (PAC) for
Bachelor of Technology Business Systems Development

WEDNESDAY, MARCH 19, 2015 4:00-6:00 P.M. ROOM T106

Committee Members:

		Present	Regrets
Alain Cadieux	Manager, New Initiatives Team, Shared Services Canada		x
Andy Zeitz	Business Technical Consultant, Kinaxis		x
Bill Wark	Account Manager, Cisco Systems	x	
Bruce Shepley	Director, Operations and Maintenance, PWGSC	x	
Kathleen Iwaskow	Manager, ITMS, Information Technology Services Branch		x
Matthew Colwell	Manager, Address and Delivery Systems, Canada Post	x	
Phil Dana	Vice President, Marketing, BMB Data Consulting		x
Russell Trigg	Director, Enterprise Business Systems Operations, Nordion	x	

Algonquin staff:

		Present	Regrets
Andy Pridham	Chair, ICT Department	x	
Jason Millar	Content Expert, Digital Health		x
Jo-Ann Aubut	Dean, Academic Development		x
Lisa Taylor	Chair, Financial, Office and Legal Studies		x
Margaret Cusson	Chair, Academic Development		x
Marlene Tosh	Chair, Specialty Nursing		x
Peter Fortura	Acting Dean, Business Administration		x
Reg Dyer	Program Coordinator, Computer Programmer	x	
Stephen Murphy	Curriculum Support Services	x	
Victoria Guitard	ICT Dept. Secretary	x	

	KEY POINTS/ACTION REQUIRED
1.	**Welcome and Introductions:** A. Pridham thanked everyone for their contribution and attending the meeting. Round table introductions were given by all.
2.	**Approval Process:** The PAC reviewed the approval process. We are currently well advanced in the internal approval step. The main purpose of this meeting is to review the final program of study and receive endorsement from PAC members.

3.	**Program of Study:** Approx. 70% of the curriculum is shared with Bachelor of Technology – Digital Health. The curriculum has been designed to allow students to switch between streams. There is a common first year and common courses throughout all Levels. The programs are structured to achieve the Business Technology Management (BTM) accreditation. Across Canada there are approx. 11 programs recognized as BTM accredited. BT-BSD is unique from all of the programs due to how we assembled business systems development with digital health and the way we integrated business. By meeting BTM accreditation we expect to also meet the Canadian Association of Information Technology Professionals (CIPS) accreditation. Students would achieve the degree, CIPS and BTM accreditation which are beneficial to students and the industry. **Program Curriculum:** The PAC reviewed the program description. This is key to capturing students' attention by stating what makes this program unique from similar programs in other institutions. Co-op and real-world projects through our Applied Research Department are highlighted. Our practical approach and hands-on learning opportunities are recognized by students and the industry. The PAC reviewed the program flow chart and courses. There is a one (1) semester mandatory Co-op, followed by two (2) optional Co-op semesters. The optional opportunity is available dependent on employer and student demand. The Co-op occurs after semester 06, which provides a skillset that will be extremely valuable for employers. Semesters 01-04 provide students fundamental coverage of programming, database, systems analysis, and design plus the fundamentals of business. The curriculum beyond semester 04 is more complex and covers project management, strategic business intelligence, and technology integration. Students are exposed to business requirements and the benefits of the linking business with technology. The business components include risk management, strategies, business system security, technology management, audit and control, entrepreneurship, and data analytics. The PAC reviewed the course descriptions and course learning requirements. The documents include in depth details such as course codes/titles, pre and co requisites courses, number of hours, and employment opportunities. The program learning outcomes (PLO) specifically relate to the skills students will be equipped with upon graduation. The depth will vary in each course and the PLO's are mapped throughout all courses to ensure they are met. The PAC acknowledged the importance of embedding the health care in semester 02 to attract students to that stream or keep current students interested. **Marketing:** The program is attractive to all genders. It is ideal to have the program marketed under both Advanced Technology and Business. We will test market the current cohort of Algonquin technology students through a survey to assess student demand. We are currently evaluating the process of students transferring into BT-BSD after completing a three-year diploma. Pathways will be made with local universities to ensure graduates would be accepted to programs at the master's level.

4.	**Formal Motion of Support:** Absent members will be solicited for their endorsement by email. At the meeting, the four (4) committee members present unanimously endorsed the following motion. RESOLUTION: There was definite support from the PAC. MOVED and SECONDED: Bruce Shepley and Bill Wark that the Bachelor of Technology – Business System Development Advisory Committee has reviewed the curriculum as presented for the Bachelor of Technology – Business System Development Program, supports the need for this program in the community, and recommends this program for approval to the President's Council and to the Board of Governors.
6.	**Next steps:** The PAC members will be kept up to date within the approval process. They will be contacted in the future regarding endorsement for co-op and future involvement.

The following are electronic emails of support from Program Advisory Committee members that were unable to attend the scheduled meeting:

From: Andrew Pridham [mailto:pridhaa@algonquincollege.com]
Sent: Tuesday, March 24, 2015 10:42 AM
To: alain.cadieux@ssc-spc.gc.ca; Andy Zeitz; Kathleen.Iwaskow@tpsgc-pwgsc.gc.ca; Dana, Philip
Cc: Victoria Guitard
Subject: BT-BSD PAC Resolution

Dear PAC Members,

I'm sorry you couldn't attend our PAC Meeting that took place on 19 March. At that meeting, the four committee members present endorsed the following resolution which will be carried forward at further stages of the approval process:

> RESOLUTION:
>
> MOVED and SECONDED: Bruce Shepley and Bill Wark that the Bachelor of Technology – Business System Development Advisory Committee has reviewed the curriculum as presented for the Bachelor of Technology – Business System Development Program, supports the need for this program in the community, and recommends this program for approval to the President's Council and to the Board of Governors.

Please review the attached materials and consider whether you could similarly endorse that resolution. A response this week by email would be appreciated.

Andrew (Andy) Pridham, P.Eng.
Academic Chair, Information and Communications Technology Department
Algonquin College | Room T307a, | 1385 Woodroffe Avenue | Ottawa | Ontario | K2G 1V8 |
www.algonquincollege.com
Tel (613) 727-4723 ext 6190
Fax (613) 727-7695

From: Kathleen Iwaskow [mailto:Kathleen.Iwaskow@tpsgc-pwgsc.gc.ca]
Sent: Tuesday, March 31, 2015 9:55 AM
To: Andrew Pridham; Alain Cadieux; Dana, Philip
Cc: Victoria Guitard
Subject: RE: BT-BSD PAC Resolution - Request #2

Good morning all,

I have reviewed the documents and fully endorse the resolution.
Kat

Kathleen Iwaskow (B.A Hons Cmmn, P.M.C., ITIL, CMM, I.S.P.)
Gestionnaire |Manager
Services de la gestion de sécurité en TI (SGSTI) | Information Technology Security Management Services (ITSMS) Division
Gestion de l'intégration d'entreprise (GIE) | Enterprise Integration Management (EIM) Directorate
Direction générale des services de gestion des applications et services opérationels de technologie informatique | Soutien en service/In-Service Support |Direction générale des services d'infotechnologie | Information Technology Services Branch
Travaux publics et services gouvernmentaux Canada | Public Works and Government Services Canada
Portage III - 1A1 # 30
11, av. Laurier, Gatineau QC K1A 0S5 | 11 Laurier Ave., Gatineau QC K1A 0S5
Kathleen.Iwaskow@tpsgc-pwgsc.gc.ca
Téléphone | Telephone 819-956-4959
Télécopieur | Facsimile 819-956-5979
Gouvernement du Canada | Government of Canada

From: Andy Zeitz [mailto:azeitz@kinaxis.com]
Sent: Wednesday, March 25, 2015 8:56 AM
To: Andrew Pridham
Subject: RE: BT-BSD PAC Resolution

Hello Andrew,

This looks good to me. I approve. Looking forward to the next meeting.

Andy Zeitz, CPIM, CSCP
Senior Solution Consultant

O: (613) 592-5780 x5362 | M: (613) 558-0719

Section 4.2: Professional Accreditation

BTM is a Canadian Information Processing Society (CIPS) accreditation for technology management programs. The accreditation was developed in 2009, making it a relatively new designation. There are currently eighteen (18) BTM accredited programs at Canadian Colleges and Universities. Algonquin College is in the process of pursuing BTM accreditation for the proposed Bachelor of Technology (Business Systems Development) (Honours) program. BTM accreditation can only be finalized once the program graduates its first cohort of students, at which time the program is audited by CIPS. BTM accreditation will give our graduates the opportunity to gain membership as professional CIPS members with BTM certification.

Section 4.3: Learning Outcomes

The proposed Bachelor of Technology (Business Systems Development) (Honours) has been developed to meet the following degree level program learning outcomes:

The graduate has reliably demonstrated the ability to:

1. Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.
2. Manage the process of evaluating, selecting and using business systems.
3. Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.
4. Manage data using appropriate methodologies and standards to improve business processes and decision-making.
5. Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.
6. Apply security principles and practices in systems development and the systems environment.
7. Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.
8. Apply quality assurance and quality management principles to business systems development projects.
9. Educate a diversity of clients in the use of business technology to support, promote and improve business processes.
10. Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.
11. Adhere to professional, ethical and legal codes and standards.
12. Conduct and evaluate research to contribute to evidence-based practice in business systems development.
13. Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.
14. Leverage artificial intelligence and agent technologies to support short and long term business decisions.

Alignment of Program Learning Outcomes with Degree Level Standard

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
1. Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	X	X	X	X	X		X	X	X			X		X	

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
2. Manage the process of evaluating, selecting and using business systems.	X	X	X	X	X		X	X			X		X	X	

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
3. Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	X		X	X	X		X	X	X	X	X		X		X

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
4. Manage data using appropriate methodologies, and standards to improve healthcare and business processes and decision-making.	X	X	X	X	X		X	X	X						X

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
5. Apply the Project Management Institute's Body of Knowledge to business systems projects.	X	X			X		X	X	X		X		X		
6. Apply security principles and practices in systems development and the systems environment.	X		X		X		X		X						

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
7. Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.	X	X			X		X	X	X		X		X	X	

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
8. Apply quality assurance and quality management principles to business systems development projects.	X		X		X		X	X	X		X				

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
9. Educate a diversity of clients in the use of business technology to support, promote and improve business processes.		X			X				X	X	X			X	X

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
10. Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.		X	X	X	X		X	X	X	X	X	X	X	X	X

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
11. Adhere to professional, ethical and legal codes and standards.	X				X		X	X	X	X		X	X	X	X
12. Conduct and evaluate research to contribute to evidence-based practice in business systems development.	X		X	X	X		X	X	X	X	X	X		X	X

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
13. Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.		X			X			X	X	X		X		X	X

	1. Depth and Breadth of Knowledge						2. Knowledge of Methods	3. Application of Knowledge			4. Communication Skills	5. Awareness of Limits of Knowledge	6. Professional Capacity Autonomy		
	a)	b)	c)	d)	e)	f)		a)	b)	c)			a)	b)	c)
Degree level Learning Outcomes	Developed knowledge of key concepts, methodologies, current advances, theoretical approaches and assumptions in the discipline and in a specialized area of a discipline	Inter- and Intra-disciplinary knowledge and relationships	Research, analysis and assessment of hypotheses relevant to one or more of the major fields in a discipline	Research experience in an area of the discipline	Critical thinking and analytical skills inside and outside the discipline	Learning outside the discipline	Methods of enquiry or creative activity, or both, in their primary area of study. (evaluate and devise arguments, and comment on scholarship)	Critical use of qualitative and quantitative information	Use a range of established techniques	Critical use of scholarly reviews and primary sources	Communicate accurately and reliably, orally and in writing, to a range of audiences	Limits to their own knowledge and ability, ambiguity and limits to knowledge and influence analyzes and interpretations	Qualities and transferable skills in the area of personal and interpersonal skills	Manage lifelong learning, personally and professionally	Academic integrity and social responsibility
14. Leverage artificial intelligence and agent technologies to support short and long term business decisions.	X	X	X	X	X		X	X	X	X		X		X	X

Mapping of Core and Non-Core Courses to Program Learning Outcomes

Course Number	Course Name	1 Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	2 Manage the process of evaluating, selecting and using business systems.	3 Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	4 Manage data using appropriate methodologies and standards to improve business processes and decision-making.	5 Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.	6 Apply security principles and practices in systems development and the systems environment.	7 Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.	8 Apply quality assurance and quality management principles to business systems development projects.	9 Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	10 Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	11 Adhere to professional, ethical and legal codes and standards.	12 Conduct and evaluate research to contribute to evidence-based practice in business systems development.	13 Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	14 Leverage artificial intelligence and agent technologies to support short and long term business decisions.
Semester 01															
MGT4102	Business Fundamentals	X						X		X				X	
CST3100	Introduction to Computer Programming	X		X			X					X			
CST3101	Database Design Fundamentals			X	X				X			X			
MAT8003	Mathematics for Programming	X		X											
ENL1100	Communications and Academic Writing	This course is a non-core course that contributes to a breadth of knowledge outside the main field of study.													
Semester 02															

Course Number	Course Name	1 Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	2 Manage the process of evaluating, selecting and using business systems.	3 Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	4 Manage data using appropriate methodologies and standards to improve business processes and decision-making.	5 Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.	6 Apply security principles and practices in systems development and the systems environment.	7 Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.	8 Apply quality assurance and quality management principles to business systems development projects.	9 Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	10 Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	11 Adhere to professional, ethical and legal codes and standards.	12 Conduct and evaluate research to contribute to evidence-based practice in business systems development.	13 Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	14 Leverage artificial intelligence and agent technologies to support short and long term business decisions.
ACC4101	Financial Accounting	X		X					X			X		X	
CST3102	Programming I	X		X			X					X			
CST3103	Data Communications and Networking			X	X		X				X				
BUS0006	Value Creation in Healthcare	X						X		X		X	X	X	
PHI1000	Logic and Critical Thinking	This course is a non-core course that contributes to a breadth of knowledge outside the main field of study.													
Semester 03															
ESC4300	Basics of Supply Chain Management		X	X				X	X		X				
CST3104	Introduction to Mobile Application Development	X		X			X								

Course Number	Course Name	1 Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	2 Manage the process of evaluating, selecting and using business systems.	3 Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	4 Manage data using appropriate methodologies and standards to improve business processes and decision-making.	5 Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.	6 Apply security principles and practices in systems development and the systems environment.	7 Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.	8 Apply quality assurance and quality management principles to business systems development projects.	9 Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	10 Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	11 Adhere to professional, ethical and legal codes and standards.	12 Conduct and evaluate research to contribute to evidence-based practice in business systems development.	13 Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	14 Leverage artificial intelligence and agent technologies to support short and long term business decisions.
CST3105	Advanced Database Design and SQL				X		X		X		X	X			
CST3106	Internet Architecture and Web Development	X		X			X					X			
ECO4201	Macroeconomics							X		X	X				
CST3107	Operating Systems	X					X				X				
Semester 04															
BUS0008	Business Analytics and Advanced Business Intelligence			X	X				X	X		X			
QUA2000	Statistics	This course is a non-core course that contributes to a breadth of knowledge outside the main field of study.													
CST3109	Business Systems Requirements Analysis		X				X		X			X	X	X	

Course Number	Course Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	Manage the process of evaluating, selecting and using business systems.	Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	Manage data using appropriate methodologies and standards to improve business processes and decision-making.	Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.	Apply security principles and practices in systems development and the systems environment.	Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.	Apply quality assurance and quality management principles to business systems development projects.	Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	Adhere to professional, ethical and legal codes and standards.	Conduct and evaluate research to contribute to evidence-based practice in business systems development.	Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	Leverage artificial intelligence and agent technologies to support short and long term business decisions.
CST3108	Data Structures and Algorithms				X				X			X			
ACC4201	Managerial Accounting							X	X			X			
ESC4503	Technology Integration Using SAP	X		X	X										
Semester 05															
BUS0007	Strategic Business Intelligence		X					X		X		X			
CST3110	Enterprise Architecture		X	X			X					X			
CST3112	Business Systems Design and Implementation	X	X		X		X		X			X			
CST3111	Project Management for IT		X	X		X		X				X			

Course Number	Course Name	1 Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	2 Manage the process of evaluating, selecting and using business systems.	3 Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	4 Manage data using appropriate methodologies and standards to improve business processes and decision-making.	5 Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.	6 Apply security principles and practices in systems development and the systems environment.	7 Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.	8 Apply quality assurance and quality management principles to business systems development projects.	9 Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	10 Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	11 Adhere to professional, ethical and legal codes and standards.	12 Conduct and evaluate research to contribute to evidence-based practice in business systems development.	13 Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	14 Leverage artificial intelligence and agent technologies to support short and long term business decisions.
PSI2000	Navigating Canada's Political Landscape	This course is a non-core course that contributes to a breadth of knowledge outside the main field of study.													
Semester 06															
MGT0107	Business Technology Management		C	X			C	X		X	C				
CST3113	Enterprise Application Development	X	X		X					X		X			X
CST3114	Data Analytics		X	X	X								X		
BUS0009	Risk Management and Strategies				X			X		C	X			X	
SOC2000	Introduction to Sociology	This course is a non-core course that contributes to a breadth of knowledge outside the main field of study.													
Co-op Work Terms															

Course Number	Course Name	1 Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	2 Manage the process of evaluating, selecting and using business systems.	3 Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	4 Manage data using appropriate methodologies and standards to improve business processes and decision-making.	5 Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.	6 Apply security principles and practices in systems development and the systems environment.	7 Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.	8 Apply quality assurance and quality management principles to business systems development projects.	9 Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	10 Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	11 Adhere to professional, ethical and legal codes and standards.	12 Conduct and evaluate research to contribute to evidence-based practice in business systems development.	13 Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	14 Leverage artificial intelligence and agent technologies to support short and long term business decisions.
WKT0009	Co-op Work Term I														
WKT0010	Co-op Work Term II (Optional)														
WKT0011	Co-op Work Term III (Optional)														
Semester 07															
BUS0010	Business Systems Security, Audit and Control						C		C			X			
CST3115	Enterprise Mobile Application Development	X	X		X							X			C
CST3119	Wearable Computing	X		X	X		X					X		X	C
CST3116	Project I	C		C	X	C	X	C	C	C		X	X	X	X
	Elective	Students choose a non-core course that contributes to a breadth of knowledge outside the main field of study.													

Course Number	Course Name	1 Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	2 Manage the process of evaluating, selecting and using business systems.	3 Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	4 Manage data using appropriate methodologies and standards to improve business processes and decision-making.	5 Apply the Project Management Institute's Body of Knowledge to business systems software engineering projects.	6 Apply security principles and practices in systems development and the systems environment.	7 Apply principles and skills of business management, leadership and change management in the context of business systems software engineering.	8 Apply quality assurance and quality management principles to business systems development projects.	9 Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	10 Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	11 Adhere to professional, ethical and legal codes and standards.	12 Conduct and evaluate research to contribute to evidence-based practice in business systems development.	13 Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	14 Leverage artificial intelligence and agent technologies to support short and long term business decisions.
	Elective	Students choose a non-core course that contributes to a breadth of knowledge outside the main field of study.													
Semester 08															
MGT6120	Entrepreneurship							X		X		X		X	
CST3118	Business Software Agents and Artificial Intelligence											C	C	C	C
CST3117	Project II	C	C	C	C	C	C	C	C	C	C	C	C	C	
	Elective	Students choose a non-core course that contributes to a breadth of knowledge outside the main field of study.													
	Elective	Students choose a non-core course that contributes to a breadth of knowledge outside the main field of study.													

Section 4.4: Course Descriptions

This section provides a listing of the course descriptions for all courses that are a part of the proposed Bachelor of Technology (Business Systems Development) (Honours) program.

These are the course descriptions that would appear in the academic calendar, and other related documentation. For the presentation of these descriptions, the courses have been divided into

- Core courses
- Non-core courses

Course Descriptions for Core Courses

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 1 **Semester 1**	MGT4102 - Business Fundamentals	In today's growing global economy, organizations are facing many new, diverse and competing challenges that have significant impact on their organizations. Students discover the essential management concepts of planning, organizing, leading and controlling. Other topics include human resources, strategy, decision making, ethics and social responsibility, as well as organizational culture and change. Students apply various theoretical frameworks utilizing tools including case methodology, terms and discussions.
YEAR 1 **Semester 1**	CST3100 - Introduction to Computer Programming	The underlying technical core of business systems is an effective and efficient implementation of program code. Through technical introduction to the fundamentals of programming with Java, students develop concise, robust and efficient code. Students examine the concepts of object-oriented programming and use pseudo code to provide a descriptive framework for algorithm development. Emphasis is on problem-solving and fundamental logic skills as well as documentation, both in-line and high-level, to underscore the importance of readability and maintainability. A key focus is top-down design, and effective testing and debugging techniques. To establish the necessary background, students use an Integrated Development Environment (IDE) as well as use program development, implementation and execution procedures and strategies, and also machine-level representation of data and common language control constructs.

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 1 **Semester 1**	CST3101 – Database Design Fundamentals	Modern business systems rely on fast information storage, processing and retrieval for everyday operations and strategic decision making. Storing data in well-structured and standard format is an important key towards achieving efficiency and speed. Throughout the course, students acquire a theoretical and practical understanding of database systems, types, design and applications. Course components consist of theoretical and hands-on design of databases based on industry standards, such as SQL. Industry case studies focus on data use, data security, cloud-based options, database design, implementation and normalization.
YEAR 1 **Semester 1**	MAT8003 – Mathematics for Programming	The core foundation of all computer science is mathematics. Students examine elementary discrete mathematics for computer science, knowledge that forms the basis of algorithm and data structure efficiency analysis. Emphasis is on mathematical definitions, proofs, and applicable methods. The topics include formal logic notation, Boolean logic, simple logic gates, proof methods, induction, well-ordering, sets, relations, elementary graph theory, integer congruencies, asymptotic notation and growth of functions, permutations and combinations, counting principles, discrete probability, linear algebra and matrix theory.
YEAR 1 **Semester 2**	ACC4101 – Financial Accounting	Generally accepted accounting principles are widely used as benchmarks throughout business. Students explore the role of financial accounting from a user perspective. They also engage with the preparation, use and analysis of financial statements and concepts of accrual accounting, in the context of various forms of business organizations and internal control issues.

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 1 **Semester 2**	CST3102 – Programming I	The de facto development paradigm for mobile and enterprise systems is object based. This course explores the fundamentals of object-oriented design and programming. Students learn to create and manipulate reusable objects, encapsulate data and logic within a class, inherit one class from another and implement polymorphism and exception handling. Topics may include design patterns, Java APIs, J-Unit testing framework and graphical user interface fundamentals. **Pre-requisite:** CST3100 - Introduction to Computer Programming; MAT8003 – Mathematics for Programming
YEAR 1 **Semester 2**	CST3103 – Data Communications and Networking	Business decision-makers increasingly demand and rely on immediate access to accurate and secure information. Students examine the concepts, components, implementation and operation of computer networks in personal area networks, local area networks, wireless networks, wide area networks, and on the internet. Knowledge of the communication layers is examined using the OSI reference model and in particular the TCP/IP protocol suite and Ethernet. Students evaluate risks, network security, vulnerabilities and mitigation strategies. Guided by sound theoretical knowledge, students also examine materials from the Cisco Network Academy Program CCNA Exploration Networking Fundamentals, CompTIA Network+ Certification as well as analyze industry case studies.
YEAR 1 **Semester 2**	BUS0006 – Value Creation in Healthcare	All organizations create value for stakeholders through the management actions, business models, and ethical decisions made in relation to internal culture and external environment. To gain multiple perspectives on value creation in the field of healthcare, students explore and analyze the stakeholder management process and decision-making framework of organizations. With the help of industry professionals, case studies and collaborative tools, students examine and apply value creation concepts and methodology to contemporary scenarios.

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 2 **Semester 3**	ESC4300 – Basics of Supply Chain Management	From a planning point of view, the need to balance demand and supply is paramount in today's business world. Students explore the concepts of managing an integrated supply chain system. Emphasis is placed on recognizing the need for developing customer-supplier relationships throughout the supply chain and true frontend to back end integration. Topics include elements of the supply chain, integrated and collaborative planning, ERP, demand management, logistics, scheduling and capacity management purchasing.
YEAR 2 **Semester 3**	CST3104 – Introduction to Mobile Application Development	Mobile devices, such as smartphones and tablets, are omnipresent and have come to dominate the landscape of mobile computing. Students examine the foundations of programming mobile applications for the Android operating system using an Integrated Development Environment (IDE) and basic mobile programming and security concepts to build applications for the smartphone and tablet. Keys topics include object-oriented database APIs, animation, multi-threading, networking and performance considerations. Particular emphasis is on user interface design for mobile devices and user interactions using multi-touch technologies. **Pre-requisite:** CST3102 - Programming I, CST3101 - Database Design Fundamentals, CST3103 - Data Communications and Networking
YEAR 2 **Semester 3**	CST3105 – Advanced Database Design and SQL	Increasingly, businesses face challenges involved with handling volumes of large and complex data. The ability to effectively store, manage, access and communicate with databases requires practical knowledge of advanced database features. Students evaluate and apply methodologies for design, analysis, scalability and evaluation of database systems. Students gain advanced understanding and practical experience in SQL, PLSQL programming, advanced engineering modeling tools, rollup and cube operations, transaction control, and data warehousing, cloud-based database services and security. **Pre-requisite:** CST3101 - Database Design Fundamentals

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 2 **Semester 3**	CST3106 – Internet Architecture and Web Development	Internet-based services are a key foundation of e-Commerce systems. Students explore the infrastructure, both in terms of networking and services, of the Internet. Students review the classical client-server architecture, explore cloud-based services as well as the concepts of Service-Oriented-Architecture (SOA) and Software-As-A-Service (SAAS). By applying principles of graphical user interface design for both browser technology and mobile devices, students define structure and content of web pages through the use of markup and scripting languages. Special emphasis is on services that provide secure remote access to enterprise database systems. **Pre-requisite:** CST3102 - Programming I, CST3103 - Data Communications and Networking
YEAR 2 **Semester 3**	ECO4201 - Macroeconomics	Students explore the principles of macroeconomics using economic models to analyze the performance of the overall economy. They examine how the level of unemployment, inflation and national income are determined. In addition, students investigate the impact that fiscal and monetary policies have on stabilizing the economy. They also consider Canada's international trade and the foreign exchange rate of the Canadian dollar.
YEAR 2 **Semester 3**	CST3107 – Operating Systems	Operating systems come in different varieties, such as Windows, Unix, iOS, Android, etc., each with its own unique attributes, but all sharing several features in common. It is important to understand the common characteristics and functionality of operating systems. Students gain an understanding of the concepts and components of operating systems as well as how they interact and function with various hardware components. Course focus includes details of various operating system structures, access (to CPU and input/out devices, etc.), resources, processes and storage management, as well as control mechanisms. Students acquire knowledge of installation, basic security, configuration, administration and modifications through robust theoretical and hands-on assignments.

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 2 **Semester 4**	BUS0008 - Business Analytics and Advanced Business Intelligence	Business Intelligence systems are essential for collecting, storing, evaluating and analyzing information. Students study the principles related to designing, building and implementing a business intelligence (BI) system using a variety of technological tools. Topics include: data warehouse, SQL in relation to BI data manipulations, dimensional modeling, online analytic processing (OLAP), visualization tools dealing with high impact and low entry requirements, data mining, ETL (extract, transform, load) and dashboards. **Prerequisites**: CST3105 - Advanced Database Design and SQL
YEAR 2 **Semester 4**	CST3109 - Business Systems Requirements Analysis	Translating client requirements into system specifications is critical to successful end products and the starting point is requirements analysis. Students gain an understanding of the development life cycle and the concepts of requirements analysis, and their impact from inception to final product. Course components include best practices, software engineering principles and standards, usability and artifacts for modeling requirements analysis. Students research, analyze, develop and evaluate solutions. Topics may include: agile development, outsourcing, ethics, security and privacy, cloud services and in-house development. **Prerequisites:** CST3102 - Programming I, CST3103 - Data Communications and Networking, CST3105 - Advanced Database Design and SQL
YEAR 2 **Semester 4**	CST3108 – Data Structures and Algorithms	Data structures and algorithms form the core of all practical computer science. Students explore a variety of important data structures and methods for implementation using experimental and analytical evaluation. Through reviewing the mathematical background and models of computation, complexity and asymptotic bounds and notation, students examine standard algorithmic paradigms. Topics may include simple recursive procedures, divide-and-conquer strategies, recursive backtracking, branch-and-bound and heuristics. **Prerequisites**: CST3102 - Programming I, MAT8003 - Mathematics For Programming

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 2 **Semester 4**	ACC4201 – Managerial Accounting	Students explore the background, goals and methods of managerial accounting and its role in business planning, control and decision making. Topics covered include product costing, product pricing, cost behavior and cost volume-profit analysis, variable costing, differential analysis, performance evaluation, budgeting and profit planning. **Pre-requisite:** ACC4101 - Financial Accounting
YEAR 2 **Semester 4**	ESC4503 – Technology Integration Using SAP	In the continuously evolving business world, there is a need for a solid framework for enterprise technology integration in business organizations, business processes and business tactical and strategic decision making. Students acquire the fundamental skills needed to start creating programs that will examine business reporting processes using SAP including NetWeaver, Business Warehouse (BW), Business Intelligence (BI) and Advanced Business Application Programming (ABAP). Through workshops and hands on learning, students build business report interfaces, write ABAP code to filter and drill down into business databases to support business decisions. **Pre-requisite:** CST3102 – Programming I, CST3105 – Advanced Database Design and SQL
YEAR 3 **Semester 5**	BUS0007 – Strategic Business Intelligence	Business Intelligence (BI) allows organizations to leverage their ability to use available information in new and innovative ways that extend beyond the usual common approaches. As such, BI has proved to be an essential strategic resource for businesses. Students examine different types of analytics that enable managers to enhance their decision-making and increase opportunities for organizational competitive advantage. Special attention is given to BI strategy and management, emerging trends in BI, big data, SPSS and/or SAS, rendering and probability in the cloud, BI reports and OLAP cubes. **Pre-requisite:** CST3105 – Advanced Database Design and SQL

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 3 **Semester 5**	CST3110 - Enterprise Architecture	In a strategic sense, enterprise system architects are key contributors of any business. Collaborating effectively at all levels within the organization is paramount. The ultimate goal of enterprise architecture is to align enterprise technology investment with business strategic planning. Students compare and contrast frameworks and methodologies used in guiding enterprise-level decisions. Through the use of case studies, students select and apply an appropriate process to support enterprise-level technology decisions used in building enterprise architecture. **Pre-requisite:** BUS0008 – Business Analytics and Advanced Business Intelligence, ACC4101 - Financial Accounting, CST3109 - Business Systems Requirements Analysis
YEAR 3 **Semester 5**	CST3112 - Business Systems Design and Implementation	Design and implementation follow requirements analysis, and often occupy a significant portion of the development process. Guided by software development industry standards and best practices, students gain solid theoretical and practical experience with the design and implementation steps by applying design techniques and creating design artifacts. Students investigate prototyping, testing, debugging and quality assurance aspects of the software engineering process. Real world case studies focus on successes and failures while emphasizing the importance of following industry best practices. **Pre-requisite:** CST3109 - Business Systems Requirements Analysis

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 3 **Semester 5**	CST3111 - Project Management for IT	The role of project management in information technology (IT) revolves around product development and implementation. The content has been closely aligned with the Project Management Institute's (PMIs) Project Management Body of Knowledge (PMBOK®) concepts and methodologies. Topics include management issues related to planning, organization, scheduling, resource allocation and project monitoring and control. Students will also examine IT project management tools for effective project scheduling and management. Through relevant case studies, student projects and presentations, students develop skills and knowledge in relation to technology project management. **Pre-requisite**: CST3109 – Business Systems Requirements Analysis
YEAR 3 **Semester 6**	MGT0107 – Business Technology Management	Government and private sector organization continuously undergo major transformation with respect to technology. Technology is a major enabler of these transformation initiatives. As a result, there is a growing need for professionals that can leverage technology to enable organizations to achieve strategic goals. These professionals possess the ability to bridge the gap between align information technology to the business objectives. Special attention is on discussing planning, decision-making, trends, alignment, optimization, processes and timing. **Pre-requisite:** BUS0007 – Strategic Business Intelligence

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 3 **Semester 6**	CST3113 – Enterprise Application Development	Enterprise applications are designed to integrate with other enterprise-level software applications used within a business or organization. Students learn the architecture of a corporate enterprise framework by examining, implementing and using technologies employed in the enterprise environment. Server-side topics include high-performance and scalable platforms (machine interconnects, parallelism, multithreading), integration, distributed applications, network programming and services. Client-side topics include mobile and web-app software, distributed system administration, and security requirements. Students acquire development experience in J2EE and mobile development. **Pre-requisite:** CST3102 - Programming I, CST3103 - Data Communications and Networking, CST3105 - Advanced Database Design and SQL
YEAR 3 **Semester 6**	CST3114 – Data Analytics	Collecting and analyzing raw data to draw conclusions helps to guide organizations in the decision-making process. Students explore the statistical tools most commonly used to process, analyze and visualize data. Topics include simple linear regression, multiple regression, logistic regression and analysis of variance, with applications to data mining and machine learning. Using interactive statistical software, students examine the commonly used tools of data analytics with emphasis on interpretation of the analytical results and effective visualization. In each topic area, real world applications help is establishing context and an understanding of the fundamental concepts. **Pre-requisite:** MAT8003 - Mathematics For Programming, QUA2000 - Statistics, CST3105 - Advanced Database Design and SQL
YEAR 3 **Semester 6**	BUS0009 – Risk Management and Strategies	We live in an ever changing world where risk is part of day-to-day life. Both government and private sector strive to develop strategies to identify and manage risk. Students acquire the knowledge and skills needed to identify, asses, monitor, and limit risks using risk management strategies and principles. Topics include risk assessment and treatment, risk management principles and practices, and risk financing.

Year and Semester	Course Number/Course Title	Calendar Course Description
N/A	WKT0009 – Co-op Work Term I	The first co-op placement provides students with experiential opportunities within the field. Students attain entry-level positions that involve a variety of activities allowing application of principles and concepts developed during previous study. Students returning from Co-op I bring additional practical considerations to subsequent study. Although centred with public and private institutions located in Eastern Ontario, co-op employment opportunities may be sought throughout Canada and abroad. **Pre-requisite:** Student must successfully complete all semester 1-6 courses.
N/A	WKT0010 – Co-op Work Term II (Optional)	Co-op provides an experiential opportunity which is directly related to the field of study. The second work term centers on an expanded role with a higher level of responsibilities in the workplace. Students returning from co-op work term two contribute expanded knowledge and abilities to their program of study. Although centred with public and private institutions located in Eastern Ontario, co-op employment opportunities are sought throughout Canada and abroad. **Pre-requisite:** WKT0009-Co-op Work Term I
N/A	WKT0011 – Co-op Work Term III (Optional)	Co-op provides an experiential opportunity which is directly related to the field of study. The third work term centers on an expanded role with a higher level of responsibilities in the workplace. Students returning from co-op work term two contribute expanded knowledge and abilities to their program of study. Although centred with public and private institutions located in Eastern Ontario, co-op employment opportunities are sought throughout Canada and abroad. **Pre-requisite:** WKT0010-Co-op Work Term II

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 4 Semester 7	BUS0010 - Business Systems Security, Audit and Control	As a result of the increasing concern for security of the information, there is a growing demand for qualified auditors to perform security audits of large organization's IT systems and infrastructure. Students examine and employ the principles and methodologies needed to plan and organize security audits and ensure compliance with enterprise security requirements. Curriculum is closely aligned with the industry-recognized Certified Information Systems Auditor (CISA) requirements. Case studies, assignments and in-class learning activities focus on performing high level security audits.
YEAR 4 Semester 7	CST3115 - Enterprise Mobile Application Development	Enterprise mobile software offers tremendous opportunity for engagement, both by ensuring customers return to your server on a regular basis, and in being central touch-point for employees or partners. Students differentiate between external (customer) and internal (employee) users and their respective design requirements. Topics include multi-platform management tools, network security requirements to support mobile users, mobile Web versus native mobile development, application programming interface (API) design for accessing enterprise data sources as well as sophisticated graphic user interface (GUI) experiences for external and internal users. Emphasis is on security (information protection, identity, device tracking, etc.) and cover forward-looking topics such as increased capability for data capture (sensors, GPS, cameras). Using Java, students develop both server and client (mobile) system components. **Pre-requisite:** CST3104 - Introduction to Mobile Application Development, CST3106 - Internet Architecture and Web Development

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 4 **Semester 7**	CST3119 – Wearable Computing	Wearable computers (WCs) are systems that typically comprise one or more body-mounted devices such as monitors or sensors, endowed with a mobile communication capability. WCs support a variety of applications including medical, lifestyle, consumer electronics and recreation. Students investigate various technologies through programming projects and hands-on experimentation with a selection of devices. Topics include Augmented Reality, GPS-based services, medical applications, user tracking for business and retail service, and gaming. **Pre-requisite:** CST3104 - Introduction to Mobile Application Development, CST3115-Enterprise Mobile Application Development
YEAR 4 **Semester 7**	CST3116 – Project I	In order to practice in a professional capacity, students must fully integrate business systems development skills and knowledge. Students gain real-world experience working on a project drawn from a broad range of areas within computer science, of scope and quality comparable to a commercial application. Under the supervision of a faculty member, students collaboratively apply research methods to produce a proposal document detailing the project background, novel contribution, deliverables and timelines. As a team, students present and defend the proposal before beginning the development phase in the following semester. **Pre-requisite:** CST3111 - Project Management for IT, CST3113 – Enterprise Application Development, CST3114 – Data Analytics
YEAR 4 **Semester 8**	MGT6120 - Entrepreneurship	Entrepreneurship and small business management are introduced from a Canadian perspective. Students develop the skills required to identify and evaluate a business opportunity; they investigate organizational structures of businesses and develop a business plan. A business simulation model provides the opportunity to practice and develop emerging entrepreneurial skills.

Year and Semester	Course Number/Course Title	Calendar Course Description
YEAR 4 **Semester 8**	CST3118 - Business Software Agents and Artificial Intelligence	An agent is anything that can be viewed as perceiving its environment through sensors and acting upon that environment through actuators. A rational agent, more specifically, carries out an action with the best outcome after considering past and current percepts. Students examine the fundamentals of artificial intelligence (AI), and how AI can be used to create agents that act with precise business objectives. Topics include types of agents and types of environments, rationality, performance measures, actuators, and sensors. Real world examples include domains such as e-Commerce, e-Business, with applications to supply chain management, web-based services negotiation. Students design, implement and deploy agents in simulated environments. **Pre-requisite:** CST3115 - Enterprise Mobile Application Development, CST3114 – Data Analytics
YEAR 4 **Semester 8**	CST3117 – Project II	Possessing practical and real-world experience in project execution is a necessity for entry into the field of business systems development. Students collaboratively develop and implement the project deliverable proposed previously. Students use acquired techniques and approaches to develop and evaluate designs, analyze algorithmic solutions, and implement, debug and test the final deliverable. The project involves substantial programming with particular attention paid to graphic user-interface design. Students write and submit a report that is combined with the proposal document. In a team-based collaborative environment, students present their project and demonstrate the newly developed system. **Pre-requisite:** CST3116 - Project I

Course Descriptions for Non-Core Courses

In the table below, the course descriptions for the non-core courses are presented by semester for each academic year. The descriptions for the elective options are presented in a sub-section of their own that follows. The date of Ministerial Consent is provided for those courses that have been previously assessed.

Year and Semester	Course Title	Calendar Course Description
YEAR 1 **Semester 1**	ENL1100 - Communications and Academic Writing	Effective communication is an integral component of success in the workplace and in lifelong learning. Students review communication theory and its connection to expository writing. Frequent writing exercises encourage the development of content that is coherent, well organized and correct. Students consider and use strategies to generate ideas, to collect and organize information, to acknowledge sources, to identify and develop a thesis and to adapt format, style and tone for different purposes and audiences.
YEAR 1 **Semester 2**	PHI1000 – Logic and Critical Thinking	Logic and critical-thinking skills play an important role in both daily life and ongoing academic studies. As foundational skills they support both the development and assessment of ideas, concepts and courses of action that are presented on a daily basis. Approaching the subject from both a practical and theoretical perspective, students hone their skills in analysis, argumentation, reasoning and persuasion. A range of topics and thinkers provide material with which students can exercise and apply their skills.
YEAR 3 **Semester 5**	QUA2000 – Statistics	Students explore fundamental statistical concepts and use statistical software to summarize, analyze and present both descriptive and inferential statistics. Topics include central tendency, variation, probability, central limit theorem, sampling, estimation and hypothesis testing. These theoretical concepts are explained through practical examples from various sectors. Students develop the required background for further study related to research.

Year and Semester	Course Title	Calendar Course Description
YEAR 3 **Semester 5**	PSI2000 - Navigating Canada's Political Landscape	A developed knowledge of government and politics is key to an effective participation in public life. Drawing on current events, students explore the societal, cultural and constitutional context along with the major political parties and institutions that shape the Canadian political landscape. Students develop skills and techniques that allow them to position politicians, parties, and policies, past and present, on the spectrum of political ideology and Canadian political traditions. Working together and individually, students analyze issues from the perspective of various political approaches.
YEAR 3 **Semester 6**	SOC2000 – Introduction to Sociology	When working with individuals and groups it is important to understand both the background and influences present. Students develop a familiarity with sociological theories and methodological approaches used to study individual and group behaviours. Students also examine variables that include culture, social class, race, and gender and how these variables may impact work with diverse individuals and groups.
YEAR 4 **Semester 7**	**Elective**	Students may choose from a variety of breadth courses. Courses from a range of disciplines are offered within the humanities, social sciences, sciences, global cultures and mathematics. Elective offerings vary from semester to semester.
YEAR 4 **Semester 7**	**Elective**	Students may choose from a variety of breadth courses. Courses from a range of disciplines are offered within the humanities, social sciences, sciences, global cultures and mathematics. Elective offerings vary from semester to semester.
YEAR 4 **Semester 8**	**Elective**	Students may choose from a variety of breadth courses. Courses from a range of disciplines are offered within the humanities, social sciences, sciences, global cultures and mathematics. Elective offerings vary from semester to semester.
YEAR 4 **Semester 8**	**Elective**	Students may choose from a variety of breadth courses. Courses from a range of disciplines are offered within the humanities, social sciences, sciences, global cultures and mathematics. Elective offerings vary from semester to semester.

Course Descriptions for Elective Non-Core Courses

Algonquin College adopted a Breadth Framework predicated on non-core courses offered at the 1000-, 2000- and 4000-levels intended to meet this requirement, and aligned to the following standards:

- 1000-level introductory humanities courses intended to contribute towards students' attainment of key skills in critical thinking, logic and argumentation, quantitative reasoning, and written and oral communication;
- 2000-level introductory courses in disciplines primarily in the humanities, sciences, social sciences, global cultures and/or mathematics. Students are engaged in the discourse of those disciplines through the application of theories and concepts, critical analysis and modes of reasoning, and;
- 4000-level courses that serve to build on their knowledge in those areas of study and require greater depth by exploring and applying advanced theoretical concepts, developing varied modes of analyses and ways of thinking inherent in those disciplines and applying them in novel and creative ways.

The following are elective courses that would be available to students of the proposed Bachelor of Technology (Business Systems Development) (Honours).

Year and Semester	Course Title	Calendar Course Description
Elective	**SOC4000 – Criminology**	The interdisciplinary study of social science examining the individual and social aspects of crime is known as criminology. Students work through an introduction to the social science perspective on crime. Presentations, discussions, and assignments allow students to investigate the various theoretical positions related to crime and criminal behaviour. Working forward from the types and definitions of crime, students trace some of the links between government policy and the impacts of these policies on both society and the individual. **Pre-requisite:** SOC2000 – Introduction to Sociology
Elective	**SOC4001 – Global Perspectives**	Sociology, through its exploration of the organization of society and the connections between people and their surroundings, provides new ways of looking at the world. Using fundamental knowledge in the field of sociology, students analyze globalization and its impact on Canadian society. Students take opposing views to debate the opportunities and challenges that come with globalization. **Pre-requisite:** SOC2000 – Introduction to Sociology

Year and Semester	Course Title	Calendar Course Description
Elective	**ENL4100 – Creative Writing**	Effectively communicating with others, both professionally and personally, is an art that requires conscious development. Students address the techniques related to interpersonal communication challenges in the diverse workplace. Focus is on communication barriers, verbal and non-verbal communication, listening, team-work and relational dynamics. Through role-play, analysis, and case studies, students engage in simulated and authentic interpersonal communication situations. **Pre-requisite:** ENL1100 – Communications and Academic Writing
Elective	**ENL4200 – New Worlds and Alternative Realities**	Speculative fiction gathers together all those works of fiction in which new worlds or alternative realities are envisioned. Within this category of prose, students have the opportunity to explore the various sub-genres that present readers with new ways of thinking about some of the issues that face society. Students also develop skills in critical analysis using a variety of approaches and methodologies from literary studies. **Pre-requisite:** ENL1100 – Communications and Academic Writing
Elective	**ENL4016 – World Literature**	Exposure to broad sources of literature promotes an open-minded perspective on today's global society. Students explore the key texts from 20th and 21st century world literature. Students explore themes, styles and writers from a variety of cultures. Critical analysis of texts supports the development of arguments related to the assigned readings. **Pre-requisite:** ENL1100 – Communications and Academic Writing
Elective	**PHI4000 – Philosophy and Popular Culture**	Many facets of today's popular culture engage, directly or indirectly, with the concerns of a variety of philosophical traditions. Drawing on a number of examples, students explore both the way popular culture permeates and spreads through society and the way it interprets and presents philosophical questions. Students develop skills and techniques for assessing the soundness and validity of thought experiments. **Pre-requisite:** PHI1000 – Logic and Critical Thinking

Year and Semester	Course Title	Calendar Course Description
Elective	**PHI4100 – Survival in the Information Age: Risk and the Media**	On an almost daily basis, the media, through its various outlets - television, radio, web sites, RSS, and podcasts - reports on issues that address our well-being. Through discussions, readings, and assignments, students enhance their ability to interpret and question information presented by the media by better understanding the inherent risks. Issues like alternative medicine (i.e. vaccinations) and socio-legal issues (i.e. bullying, hacking, surveillance, and privacy) provide grounds for students to use principles from the social science as a means to think critically about real and perceived risks in daily life. **Pre-requisite:** PHI1000 – Logic and Critical Thinking
Elective	**CUL4000 – Global Citizenship**	Informed citizens in today's world appreciate the meaning of civic life at the local, national and global level. Students reflect on and develop a personal awareness of the meaning of freedoms, rights and obligations in a diverse global community and consider the political, social and economic drivers that influence patterns of human behaviour and the health of the planet. Based on general principles of global citizenship, students look beyond national borders to assess personal responsibilities related to the health and well-being of the planet and inhabitants. Students critically evaluate information related to environmental and social health, equipped with attitudes and behaviours that foster global environmental and social responsibility.
New Elective Non-Core Courses Proposed in Earlier Applications		
Elective *(proposed new elective in an earlier application)*	**ECO4001 – Political Economy**	Political economy is the study of the interrelationship between economies and political processes and institutions in society. All economies require state political power to set their rules, enforce economic order, and to correct for market failures that would otherwise undermine the social fabric. Similarly, state power and government policies are shaped in large measure by economic capacities, including being constrained by the need to tend to the economic wellbeing of citizens. In this course, students debate prominent ideas in political economy schools, and practice the application of political economic analysis to high-profile current events in Canada and internationally.

Year and Semester	Course Title	Calendar Course Description
Elective *(proposed new elective in an earlier application)*	**ENL4300 – The Brave New Worlds of Dystopian Fiction**	Over the last century, dystopian fiction has become a remarkably popular genre in literature and film, particularly among young adults. Dystopian fiction often features oppressive totalitarian regimes, political dissent, environmental degradation and technological manipulation. In order to understand what a dystopia is, one must first understand what it is not. Through the study of representative works of literature and film, students examine the relationship between dystopic and utopic societies, and discover how dystopian fiction often functions as a creative outlet for authors and filmmakers to express the social, political, cultural, and technological anxieties of contemporary society. Students reflect on issues in the world around them, and develop an appreciation for how these concerns are mirrored in dystopian fiction.
Elective *(proposed new elective in an earlier application)*	**PHI4002 – The Philosophy of Drugs**	Drugs are everywhere: professionals prescribe them to us to make us "better"; we take them recreationally; we give them to our children, pets and other loved ones; we buy them on the streets, in grocery stores and grow them in our gardens. What are "drugs"? Why are some drugs legal and others not? How do drugs get to market? What ethical issues are relevant in a global drug industry? Are current intellectual property regimes appropriate if the goal of drug research is to promote benefits to society? Students critically examine these, and other, questions through the lens of historical and contemporary ethical, philosophical and legal theories and arguments. Students engage in various peer-oriented learning activities throughout the course.
Elective *(proposed new elective in an earlier application)*	**PHI4003 – The Philosophy of Love and Sex**	Love and sex are central to the human condition, and have been topics of academic inquiry and controversy throughout history. Various practices surrounding love and sex are celebrated in Western culture, such as monogamy and marriage, while other practices, such as polygamy and pedophilia, are condemned. Why is this? Students critically explore these and other issues surrounding love and sex using examples from popular music, movies and literature, framing those issues with the help of historical and contemporary philosophical theories and arguments. Students engage in various peer-oriented learning activities throughout the course.

Year and Semester	Course Title	Calendar Course Description
Elective *(proposed new elective in an earlier application)*	**PHI4004 – Technology, Society and the Environment**	Environmental issues have come to occupy a central place in the marketplace, politics, policy, and society at large. Owing largely to the many environmental consequences that have accompanied industrialization, we humans have been forced to rethink the complex relationship between technology, society and the environment. Students investigate philosophical concepts and theories surrounding technology, society and the environment including: the "naturalness" of technology, sustainability and animal rights. Students critically examine course material by focusing on questions such as: What is nature, and what role do/should humans occupy in it? What do we owe non-human organisms? What do we owe future generations? Students engage in various peer-oriented learning activities throughout the course.
Elective *(proposed new elective in an earlier application)*	**PHY4000 – Black Holes, Big Bangs and the Cosmos**	The dynamic and exciting field of Cosmology outlines our current understanding of the Universe from its start, at the so called Big Bang, through the ensuing 13 plus billion years to the present and beyond. Students learn how to discuss our present understanding of the three phases of the Universe as well as its five part make up, with matter making up only 4% of the whole. Students explain our knowledge of the various phases of evolution of the Cosmos and also the latest theories and experiments that are trying to address our uncertainties. Throughout the course, students evaluate and debate many of today's ideas and concepts revolving around cosmology.

N.B. The elective options will increase with the addition of new degrees. Therefore, it is anticipated that by the time the Bachelor of Technology (Business Systems Development) (Honours) would launch, more breadth elective options would be available to students.

Section 4.5: Course Schedules

Section 4.5.1: Course Schedule 1

***** Excluded for web version – confidential/proprietary material***

Section 4.5.2: Course Schedule 2

Year and Semester	Course Title	Total Core Course Semester Hours	Total Non-Core Course Semester Hours	Course Prerequisites and Co-requisites	Highest Qualification Earned and Discipline of Study
YEAR 1 Semester 1	MGT4102 - Business Fundamentals	45			PhD (Industrial Engineering)
	CST3100 - Introduction to Computer Programming	75			PhD (Computer Science)
	CST3101 - Database Design Fundamentals	60			PhD (Computer Engineering)
	MAT8003 - Mathematics for Programming	45			PhD (Computer Science)
	ENL1100 - Communications and Academic Writing		45		PhD (English)
YEAR 1 Semester 2	ACC4101 - Financial Accounting	45			MAcc (Accountancy and Taxation)
	CST3102 - Programming I	75		CST3100 - Introduction to Computer Programming, MAT8003 – Mathematics for Programming	PhD (Computer Science)
	CST3103 - Data Communications and Networking	45			PhD (Computer Engineering)
	BUS0006 - Value Creation in Healthcare	45			MBA
	PHI1000 - Logic and Critical Thinking		60		PhD (Philosophy)
YEAR 2 Semester 3	ESC4300 - Basics of Supply Chain Management	45			PhD (Industrial Engineering)

Year and Semester	Course Title	Total Core Course Semester Hours	Total Non-Core Course Semester Hours	Course Prerequisites and Co-requisites	Highest Qualification Earned and Discipline of Study
	CST3104 - Introduction to Mobile Application Development	60		CST3102 - Programming I, CST3101 - Database Design Fundamentals, CST3103 - Data Communications and Networking	PhD (Computer Science)
	CST3105 - Advanced Database Design and SQL	60		CST3101 - Database Design Fundamentals	PhD (Computer Engineering)
	CST3106 - Internet Architecture and Web Development	60		CST3102 - Programming I, CST3103 - Data Communications and Networking	PhD (Computer Science)
	ECO4201 - Macroeconomics	45			PhD (Mathematics)
	CST3107 - Operating Systems	45			PhD (Computer Engineering)
YEAR 2 Semester 4	BUS0008 - Business Analytics and Advanced Business Intelligence	60		CST3105 - Advanced Database Design and SQL	PhD (Business Administration)
	QUA2000 – Statistics		45		PhD (Psychology) PhD (Applied Social Psychology-Industrial/Organizational Behaviour)
	CST3109 - Business Systems Requirements Analysis	45		CST3102 - Programming I, CST3103 - Data Communications and Networking, CST3105 - Advanced Database Design and SQL	PhD (Computer Engineering)
	CST3108 – Data Structures and Algorithms	60		CST3102 - Programming I, MAT8003 - Mathematics For Programming	PhD (Computer Science)

Year and Semester	Course Title	Total Core Course Semester Hours	Total Non-Core Course Semester Hours	Course Prerequisites and Co-requisites	Highest Qualification Earned and Discipline of Study
	ACC4201 - Managerial Accounting	45		ACC4101 - Financial Accounting	MAcc (Accountancy and Taxation)
	ESC4503 - Technology Integration Using SAP	45		CST3102 - Programming I, CST3105 – Advanced Database Design and SQL	PhD (Engineering Information Technology)
YEAR 3 Semester 5	BUS0007 - Strategic Business Intelligence	60		CST3105 – Advanced Database Design and SQL	PhD (Business Administration)
	CST3110 - Enterprise Architecture	45		BUS0008 – Business Analytics and Advanced Business Intelligence, ACC4101 - Financial Accounting, CST3109 - Business Systems Requirements Analysis	Executive Master of Electronic Commerce
	CST3112 - Business Systems Design and Implementation	60		CST3109 - Business Systems Requirements Analysis	PhD (Computer Engineering)
	CST3111 - Project Management for IT	45		CST3109 – Business Systems Requirements Analysis	MSc (eHealth)
	PSI2000 - Navigating Canada's Political Landscape		60		PhD (Political Science)
YEAR 3 Semester 6	MGT0107 - Business Technology Management	45		BUS0007 – Strategic Business Intelligence	Executive Master of Electronic Commerce
	CST3113 - Enterprise Application Development	60		CST3102 - Programming I, CST3103- Data Communications and Networking, CST3105 - Advanced Database Design and SQL	PhD (Computer Science)

Year and Semester	Course Title	Total Core Course Semester Hours	Total Non-Core Course Semester Hours	Course Prerequisites and Co-requisites	Highest Qualification Earned and Discipline of Study
	CST3114 - Data Analytics	60		MAT8003 - Mathematics For Programming, QUA2000 - Statistics, CST3105 - Advanced Database Design and SQL	PhD (Computer Science)
	BUS0009 - Risk Management and Strategies	45			Executive Master of Electronic Commerce
	SOC2000 - Introduction to Sociology		60		PhD (Applied Social Psychology-Industrial/Organizational Behaviour)
YEAR 3	WKT0009 - Co-op Work Term I	420		**Pre-requisite:** Student must successfully complete all semester 1-6 courses	
YEAR 3	WKT0010 - Co-op Work Term II (Optional)	420		WKT0009 - Co-op Work Term I	
YEAR 3	WKT0011 - Co-op Work Term III (Optional)	420		WKT0010 - Co-op Work Term II	
YEAR 4 Semester 7	BUS0010 - Business Systems Security, Audit and Control	45			Executive Master of Electronic Commerce
	CST3115 - Enterprise Mobile Application Development	60		CST3104 - Introduction to Mobile Application Development, CST3106 - Internet Architecture and Web Development	PhD (Computer Science)
	CST3119 - Wearable Computing	45		CST3104 - Introduction to Mobile Application Development, CST3115- Enterprise Mobile Application Development	PhD (Computer Science)

Year and Semester	Course Title	Total Core Course Semester Hours	Total Non-Core Course Semester Hours	Course Prerequisites and Co-requisites	Highest Qualification Earned and Discipline of Study
	CST3116 - Project I	45		CST3111 - Project Management for IT, CST3113 – Enterprise Application Development, CST3114 – Data Analytics	PhD (Computer Science)
	Elective		45		Masters minimum, PhD preferred
	Elective		45		Masters minimum, PhD preferred
YEAR 4 Semester 8	MGT6120 - Entrepreneurship	45			MBA
	CST3118 - Business Software Agents and Artificial Intelligence	60		CST3115 - Enterprise Mobile Application Development, CST3114 – Data Analytics	PhD (Computer Science)
	CST3117 - Project II	45		CST3116 - Project I	PhD (Computer Science)
	Elective		45		Masters minimum, PhD preferred
	Elective		45		Masters minimum, PhD preferred
Subtotal Course Hours		**1770**	**450**		
Total Program Hours		**2220**			

Section 4.6: Work-integrated Learning Experience

This section provides details of the work experience requirements for the proposed Bachelor of Technology (Business Systems Development) (Honours) program. In addition to the explanation of the integration of the work experiences within the program content, information is included regarding the types of placements, the support for finding placements and placement outcomes.

Integration of Work Experiences

The proposed Bachelor of Technology (Business Systems Development) (Honours) program includes one (1) mandatory co-op work term that must be completed successfully to qualify for graduation, and two (2) additional optional work terms that the students may complete depending upon availability. The College will not guarantee any optional work terms, but is committed to supporting those students who manage to arrange such additional (optional) work experiences, as we believe they are beneficial for students. The mandatory work term is scheduled for the summer semester (May – August) when potential employer/supervisors are likely to be able to provide quality work experiences. This work term will be fourteen (14) weeks in length. If a student is able to arrange optional work terms they will begin immediately following the mandatory work term. Each optional work term will be fourteen (14) weeks in length.

The co-op work terms take place after completion of the third year of study. Based on the first three years of studies, students will be able to function with a good level of autonomy and will be able to contribute practically in their chosen placement.

The placement of the co-op work terms is part of a deliberate strategy to use the practical work experience as an educational tool in subsequent courses. As a result, it is believed that fourth-year learning will be augmented based on participation in real-world projects and activities. Furthermore, ideas for the fourth-year capstone projects may be derived from these co-op experiences.

In addition to the co-op work placements, opportunities for class-based projects and student work terms may be available through Algonquin College's Office of Applied Research and Innovation (ARI). ARI engages small, medium and large enterprises to offer those companies access to the considerable knowledge and skills of Algonquin's professors and students. Thus, ARI helps companies bring real-world projects to campus, where professors and students are given opportunities for further access to work-integrated learning.

Types of Work-integrated Learning Experiences

The diversity and quantity of organizations involved in business systems development activities that draw upon the knowledge contained within the discipline of this proposed degree provides for a wide array of placement opportunities. With the proposed program located in Ottawa, there is the potential for placements both within the public sector and the private sector.

During their placements, students are likely to be members of project teams engaged in the design, use, integration, analysis or support of business information systems. Ideally, students will be engaged in consulting activities, analytical work, technical assessments, modeling and simulation exercises, as well as a variety of meetings related to design review, project management and other emerging issues.

Support for co-op placements from local employers is high, with a variety of organizations already pledging a willingness to offer co-op placements to students enrolled in the proposed Bachelor of Technology (Business Systems Development) (Honours) program.

These organizations include:

- Blockthrough
- Curtiss Wright
- CV Diagnostix
- EION, Halogen,
- nitLive
- CHEO-NSO
- University of Ottawa – Health Services
- Optelian, Ottawa Hospital
- PCL
- Perley Rideau
- Vocantas

When the first year of the program delivery begins, the academic department, in collaboration with the Cooperative Education Department, will use established procedures and practices to connect with employers and encourage them to provide placements and to explore the benefits provided through a work term. In order to ensure rich and meaningful work experiences for students, this will be an on-going initiative.

Support for Work-integrated Learning Experiences

Co-op work experiences are supported by Algonquin's Cooperative Education Department (see Section 6.3 Support Services). In more specific terms, staff from the Co-op Department facilitates the relationship between the employer/supervisor and the student, while ensuring that the College meets its responsibilities for the quality of the work experience. The Co-op Department works collaboratively with faculty members from the academic department to ensure the placements are appropriate. The Co-op Department leverages the connections of faculty members with the industry/community. These connections are a key aspect of how faculty members maintain their currency as part of their ongoing professional development. Examples of activities that facilitate community relationships include being active on the program advisory committee, being active in local professional societies, attending and participating in industry conferences, participating in applied research, and organizing plant tours and guest speakers.

In addition to the Co-op Preparation online module offered prior to the start of the first co-op work term, students receive support and guidance from staff in the Co-op Department throughout the application process, including the submission of resumes, and the scheduling of interviews. While students are on placement, there is further support from the Co-op Department through the monitoring of the work experience. In collaboration with faculty from the academic program, site visits to the placement are organized. Finally, staff in the Co-op Department mediate and guide the resolution of any issues that may arise during the work term. Algonquin’s Cooperative Education Department details its services on the website: http://www.algonquincollege.com/coop/

Outcomes for Co-op Work Terms

There is one (1) mandatory work term, and two (2) optional work terms in the proposed Bachelor of Technology (Business Systems Development) (Honours) program. The outcomes for the work term(s) are presented in the table below (See TABLE 4.6.1: Outcomes for Work Experience).

TABLE 4.6.1: Outcomes for Work-integrated Learning Experiences

Work Term	Co-op Work Term I
Hours	420
Calendar Description	This co-op placement provides students with experiential opportunities within the field. Students attain entry-level positions that involve a variety of activities allowing application of principles and concepts developed during previous study. Students returning from Co-op I bring additional practical considerations to subsequent study. Although centred with public and private institutions located in Eastern Ontario, co-op employment opportunities may be sought throughout Canada and abroad. **Pre-requisite:** Student must successfully complete all semester 1-6 courses.
Course Outcomes	• Contribute to the practical application of discipline-specific concepts in a workplace environment. • Perform assigned duties in a professional fashion. • Obtain feedback on workplace performance. • Compile a comprehensive report on placement activities. • Conduct oneself in a professional manner based on industry expectations.
Work Term	Co-op Work Term II (Optional)
Hours	420
Calendar Description	Co-op provides an experiential opportunity which is directly related to the field of study. The second work term centers on an expanded role with a higher level of responsibilities in the workplace. Students returning from co-op work term two contribute expanded knowledge and abilities to their program of study. Although centred with public and private institutions located in Eastern Ontario, co-op employment opportunities are sought throughout Canada and abroad. **Pre-requisite:** WKT0009 – Co-op Work Term I
Course Outcomes	• Propose solutions for issues that emerge during a project. • Adopt proactive strategies for ensuring workplace performance meets expectations. • Manage assigned resources and responsibilities professionally. • Document placement activities using standard industry tools and approaches. • Catalogue contributions made to projects during placement. • Conduct oneself in a professional manner based on industry expectations.
Work Term	Co-op Work Term III (Optional)
Hours	420
Calendar Description	Co-op provides an experiential opportunity which is directly related to the field of study. The third work term centers on an expanded role with a higher level of responsibilities in the workplace. Students returning from co-op work term two contribute expanded knowledge and abilities to their program of study. Although centred with public and private institutions located in Eastern Ontario, co-op employment opportunities are sought throughout Canada and abroad. **Pre-requisite:** WKT0010 – Co-op Work Term II

TABLE 4.6.1: Outcomes for Work-integrated Learning Experiences

Course Outcomes	• Propose solutions for issues that emerge during a project. • Adopt proactive strategies for ensuring workplace performance meets expectations. • Manage assigned resources and responsibilities professionally. • Document placement activities using standard industry tools and approaches. • Catalogue contributions made to projects during placement. • Conduct oneself in a professional manner based on industry expectations.

Following established practices and procedures for cooperative education at Algonquin, evaluation of student performance during the placement will be based on input from the employer/supervisor and on work completed by the student. The employer/supervisor will complete both a Midterm Progress Report and a Final Employer Evaluation. On both of these documents, students need to meet or exceed established criteria for the placement. In addition, students will write a Final Work Term Report that will be submitted to the academic department for grading by a faculty member. As part of this report, students need to connect their work experience with the learning outcomes that were established for the work term. Once again, students need to meet or exceed established criteria for the report.

The Cooperative Education Department facilitates the co-op process including the development of job opportunities and the preparation of students for the work force. The department acts as a liaison between the student, the employer and the academic department and collects the relevant academic assignments. A website facilitates access to student and employer related web-based forms http://www.algonquincollege.com/coop/.

Students, employers and the Co-operative Education Office work together to ensure appropriate communication and assessment during the co-op placement. All have access to a web-based platform that includes the following guidelines/assessments:

- Student Learning Objectives Guidelines
- Midterm Evaluation Rubric (Self-assessment)
- Midterm Evaluation Rubric (Employer)
- Final Work-term Report Guidelines
- Final Work-term Evaluation Rubric (Self-assessment)
- Final Work-term Evaluation Rubric (Employer)
- Final Work-term Reflection Report Rubric

The following is the text content of the Final Work-Term Evaluation Rubrics (both self-assessment and employer) and the web-based Performance Appraisal (completed by the employer) available from the secure sign-in website which is submitted directly to the Co-op Department.

Performance Appraisal for Cooperative Education (Final Evaluation-by Employer)

Supervisor's Name:
Organization:
Student's Name:
Are you satisfied with the student's performance (Y/N):
Please rank the student's abilities and skills based on the following criteria in the rubric.

Points/comments are assigned to each skill/competency/work habit etc.
(0 Points-Unsatisfactory, 1 Point-Satisfactory, 2 Points-Exemplary, Comments-if applicable)

Outcome #1: Take responsibility for their own learning and development
Motivation and enthusiasm
Student shows motivation and eagerness to learn.
Student shows enthusiasm in approaching work tasks.
Student takes responsibility for his/her learning objectives.
Work habits
Student is punctual and attend regularly, notifies of absences appropriately reported.
Student is thorough and prompt in completion of tasks and assignments.
Student is diligent in following instructions.
Student shows appropriateness of appearance and presentation.
Student seeks new challenges, assignments and projects.
Student shows initiative in ongoing communication and collaboration with mentor in a timely and effective manner.
Student accepts suggestions and criticisms and maintains confidence.
Learning Objectives
Student reviewed learning objectives.
Student drafted measurable learning objectives.
Student clarified learning objectives and career goals throughout the work placement.
Outcome #2: Show competence in their workplace placement activities.
Apply discipline-specific knowledge and skills
Student applied discipline-specific knowledge and skills.
Organization and planning
Student manages time on tasks and completes work in a timely manner.
Student communicates information and ideas in both writing and speaking in a manner that is clear, grammatically correct and appropriate to the audience.
Student listens to others' ideas and opinions with an open mind.

Student expresses his/her ideas and opinions openly using language that demonstrates respect for people and their differences.
Outcome #3: Apply critical thinking skills in the development of the job.
Adaptability
Student learns from the placement experience, to react to unexpected circumstances.
Student is open to new ideas.
Student accepts and learns from differences in the experiences of others.
Creativity
Student seeks new and better ways of doing things.
Self-evaluation
Student accurately assesses his/her level of effectiveness and competence in practice and identifies strengths and learning needs.
Decision-making
Student analyzes work situations and makes appropriate decisions and acts on them.
Outcome #4: Develop effective relations within a team of professionals.
Interpersonal and intercultural skills
Student cooperates and works effectively with manager.
Student shows consideration and respect to others and maintains purposeful working relationship that respect diversity (culture, beliefs, sexual orientation).
Student works effectively in a team environment.
Strong knowledge of the company and work environment
Student shows effort to increase his/her knowledge of the organization, its mission, policies, rules and regulations in relation of the work performed.

Student Self-Assessment Final Rubric

Student's Full Name:
Supervisor's Name:
Organization:

Please rank your abilities and skills based on the following criteria in the rubric. This assessment will be a helpful tool when writing your final report and may be discussed with your employer during the final review.

Points/comments are assigned to each skill/competency/work habit etc.
(0 Points-Unsatisfactory, 1 Point-Satisfactory, 2 Points-Exemplary, Comments-if applicable)

Outcome #1: Take responsibility for their own learning and development
Motivation and enthusiasm
I show motivation and eagerness to learn.
I show enthusiasm in approaching work tasks.
I take responsibility for his/her learning objectives.
Work habits
I am punctual and attend regularly, notifies of absences appropriately reported.
I am thorough and prompt completion of tasks and assignments.
I am diligent in following instructions.
I show appropriateness of appearance and presentation.
I seek new challenges, assignments and projects.
I show initiative in ongoing communication and collaboration with mentor in a timely and effective manner.
Learning Objectives
I accept suggestions and criticisms and maintain confidence.
I reviewed learning objectives.
I drafted measurable learning objectives.
Outcome #2: Show competence in their workplace placement activities.
Apply discipline-specific knowledge and skills
I apply discipline-specific knowledge and skills.
Organization and planning
I manage time on tasks and completes work in a timely manner.
I communicate information and ideas in both writing and speaking in a manner that is clear, grammatically correct and appropriate to the audience.
I listen to others' ideas and opinions with an open mind.
I express my ideas and opinions openly using language that demonstrates respect for people and their differences.
Outcome #3: Apply critical thinking skills in the development of the job.
Adaptability
I learn from the placement experience, to react to unexpected circumstances.
I am open to new ideas.
I accept and learn from differences in the experiences of others.

Creativity
I seek new and better ways of doing things.
Self-evaluation
I accurately assess my level of effectiveness and competence in practice and identify strengths and learning needs.
Decision-making
I analyze work situations and make appropriate decisions and acts on them.
Outcome #4: Develop effective relations within a team of professionals.
Interpersonal and intercultural skills
I cooperate and work effectively with manager.
I show consideration and respect to others and maintain purposeful working relationship that respect diversity (culture, beliefs, sexual orientation).
I work effectively in a team environment.
Strong knowledge of the company and work environment
I show effort to increase my knowledge of the organization, its mission, policies, rules and regulations in relation of the work performed.

Please provide any concerns/comments about your Co-op experience.

_____

Conclusion

In keeping with the Board's standards and benchmarks for program content, the proposed Bachelor of Technology (Business Systems Development) (Honours) program includes one (1) mandatory co-op work term that is scheduled in a fourteen (14) week block. The work term is in the summer semester (May – August) between the third and fourth year of study. In addition, the proposed program allows students to arrange up to two (2) additional optional 14-week co-op work terms in order to augment the students' experiential learning experiences. The second and third optional co-op work terms are each fourteen weeks in duration, and are scheduled to commence immediately following the mandatory work term. As indicated above, each of these work experiences:

- are appropriate to the program;
- have articulated learning outcomes; and
- identifies an appropriate method for both instructor and employer/supervisor assessment leading to the assignment of a grade.

Students in the proposed Bachelor of Technology (Business Systems Development) (Honours), as well as employers in the industry, will benefit from Algonquin's established reputation for experiential learning as exemplified through cooperative education. Moreover, on-going collaboration between the academic department and Algonquin's Cooperative Education Department will ensure that there are rich and meaningful work experiences that contribute to both the breadth and depth of the knowledge and skills developed by the students.

Section 4.7: Course Outlines

Section 4.7.1: Core Courses

Excluded for web version – confidential/proprietary material

Section 4.7.2: New Non-Core Courses

No new non-core courses are being submitted with this application.

Section 4.8: Bridging Course Descriptions

Based on the gap analysis provided in Section 4.10 no bridging courses are planned for this proposed program. A combination of the unique blend of knowledge domains covered throughout the program, and the manner in which the knowledge domains are threaded throughout the program of study, prevent us from easily moving students into upper years of the program.

Section 4.9: Bridging Course Outlines

Not applicable (see Section 4.8).

Section 4.10: Gap Analysis

Computer Engineering Technology – Computing Science Ontario College Advanced Diploma
The outcomes of prior study for this program are drawn from the Ministry of Advanced Education and Skills Development published program standards that "outline the essential skills and knowledge that a student must acquire and be able to reliably demonstrate in order to graduate from the program."[2]

Students graduating with a Computer Engineering Technology – Computer Science Ontario College Advanced Diploma will have acquired knowledge and skills in the areas identified in the following chart.

The degree completion arrangements for graduates of the Computer Engineering Technology – Computer Science program require these students to successfully complete several courses throughout the program of study, which combine missing knowledge and skills that are addressed in all four years of the degree program. As described previously (see Section 3.4) the pathway options are quite limited for this degree program. This is partly due to the three knowledge domains integrated throughout the four years of the program, resulting in various knowledge pathways that preclude clean bridging options.

For this degree completion arrangement, the necessary academic rigour is in place to ensure that the degree level standard and the degree program outcomes are met.

Degree completion arrangements for graduates of: Computer Engineering Technology – Computing Science Ontario College Advanced Diploma
( ) denotes semester in which course occurs

Degree Program Outcomes	Outcomes of Prior Study	Gap in Knowledge and Skills	Remediation of Gap
1. Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	1,2,3,4,6,7,9	Strategic business thinking, business fundamentals, advanced database concepts	Business Fundamentals(1) Financial Accounting (2) Value Creation in Healthcare(2) Macroeconomics (4) Business Analytics and Advanced Business Intelligence (4)
2. Manage the process of evaluating, selecting and using business systems.	3,4,9	Management, evaluation, broad business perspective, formal RFP	Business Fundamentals(1) Financial Accounting(2) Basics of Supply Chain Management(3) Strategic Business Intelligence(5) Enterprise Architecture(5) Project Management for IT(5) Business Technology Management(6) Business Systems Security, Audit and Control(7)

[2] Ontario Ministry of Training, Colleges and Universities, "What Does a Program Standard Contain?," [ONLINE] (22 February 2006) Available: http://www.tcu.gov.on.ca/eng/general/college/progstan/contain.html

			Project I(7) Project II(8)
3. Develop and improve business systems by applying accepted methodologies, theories, concepts and practices.	2,3,6,7,9	Business concepts	Financial Accounting(2) Basics of Supply Chain Management(3) Macroeconomics(4) Technology Integration Using SAP(4) Business Analytics and Advanced Business Intelligence(4) Strategic Business Intelligence(5) Enterprise Architecture(5) Project Management for IT(5) Business Technology Management(6) Enterprise Mobile Application Development(7) Project I(7) Entrepreneurship(8) Business Software Agents and Project II(8)
4. Manage data using appropriate methodologies and standards to improve business processes and decision-making.	1,2,3,4,7	Strategies, decision-making, business fundamentals, business intelligence	Technology Integration Using SAP(4) Business Analytics and Advanced Business Intelligence(4) Enterprise Mobile Application Development(7) Project I(7) Business Software Agents (8) Project II(8)
5. Apply the Project Management Institutes Body of Knowledge to business systems software engineering projects.	4,9	PMI BOK	Strategic Business Intelligence(5) Project Management for IT(5) Project I(7) Project II(8)
6. Apply security principles and practices in systems development and the systems environment.	3,6,7	Enterprise-level system security	Enterprise Architecture(5) Business Technology Management(6) Business Systems Security, Audit and Control(7)
7. Apply principles and skills of business management, leadership and change management in the context of business systems	4,9	Fundamental business concepts, some change management	Business Fundamentals(1) Financial Accounting(2) Value Creation in Healthcare(2) Basics of Supply Chain Management(3) Macroeconomics(4) Strategic Business Intelligence(5) Project Management for IT(5) Business Technology Management(6)

software engineering.			Enterprise Mobile Application Development(7) Project I(7) Entrepreneurship(8) Project II(8)
8. Apply quality assurance and quality management principles to business systems development projects.	4,7,9	Quality assurance from a business perspective	Financial Accounting(2) Basics of Supply Chain Management(3) Business Systems Security, Audit and Control(7) Project I(7) Project II(8)
9. Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	1,7,9	Business technology management, strategic analysis of business processes	Business Fundamentals(1) Value Creation in Healthcare(2) Business Analytics and Advanced Business Intelligence(4) Strategic Business Intelligence(5) Business Technology Management(6) Project I(7) Entrepreneurship(8) Project II(8)
10. Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	9	Management skills, fundamental business concepts, strategic analysis and decision-making	Basics of Supply Chain Management(3) Business Technology Management(6) Project I(7) Project II(8)
11. Adhere to professional, ethical and legal codes and standards.	7,8,9,10	Management perspective, accounting principles, strategic planning	Financial Accounting(2) Value Creation in Healthcare(2) Introduction to the Canadian Healthcare System(3) Business Analytics and Advanced Business Intelligence (4) Strategic Business Intelligence(5) Enterprise Architecture(5) Project Management for IT(5) Business Systems Security, Audit and Control(7) Enterprise Mobile Application Development(7) Project I(7) Project II(8)
12. Conduct and evaluate research	N/A	Research	Value Creation in Healthcare(2) Entrepreneurship(8)

to contribute to evidence-based practice in business systems development.			Project II(8)
13. Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	10	No Gap	N/A
14. Leverage artificial intelligence and agent technologies to support short and long term business decisions.	N/A	Gap	Enterprise Application Development (6) Enterprise Mobile Application Development (7) Wearable Computing (7) Business Software Agents and Artificial Intelligence (8)

() denotes level in which course occurs

Computer Engineering Technology – Computing Science program learning outcomes

1. Diagnose, solve, troubleshoot, and document technical problems involving computing devices using appropriate methodologies.
2. Integrate multiple software and hardware components using appropriate network architecture.
3. Participate in analyzing, planning, designing, and developing the architecture of computing devices and systems.
4. Plan, install, configure, modify, test, and maintain a variety of computer systems to meet functional requirements.
5. Apply principles of digital and analog circuits to the implementation of embedded computing devices.
6. Analyze, build, test, implement, and maintain applications.
7. Evaluate and document security issues associated with a variety of computing devices and propose alternatives to increase product reliability.
8. Articulate, defend, and conform to workplace expectations found in technology environments.
9. Contribute to the successful completion of the project applying the project management principles in use.
10. Identify and apply discipline-specific factors that enable their contribution to the local and global community through social responsibility, economic commitment and environmental stewardship.

Computer Programmer Ontario College Diploma

The outcomes of prior study for this program are drawn from the Ministry of Advanced Education and Skills Development published program standards that "outline the essential skills and knowledge that a student must acquire and be able to reliably demonstrate in order to graduate from the program."[3]

Students graduating with a Computer Programmer Ontario College Diploma will have acquired knowledge and skills in the areas identified in the following chart.

The degree completion arrangements for graduates of the Computer Programmer program require these students to successfully complete several courses throughout the program of study, which combine missing knowledge and skills that are addressed in all four years of the degree program. As described previously (see Section 3.4) the pathwayoptions are quite limited for this degree program. This is partly due to the three knowledge domains integrated throughout the four years of the program, resulting in various knowledge pathways that preclude clean bridging options.

For this degree completion arrangement, the necessary academic rigor is in place to ensure that the degree level standard and the degree program outcomes are met.

Degree completion arrangements for graduates of:
Computer Programmer Ontario College Diploma
( ) denotes semester in which course occurs

Degree Program Outcomes	Outcomes of Prior Study	Gap in Knowledge and Skills	Remediation of Gap
1. Analyze, design, develop, implement and maintain business systems and/or components to support strategic business requirements.	1,2,3,5,6	Strategic business thinking, business fundamentals	Business Fundamentals(1) Financial Accounting (2) Value Creation in Healthcare(2) Macroeconomics (4) Business Analytics and Advanced Business Intelligence (4)
2. Manage the process of evaluating, selecting and using business systems.	5,6,9	Management, evaluation, broad business perspective, formal RFP	Business Fundamentals(1) Financial Accounting(2) Basics of Supply Chain Management(3) Strategic Business Intelligence(5) Enterprise Architecture(5) Project Management for IT(5) Business Technology Management(6) Business Systems Security, Audit and Control(7) Project I(7) Project II(8)
3. Develop and improve business	4,5,6,9	Business concepts	Financial Accounting(2) Basics of Supply Chain Management(3)

[3] Ontario Ministry of Training, Colleges and Universities, "What Does a Program Standard Contain?," [ONLINE] (22 February 2006) Available: http://www.tcu.gov.on.ca/eng/general/college/progstan/contain.html

systems by applying accepted methodologies, theories, concepts and practices.			Macroeconomics(4) Technology Integration Using SAP(4) Business Analytics and Advanced Business Intelligence(4) Strategic Business Intelligence(5) Enterprise Architecture(5) Project Management for IT(5) Business Technology Management(6) Risk Management and Strategies(6) Enterprise Mobile Application Development(7) Project I(7) Business Software Agents and Artificial Intelligence(8) Project II(8)
4. Manage data using appropriate methodologies and standards to improve business processes and decision-making.	3,4,5,6,9	Strategies, decision-making, business fundamentals, business intelligence	Technology Integration Using SAP(4) Business Analytics and Advanced Business Intelligence(4) Enterprise Mobile Application Development(7) Risk Management and Strategies(6) Project I(7) Business Software Agents and Artificial Intelligence(8) Project II(8)
5. Apply the Project Management Institutes Body of Knowledge to business systems software engineering projects.	7,8,9	PMI BOK	Strategic Business Intelligence(5) Project Management for IT(5) Project I(7) Project II(8)
6. Apply security principles and practices in systems development and the systems environment.	2,4,6	Enterprise-level system security	Enterprise Architecture(5) Business Technology Management(6) Business Systems Security, Audit and Control(7)
7. Apply principles and skills of business management, leadership and change management in the context of business systems	5,6,7,8,9	Fundamental business concepts, some change management	Business Fundamentals(1) Financial Accounting(2) Value Creation in Healthcare(2) Basics of Supply Chain Management(3) Macroeconomics(4) Strategic Business Intelligence(5) Project Management for IT(5) Business Technology Management(6) Risk Management and Strategies(6)

software engineering.			Enterprise Mobile Application Development(7) Project I(7) Entrepreneurship(8) Project II(8)
8. Apply quality assurance and quality management principles to business systems development projects.	6,8,9	Quality assurance from a business perspective	Financial Accounting(2) Basics of Supply Chain Management(3) Business Systems Security, Audit and Control(7) Project I(7) Project II(8)
9. Educate a diversity of clients in the use of business technology to support, promote and improve business processes.	7,8,9	Business technology management, strategic analysis of business processes	Business Fundamentals(1) Value Creation in Healthcare(2) Business Analytics and Advanced Business Intelligence(4) Strategic Business Intelligence(5) Business Technology Management(6) Enterprise Application Development(6) Risk Management and Strategies(6) Project I(7) Entrepreneurship(8) Project II(8)
10. Apply business technology management skills to innovate in business systems development targeting new and existing local and global markets.	9,10	Management skills, fundamental business concepts, strategic analysis and decision-making	Basics of Supply Chain Management(3) Business Technology Management(6) Project I(7) Project II(8)
11. Adhere to professional, ethical and legal codes and standards.	6,8,9	Management perspective, accounting principles, strategic planning	Financial Accounting(2) Value Creation in Healthcare(2) Business Analytics and Advanced Business Intelligence (4) Strategic Business Intelligence(5) Enterprise Architecture (5) Project Management for IT (5) Enterprise Application Development (6) Business Systems Security, Audit and Control (7) Enterprise Mobile Application Development (7) Project I (7) Project II (8)
12. Conduct and evaluate research	N/A	Research	Value Creation in Healthcare(2) Project I(7)

to contribute to evidence-based practice in business systems development.			Entrepreneurship(8) Project II(8)
13. Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.	10	No Gap	N/A
14. Leverage artificial intelligence and agent technologies to support short and long term business decisions.	N/A	Business strategic decision-making	Enterprise Application Development (6) Enterprise Mobile Application Development (7) Wearable Computing (7) Business Software Agents and Artificial Intelligence (8)

() denotes semester in which course occurs

Computer Programmer Ontario College Diploma program learning outcomes

1. Use documented solutions to troubleshoot problems associated with software installation and customization.
2. Develop, test, document, deploy, and maintain secure program code based on specifications.
3. Perform routine maintenance on a database.
4. Apply knowledge of networking concepts to develop, deploy, and maintain program code.
5. Gather and document required information and assist in an analysis of a business.
6. Use relevant methodologies, policies, and standards to develop secure program code.
7. Maintain effective working relationships with clients.
8. Conform to workplace expectations found in information technology (IT) environments.
9. Contribute to the successful completion of the project applying the project management principles in use.
10. Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.

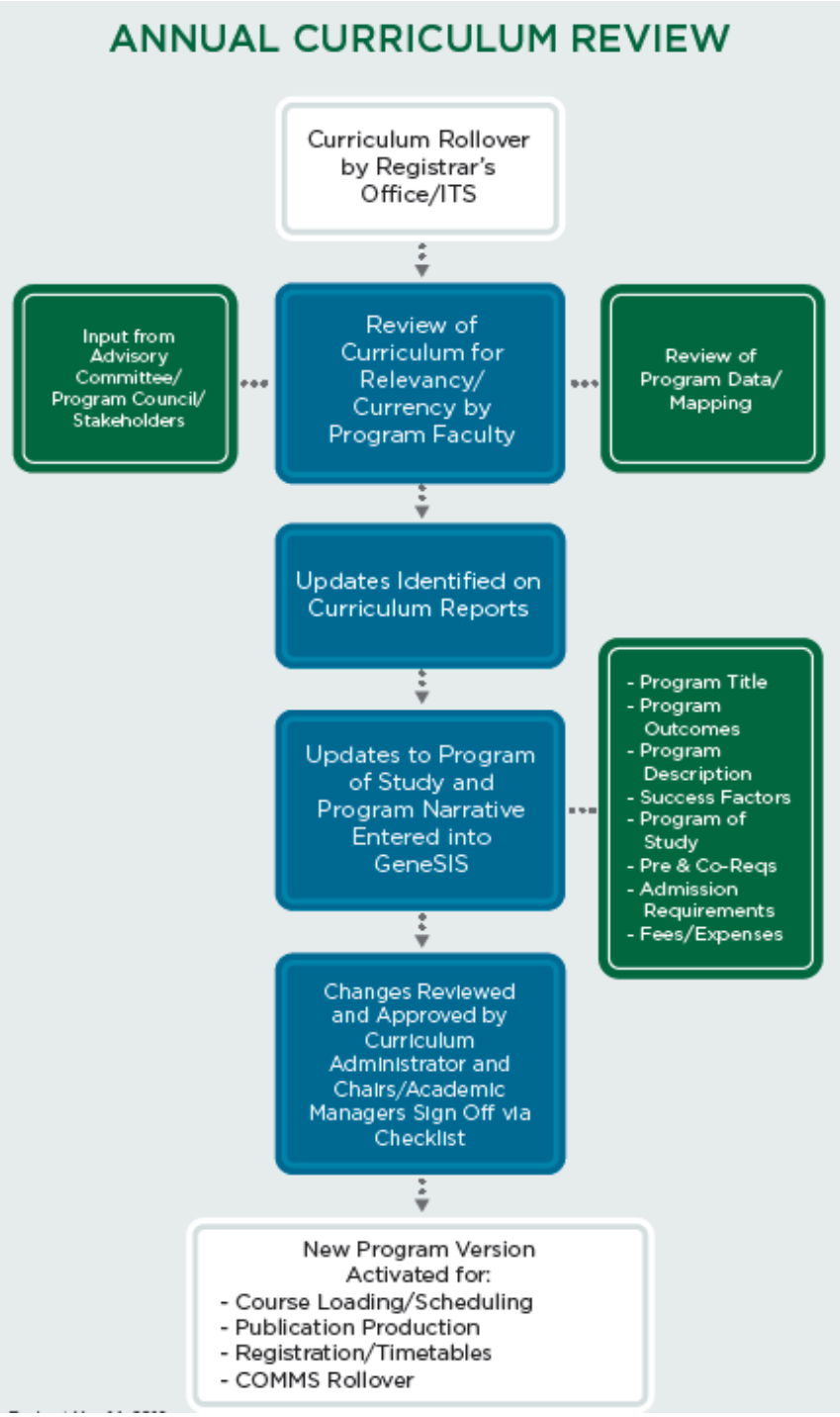
Section 5: Program Delivery

The program methodologies proposed for the delivery of curriculum and other program elements, and the associated quality assurance policies and procedures meet the Board's requirements as described in the following sections.

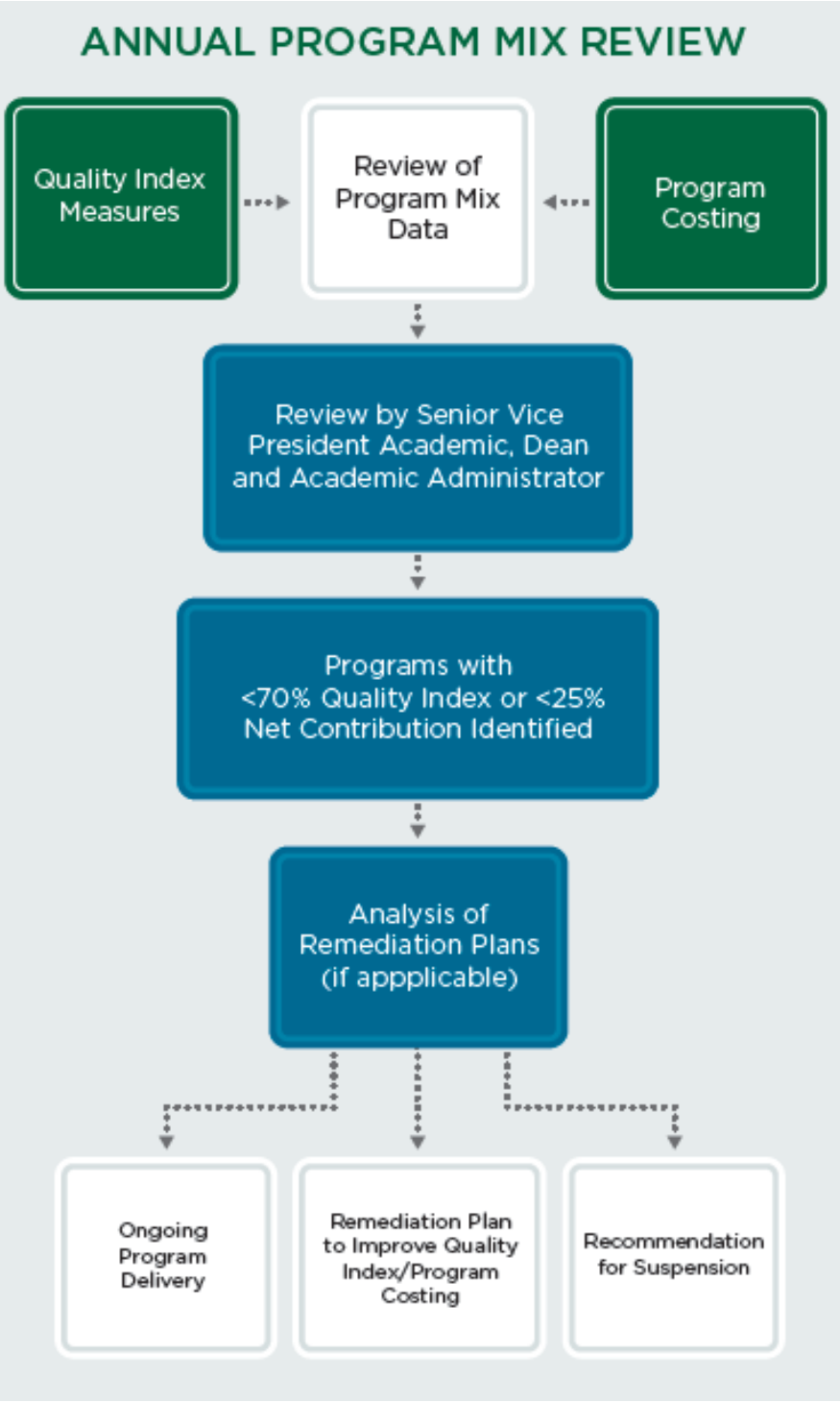
Section 5.1: Quality Assurance of Delivery

Algonquin College has a robust program quality assurance process consisting of three primary components, Annual Curriculum Review, Program Mix Review and Program Quality Review. These processes include evidence-based and participatory inquiry to determine whether courses and the program (whether delivered using traditional, web facilitated, blended, hybrid or online methods) are achieving the intended learning outcomes. Furthermore, the results of the quality assurances practices are used to guide curriculum design and delivery, pedagogy and educational processes as here described.

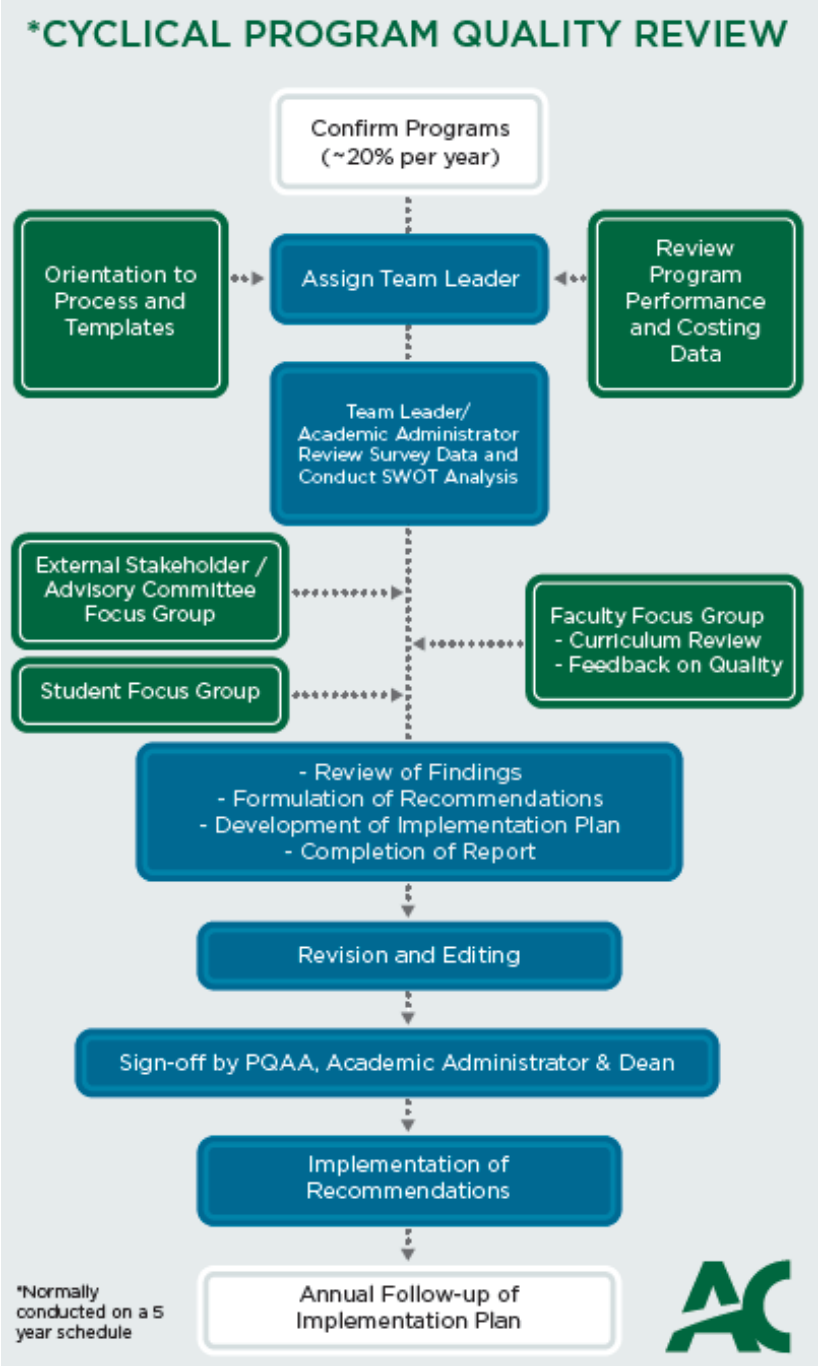
The Annual Curriculum Review process includes reviewing and revising the curriculum, incorporating input from recent Student Course Feedback and KPI surveys, advisory committees and program councils, and formalizing changes for the next academic year.


ANNUAL CURRICULUM REVIEW
Curriculum Rollover by Registrar's Office/ITS
Input from Advisory Committee/ Program Council/ Stakeholders
Review of Curriculum for Relevancy/ Currency by Program Faculty
Review of Program Data/ Mapping
Updates Identified on Curriculum Reports
Updates to Program of Study and Program Narrative Entered into GeneSIS
- Program Title
- Program Outcomes
- Program Description
- Success Factors
- Program of Study
- Pre & Co-Reqs
- Admission Requirements
- Fees/Expenses
Changes Reviewed and Approved by Curriculum Administrator and Chairs/Academic Managers Sign Off via Checklist
New Program Version Activated for:
- Course Loading/Scheduling
- Publication Production
- Registration/Timetables
- COMMS Rollover

Program Mix Review is usually undertaken at the end of the fiscal year. The program's fiscal data is reviewed annually along with the results of the KPI and Student Course Feedback surveys. The program is given a score based on both financial and qualitative measures. A Board of Governors' directive is that programs with a financial contribution of less than 25% or a Quality Index Score less than 70% develop remediation plans.



Program Quality Review is a comprehensive process normally occurring on a five year cycle at which time a program augments its Annual Program Review audit with an in depth review of historical survey data for the previous five years. Curriculum is remapped to ensure it remains compliant with the Quality Assurance Framework, degree level standards and program learning outcomes. Course outlines are reviewed to ensure they are complete and that there is congruency between course learning outcomes, learning activities and evaluation methods. Recommendations for improvement are made, and an implementation plan is developed. The implementation plan is tracked on an annual basis until all recommendations have been assessed.



These three quality assurance processes are depicted in a flow chart at http://www.algonquincollege.com/academic-development/our-services/program-quality-assurance/ (*link to the* 'Algonquin College Program Quality Assurance Model').

The electronic policies file (Section 16: Policies) includes policies and procedures pertaining to quality assurance within the following:
Policy AA03: Program/Department Councils
Policy AA25: Student Course Feedback
Policy AA38: Program Quality Assurance

Section 5.2: Student Feedback

Algonquin College believes that student feedback as to the quality and effectiveness of course/program delivery is an important component in the ongoing improvement of the delivery of programs. There are standardized and regular feedback mechanisms in place to gather quantitative and qualitative data to inform plans and actions. Student Course Feedback (Course Assessment) survey results provide quantitative data that is analyzed annually and compared year to year. Aligning with the College's desire to reach all students *anytime, anywhere*, Student Course Feedback surveys moved online in 2009. Instead of a traditional one-time in-class opportunity to provide feedback, surveys are open for a generous time period, with results available to individual course professors and Academic Administrators immediately at the end of the course. Furthermore, the archiving of survey results paves the way for efficient longitudinal analyses of this survey data enabling the College to determine whether improvement initiatives have made a change in the program from the students' perspective or indicating where improvements are necessary. Qualitative information is also obtained from Student Course Feedback surveys and Program Council meetings. All of this information is reviewed on an ongoing basis and responded to, as appropriate.

With the move to the online collection of Student Course Feedback surveys, in 2013, the College initiated a working group with the goal of increasing the student response rates. Recommendations put forth were implemented for the 2014-15 Academic Year that resulted in increases to the response rate every term. Additionally, the working group examined the questions utilized in the survey tool, and put forth numerous recommendations that have resulted in the survey using the set of questions for all courses. The Student Course Feedback questions are listed at the end of this section.

Where student feedback or performance are indicative of the need for support, academic advising and student support specialists are available to assist students. Academic Advising is available to students through the coordinator for the program, or through the services of faculty assigned an advising role. The role of the academic advisor is defined in AA40: Academic Advising http://www2.algonquincollege.com/directives/policy/academic-advising/ as "...a professor or instructor who has been assigned the responsibility of providing academic guidance to students in his/her program at one or more specified levels." (AA40, p.1) Academic advising tools and other resources, such as the Academic Advising Handbook for Resources are available to faculty to assist in supporting students' needs: http://www.algonquincollege.com/acadvising/

Student support specialists are assigned to each Faculty to provide guidance for overall student issues and to provide support to students struggling with academics. http://www.algonquincollege.com/student-success/home/support-services/

Student Coaching, Peer Tutoring and Study Workshops are also available to help students identify solutions to difficulties with their studies through face-to-face coaching and virtual applications. Additionally, a Student Learning Centre is available to provide students with support in English, math, and computer skills. http://www.algonquincollege.com/slc/

The electronic policies file (Section 16: Policies) includes policies and procedures pertaining to student feedback, academic advising and dealing with poor student performance or enhancing student performance within the following:

AA03: Program Councils
AA25: Student Course Feedback
AA40: Academic Advising

Student Course Feedback - Questions

The Course

1. Overall, please rate the quality of this course
   Response: Excellent to Not Satisfactory N/A
2. Course learning activities (e.g. lectures, discussions, practical work, group work, etc) are varied.
   Response: 5-Point Likert Scale w/NA
3. Course learning activities are linked to the course learning requirements.
   Response: 5-Point Likert Scale w/
4. All of the course learning requirements are covered in the course.
   Response: 5-Point Likert Scale w/NA
5. What did you like most about this course?
   Response: Long Answer – free flowing
6. How could the course be improved to be of benefit to future students?
   Response: Long Answer – free flowing

The Professor

7. Overall, please rate the effectiveness of your course professor
   Response: Excellent to Not Satisfactory N/A
8. What did you like most about the course professor?
   Response: Long Answer – free flowing
9. What, if anything, could the professor do differently to be of benefit to future students?
   Response: Long Answer – free flowing

Section 6: Capacity to Deliver

The proposed program is appropriate to the college's mission, goals and strengths.
Algonquin College's strategic plan, ***50+5: Strategic Plan 2017-2022,*** articulates its mission, goals and strength. The new strategic plan and Strategic Mandate Agreement may be reviewed at the following link:
http://www.algonquincollege.com/reports/

Algonquin College's Vision, Mission and Core Values

Algonquin College's organizational philosophy is defined by our vision, mission and core values. These critical elements describe who we are, what we want to achieve, and what will guide our decision-making on a daily basis. The vision sets out the ideal state that we want to achieve and the mission identifies our purpose, while the core values articulate our most fundamental beliefs and the behaviours expected of employees and students. Combined, the vision, mission and values, set the context for the current Strategic Plan for 2017-2022 and for the long-term development of the College. Extensive public consultation and engagement of the College community has informed this plan's direction. The College's current strategic plan retains the core values espoused in the previous 2012-2017 plan, however, contains a revision to the Mission and Vision as follows:

VISION STATEMENT
To be a global leader in personalized, digitally-connected experiential learning.

MISSION STATEMENT
To transform hopes and dreams into lifelong career success.

CORE VALUES
Caring
We have a sincere and compassionate interest in the well-being of the individual.
Learning
We believe in the pursuit of knowledge, personal growth and development.
Integrity
We believe in trust, honesty and fairness in all relationships and transactions.
Respect
We value the dignity and uniqueness of the individual.
We value the equity and diversity in our community.

Section 6.1: Learning and Physical Resources

The Algonquin College Library offers a variety of services to support faculty teaching and student learning by providing access to Library professionals and para-professionals as well as print and electronic resources.

Algonquin's main campus is well situated in the National Capital Region. This gives our students the advantage of being close to many specialized libraries. The Algonquin Library has local agreements with many area libraries which permit direct student borrowing or Inter-library loan service. The libraries covered under these agreements include Carleton University and University of Ottawa libraries.

In addition to individual Library agreements, the Algonquin College Library is a partner in the National Capital **Sm@rtLibrary** which includes numerous member institutions. This partnership facilitates students' access to resources available at partner institutions. Current partners include:

- University of Ottawa
- Carleton University
- Ottawa Public Library
- Canadian Museum of Civilization
- Canadian War Museum
- Canadian Mortgage and Housing Corporation
- La Cité collégiale
- National Gallery
- Bibliothèque municipal de Gatineau
- Université du Québec en Outaouais
- Canada Science and Technology Museums Corporation
- Dominican College University

Print/in-house resources relevant to Bachelor of Technology (Business Systems Development):
The Algonquin Library collection totals about 65,000 volumes in-house. As this program covers topics in Computing and Business, it is difficult to estimate the number of books in our present collection that would support the new program. There are potentially thousands of books that may be relevant. The most current titles would generally be in electronic format (ebook). The library will also supplement existing resources by purchasing additional specialized titles to complement current holdings in the area of business systems development.

Included in the above are audio-visual items that may be relevant for the program. Students may benefit greatly from the lynda.com tutorials and video resources from the Films on Demand educational video database. The Library also provides resources for support subject areas such as Mathematics, Communications (Language/Writing/Presentations), Critical Thinking, Basic Computing, among others.

Electronic/Online Resources
Databases
The Algonquin Library provides access to over 50 databases. Many of these databases would include journal titles of relevance to a business systems development program. Database titles of specific interest would be:

- IEEE
- ACM
- AIS
- Business Source Complete
- General Business File
- Computer Database
- Information Science and Library Issues Collection
- Safari Tech Books Online
- Ebsco
- Academic Search Complete
- Lynda.com

Journals

Online journal titles are available through our various electronic databases and include the following:

- Technology Analysis & Strategic Management
- Journal of Education for Business
- Pro Lingo
- Expert Systems
- Journal of Intelligent & Fuzzy Systems
- Science of Computer Programming
- Journal of Electrical & Computer Engineering

Journals and articles on relevant topics can be found in various business databases and computer or technical databases. The Library offers a “Onesearch” service which allows searching of most library databases simultaneously. This service will greatly benefit students as they search for topics that are multi-disciplinary.

Audio Visual – Streamed Video

The Algonquin Library provides access to a large collection of online (streamed) video from Films on Demand. Other online video collections are available through the Library, including National Film Board (NFB) and PBS LearningMedia.

Electronic Books

The Library’s e-Book collection contains over 30,000 titles and 29,000 public documents. Other areas of interest covered in the various e-book collections include Mathematics, Basic Computing, English Communications, among others.

General Information

Algonquin’s main campus is well situated in the National Capital Region. This gives our students the advantage of being close to many specialized libraries. The Algonquin Library has local agreements with many area libraries which permit direct student borrowing or Inter-library loan service. The libraries covered under these agreements include Carleton University and Ottawa University libraries.

In addition to individual library agreements, the Algonquin College Library is a partner in the National Capital **Sm@rtLibrary** which includes numerous member institutions. This partnership facilitates students' access to resources available at partner institutions. Current partners include:

- University of Ottawa
- Carleton University
- Ottawa Public Library
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- Canadian Museum of Civilization
- Canadian War Museum
- Canadian Mortgage and Housing Corporation
- National Gallery
- Bibliothèque municipal de Gatineau
- Université du Québec en Outaouais
- Canada Science and Technology Museums Corporation
- Dominican University College

Specialized Equipment

The Bachelor of Technology (Business Systems Development) (Honours) program does not require the purchase of specialized hardware to support delivery of the program. The software required for the delivery of the lab components of courses will be either Open Source, or provided under the terms of Academic Licenses with the software vendor.

Laboratory Space

Specialized lab space is not required for this program. All labs requiring IT resources will be performed on student-owned laptops that meet specifications provided by the college. Labs will be scheduled in rooms that provide all students with access to power and wireless network connectivity for their laptops.

Section 6.2: Resource Renewal and Upgrading

Library Resources
The College plans and invests in Library acquisitions on an annual basis. Library resource needs are identified by the librarians as well as faculty members. Faculty members review existing acquisitions, typically in the May/June timeframe. New resources (text, video, journal, electronic) that will be of benefits are prioritized and purchasing recommendations submitted to the Library for consideration as per yearly funding allocations. Policy AA31 further details the Library's (formerly the Learning Resource Centre) mandate.

Computers and Computer Access
The College establishes an instructional computing and technology renewal and upgrading plan on an annual basis. A process for renewal of computers and their deployment to staff has been established as detailed in Policy IT02- Technology Evergreening and Policy IT06-Deployment of Computing Devices. The College has approximately 2050 computers accessible at the Woodroffe campus within combined general and specialized labs that are equipped on average with 34 computers.

New equipment and renewal requirements are identified and prioritized on an annual basis in conjunction with capital equipment planning. The College Space and Infrastructure Committee (CSIC) develops plans to address strategic directions, needs and areas for improvement. On an annual basis, Schools are requested by the CSIC to bring forward requests for renovations and/or space requirements to improve the learning environment. These requests are prioritized by a sub-committee of CSIC.

Allocation of funds for environmental and learning resources is an annual process as per the budget approved by Algonquin College's Board of Governors. Capital funds are distributed amongst the Faculties/Schools in the College and the allocation varies from year to year, based on funds available.

Classrooms
The College upgrades and enhances facilities on an ongoing basis taking into account enrolments, faculty support needs, and the growing use of web-based technologies for learning and teaching. There are currently 147 classrooms at the Ottawa campus that are upgraded according to the needs identified through the annual Learning Environment Quality identification, prioritization, and funding process. Lecture rooms vary in size and seat from 20-140 students. All classrooms at Algonquin College have e-learning capabilities that can be used for course delivery and web access. E-classrooms are equipped with wireless Internet access, video equipment, a speaker system, a high-resolution projector, a computer with wired access to high speed internet, and a white or black board. Of the E-classrooms, 130 have been enhanced to mobile classrooms supporting the use of laptops and other mobile devices with full access to power, an enhanced data projector and a Smart Podium interactive pen display. E-classrooms are equipped with video equipment, a speaker system, a high-resolution projector, a computer with access to high speed internet, and a white or black board.

Policy AA 31: Learning Resource Centre
Policy IT 02: Technology Evergreening
Policy IT 06: Deployment of Computing Devices
Procedure: College Technology Committee Terms of Reference
Procedure: College Space and Infrastructure Committee Mandate

Section 6.3: Support Services

Support Service	Brief Description of Service
Welcome Centre	The Robert C. Gillett Student Commons provides a variety of services dedicated to student success. The Welcome Centre in Student Support Services, located on the third floor of the Student Commons (E341), is designed to serve as a vital first point of access to a number of support services for potential applicants, current students and graduates from one centralized location, in the hopes of establishing a familiar and ongoing resource during an individual's affiliation with Algonquin College. The Welcome Centre features five stations including one accessible station to assist students and clients in their pursuit of service from the Centre for Students with Disabilities, Counselling Services, and the Employment Support Centre (formerly known as Student Employment Services).
The AC Hub	The AC Hub is devised as a one-stop access point for student engagement and a source for information, events and workshops. Students will cultivate partnerships, friendships and networking connections within the AC Hub and their communities. Our goal is to enhance the academic experience beyond the scope of the classroom, providing students the opportunity to become actively involved in campus life and the surrounding community. The AC Hub hosts College-wide Orientation, provides signature events (including the annual Volunteer Appreciation Gala), and also provides volunteer opportunities on campus and in the community recognized by a Co-Curricular Record to acknowledge students' contributions. Additionally, the AC Hub delivers hands-on workshops, exposes students to industries through keynote speakers and AC Hub Talks, provides a support structure for students through a Peer Mentoring program, offers services at the AC Hub Satellite (second floor, C building) and three AC Hub Mobile desks across the sprawling Woodroffe campus to help keep students informed, and provides both physical and virtual outreach to regional campuses.
Academic Advising	Algonquin College's Policy on Academic Advising, AA40, defines an advisor as "…a professor or instructor who has been assigned the responsibility of providing academic guidance to students in his/her program." In this role, the faculty member provides the student with an opportunity to • plan, discuss, and review academic progress • address challenges that may impede successful performance • identify education, life and career goals • assist the student in creating a plan to realize those goals • refer the student to all College resources the College

Support Service	Brief Description of Service
Student Success Specialists	Student Success Specialists are support staff who provide a friendly first point of contact for students of a designated Academic area (e.g. Faculty of Technology and Trades), or group (e.g., Aboriginal, WSIB). They work closely with Academic and Student Services staff to: • promote and implement student success initiatives (e.g., connecting with students at risk) • ensure students' questions are answered promptly or directed to the appropriate forum • participate in activities that help students in the transition to the College (e.g., orientation) • provide information about admissions, records, programs of study and bursaries • link students to appropriate resources and services
Counselling: Career and Personal	Counselling Services (Woodroffe Location) is staffed by 8 full-time professional counsellors. This department provides confidential support services to students facing the academic, career, and personal challenges of college. Services include: • Short term and Supportive counselling for common mental health issues experienced by students, such anxiety, depression, and stress regulation • Crisis intervention and suicide risk assessment • Proactive outreach initiatives issues such as team building, effective group work, communication skills, and stress management • Program-choice planning and career direction assessment • Tragic Event Response Team • Parent Resource Network • Employee training initiatives such as "SafeTALK" suicide intervention, "Positive Space" sexual orientation awareness, and a range of mental health awareness workshops.
Financial Aid	The Financial Aid Office is staffed with 1 manager, 1 front office supervisor, 10 full-time employees and 4 part-time employees who administer various government financial assistance programs to eligible full and part-time students. Services include, but are not limited to: • Administration of the Ontario Student Assistance Program (OSAP) • Determination of an individual student's eligibility for the various types of funding • Administration of the student bursary programs for students • Interpretation of the rules and regulations of the Ministry of Advanced Education and Skills Development

Support Service	Brief Description of Service
Employment Support Centre	The Employment Support Centre offers professional cost-free services to students, graduates, and employers. The department is comprised of three full-time employees including two Employment Officers and one Employment Outreach Officer. The Employment Support Centre promotes college programs to the community and offers a comprehensive electronic job posting service ensuring employers and qualified students/graduates are connected. Services include, but are not limited to: • Electronic job posting system (MyCareerZone) • One-on-one job coaching appointments • Résumé and cover letter review drop-in service • Job search techniques and interview preparation • Labour market information • Career Fairs and other on-campus recruitment activities
Tutoring	The Counselling Service's 'Peer Tutoring' provides the one-on-one opportunity for students experiencing difficulties in a particular course to be matched with a senior student (nominal fee applies) for academic assistance.
Services for Students with Disabilities	The Centre for Accessible Learning provides disability-related counselling and advising, including specialized academic and personal counselling that is developed specifically for students with disabilities and not duplicated by regular counselling and advising services available to all students. The Centre is staffed with 1 manager and 12 full-time employees including 6 Disability Counsellors, 1 Learning Strategist, 1 Intake and Assessment Advisor, 2 Assistive Technologists, 1 Test Room Facilitator, 1 Office Administrator and numerous additional part-time staff. We also employ two part time counsellors and two part-time learning strategists. Services include, but are not limited to: • Counselling and support so that students with disabilities can work within an accessible college environment • Assistive reading technologies • A large Test Centre for the provision of test and exam accommodations • Transcription services (ie: Braille, large print, alternative/digital formats such as accessible e-text) • Assistance to find specialized and peer tutors • Interpreters/electronic note taking for students with hearing loss • Peer notetaking services • Access to, and training for, assistive devices • Access to a large Assistive Technology Lab • A Transition Centre for students with Autism Spectrum Disorder • Consultation with faculty for students with disability-related needs • Liaison with and referral to other Student Support Services and agencies • Liaison with campus and community agencies on the students' behalf

Support Service	Brief Description of Service
Other Services:	
Cooperative Education Department	The Cooperative Education Department facilitates the co-op process including the development of job opportunities and the preparation of the students for the work force. The department acts as a liaison between the student, the employer and the participating academic departments and collects the relevant academic assignments. The academic coordinators evaluate the student's co-op work term report. The staffing complement is 5 full-time employees. Services include, but are not limited to: • Job posting process, distribution of applications to employers • Arranging interviews on or off campus, process job offers • Site visits with the employer and student during the work placement • Consultation with co-op professionals to mitigate issues encountered during the job search or while on placement
Health Services	Health Services provides professional, confidential medical services for students. Physicians are available by appointment and walk-in. Registered Nurses provide assessment and treatment of minor illnesses or injury. Health Services is staffed with both full and part-time physicians, nurses and support staff. There are 6 combined full and part-time physicians, one registered dietitian, one psychiatrist and 7 nurses on staff. Services include, but are not limited to: • Allergy injections • Birth control information and prescriptions • Blood tests • Emergency treatment for accidents/illnesses • Mental health support • Health counseling (nutrition, stress, exercise, smoking, drugs, alcohol) • Treatment for acute illness (headaches, colds, etc.) • Vaccinations
Mamidosewin Centre for Aboriginal Students	The Mamidosewin Centre provides a variety of cultural programs and services to Aboriginal students. In addition to welcoming social events and activities, services offered include, but are not limited to: • Information on Aboriginal bursaries, scholarships and other funding • Workshops and individual support with study skills, time management, tutors etc.) • Career, academic or personal counselling with an Aboriginal counsellor • Aboriginal Education to Employment program and job listings • Referrals to Aboriginal services (housing, counselling, employment etc.)
College Ombudsperson	The Ombudsman provides confidential, independent, and impartial assistance and intervention to address any college-related concerns of

Support Service	Brief Description of Service
	students. The Ombudsman has effective access to both College and Students' Association officials and can assist students with concerns related to any aspect of student life at the College – from policies, procedures to rights and responsibilities. Assistance is provided to ensure fair, just, and equitable treatment and may be provided in the following areas: • Coaching students in making appropriate choices based on unique/personal circumstances • Promoting a proactive perspective for managing and resolving conflicts and/or concerns that may occur • Facilitating communication between the student and other members of the College community • Resolving student concerns/ issues with other students, faculty, staff
Residence Life	Residence Life supports the holistic development of students through individual, interpersonal, intellectual and community education and empowers students to live, learn, and lead in an inclusive and safe community. The Manager-Residence Life and the Residence Life Coordinator supervise the Two Senior Resident Advisor, the Residence Programmer and 20 Resident Advisors. Services include, but are not limited to: • Educational Programming and Building Wide Events • Residence Orientation • Algonquin Residence Council • Student Outreach and Support • Community Management and Policy education
Registrar's Office	The Registrar's Office maintains student records and provides relevant support from admission to graduation. Services include, but are not limited to: • Admissions, fees, registrations, withdrawals • Applications for course exemptions • Academic records and transcripts • Scheduling (timetables)
Safety and Security Services	Safety, Security & Emergency Management ensures the College provides sustainable safe and secure learning, working and social environments for all of its occupants through the implementation of coordinated risk mitigation strategies and integrated programming. Services include, but are not limited to: • Full service prevention and patrol programs. • Communications, dispatch and reporting centre (24 hrs/day) • Walk Safe Services • Incident Response, Emergency Response and Investigations • Risk management risk assessment & consultation services • Workshops and presentations on a variety of safety issues

Section 6.4: Faculty

Enrolment Projections and Staffing Implications

	Cumulative Semester Enrolment Full-time	Contact Hours	Cumulative Full-time Faculty Equivalents (F.T.E.)	Cumulative Part-time Faculty Equivalents (F.T.E.)	Contact Hours taught by Full-time Faculty	Contact Hours taught by Part-time Faculty	Ratio of Full-time Students: Full-time Faculty
Year 1 2019-20	54	540	1	1.26	360	455	1:59
Year 2 2021-22	104	540+600=1140	2	2.43	720	875	1:63
Year 3 2022-23	165	1140+510=1650	3	3.51	1080	1265	1:67
Year 4 2023-24	252	1650+525=2175	4	4.68	1440	1685	1:70

The table above depicts both the enrolment and staffing projections for the program. The figures are based on a plan to hire a full-time faculty member in each of the second, third and fourth years following the launch of the program, assuming stable enrolment.

Faculty Selection

Faculty selection and orientation are detailed within Policy HR07: Full-time Hiring Process and Policy HR10: New Employee Orientation. All future new full-time hires in the School of Advanced Technology designate a graduate degree as the preferred credential. If hiring a full-time professor to teach primarily in a degree program, a terminal credential will be the requirement. Faculty identified for the Bachelor of Technology (Business Systems Development) (Honours) program meet the Board requirement of no fewer than 50% of the faculty proposed to teach hold the terminal academic credential in the field or in a closely related field of study. There are 11 faculty identified to teach core courses in the program, 6 of which hold PhD's and 5 who hold Master's level credentials. Of the 34 core courses within the course schedule, 25 (74%) have a PhD identified eligible to teach. Although Master's qualified faculty have also been identified for certain of these courses, the number of PhDs is such that the program would be able to ensure that 50% of the faculty assigned to a cohort would hold the terminal credential.

Review of Faculty Performance

The Academic Chair is expected to conduct regular reviews of faculty performance, which includes a review of student feedback on teaching and supervision (see Policy AA25: Student Course Feedback). Formal performance appraisals of faculty are to be conducted no less than once every three years and as often as yearly. However, Student Course Feedback surveys are reviewed following each semester and any areas for improvement are addressed with faculty on an ongoing basis. Performance appraisals of faculty are conducted to ensure that student

needs are being adequately met as well as to discuss the ongoing needs and professional development of faculty.

New professors are subject to a one-year probationary period during which time the Chair will evaluate them at regular intervals (every 4 months). The Chair completes a final, more detailed, evaluation immediately prior to the end of the probationary period to formally acknowledge and confirm the faculty member's suitability.

The College has initiated a Faculty Performance Development Program that provides for a consistent approach across the College in how faculty performance is evaluated, as well as ensuring that it is collaborative and respectful of all stakeholders. The program includes teaching observations, faculty self-evaluations and setting of professional development plans that are completed on a three-year cycle, with annual reviews to all for timely guidance.

Faculty Currency and Professional Development

As previously detailed in Section 5.3, the College offers a wide range of professional development activities for staff throughout the year. Policy H04: Tuition Assistance – Degree Completion was instated to assist staff who wish to pursue further studies. The purpose of Policy H04 is:

> *'To provide professors and other College employees with support in acquiring degrees at the bachelor's, master's and doctoral level at postsecondary institutions to better serve the needs of the students, the strategic directions of the College, and to assist employees in achieving their professional development goals.'*

Other varied professional development opportunities offered by the Centre for Organizational Learning with Human Resources may be viewed at: http://www.algonquincollege.com/pd/. Program faculty have received support to pursue furthering their academic credentials.

Faculty Innovation

Algonquin supports experimentation with new teaching methods and is an advocate for innovation. Innovation was specifically referenced in the College's 2008-2013 Strategic Plan and defined as, *"…the successful implementation of creative ideas which includes initiatives related to staff, programs, technology and business processes."* As such an Academic Innovation Fund was established in 2009 to formally support experimentation with new teaching methodologies. Now known as the Algonquin College Innovation Fund (ACIF), faculty and staff are able to propose and receive up to a maximum of $10,000 for projects that will lead to productivity improvements, enhanced teaching and learning, more engaged employees and greater student success.

An Innovation Centre is available to staff to experiment with new teaching tools that houses some of the latest hardware and software available as well as various books and resources related to innovation. Three workstations are available to all staff for innovating and experimenting.

Whenever new technologies are adopted professional development is provided through Learning and Teaching Services. Typically prior to adopting system wide technologies, the College will pilot/experiment, using off-site hosting services when necessary, and rollout the professional development support in tandem. This process was used with Adobe Connect

adoption and prior to adopting Blackboard™ 9.1 and Elluminate. A Virtual Desktop Infrastructure is now in place which allows students and staff to have access to any College licensed software anywhere/anytime on any device assisting with more flexible course delivery.

Faculty Teaching and Supervision Loads

Faculty teaching and supervision loads are assigned in accordance with the Academic Employees Collective Agreement's Standard Workload Formula (SWF) defined in Article 11 – Workload. The pertinent workload excerpt is in included in Section 16: Policies.

The electronic policies file (Section 16: Policies) includes policies and procedures pertaining to faculty within the following:
Policy AA 23: Faculty Consultation with Students
Policy AA 25: Student Course Feedback
Policy AA 40: Academic Advising
Policy HR 02: Professional Development Leave
Policy HR 03: Tuition Assistance - Algonquin College Courses
Policy HR 04: Tuition Assistance - Degree Completion
Policy HR 07: Full-time Hiring Process
Policy HR 10: New Employee Orientation
Procedure: Credential Evidence and Release of Information
Procedure: Ontario Colleges of Applied Arts and Technology Academic Employees Collective Agreement (Effective From: September 1, 2014 - September 30, 2017) Excerpt Article 11 Workload

Section 6.5: Curriculum Vitae Release

The college has on file and available for inspection, from all faculty and staff whose CVs are included in this submission, signatures that attest to the truthfulness and completeness of the information contained in their CV and agreeing to the inclusion of their curriculum vitae in any documents/web sites associated with the submission, review, and final status of the program application.

Section 6.6: Curriculum Vitae of Faculty Assigned to the Degree Program

The curriculum vitae of faculty assigned to the Bachelor of Technology (Business Systems Development) (Honours) program are included in this section. To summarize, the following faculty are assigned to the core courses of this program:

Faculty assigned to core courses:

Faculty	Credentials
Abbas, Sadiq	PhD Engineering Information Technology
Abboud, Nadim	PhD Industrial Engineering
Al-Mulla, Zaid	MAcc (Accountancy and Taxation)
Iroakazi, Sandra	PhD Computer Engineering
Parizeau, Yvon	Executive Master in Electronic Commerce
Ramroop, Omar	MBA
Sant, Anubha	MSc eHealth
Taillon, Peter	PhD Computer Science
Taller, Martin	MBA
Tamim, Haitham	PhD Business Administration
Tibu, Valerian	PhD Mathematics

As the program was primarily developed over a span covering 2014-15, the curriculum vitae provided reflect the currency effective those years.

Note:
The CVs of faculty responsible for the delivery of non-core (breadth) courses for which Ministerial Consent has already been granted are on file with PEQAB and are current.

Section 6.6.1: Curriculum Vitae of Faculty Assigned to Core Courses

***** Excluded for web version – confidential/proprietary material***

Section 7: Credential Recognition

The program has been designed to maximize the graduates' potential for employment and promotion in the field and for further study as evidenced by the following communications from employers, professional associations and academic institutions.

Included in this section are letters of support from:

- Blockthrough
- CHEO – Newborn Screening Ontario
- Curtiss Wright
- CV Diagnostix
- EION
- Halogen
- InitLive
- Optelian
- Ottawa Hospital
- PCL
- Perley Rideau
- University of Ottawa
- Vocantis

April 7, 2016

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Hi Margaret,

Blockthrough is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,

Martin Kratky-Katz

Martin Kratky-Katz
CEO, Blockthrough
martin@blockthrough.com
+1 (613) 252-8410

NEWBORN SCREENING ONTARIO
DÉPISTAGE NÉONATAL ONTARIO

CHEO
NSO is located at the Children's Hospital of Eastern Ontario

August 10th, 2016

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Please accept this letter as confirmation that Newborn Screening Ontario is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,

Jennifer Milburn
Operations Director, Newborn Screening Ontario
613-7373-7600 ext. 2905

JM/vc

CURTISS-WRIGHT

July 18, 2016

David Hall, Manager
Cooperative Education
Algonquin College
1385 Woodroffe Ave/E345
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Please accept this letter as confirmation that Curtiss-Wright Defense Solutions is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

☒ Placements for students for the required co-op work experience component of the program,

☒ Hiring potential for graduates should the opportunities be available.

Sincerely,

Kim DeRycke
Sr. Human Resources Generalist

CV DiagnostiX

May 24th, 2016

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Dear Ms. Cusson,

Please accept this letter as confirmation that CV Diagnostix, Inc. is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,

Robert Griffin
Senior VP Engineering & Development

EION

INTELLIGENCE IN THE AIR

1 June 2016

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Please accept this letter as confirmation that EION Inc. is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Please feel free to contact me if you have any further questions.

Sincerely,

Anand Srinivasan
Vice President

Corporate Headquarters

320 March Road, Suite 500, Ottawa, ON, K2K 2E3, Canada. Phone: +1 (613) 271-4400, Fax: +1 (613) 271-7040, www.eion.com

HALOGEN SOFTWARE

May 25, 2016

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Please accept this letter as confirmation that Halogen Software Inc. is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,

DocuSigned by:
[signature]
48EC68F2AD504F0...

Dominique Jones
Chief People Officer
Halogen Software Inc.

Halogen Software Inc. Tel: +1 613-270-1011 North America: 1 866-566-7778 Fax: +1 613-270-8311
495 March Road, Suite 100, Ottawa, ON Canada K2K 3G1 www.halogensoftware.com

May 24, 2016

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Please accept this letter as confirmation that InitLive is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,

Debbie Pinard
CEO, InitLive

Optelian

May 27, 2016

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Please accept this letter as confirmation that <insert organization name> is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,

Patricia Bluett

Manager, Human Resources

Optelian

1 Brewer Hunt Way | Ottawa, Ontario K2K 2B5

Office: 613-287-2000 ext. 2155 | Fax: 613-287-2003

patricia.bluett@optelian.com

optelian.com

1 Brewer Hunt Way, Ottawa, Ontario K2K 2B5
Local: 613-287-2000 | Toll-Free: 877-225-9428 | optelian.com

The Ottawa Hospital | L'Hôpital d'Ottawa

September 28, 2015

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Digital Health)

Please accept this letter as confirmation that The Ottawa Hospital is pleased to offer this letter in support of the proposed Bachelor of Technology (Digital Health) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,

Renée Légaré
Executive Vice-President
Human Resources

c.c.: S. Shamji, Executive Vice-President and Chief Information Officer
V. Naik, Vice-President, Education

☐ *Civic Campus Civic*
1053 av. Carling Avenue
Ottawa, Ontario K1Y 4E9

☐ *General Campus Général*
501 chemin Smyth Road
Ottawa, Ontario K1H 8L6

☐ *Riverside Campus Riverside*
1967 prom. Riverside Drive
Ottawa, Ontario K1H 7W9

PCL
CONSTRUCTION LEADERS

BEST MANAGED COMPANIES

May 26, 2016

David Hall, Manager
Cooperative Education
Algonquin College
1385 Woodroffe Ave/E345
Ottawa, ON K2G 1V8

RE: BACHELOR OF TECHNOLOGY (BUSINESS SYSTEMS DEVELOPMENT)

Please accept this letter as confirmation that PCL Constructors Canada Inc. is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- ☒ Placements for students for the required co-op work experience component of the program,
- ☒ Hiring potential for graduates should the opportunities be available.

Sincerely,

PCL Constructors Canada Inc.

Dina Khrino
HRPD Coordinator

PCL CONSTRUCTORS CANADA INC.
49 Auriga Drive, Nepean, Ontario, K2E 8A1 Telephone: (613) 225-6130 Fax: (613) 225-6176

Perley Rideau
The Perley and Rideau Veterans' Health Centre
www.perleyrideau.ca 1750 Russell Road, Ottawa, Ontario K1G 5Z6 Tel.: (613) 526-7171 Fax: (613) 526-7172

August 23, 2016

Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Dear Ms. Cusson:

Please accept this letter as confirmation that The Perley and Rideau Veterans' Health Centre is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,

Akos Hoffer
Chief Executive Officer

Together... we improve the well-being of the people we serve

uOttawa
Université d'Ottawa | University of Ottawa
Service de santé | Health Services
100 Marie-Curie (300) Ottawa ON K1N 6N5

August 16, 2016

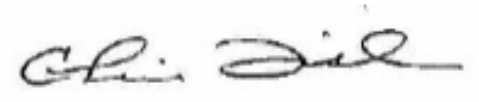
Margaret Cusson, Chair
Academic Development
Algonquin College
1385 Woodroffe Ave/C226H
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Please accept this letter as confirmation that University of Ottawa Health Services is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

- Placements for students for the required co-op work experience component of the program,
- Hiring potential for graduates should the opportunities be available.

Sincerely,



Christopher Fisher
Executive Director

VOCANTAS
Powerful Integrated Voice

Powerful Integrated Voice

June 17, 2016

David Hall, Manager
Cooperative Education
Algonquin College
1385 Woodroffe Ave/E345
Ottawa, ON K2G 1V8

Re: Bachelor of Technology (Business Systems Development)

Please accept this letter as confirmation that Vocantas is pleased to offer this letter in support of the proposed Bachelor of Technology (Business Systems Development) and may be able to provide:

☒ Placements for students for the required co-op work experience component of the program,

☒ Hiring potential for graduates should the opportunities be available.

Sincerely,

Keri Fraser
VP of Marketing and Business Development
Vocantas Inc.

The following universities have indicated that they will consider Bachelor of Technology (Business Systems Developments) (Honours) program graduates for admission into their existing graduate level programs:

- **Carleton University:** will consider graduates of Algonquin College's Bachelor of Technology (Business Systems Developments) (Honours) degree for admission to graduate programs (Masters and PhD) in digital media (variety of streams are available). (Letter included in this section.)
- **Royal Roads University:** will consider graduates of Algonquin College's Bachelor of Technology (Business Systems Developments) (Honours) degree for admission to Masters Business Administration. (Letter included in this section.)

Carleton UNIVERSITY
Canada's Capital University

Memo

To: Andrew Pridham, Academic Chair, Information and Communications Technology Department, Algonquin College

CC:

From: Christopher Smelser, Director (Acting), School of Information Technology, Carleton University

Date: 1/3/17

Re: Re: Admissibility of Algonquin Business Systems Development Degree holders,

---

It was encouraged to read over the program overview for Algonquin's new offering in "Business Systems Development" (BSD) as this program addresses a growing need to provide skilled workers in today's constantly expanding IT marketplace. A program in Business Systems Development is perhaps even more significant in the national capital region as many of the skills developed in the program are immediately applicable in the federal government setting.

Our graduate program (both Masters and PhD) in digital media is open to a wide variety of backgrounds. Some streams of our program, such as data visualization and data analytics could be a good fit for students graduating from BSD as these areas would complement the skill set developed during their degree.

At Carleton, we would approach the application of students to our graduate programs in accordance with the guidelines set out by each academic unit. As such, a student with a degree in Business Systems development form Algonquin College would be eligible for consideration for admission into our Digital Media graduate program provided that they meet the requirements set out in the graduate calendar.

Christopher W. Smelser
Associate Professor
Director (Acting) – Carleton School of Information Technology
Faculty of Engineering and Design
Carleton University
1125 Colonel By Dr.
Ottawa, ON, Canada
K1S 5B6

Royal Roads UNIVERSITY

March 3, 2017

Jessica DeVries
Chair of Academic Development
Algonquin College
1385 Woodroffe Avenue
Ottawa, Ontario K2G 1V8

Jessica,

Re: Bachelor of Technology (Business Systems Development) (Honours)

One of the requirements for standard admission into the Royal Roads University's Master of Business Administration (MBA) program is the successful completion of a four-year undergraduate degree in a related field from a recognized post-secondary institution.

I have reviewed the executive summary, the program abstract, learning outcomes and program of study for the Bachelor of Technology (Business Systems Development) (Honours) that Algonquin College proposes to launch beginning in 2019. I can confirm that this program satisfies the undergraduate degree requirement for admission into the Royal Roads University MBA program.

Please let me know if you require anything further. I wish you the best of success with your new program.

Sincerely,

William R. Holmes, DBA, CPA, CMA, CGA, CPHR
Dean, Faculty of Management

Royal Roads University, Faculty of Management
2005 Sooke Road Victoria, BC, Canada V9B 5Y2
T 250.391.2600 TF 1.800.788.8028 royalroads.ca

LIFE.CHANGING

Section 8: Regulation and Accreditation

As indicated in Section 4.2, Algonquin College is in the process of applying for accreditation from the Canadian Information Processing Society (CIPS). The following is the result of the informal “desk audit” conducted as the second stage of the accreditation process.

The Business Technology Management Accreditation Council (BTMAC) offers an informal review to programs that have not yet produced graduates and do not qualify for a formal accreditation visit. The purpose of the informal evaluation is to provide comment and advice to the institution with respect to the program. The review will focus solely on the alignment of the program to the BTM Learning Outcomes. To be successful, a program needs to demonstrate that it produces learning outcomes that are largely aligned with the BTM Learning Outcomes and Competency Standards.

A report is prepared by a competent team having suitable qualifications and is presented to the BTMAC for consideration. Programs that are successful in the review will be allowed to use the term *BTM Recognized* on communications for a maximum of four (4) years. No undertaking is given by the BTMAC as to the eventual accreditation of the program.

The questionnaire provides essential qualitative and quantitative input for the evaluation team as part of the overall review process. It also serves as a tool for self-assessment.

The program recognition process consists of the following steps:

1. Request by the institution for evaluation of its program(s);
2. Completion and submission of a questionnaire and supplementary material;
3. Submission of a draft report by the review team to the dean and/or program director approximately 6 weeks after the submission. The institution may respond to team's finding and/or note errors of fact or findings and respond with 14 days.
4. Final decision by the Business Management and Technology Accreditation Council regarding recognition status.

Algonquin College has initiated the BTM informal review process.

Section 9: Nomenclature

The Bachelor of Technology (Business Systems Development) (Honours) program title meets the Board nomenclature requirements. This title follows one of the approved approaches to nomenclature for Bachelor degrees in applied areas, available for designating college degrees, the Bachelor of Faculty (Subject).

The degree title conveys accurate information about the degree level since *Bachelor* is reflected in the title, which is congruent with degree level learning. As required, the quality standards are as dictated by the *Ontario Qualifications Framework (OQF)*, specifically section *11. Baccalaureate/Bachelor's Degree Honours*. As such, the program is a four-year degree in an applied area of study and meets the degree level standards of the Baccalaureate/Bachelor's Degree Honours designation. Inclusion of *Honours* in the degree nomenclature facilitates public understanding that it brings the degree title into alignment with other comparable provincial four-year baccalaureate programs. Additionally, it clarifies the academic rigour, conceptual sophistication, specialized knowledge and intellectual autonomy associated with the credential earned. Finally, it provides unambiguity with respect to the depth and nature of the degree to postsecondary institutions receiving applications from graduates of this program wishing to pursue graduate studies.

The inclusion of the term "Technology" is critical to the understanding of the discipline addressed by the degree. This degree focuses on two core knowledge domains, including more traditional software development knowledge, and business technology management. Thus, in both knowledge domains a focus on technology is maintained. The addition of the "Business Systems Development" subject indicator clarifies that the degree focuses specifically on the two core knowledge domains as they relate to business systems development, that is, information communications systems in business environments. This title facilitates the public's understanding, and assists students, employers, and other postsecondary institutions in recognizing the level, nature and discipline of study. As noted in Section 4.2, Algonquin College is in the process of pursuing BTM accreditation for the proposed Bachelor of Technology (Business Systems Development) (Honours) program. The title of the proposed program is aligned with BTM recognized programs. The title is supported by the Bachelor of Technology (Business Systems Development) (Honours) Program Advisory Committee.

Section 10: Program Evaluation

Algonquin College has a formal, institutionally approved policy and procedure for the periodic review of programs that embodies the characteristics required of the Board. As previously explained in Section 5.1 Quality Assurance of Delivery, Algonquin has an effective Program Quality Assurance process detailed in Policy AA38: Program Quality Assurance. The program evaluation process consists of three primary components, Annual Curriculum Review, Program Mix Review and Program Quality Review (PQR).

The three-prong quality review process includes two annual reviews, each with a different focus, and one in depth review every five years. The current PQR process was originally designed for postsecondary programs leading to Ontario College Credentials. The quality criteria parallel those used by the Provincial Program Quality Assurance Process Audit (PQAPA) and map to the expectations of the Program Evaluation Standard as stated in the PEQAB Handbook for Ontario Colleges. The PQAPA external audit of the College review processes ensures that the College has a process in place that assures continuous quality improvement. Note that, based on feedback obtained from a PEQAB Quality Assessment Panel, the mapping to the Program Evaluation Standard is being made more explicit within the Bachelor's Degree PQR report template, and quality criteria elements may be extended to include all PEQAB Benchmarks.

The Program Quality Review process at the College has been extended for degree programs. In addition to conducting a PQR (self-study), a Program Evaluation Committee is established that adheres to the Board's requirements. The Program Evaluation Committee is expected to evaluate a program based on the PQR report and a site visit during which members of the Committee meet with faculty members, students, graduates, employers and administrators to gather information. A Program Evaluation Committee report is completed that provides an assessment of the program quality and leads to recommendations for change intended to strengthen the quality of the program and support ongoing continuous improvement. The report is addressed to senior administration and shared with the College's Academic Council, Board of Governors, faculty members and students in the program, and includes a plan of action to respond to the report's recommendations. The Program Quality Assurance Administrator works with the Program Chair in following up on the status of implementation of recommendations. A cyclical program review schedule is established that conforms to Board requirements in that the PQR is conducted prior to a request for Ministerial Consent Renewal. The PQR template for Bachelor's Degrees and associated documentation to facilitate the process may be viewed at the following link: http://www3.algonquincollege.com/academic-development/program-quality-review-bachelors-degrees/
Algonquin College's overall Quality Assurance Model and Processes may be viewed on the Program Quality Assurance Website: http://www3.algonquincollege.com/academic-development/our-services/program-quality-assurance/

The electronic policies file (Section 16: Policies) includes the policy on Quality Assurance within the following:
Policy AA 38: Program Quality Assurance

Section 11: Academic Freedom and Integrity

Algonquin College policies detail procedures relative to academic freedom, ownership of intellectual products of its employees and students, compliance with copyright law, academic honesty/integrity, and research involving humans and/or animals, as well as the management of research funds.

The electronic policies file (Section 16: Policies) includes policies and procedures pertaining to academic freedom and integrity within the following:

Policy AA 18: Academic Dishonesty and Discipline
Policy AA 20: Plagiarism
Policy AA 34: Copyright
Policy AA 35: Confidentiality of Student Records
Policy AA 42: Learning Management System
Policy IT 05: Information Sensitivity and Security
Policy RE 01: Research Administration
Policy RE 02: Integrity in Research and Scholarly Activities
Policy RE 03: Research Involving Human Subjects
Policy RE 04: Use of Animals in Teaching, Research and Other Activities
Policy RE 05: Intellectual Property
Policy RE 06: Use of Biohazardous and Radioactive Materials in Research and Education
Policy RE 07: Academic Freedom Rights and Responsibilities

Section 12: Student Protection

In accordance with Algonquin's core values of caring, learning, integrity and respect, ensuring ethical business practices and the protection of students' interests are integral to the College's operation. Algonquin endeavors to ensure transparency, thoroughness, and clarity of its publications in terms of informing prospective and current students' as to their responsibilities and rights. Numerous policies and practices provide evidence of compliance with the Board's requirements for student protection.

Applicant and student requirements and obligations are published in hard copy and/or web based formats as follows:

Program Monographs

- Full-time programs: http://www.algonquincollege.com/future/fulltime.html
- Part-time programs: http://www.algonquincollege.com/ccol/programs/

Monographs detail fees and expenses as well as information regarding the technological requirements and success factors required of a program. For example, for mandatory Bring Your Own Device (BYOD), formerly laptop/mobile programs, publications direct students to the BYOD website to obtain the technical specifications for programs and details of service provisions at:
http://www7.algonquincollege.com/byod/
Other primary College publications include the Viewbook.

Viewbook

Students can access a Viewbook to gain additional details, including videos and stories from current students and alumni, to guide the selection of their programs.
http://www.algonquincollege.com/html/viewland/

Prospective and current students can view all College policies online at http://www2.algonquincollege.com/directives/. Excerpts of these policies are published in the Student Handbook available from the Student Affairs website at http://www.algonquincollege.com/studentsupportservices/student-handbook/

The electronic policies file (Section 16: Policies), includes policies and procedures pertaining to student protection within the following:
Policy AA 09: Transfer of Academic Credit (Internal)
Policy AA 10: Transfer of Academic Credit (External)
Policy AA 11: Registration
Policy AA 18: Academic Dishonesty and Discipline
Policy AA 19: Academic Appeal
Policy AA 37: Review of Final Grade
Policy AA 39: Program Progression and Graduation Requirements
Policy AD 02: Freedom of Information and Protection of Privacy Act
Policy HR 22: Respectful Workplace
Policy SA 02: Ombudsman
Policy SA 03: Student Complaints
Policy SA 06: Fees
Policy SA 07: Student Conduct

Section 13: Economic Need

The benchmark for economic need is demonstrated through the evidence contained within this section that includes:

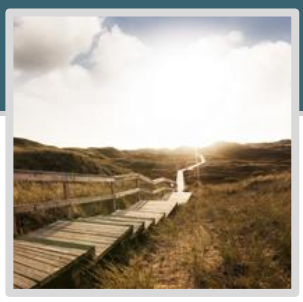
- A commissioned Labour Market Analyses conducted for Algonquin College by Hanover Research (November 2013);
- OCAS data on related degree programs (September 2016)
- Algonquin College Applicant Demand Survey results (March 2015)
- Current Employment Opportunities Listings (September 2015)

The information provided demonstrates the need for and viability of this program.

Market Analysis: Bachelor of Technology in Business Systems Development

Prepared for Algonquin College

November 2013


In the following report, Hanover Research assesses the market for a proposed Bachelor of Technology in Business Systems Development program. The report examines student demand, labour market trends, and potential competition for the proposed program.

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Executive Summary and Key Findings

Introduction

This report analyzes the market for a Bachelor of Technology in Business Systems Development. This analysis includes assessments of student demand, labour market outlook, and current competition. To this end, the report comprises the following sections:

- **Section I: Student Demand** – This section analyzes the demand for degrees in information and communications technology (ICT) and business in Canada and in Ontario in particular.
- **Section II: Labour Market Analysis** – This section discusses occupational projections for jobs requiring both ICT and business training. The section also provides a summary of current trends for the ICT and business labour market.
- **Section III: Competitor Profiles** – This section profiles two Business Technology Management (BTM) programs in Ontario. One of the programs, a double-degree program offered jointly by the University of Waterloo and Wilfrid Laurier University, is a relatively close match to the business systems development program proposed by Algonquin College (Algonquin).

Key Findings

- **Data on current and future labour market needs suggest that Algonquin's program would succeed, though data on student demand present a more complex picture.** Indicators of labour market demand point to shortages in ICT workers who have business knowledge and experience. Thus, ICT program graduates who possess information technology competency, combined with business knowledge, will remain in high demand for the foreseeable future in Canada and Ontario. However, recent enrollment data for programs broadly related to ICT and business show only modest growth in student demand. Nonetheless, reports of rapid growth in applications to BTM programs may indicate rising demand for programs very similar to Algonquin's proposed offering.
- **Indicators of student demand show limited growth in broad business and computing fields, but stronger prospects for combined ICT/business programs.** Although recent enrolment growth in ICT programs and business programs is modest, there are limited enrolment data specifically for programs that provide thorough training in both. Emerging programs in BTM, which combine computing and business training, have seen student applications increase by 24 percent per year. Industry experts project that 12 current BTM programs will produce over 1,000 graduates per year total once mature.
- **ICT programs that provide business training will produce graduates with strong marketplace opportunities.** According to the Information and Communications Technology Council, there are "pervasive shortages" of employees with ICT backgrounds who are also familiar with business needs. Furthermore, many companies seeking to hire ICT professionals require that candidates have previous practical experience. This demand for experience is in fact a demand for business and professional acumen that recent graduates from programs focusing only on ICT skills do not typically possess.

- **Programs that focus on ICT skills exclusively will find it increasingly difficult to place their graduates.** The supply of qualified workers for *entry-level* ICT jobs in Canada and Ontario is expected to outpace demand, even though the overall labour market demand for IT jobs is expected to grow strongly through 2016. Entry-level jobs will not be difficult for companies to fill. This is due to the popularity of computing programs and immigrant interest in related jobs.
- **Algonquin's proposed Business Systems Development program would be unique as a computing-based single degree program.** The only recognized BTM program with computing training as extensive as Algonquin's program is the University of Waterloo and Wilfrid Laurier University's double degree program in business administration and computer science. Other BTM programs tend to be based in schools or departments of business and have fewer computing requirements than Algonquin's proposed offering.
- **Algonquin's proposed co-op element would play an important role in the success of program graduates.** Since the market currently has demand for experienced ICT specialists, any ICT program should include opportunities for practical experience. Most BTM programs provide one year of co-op experience for each graduate.
- **Programs that combine business and ICT often contain individual courses that integrate business and ICT training**. Even though BTM programs draw from two different disciplines, courses may cover topics such as "E-Business Commerce," "Business Information Systems," and "Data and Knowledge Management," with a view to bringing both disciplines together in the classroom. Capstone projects or practical projects that demand the synthesis of ICT and business concepts are common.

Section I: Student Demand

In this section, Hanover Research analyzes indicators of student demand for bachelor's degrees in business systems development and related fields. The section first examines the number of relevant program enrolments throughout Canada and then looks at the number of program completions in Ontario alone to identify trends in student demand.

Enrolment Data

To gauge potential student interest in specific degree programs, Hanover analyzes five-year enrolment trends in relevant Classification of Instructional Programs (CIP) codes.[4] Statistics Canada publishes a CIP system to aid in the classification and analysis of educational programs. An analysis of the enrolment data for programs relevant to a particular CIP code is useful in modeling future trends in student demand; for instance, if the number of enrolments in a specific subject area has been increasing, it is reasonable to conclude that demand for degrees in that subject area is increasing.

Figure 1.1 lists six CIP classifications related to a degree in business systems development. It is important to note that currently there is no particular CIP code assigned to business systems development. The one that most closely approximates it is "Management Information Systems,"

[4] "Classification of Instructional Programs (CIP) Canada 2011." Statistics Canada. http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVDPage1&db=imdb&dis=2&adm=8&TVD=127939

which incorporates business and computing training. However, since Algonquin College's proposed program would likely require more computing training than such business programs would require, Hanover has included additional computing CIP codes that may be relevant to the proposed offering.

Figure 1.1: CIP Classifications Related to Business Systems Development

CIP CODE	CIP TITLE	DESCRIPTION
52.1201	Management Information Systems, General	This instructional program class comprises any program that generally prepares individuals to provide and manage data systems and related facilities for processing and retrieving internal business information; select systems and train personnel; and respond to external data requests. These programs include courses in cost and accounting information systems, management control systems, personnel information systems, data storage and security, business systems networking, report preparation, computer facilities and equipment operation and maintenance, operator supervision and training, and management information systems policy and planning.
11.0103	Information Technology	This instructional program class comprises any program that focuses on the design of technological information systems, including computing systems, as solutions to business and research data and communications support needs. These programs include courses in the principles of computer hardware and software components, algorithms, databases, telecommunications, user tactics, application testing, and human interface design.
11.0401	Information Science/Studies	This instructional program class comprises any program that focuses on the theory, organization, and process of information collection, transmission, and utilization in traditional and electronic forms. These programs include courses in information classification and organization; information storage and processing; transmission, transfer, and signalling; communications and networking; systems planning and design; human interfacing and use analysis; database development; information policy analysis; and related aspects of hardware, software, economics, social factors, and capacity.
11.0501	Computer Systems Analysis/Analyst	This instructional program class comprises any program that prepares individuals to apply programming and systems analysis principles to the selection, implementation, and troubleshooting of customized computer and software installations across the life cycle. These programs include courses in computer hardware and software; compilation, composition, execution, and operating systems; low- and high-level languages and language programming; programming and debugging techniques; installation and maintenance testing and documentation; process and data flow analysis; user needs analysis and documentation; cost-benefit analysis; and specification design.
11.0802	Data Modeling/Warehousing and Database Administration	This instructional program class comprises any program that prepares individuals to design and manage the construction of databases and related software programs and applications, including the linking of individual data sets to create complex searchable databases (warehousing) and the use of analytical search tools (mining). These programs include courses in database theory, logic, and semantics; operational and warehouse modelling; dimensionality; attributes and hierarchies; data definition; technical architecture; access and security design; integration; formatting and extraction; data delivery; index design; implementation problems; planning and budgeting; and client and networking issues.

CIP CODE	CIP TITLE	DESCRIPTION
11.1005	Information Technology Project Management	This instructional program class comprises any program that prepares individuals to design, develop, and manage information technology projects in a variety of companies and organizations. These programs include courses in principles of project management, risk management, procurement and contract management, information security management, software management, organizational principles and behaviour, communications, quality assurance, financial analysis, leadership, and team effectiveness.

Source: Statistics Canada

The Government of Canada does not regularly collect or publish detailed data related to program enrolment or completion, making a comprehensive analysis of the demand for individual degree programs difficult. However, Statistics Canada does collect and publish enrolment information for very broad collections of CIP codes. The CIP classifications relating to business systems development fall under two Primary Groupings (PG), 52 – "Business, Management and Public Administration," and 11 – "Computer and Information Sciences and Support Services."

Figure 1.2 shows the number of students enrolled in first cycle (bachelor's degree or equivalent) programs in these primary groupings for the years 2007 to 2011 in Canada and Ontario. Although these data are not precise enough to establish demand for business systems development in particular, they show relevant trends in the broad educational fields that contain business systems development.[5]

The data on enrolment trends in Figure 1.2 include three metrics that offer further insight into changes in enrolment:

- Compound Annual Growth Rate (CAGR) – This reflects the percentage growth that would occur each year if the same rate of change had occurred yearly between 2007 and 2011. CAGR gives an impression of a theoretical, steady growth rate by ignoring data presented during middle years.
- Average Annual Change (AAC) – This is determined by calculating the average year-to-year difference. It allows for an analysis of directional trends and volume to an extent because CIPs with very large completions numbers and higher growth generally have larger AACs.
- Standard Deviation (STDEV) – Standard deviation illustrates whether completion trends for a specific CIP exhibit steady or erratic rates of numerical change from year to year (using AAC). A high standard deviation indicates volatility over the five-year periods, while a low standard deviation indicates steadiness.

An analysis of these three metrics gives insight into the magnitude of enrolment and completions growth, as well as the consistency of growth over time.

As Figure 1.2 shows, the total number of students enrolled in bachelor's programs throughout Canada grew by about 2.8 percent annually. At 4.6 percent, **the national growth rate for enrolments in "Business, Management and Public Administration" programs is significantly higher than the growth in Canadian enrolments as a whole**. While enrolments

[5] "Table 477-0019." Statistics Canada. http://www5.statcan.gc.ca/cansim/a26

in “Mathematics, Computer and Information Sciences” appear flat based on CAGR and AAC, the data reveal a 4.8 percent dip in enrolments between 2007 and 2008, and a further 0.1 percent drop between 2008 and 2009, but data from the two most recent years have shown consistent enrolment increases of 2.9 percent from 2009 to 2010 and 2.3 percent from 2010 to 2011. These increases coincide with a strong increase in all program enrolments between 2009 and 2010 (6.8 percent), and 2010 to 2011 (3.3 percent). Even though “Mathematics, Computer and Information Sciences” enrolments growth has not been flat, its recent growth is still slower than the growth of all programs taken together.

All Ontario enrolments increased annually at a rate of 2.7 percent, which is slightly slower than the national rate. **Ontario enrolments in “Business, Management and Public Administration” programs grew at 3.8 percent, which is faster than the enrolment growth for all instructional programs in Ontario**. This trend mirrors the national numbers, with the exception that Ontario’s “Business, Management and Public Administration” enrolments are growing at a slower rate than national enrolments in these types of programs. “Mathematics, Computer, and Information Sciences” programs in Ontario saw a dramatic enrolment decrease between 2007 and 2008, in keeping with the national trend. However, these programs saw increased enrolments from 2008 to 2009, while the national numbers were still decreasing. Nonetheless, enrolment growth in “Mathematics, Computer and Information Sciences” programs is slower than overall enrolment growth in Ontario.

Figure 1.2: Bachelor's Enrolments in Fields Related to Business Systems Development

CIP-PG	2007	2008	2009	2010	2011	CAGR	AAC	STDEV
CANADA								
Total, All Instructional Programs	800,505	803,838	810,435	864,243	892,353	2.8%	22,962	20,193.4
Business, Management and Public Administration	125,403	129,072	133,347	142,644	149,469	4.5%	6,016.5	2,233.8
Mathematics, Computer, and Information Sciences	26,061	24,813	24,792	25,476	26,064	0.0%	0.8	770.0
ONTARIO								
Total, All Instructional Programs	366,687	367,371	369,090	394,749	407,340	2.7%	10,163.3	10,089.3
Business, Management and Public Administration	55,398	56,793	58,197	61,950	64,125	3.7%	2,181.8	960.8
Mathematics, Computer, and Information Sciences	13,671	12,930	13,128	14,592	14,721	1.9%	262.5	786.2

Source: Statistics Canada

Graduates of Ontario Institutions

Within Ontario, the provincial Ministry of Training, Colleges, and Universities (OMTCU) provides more detailed data on program completions in Ontario's colleges of applied arts and technology.[6] Once again, there is no specific classification for business systems development, so Hanover collected data on several related fields in order to determine the potential market for a degree in business systems development. Figure 1.3, on the following page, shows the number of graduates from relevant programs over the last five years. These graduates include all degrees, certificates, and diplomas issued.

Limitations

The data available from OMTCU are taken only from colleges of applied arts and technology, not from universities. Data for degrees in programs similar to business systems development awarded by universities are not available. Therefore, the results are of only limited utility, since most applied arts and technology colleges do not offer bachelor's degrees, and thus the number of degrees reported is only a very small portion of the degrees awarded in Ontario. The results can, however, give an indication of trends in student interest in a field of study, on the presumption that if interest in diplomas and certificates for a field is rising, then interest in degrees in that field will be also.

In Figure 1.3, program types are labeled with the resulting diploma or certificate according to the following abbreviations:

- OCD – Ontario College Diploma, typically completed in two years.
- OCAD – Ontario College Advanced Diploma, typically completed in three years.
- OCGC – Ontario College Graduate Certificate, typically completed in one year.
- DAAS – Degree in Applied Area of Study, typically completed in four years.

Results

[6] Ontario Ministry of Training, Colleges and Universities. http://www.tcu.gov.on.ca/eng/

In general, Ontario completions of programs related to business systems development in colleges of applied arts and technology have shown little growth over the last five years. "Business Administration – Information Systems" and "Accounting and Information Technology" have seen strongly declining rates of completions. However, these programs have low enrolment volumes, as many of the relevant program titles do. The program with the largest enrolment volume, "Computer Systems Technology," has shown consistent growth in completions since it saw a strong decline between 2008 and 2009. The low CAGR does not reflect a surge in completions these programs exhibited in 2012. Similarly, "Enterprise Database Management" program completions had been in decline from 2007 to 2011. However, in 2012 completions in these programs almost doubled from 2011. However, without additional data showing increased completions over a number of years, it is unclear whether the increases of 2012 reflect a trend in increasing demand for such programs or whether they reflect the instability of technology fields.

These results diverge from the overall trends in bachelor's-level enrolments in "Business, Management, and Public Administration" programs, which indicate increasing demand. These results also diverge from the overall trends in bachelor's-level enrolments in "Mathematics, Computer and Information Sciences," which indicated low demand growth.

Figure 1.3: Graduates from Ontario Programs Related to Business Systems Development

PROGRAM TYPE	2008	2009	2010	2011	2012	CAGR	AAC	STDEV
All Colleges, All Programs	60,406	59,012	62,842	72,066	78,651	6.8%	4,561.3	8,869
Business - Information Systems (OCD)	13	40	24	23	20	11.4%	1.8	15.7
Business Administration - Information Systems (OCAD)	51	31	22	17	19	-21.9%	-8.0	8.0
Computer Systems Technology (OCAD)	406	281	300	337	430	1.4%	6.0	80.4
Information Systems Business Analyst (OCGC)	-	-	-	10	13	n/a	n/a	n/a
Accounting and Information Technology (OCGC)	51	34	25	41	29	-13.2%	-5.5	12.7
Enterprise Database Management (OCGC)	57	52	44	34	66	3.7%	2.3	17.3
Total, Selected Programs	**578**	**438**	**415**	**462**	**577**	**0.0%**	**-0.3**	**94.3**

Source: Ontario Ministry of Training, Colleges, and Universities[7]

[7] "Employment Profile." Ontario Ministry of Training, Colleges and Universities. http://www.tcu.gov.on.ca/eng/labourmarket/employmentprofiles/index.asp

Additional Student Demand Indicators

There are few student demand indicators for a specific program like business systems development, but available sources indicate that student demand for such a program would be high.

According to Careermash.ca, applications to Business Technology Management (BTM) programs are rising by an average of 24 percent per year.[8] BTM programs, which will be addressed in greater detail below, are post-secondary programs that provide dual foundations in ICT and business to prepare students for successful ICT careers in business.[9] Notably, this growth figure, which is provided by the organization that designed and promotes the BTM program, the Canadian Coalition for Tomorrow's ICT Skills (CCICT), reflects only applications and not acceptances, enrolments, or degree completions. Accordingly, it does not provide proof that BTM programs are actually growing, though it affords reason to believe that they are likely to grow.

In addition, though the BTM program first appeared in 2009, already by 2011 a report from the Information and Communications Technology Council (ICTC) projected that 12 Canadian BTM programs would graduate over 1,000 students per year as the programs matured.[10]

Section II: Labour Market Analysis

In this section, Hanover Research examines the labour market demand for graduates with degrees in fields related to business systems development. Since there are currently no degrees awarded in "business systems development" specifically,[11] this report also considers occupations related to management information systems, business information systems, and information systems generally.

Employment projections provided by the Government of Canada utilize very broad classifications which will not produce a fine-grained forecast for jobs specifically related to business systems development. In order to compensate for this shortcoming, this report also analyzes job bank data and surveys the available secondary literature on the business information systems job market.

Most reports on the Canadian labour market are keyed to the occupational descriptions in the National Occupational Classification (NOC) codes. The NOC codes most relevant to Algonquin College's proposed business systems development program are listed in Figure 2.1, below.[12]

Figure 2.1 NOC Codes Relevant to Business Systems Development

[8] "Business Technology Management (BTM) Overview." Career Mash. http://careermash.ca/education/business-technology-management-btm/btm-overview
[9] Ibid.
[10] "Outlook for Human Resources in the ICT Labour Market, 2011-2016." Information and communications Technology Council. p. 15. http://www.trios.com/career/share/ICTC_report.pdf
[11] The Association of Universities and Colleges of Canada's (AUCC's) study program search found no programs or majors currently holding that title (http://www.aucc.ca/canadian-universities/study-programs/).
[12] Human Resources and Skills Development Canada. http://www5.hrsdc.gc.ca/NOC/English/NOC/2011/SearchKeywordResult.aspx?val11=information+systems&val12=0&val13=0&val14=&val15=0&val16=0

NOC CODE	NOC TITLE	DESCRIPTION
2171	Information Systems Analysts and Consultants	Information systems analysts and consultants analyze systems requirements, develop and implement information systems development plans, policies and procedures, and provide advice on a wide range of information systems issues. They are employed in information technology consulting firms and in information technology units throughout the private and public sectors, or they may be self-employed.
0213	Computer and Information Systems Managers	Computer and information systems managers plan, organize, direct, control and evaluate the activities of organizations that analyze, design, develop, implement, operate and administer computer and telecommunications software, networks and information systems. They are employed throughout the public and private sectors.

Source: Human Resources and Skills Development Canada

National Labour Market Data

Human Resources and Skills Development Canada (HRSDC) publishes national labour market projections that employ Canadian Occupational Projections System (COPS). HRSDC describes the COPS models and projections as focused on trends in labour supply and demand over a 10-year span.[13] The most recent projections available cover the period 2011-2020.

COPS, however, only produces employment projections for three-digit NOC classifications, rather than the four-digit detailed classifications in Figure 2.1 above. Figure 2.2 below shows the employment for the three-digit NOC codes containing information systems jobs. Again, the wide scope of the classifications reduces the accuracy of predictions concerning the business systems development labour market specifically.

Figure 2.2, below, shows that all fields related to information systems are expected to grow through 2020. A more important consideration, however, is the average annual surplus or deficit of available jobs through 2020. A deficit of jobs indicates that there are fewer jobs available than there are qualified candidates to fill the positions. Graduates of educational programs related to such fields may have fewer opportunities for employment. HRSDC projects an average annual deficit of jobs for code 217, “Computer and Information Systems Professionals.” This broad CIP code includes the classification “Information Systems Analysts and Consultants” (2171),[14] which in turn contains jobs related to business systems development.

HRSDC anticipates a deficit of jobs in “Computer and Information Systems Professionals” despite strong overall projected growth in labour demand in this area (24 percent between 2010 and 2020. HRSDC suggests that the supply of such workers will exceed market demand due to strong student interest in related computing programs, as well as immigrant interest in such jobs. Immigrant interest is projected to be high since related skills learned abroad are easily applied to computing and information systems jobs in Canada.[15]

Graduates of a bachelor’s program in business systems development likely will not immediately pursue jobs related to code 021, “Managers in Engineering, Architecture, Science and Information Systems.” Nonetheless, occupations under this code, which include “Computer and

[13] “Canadian Occupational Projection System (COPS).” Human Resources and Skills Development Canada. http://www23.hrsdc.gc.ca/w.2lc.4m.2@-eng.jsp
[14] “Computer and Information Systems Professionals.” Human Resources and Skills Development Canada. http://www23.hrsdc.gc.ca/occupationsummarydetail.jsp?&tid=37
[15] Ibid.

Information System Managers," are expected to increase by over 20 percent by 2020, with a small surplus of annual jobs available.

Figure 2.2: Employment Outlook, Jobs Related to Business Systems Development

NOC CODE	NOC TITLE	NUMBER		CHANGE 2010-20		AVERAGE ANNUAL JOB OPENINGS	AVERAGE ANNUAL JOB SEEKERS	AVERAGE ANNUAL SURPLUS/ DEFICIT OF JOBS AVAILABLE
		2010	2020	NUMBER	PERCENT			
217	Computer and Information Systems Professionals	372,787	461,187	88,400	24%	15,284	21,066	-5,782
021	Managers in Engineering, Architecture, Science and Information Systems	77,670	94,203	16,533	21%	3,907	3,740	167

Source: Human Resources and Skills Development Canada

Job Bank Data

As a supplement to national employment statistics for occupations associated with business systems development programs, Hanover analyzed relevant job postings. The job posting analysis addresses some of the deficiencies in the preceding national labour data analysis, including the lack of both occupation- level detail and regional data in the NOC- based employment projections.

Unfortunately, Canadian job banks do not offer trend analysis over time. The hits returned indicate how many relevant jobs are available at a single moment but do not identify a trend or predict an increase or decrease in job availability. Also, even fairly well-defined search terms often generate hits that are not very close matches to the original terms. Nonetheless, examining current job postings can provide an idea of how common jobs are in a particular field, as well as specific examples of available jobs. Hanover collected job hits and descriptions from two job banks, Working in Canada[16] and Indeed.com (Canada).[17]

Figure 3.3 below lists the hits to relevant search terms in Canada as a whole and in Ontario in particular. Results suggest that approximately half of Canada's jobs related to business systems development are located in Ontario. Common job titles associated with these terms were Information Systems Business Analyst, Information Systems Analyst, Systems Analyst, Software Quality Assurance Analyst, Informatics Consultant, Business Systems Consultant, Business Systems Officer, and Systems Engineer.

Figure 2.3: Job Bank Postings Relevant to Business Systems Development

SEARCH TERMS	HITS IN CANADA	HITS IN ONTARIO
WORKING IN CANADA		

[16] "Job Search." Working in Canada. http://www.workingincanada.gc.ca/job_search.do
[17] "Job Search Canada." Indeed. www.indeed.ca.

SEARCH TERMS	HITS IN CANADA	HITS IN ONTARIO
"Information Systems Analysts and Consultants" (NOC 2171)	926	400
"Computer and Information Systems Managers" (NOC 0213)	136	52
"Information Systems Business Analyst"	607	263
INDEED.COM CANADA		
"Business Systems Development"	12,818	6,383
"Business Systems"	24,504	11,852
"Business Information Systems"	12,358	6,099
"Management Information Systems"	13,462	6,484

Sources: Working in Canada, Indeed

Secondary Literature Forecasts

Reports from professional ICT associations in Canada, as well as the OMTCU, provide another picture of the state of the business systems labour market. These sources suggest that the market for business systems related jobs is growing along with the market for ICT taken together.

ICT Labour Market Outlook – ICTC

In March of 2011, the Information and Communications Technology Council (ICTC) released a report, "Outlook for Human Resources in the ICT Labour Market, 2011-2016,"[18] which addresses overall information technology labour market trends, as well as trends related to business systems development. The report provides predictions of both national and regional employment growth to 2016, as well as trends shaping the supply and demand for ICT professionals.

ICTC forecasts "pervasive shortages" of computer and information systems managers as well as information systems analysts and consultants in Canada and Ontario by 2016.[19] The report asserts, "The most rapidly growing ICT Occupations are those which combine ICT skills with an understanding of business needs."[20] The report's historical data on Information Systems Analysts and Consultants, Database Analysts and Data Administrators, and Computer and Information Systems Managers, show employment growth from 2000 to 2010. Growth for Information Systems Analysts and Consultants was particularly strong: employment in the occupation grew by nearly 125 percent over the 10-year period.[21]

ICTC reports that demand in fields at the intersection of ICT and business is currently outstripping supply. This scenario will likely extend into the future for a number of reasons. First, many ICT job postings, even for entry-level jobs, require applicants to have three to eight years of relevant experience. **This requirement reflects the desire to bring on ICT employees that have complementary business or professional skills that are not developed in a typical ICT program**. This prerequisite can be a barrier to job placement for new graduates in ICT fields. This trend further constricts the number of trained job-seekers who successfully obtain job placements and, ultimately, results in shortages of experienced ICT specialists.[22] Although this finding may appear to conflict with the anticipated surplus of ICT job-seekers discussed

[18] "Outlook for Human Resources in the ICT Labour Market, 2011-2016," Op. cit.
[19] Ibid., pp. 42, 67.
[20] Ibid., p. 18.
[21] Ibid.
[22] Ibid., p. 23.

earlier in this report, it does not. This surplus reflects job-seekers who have ICT training but no business training or experience. While the number of these candidates will exceed the number of available jobs, there will be an insufficient number of graduates with the training employers seek.

In order to provide post-secondary ICT training that qualifies graduates for the dominant hiring requirements of today's ICT labour market, the Canadian Coalition of Tomorrow's ICT Skills designed the Business Technology Management (BTM) program. "BTM programs address a major gap, namely the need for ICT professionals who understand both ICT and the business processes to which ICT is applied."[23] The ICTC report projects that BTM graduates will make up 6 to 10 percent of new entrants into the Canadian ICT labour market by 2016 and will have a "significant impact" on Canadian institutional ability to meet long-term ICT needs,[24] although the current volume of program graduates will have a minimal impact on short-term demand.[25]

There is some debate over the source of qualified professionals to fill ICT labour shortages. Karna Gupta, of the Information Technology Association of Canada, has argued that labour market demands require that businesses turn to immigration to fill demand for skilled workers. [26] In contrast, the ICTC labour market report suggests that immigrants who are not native English- or French-speakers would likely not qualify for the advanced positions that need to be filled.[27] ICTC predicts that the effects of immigration trends on the ICT labour market will remain stable until 2016.[28]

New ICT-oriented programs, while equipping students with skills that are broadly applicable, should also consider capitalizing on institutional strengths to prepare graduates for specific industries.

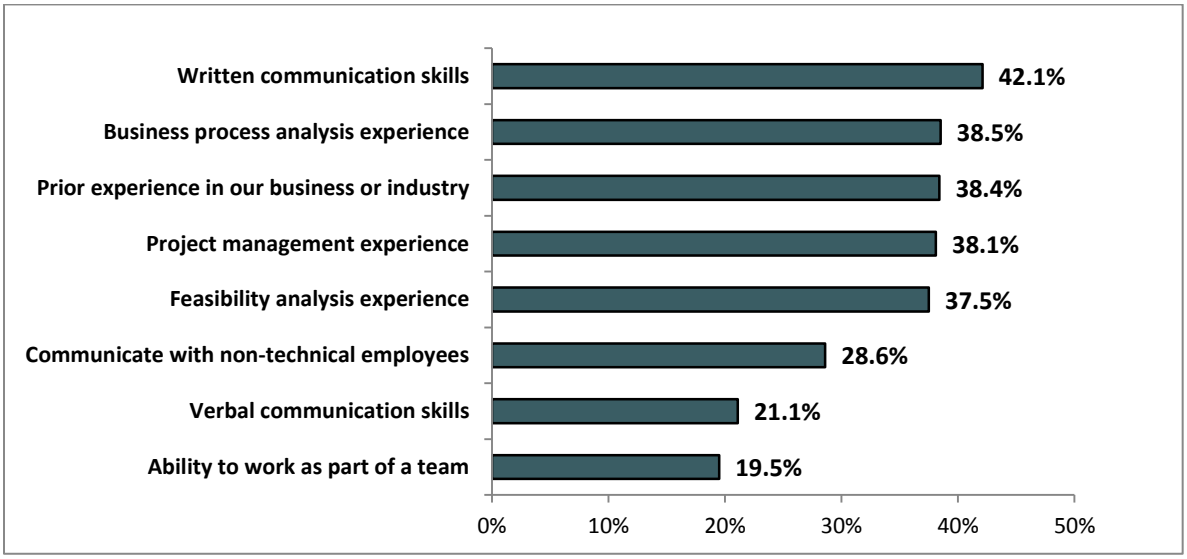
The difficulty companies have in finding employees with sufficient ICT and business education and experience is compounded by **barriers to transferring professional across industries**. Many industries reliant on ICT have specific ICT skill demands that cannot easily be transferred across industries by ICT workers.[29] For example, skills as an analyst in retail will likely not transfer to a career as an analyst in the oil and gas industry. Consequently, a new ICT program, while equipping students with skills that are broadly applicable, should consider capitalizing on institutional strengths to prepare graduates for specific industries.

Based on interviews with 100 business executives, ICTC concludes that **employers' greatest challenge in hiring is "recruiting ICT professionals who have the equally important complementary [non-technical] skills."**[30] Although most executives reported only modest difficulty finding technical expertise, many rated several "soft" or non-technical skills as a 4 or 5

[23] Ibid., p. 15.
[24] Ibid.
[25] Ibid., p. 67.
[26] Gupta, K. "The Issue: The Importance of global Workers in Canada's ICT Industry." Information Technology Association of Canada. p. 2. http://itac.ca/uploads/research/The_Issue_-_The_Importance_of_Global_Workers_in_Canadas_ICT_Industry.pdf
[27] "Outlook for Human Resources in the ICT Labour Market, 2011-2016," p. 16.
[28] Ibid.
[29] Ibid., p. 18.
[30] Ibid., p. 22.

on a 1-5 scale measuring hiring difficulty. Figure 2.4, below, shows the percentage of executives who assigned 4 or 5 ratings to selected non-technical skills. Written communication skills rank first, and several forms of business expertise rank highly as well.[31]

Figure 2.4: Percentage of Employers Reporting Difficulty in Recruiting Non-Technical Skills



Source: Information and Communications Technology Council
N=100

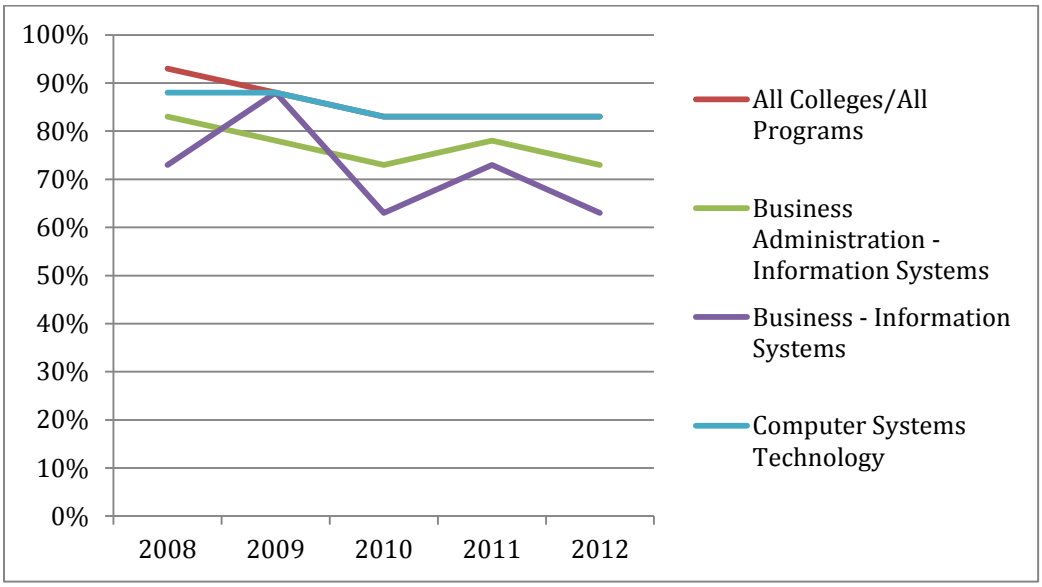
Ontario ICT Employment Rates – OMTCU

Graduate employment rates calculated by The Ontario Ministry of Training, Colleges, and Universities provide another indicator of Ontario's labour market demand for holders of degrees related to business systems development. OMTCU's data are based on surveys of Ontario's colleges of applied arts and technology and so do not include all graduates with bachelor's degrees. The data illustrate trends in Ontario's demand between 2008 and 2012 for workers with skills similar to what a business systems development bachelor's degree holder would possess.[32]

Figure 2.5 shows the employment rates for graduates holding degrees in "Business Administration – Information Systems," "Business – Information Systems," and "Computer Systems Technology." Data for "All Colleges/All Programs" are also included for comparison. The employment rate for graduates trained in "Computer Systems Technology" matched the pace of the overall graduate employment rate for the past four years. The employment rates for graduates trained in "Business Administration - Information Systems" and "Business – Information Systems" were irregular and trending slightly downward over the five-year span. These trends may reflect the difficulty that new graduates may have in finding ICT jobs immediately after graduation.

Figure 2.5: Program Graduate Employment Rates – Ontario's Colleges of Applied Arts and Technology

[31] Ibid., p. 23.
[32] "Employment Profiles," Op. cit.



Source: Ontario Ministry of Training, Colleges, and Universities

Section III: Competitor Profiles

In this section, Hanover provides an overview of the characteristics of Business Technology Management (BTM) programs, which resemble Algonquin's proposed program in several respects. We then profile two potential competitor programs in Ontario that provide a combination of ICT and business training.

Business Technology Management Overview

An increasing number of Canadian colleges and universities are attempting to meet the demand for business-trained ICT workers by offering programs that incorporate curricular elements from both business and ICT fields. As mentioned above, CCICT designed the BTM model in 2009 expressly for this purpose.

According to CCICT, the BTM is a "digital economy version" of a standard management information systems program. The BTM curriculum guidelines are deliberately open-ended, allowing for programs that differ significantly in curriculum, specializations, and administrative arrangements so long as they cover a minimum set of learning outcomes.[33] Despite their differences, all BTMs share the following goals:[34]

- Gain a real understanding of organizations and the world of business;
- Acquire knowledge of business techniques, such as business design and project management;
- Develop excellent interpersonal, communications, and leadership skills;
- Acquire a keen understanding of how best to use technology to improve business activities; and

[33] "BTM: Business Technology Management Pamphlet." Canadian Coalition of Tomorrow's ICT Skills. p. 1. http://ccict.ca/wp-content/uploads/2010/12/BTM-Pamphlet.pdf
[34] Bulleted points adapted from: "Business Technology Management (BTM) Overview," Op. cit.

- Develop the practical skills to be an effective project leader.

Since 2009, 13 universities have either developed programs that meet the BTM curricular requirements, or have sought to have pre-existing programs recognized as satisfying the requirements. Figure 3.1, on the following page, lists these institutions and their BTM programs. Notably, many programs recognized as BTMs by CCICT have titles other than "Business Technology Management." So far, only one institution, Simon Fraser University (SFU), has a BTM program accredited by the Canadian Information Processing Society (CIPS),[35] CCICT's accrediting partner for BTM programs.[36]

Figure 3.1: Institutions with BTM Programs Recognized by CCICT

INSTITUTION	PROGRAM TITLE
Acadia University (Halifax)	BBA with BTM Concentration
Concordia University (Montreal)	Bachelor of Commerce with BTM Major
Laval University (Quebec City)	Bachelor of Business Administration
Ryerson University (Toronto)	Business Technology Management
Simon Fraser University (Vancouver)	Business Administration with Certificate in Business Technology Management
Université du Québec à Montreal (Montreal)	Bachelor of Business Administration - Certificate in Computerized Management and e-Business
Université du Québec en Outaouais (Montreal)	Bachelor of Business Administration
University of Alberta (Alberta)	Management Information Systems (MIS) Major
University of British Columbia (Vancouver)	Bachelor of Commerce with BTM Specialization
University of Toronto, Mississauga	Digital Enterprise Management, HBA
University of Waterloo and Wilfrid Laurier University (Joint Computer Science and Business program)	Bachelor of Business Administration and Bachelor of Computer Science Double Degree (BBA/BCS)
Wilfrid Laurier University, Brantford campus	Bachelor of Business Technology Management
York University	BBA or iBBA with Operations Management and Information Systems

Source: Career Mash[37]

The specifics of BTM program curricula vary among institutions, though there is a basic curricular framework for all programs, presented in Figure 3.2. Individual programs may address these open-ended topics in a variety of ways. The CCICT also recommends each program have a co-op element providing students one year of relevant experience, but a co-op experience is not required.[38] The senior year of a BTM program involves the integration of ICT and business skills in fields such as sales, customer relations, and supply chain management.[39]

[35] "Business Technology Management." Canadian Information Processing Society. http://www.cips.ca/BTM
[36] "BTM: Business Technology Management Pamphlet," Op. cit., p. 3.
[37] "Business Technology Management." CareerMash. http://careermash.ca/education/business-technology-management-btm
[38] "BTM: Business Technology Management Pamphlet," Op. cit., p. 3.
[39] Outlook for Human Resources in the ICT Labour Market, 2011-2016, Op. cit., p. 15.

Figure 3.2: Components of BTM Programs

CORE BUSINESS SUBJECTS	CORE ICT SUBJECTS
▪ Marketing ▪ Operations management ▪ Accounting and finance ▪ Human resources management ▪ Law	▪ Systems analysis and design ▪ Internet and web-based application ▪ ICT architecture and infrastructure ▪ Privacy and security

Source: Information and Communications Technology Council[40]

BTM programs will prepare graduates for a variety of jobs that require knowledge of both business and ICT. These positions would largely be the same as the jobs pursued by graduates of Algonquin College's proposed program, although graduate of the college would likely apply for jobs requiring higher level computing skills than typical BTM graduates. BTM program graduates will be qualified for jobs in the following professions:[41]

- Business analysis;
- Consulting;
- IT management;
- Project management;
- Entrepreneurship; and
- Change management.

Competitor Programs

The two programs profiled below were selected from the recognized BTM programs listed above. The programs are noteworthy because they are offered by Ontario-based institutions and they illustrate the variety of curricular requirements that can be found in programs dedicated to educating students in both business and ICT.

University of Waterloo and Wilfrid Laurier University

The University of Waterloo (UW) and Wilfrid Laurier University (WLU) offer a joint Honours Computer Science (BSc) and Honours Business Administration (BBA) degree program, the only double degree program currently recognized by CCICT. This new program, launched in 2010, is also the only BTM program that incorporates a computer science degree.

UW couches the program's goal in broad terms, noting that students will develop expertise in both computer science and business administration so as to "meet the demand from today's information rich society for personnel with both computer science and business management knowledge."[42] The computer science degree portion of the program, completed through UW,

[40] Ibid.
[41] "BTM: Business Technology Management Pamphlet," Op. cit., p. 1.
[42] "Cheriton School of Computer Science: Undergraduate Programs & Courses." University of Waterloo. https://cs.uwaterloo.ca/future-undergraduate-students/undergraduate-programs-courses

highlights student flexibility in choosing their elective courses while they gain a solid understanding of computer science.[43] The business degree portion of the program, completed through WLU, emphasizes student opportunities to gain practical experience applying theoretical business concepts.[44]

This double degree program provides the most comprehensive dual foundation education of the BTM programs, as students must satisfy requirements for two bachelor's degrees. Figure 3.3 displays the course requirements for the joint degree programs. The 26-credit program can be completed in 4 and 2/3 years of full-time study, including one year of co-op experience.[45] This program most closely matches the extensive computing training that Algonquin College is proposing, though the double degree program covers more computing, business, and mathematics topics than Algonquin's proposed program for a single degree. The substantial list of computing program electives available at WU, including "Introduction to Artificial Intelligence," "Computer Security and Privacy," and "Software Design and Architectures," allow students to develop unique computing specializations.

Interestingly, the double degree program does not appear to provide programmatic requirements for coursework that integrates knowledge of both fields, as students will be pursuing distinct degrees at different institutions. In this respect, it differs from other BTM programs, which have capstone classes or courses that more explicitly integrate business and information technology.

[43] "2013-2014 Bachelor of Business Administration / Bachelor of Computer Science Double Degree Checklist (Co-op)." University of Waterloo. https://cs.uwaterloo.ca/current/programs/require/2013-2014/bbabcs.html
[44] "Laurier School of Business and Economics." Wilfrid Laurier University. http://www.wlu.ca/homepage.php?grp_id=356
[45] "Degree Requirements." University of Waterloo. http://ugradcalendar.uwaterloo.ca/page/MATH-Bus-Admin-Computer-Sci-Double-Degree-Reqmnt

Figure 3.3 Course Requirements for the Joint Honours Computer Science (BSc) and Honours Business Administration (BBA) Program

REQUIRED BUSINESS COURSES	REQUIRED COMPUTER SCIENCE COURSES
YEAR 1	
■ BU 111 - Understanding the Business Environment ■ BU 121 - Functional Areas of the Organization ■ EC 120 - Introduction to Microeconomics ■ EC 140 - Introduction to Macroeconomics	■ CS 135 - Designing Functional Programs ■ CS 136 - Elementary Algorithm Design and Data Abstraction ■ MA 135 - Algebra for Honours Mathematics ■ MA 137 - Calculus 1 for Honours Mathematics ■ MA 136 - Linear Algebra 1 for Honours Mathematics ■ MA 138 - Calculus 2 for Honours Mathematics
YEAR 2	
■ BU 127 - Introduction to Financial Accounting ■ BU 283 - Financial Management I ■ BU 288 - Organizational Behaviour I ■ BU 231 - Business Law ■ BU 247 - Managerial Accounting ■ EC 250 - Intermediate Macroeconomic Analysis for Management Or EC 260 - Intermediate Microeconomic Analysis for Management	■ ST 230 - Probability ■ ST 231 - Statistics ■ CO 250 - Introduction to Optimization ■ CS 245 - Logic and Computation ■ CS 246 - Object-Oriented Software Development ■ MA 239 - Introduction to Combinatorics
YEAR 3	
■ BU 352 - Introduction to Marketing Management ■ BU 354 - Human Resources Management ■ BU 385 - Operations Management I ■ BU 393 - Financial Management II ■ BU 362 - Building and Managing Products, Services and Brands ■ BU 395 - Operations Management II ■ BU 398 - Organizational Behaviour II	■ CS 240 - Data Structures and Data management ■ CS 241 - foundations of Sequential Programs ■ CS 251 - Computer Organization and Design
Four additional elective courses from business or computer science.	
YEARS 4 AND 5	

REQUIRED BUSINESS COURSES	REQUIRED COMPUTER SCIENCE COURSES
■ BU 481 - Business Policy I ■ BU 491 - Business Policy II	■ CS 341 - Algorithms ■ CS 350 - Operating Systems ■ CS 490 - Information Systems Management ■ CS 492 - The Social Implications of Computing ■ Four additional computing electives from a list of 34 courses

Source: University of Waterloo and Wilfrid Laurier University

Program graduates could very well be in competition for jobs with graduates of the proposed Algonquin College Business Systems Development program. While both the UW and WLU web sites note the availability and course requirements for this program, neither provides substantial information on the goals or job market opportunities available to graduates of this unique program. Nonetheless, the opportunities available to graduates with each institution's contributing degrees show that many possibilities would be available. Graduates with a bachelor's in business administration from WLU are qualified for various public or private sector jobs, as well as entrepreneurial endeavours.[46] The University of Waterloo provides a more extensive list of recent program graduate job placements, including:[47]

- Software Development;
- Quality Assurance Lead;
- Software Design Engineer in Testing;
- Software Developer;
- Software Development Engineer;
- Software Engineer;
- Software Development Engineer;
- Product Development & Systems Integration;
- Software Developer; and
- Net Developer.

Wilfrid Laurier University

[46] "Laurier School of Business & Economics: Programs." Wilfrid Laurier University. http://www.wlu.ca/homepage.php?grp_id=12613
[47] "Computer Science." University of Waterloo. http://uwaterloo.ca/find-out-more/programs/computer-science

Wilfrid Laurier University's Brantford Campus offers a CCICT-recognized Honours Bachelor of Business Technology Management. The program requires 20 credits of coursework.[48] WLU states that their program was designed around the CCICT learning guidelines for BTM programs, which is reflected in the program's goals:[49]

- *Prepare graduates to be leaders in a turbulent world of technology-based change.*
- *Teach students to effectively leverage technology in the workplace and beyond.*
- *Provide not only technical and professional training, but place distinct emphasis on developing leadership, interpersonal communications, and collaboration skills.*
- *Better prepare graduates for the workplace of the future through embedded liberal arts and leadership courses.*

WLU's BTM program contains elements similar to many BTM programs that are based in university business departments or schools of business. Students have an opportunity for a co-op experience and must complete a capstone course, "Business Strategy and Enterprise Architecture." These programmatic elements both encourage student synthesis of the computing and business elements of the program while providing experience with "real organizational problems."[50]

Figure 3.5, on the follow page, presents course requirements for WLU's degree. Through an examination of course descriptions, Hanover has categorized the BTM program requirements into business requirements and ICT requirements. However, many areas, such as "Management Information Systems" and "Project Management" have strong elements from both ICT and business, so the distinction between these areas is not absolute. Notably, this program addresses almost all of the business areas that Algonquin's proposed program would include. However, it is unclear how much training the WLU program provides in enterprise systems such as SAP or PeopleSoft. WLU's program covers fewer computing areas than Algonquin's proposed program and focuses on the managerial aspects of a number of computing areas. Notably, WLU's program, unlike Algonquin's proposed program, does not have a stated educational focus in web applications, operation systems, or emerging technologies.

[48] "Bachelor of Business Technology Management." Wilfrid Laurier University. http://www.wlu.ca/calendars/program.php?cal=1&d=1077&p=2193&s=502&y=53
[49] Bulleted points adapted from: "Business Technology Management." Wilfrid Laurier University. https://www.wlu.ca/page.php?grp_id=1983&p=17606
[50] "Business Strategy and Enterprise Architecture." Wilfrid Laurier University. http://www.wlu.ca/calendars/course.php?c=32275&cal=1&d=1255&s=566&y=57

Figure 3.5: Course Requirements for Wilfrid Laurier University's Business Technology Management Program

REQUIRED BUSINESS COURSES	REQUIRED ICT COURSES
■ MB 105 - Business in a Networked Society ■ JN 109/MB 109/OL 109 - Interpersonal Communications in Contemporary Society ■ MB 202 - Marketing ■ MB 207 - Introduction to Financial Accounting ■ MB 217 - Introduction to Managerial Accounting ■ MB 235 - Statistics for Management ■ MB 245 - Operations Management ■ MB 300/OL 300 - Ethics and Organizational Responsibility ■ MB 307 - Fundamentals of Finance ■ MB 335 - Business Change Management ■ MB 337 - Business Law ■ MB 345 - International Business ■ MB 365/ OL 365 - Influence, Persuasion and Negotiation ■ MB 481 - BTM Introduction to Project Management ■ MB 485 - Business Strategy and Enterprise Architecture ■ EC 120 - Introduction to Microeconomics, *Or* EC 140 - Introduction to Macroeconomics	■ MB 115 - Information Technology ■ MB 215 - Software Development ■ MB 315 - Data and Knowledge Management ■ MB 325 - Management of Information Systems I ■ MB 385 - Systems Analysis and Design ■ MB 425 - Management of Information Systems II ■ MB 475 - Technology and Innovation Management

Source: Wilfrid Laurier University[51]

The computing skills acquired through the WLU program would not likely qualify graduates for the more computing-heavy occupations that Algonquin envisions for its own graduates. However, some roles in business analysis and marketing support, as well as technology entrepreneurship, would require sophisticated ICT knowledge. WLU states that program will be prepared for the following careers:[52]

- Business analysis;
- Project management;

[51] "Bachelor of Business Technology Management," Op. cit.
[52] "Business Technology Management," Op. cit.

- Sales;
- Consulting;
- Customer and supplier management;
- Marketing support;
- Technology entrepreneurship; and
- Independent consulting.

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Washington, DC 20006

P 202.756.2971 F 866.808.6585
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OCAS Data on Related Degree Programs (November 2015)

In additional to a fulsome Labour Market Analysis, Algonquin College additionally reviewed OCAS applicant data to determine student demand for similar programming at other colleges. Seneca College of Applied Arts and Technology is the only other Ontario College currently offering a related degree, as well as a related degree in applied technology. Applicant information related to Seneca's Bachelor of Technology – Software Development degree is provided in the following table.

Bachelor of Technology – Software Development (Seneca)

	APPLICATION					REGISTRATION					ENROLMENT				
Applicant Year/Type	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
BOTH	376	404	437	435	437	90	96	108	97	108	68	81	79	88	96
DIRECT	189	226	234	215	234	35	44	51	46	51	39	39	33	39	44
NON-DIRECT	187	178	203	220	203	55	52	57	51	57	29	42	46	49	52

Applicant Demand – Student Surveys

The following surveys were conducted within students from Algonquin College's existing Computer Engineering Technology – Computing Science Ontario College Advanced Diploma program and the Computer Programmer Ontario College Diploma programs in 2015.

	Total Interest	Extremely	Very	Somewhat
Bachelor of Technology (Business Systems Development) (Honours)	45	5	13	27
Bachelor of Technology (Business Systems Development) (Honours)	63	10	19	34
Overlap	40			
Would have taken the program?	53			
Continue at Algonquin?	65			
Number of Participants	99			

Student interest surveys were conducted to gauge how much interest Algonquin College 1st year computer science students might have in bridging into either our proposed Bachelor of Technology (Business Systems Development) (Honours) or (Digital Health) (Honours) programs. Of the 99 responses, 63 students expressed interest in the Business Systems Development program (Table 1), while 45 expressed interest in the Digital Health program (40 of those 63 students were interested in both programs). When asked, 53 students indicated that they would have enrolled in one of the two programs had it been offered when they were applying to Algonquin College. Sixty-three (63) students indicated that they plan to continue their studies at Algonquin upon completion of their current program.

Current Employment Opportunities

The following job advertisings provide additional evidence of the economic need for this program. Employers (locally, provincially, and nationally) are seeking candidates for Business Systems Development related positions. These particular postings were selected because of the relevance of the proposed degree learning outcomes to the position.

The following positions were advertised on popular job search websites as listed below between April and June 2016 and in February 2017.

www.monster.ca
www.monster.com
www.indeed.com
www.linkedin.com
www.workopolis.com

Position and Organization	Location	Job Descriptions	Education Requirements
Business Systems Analyst - Randstad Technologies	Ottawa, ON	The successful candidate will be supporting the creation, development and enhancement of the client's Web and Mobile assets by detailing and documenting requirements; designing component solutions; and, facilitating releases of new or enhanced versions of the assets	▪ Requirements: ▪ Degree (IT, IS, or business administration with IT focus) or equivalent certification or experience; ▪ Demonstrated track record with consumer-facing, web/mobile based projects; ▪ Advanced use of the Microsoft Office suite; ▪ Knowledge of Java in a Linux environment an asset; ▪ Knowledge of data warehouse/business intelligence concepts, architectural components an asset; ▪ Knowledge of Agile project management an asset; ▪ Proficient in written and spoken English; bilingualism an asset; ▪ Minimal travel
Business Analyst – TEKsystems Inc.	Ottawa, ON	The Business Analyst is part of a team of Business Analysts supporting the clients project management office. This	▪ Bachelor's degree in Business, Information Technology, or a related field;

Position and Organization	Location	Job Descriptions	Education Requirements
		position is primarily focused on an Enterprise Resource Planning upgrade, but will also include supporting other programs as required by the Project Management Office.	▪ Minimum of five (5) years of professional experience in a business analysis capacity; ▪ Expertise in Enterprise Resource Planning Tools ; ▪ Expertise in business process analysis, data analysis and requirements documentation, including strong skills in related diagraming and modeling toolsets; ▪ Experience with Data Management and Governance best practices; ▪ CBAP, CCBA certifications nice to have.
Developer – Hays	Ottawa, ON	As a .NET Developer you will join a team responsible for the design and development of wireless network management applications (Web and Desktop/Client Server) you will implement WCF services, various UI subsystems and components, web client UIs, algorithms, console applications, plug-ins and versioned data migration modules. You will also take part in system and integration testing; merge development branches under source control; estimation; architecture, elaboration and design review sessions; documentation of software requirements and designs.	To qualify for the outstanding job opportunity the ideal candidate will have; a degree in Computer Science, Software Engineering or similar; more than 3 years' experience in software development using C#.Net, WCF, WPF, Silverlight, Winforms, LINQ, MVVM, IIS, LINQ to SQL, SQLEXPRESS, Visual Studio, TFS. Ideal you will have knowledge and experience of the wireless industry as well as GIS technologies such as Mapinfo.
Developer – CGI	Ottawa, ON	The Information Technology Services (ITS) Department's Operations and Markets Portfolio provides the applications, software, hardware and technical support to the	▪ bachelor's degree in computer science or engineering ▪ minimum of five years of relevant work experience in application

Position and Organization	Location	Job Descriptions	Education Requirements
		business functions of the Funds Management and Banking and Financial Markets departments. As a Java8/Weblogic Developer, you will work within the Applications and Business Services Team under the direction of the project manager to support this portfolio with a major software upgrade and it's integration.	development and systems integration ▪ or ▪ an equivalent combination of education and experience may be considered
Business Systems Analyst – Shopify	Ottawa, ON	As a Systems Analyst, you will work in a highly collaborative fashion as a core member of the Business Systems team. You'll be ensuring the reliability of existing systems and solutions, and you'll have an enthusiasm for continuous improvement to business operations which you'll help deliver through minor enhancements and projects. You will need to develop a deep understanding of our tools, and business processes.	▪ Minimum 2 years' experience in a business systems role either supporting or extending/configuring applications. ▪ Experience with requirements gathering, analysis and solution design ▪ Experience with IT controls and compliance to meet standards for publicly traded companies ▪ Experience with Web Services and other integration tools ▪ Great organizational and interpersonal skills, with proven success building relationships across all levels ▪ A desire to become more tech savvy and a willingness to learn
Business Analyst - CGI	Ottawa, ON	The Security Operations Centre Analyst will, after an extensive training period and with ongoing support: • Monitor security alerts of potential hacker attacks detected by security systems such as: Intrusion Detection & Prevention Systems (NIDS/NIPS, HIDS/HIPS,	▪ Experience in IT (Information Technology) and an interest in IT Security. ▪ Understanding, and preferably some experience as well, of networking and TCP/IP. ▪ A non-mandatory asset would be completion of a post-secondary

Position and Organization	Location	Job Descriptions	Education Requirements
		WIDS), Log Monitoring, File Integrity Monitoring and SIEM. • Determine and classify the severity of alerts and assess potential impacts. • Report and investigate potential security incidents. • Provide recommendations to clients for containment and eradication of threats. • Maintain Intrusion Detection/Prevention signatures. • Update security operations processes and procedures. • Assist in IT security investigations, exercises and tests. • Research, consultation with colleagues and training to maintain awareness of trends in new security threats, technologies and regulations. • Other related duties as assigned by the supervisor.	educational program in IT Security or Computer Sciences from a recognized community college or university. ▪ Government of Canada Secret Clearance is required (or the ability to obtain one
Developer – Precision IT	Ottawa, ON	Our Federal Government client is looking for a Programmer/Analyst to join our team of consultants. This is a 1 year contract with 3-year option period. A valid Secret level security clearance is required. The Programmer/Analyst must have experience developing in C++, Java and working with DB2, IBM WebSphere and EDI.	▪ BS/BA Information Systems, Business Management, or equivalent
Business Analyst – The Muse	Ottawa, ON	Are you an enthusiastic individual looking to help lead development of a system used worldwide by thousands of users and organizations? Work with and grow a passionate and talented team of engineers to design and build a next generation software system that extends the ArcGIS platform with business analysis capabilities and provides access	▪ Participate and assist in creating software components that follow industry-standard design patterns, development methodologies, and deployment models ▪ Solve and articulate complex problems with application design, development, and user experiences

Position and Organization	Location	Job Descriptions	Education Requirements
		to a wide range of data from demographic to landscape.	▪ Assist in bringing excellent software to our users ▪ Work in a team environment to design and develop quality software products and components for the management, manipulation, and display of a wide variety of data ▪ Manage new initiatives through the full lifecycle, including performing technical management and overseeing implementation and adoption ▪ Perform management tasks, including workload planning, management reporting, and process improvements
Business Systems Analyst - Eperformance	Ottawa, ON	Eperformance implements and manages web software applications for our clients. We are looking for a skilled and motivated individual to review the business needs and designing, implementing and supporting CRM applications for our clients. In this role the candidate will provide analytical skills, creative thinking and detail-oriented to our clients to ensure the effective deployment and use of our software applications.	▪ BS/BA in Computer Science or Information Systems or Business Management, or equivalent ▪ 3-5 years' experience working with large packaged applications ▪ Strong conceptual, analytic and problem solving skills ▪ Ability to work under pressure, meet deadlines, and work on multiple projects simultaneously ▪ Team player and able to effectively interact with staff at all levels of the firm

Position and Organization	Location	Job Descriptions	Education Requirements
Systems Analyst - Royal Canadian Mint	Ottawa, ON	Under the direction and within the policies of the Royal Canadian Mint, interfaces and interacts with clients to analyze, interpret and understand their requirements. Conceives and recommends technical and business solutions, provides guidance on the efficient use of various software products involved, resolves software problems, provides technical expertise and participates in system-related projects and software development applications, leads and/or participates in system development projects and participates in technical projects. Plans, organizes, coordinates and recommends efficient and effective manual, automated or computerized system solutions, maintains in-depth knowledge of the RCM hardware/software environment, as well as a current knowledge of the state-of-the-art in computer sciences and development and applicability of new technologies while keeping informed of interrelated technologies and directions.	▪ Bachelor's Degree in either Computer Science or Business (with information technology courses) or Information Technology Diploma or equivalent experience (Microsoft developer certifications highly desirable) ▪ ITIL and/or MOF certifications is highly desirable; ▪ Must be able to demonstrate experience and proficiency in authoring and reviewing technical documentation including; public API documentation, functional specifications, test plans, system workflow diagrams, threat model diagrams and class diagrams in UML; ▪ Strong system programming skills using MS platforms is required; ▪ Extensive hands-on technical and functional experience with a corporate grade Enterprise Resource Planning system (Microsoft Dynamics AX would be highly desirable); ▪ Extensive experience with manufacturing, shipping/warehouse management, sales and marketing or financial systems; ▪ Experience leading specialized development team resources.

Position and Organization	Location	Job Descriptions	Education Requirements
Systems Analyst - Adecco	Ottawa, ON	Adecco is hiring for a permanent full time Systems Analyst in Ottawa, ON. This is an excellent opportunity with a strong organization that is dedicated to supporting communities in regards to Government programs and policies. This amazing organization is located downtown Ottawa and offers a diverse benefits package, RRSP program and reduced summer hours. The Systems Analyst will be responsible for providing data life cycle management expertise in a Microsoft SQL Server environment. The primary role is performing SQL Server DBA duties (System DBA and Developer DBA skillsets). This includes delivering a consistent and reliable data service including planning, designing, installing, troubleshooting, optimizing, reporting and retiring SQL Server environments. The secondary role is dependent on the candidate's experience and would include other Infrastructure items such as Firewall, Networking, Citrix, VMWare, SAN and Microsoft Exchange. This role is ideal for those that have good SQL Server skills but also like the breadth of providing additional infrastructure services.	▪ Post-secondary education in Information Technology and experience with SQL Server, Reporting and Data Lifecycle architect. ▪ Continuous self-education on Microsoft SQL Server and its components (ie. SSRS) and data lifecycle best practices are a core aspect of this role.
Software Developer - Business Analyst Desktop - The Muse	Ottawa, ON	Are you an enthusiastic individual looking to help develop a system used worldwide by thousands of users and organizations? Work with a passionate and talented team of engineers to design and build a next generation software system that extends the ArcGIS platform	▪ Bachelor’s or master’s in computer science, engineering, mathematics, or related field, depending on position level ▪ Three or more years of development experience

Position and Organization	Location	Job Descriptions	Education Requirements
		with business analysis capabilities and provides access to a wide range of data from demographic to landscape.	▪ Expertise with standard programming languages and technologies (C/C++ and C#, Python, COM, STL, Boost) ▪ Expertise with Microsoft technology (Visual Studio, .NET Framework, WinForms, WPF) ▪ Knowledge of software development methodologies (Agile and SCRUM) ▪ Ability to master new technology quickly and to work in a constantly evolving environment ▪ Excellent communication skills and the ability to work with a diverse team
Software Engineer	Kanata, ON	Juniper Networks is looking for a highly skilled and motivated Jr Software Engineer/New Grad to join the Kanata software team. Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. Our products and technology run the world's largest and most demanding networks today, enabling service providers, enterprises, and governments to create value and accelerate business success. Everyday our 9,000+ colleagues come together across 46 countries to realize our company vision – Connect Everything, Empower Everyone. We are innovating in ways that empower our customers, our	▪ Bachelors/Masters in Computer Science/Computer Engineering or equivalent ▪ Strong debugging and analytical skills ▪ Programing experience in FreeBSD or Linux ▪ Familiarity with networking and system building blocks such as TCP/IP, Packets, Sockets, VPN ▪ OAMP, High Availability, OS Architecture, Ethernet, State Machines, SMP/Multi-Core Development ▪ EXCELLENT oral and written communication skills in English ▪ Demonstrate initiative, logical and creative thinking

Position and Organization	Location	Job Descriptions	Education Requirements
		partners and ultimately, everyone, in a connected world.	
Software Developer – Business Intelligence – Esri	Ottawa, ON	Are you an enthusiastic Software Engineer looking to help enhance Esri's software system that is used worldwide by thousands of organizations? Work with a passionate and talented team of engineers to design and build a next generation software system that runs on browsers, mobile devices, and enterprise class servers and in the cloud.	▪ Bachelor's or Master's in computer science, engineering, mathematics, or related field, depending on position level ▪ One or more years of development experience using MicroStrategy's Business Intelligence platform ▪ One or more years of geospatial software development experience ▪ Experience with Esri products, specifically ArcGIS for Server APIs (Objective-C, Android, JavaScript, or Silverlight API) ▪ Experience with web technologies (HTML5 and RESTful web services) for developing large web- and desktop-based software solutions and products ▪ Expertise with standard programming languages (C/C++/C#, Java, Objective-C) ▪ Strong knowledge of an RDBMS (Oracle, SQL Server, DB2, etc.) ▪ Knowledge of software development methodologies (RAD, RUP, Agile, SCRUM)

Position and Organization	Location	Job Descriptions	Education Requirements
			and design techniques (UML, Entity Relationship Diagramming, Data Flow Diagramming) ▪ Ability to master new technology quickly and to work in a constantly evolving environment ▪ Excellent communication skills and the ability to work with a diverse team
BI Developer - Halogen	Ottawa, ON	Do you have a passion for working with data and business intelligence? Would you love being an integral part of organizing the information to make a company successful? Do you like knowing your efforts have direct and immediate impact? Our BI Developer will have the opportunity to do just that. You'll have an opportunity to utilize your expertise and experience working with the latest tools and technologies to aggregate data from multiple systems so Halogen's leadership can set the strategy to create real business outcomes.	▪ Be a university graduate in Computer Science or related program with 4-5 years of experience as a BI Developer ▪ Have strong SQL skills with the ability to optimize, analyze, and improve database SQL performance of SQL Server ▪ Have end to end knowledge of business intelligence and data warehousing architectures including extensive knowledge and use of Star Schemas, Snowflake Schemas, Slowly Changing Dimensions, and Aggregation Techniques. ▪ Have full domain knowledge of modern BI presentation tools ▪ Have excellent communication skills ▪ Have a good understanding of business applications like CRM, ERP, Billing and Professional Services Automation ▪ Have experience with MS Dynamics (asset)

Position and Organization	Location	Job Descriptions	Education Requirements
Business Systems Analyst – WebTech Wireless	Vancouver, BC	The Business Systems team is responsible for process improvement and integration, change management, and system deployments in alignment with the core operational requirements and goals. The Business Systems Analyst is responsible for leading and managing business systems projects and initiatives, implementing improvements to current and future processes and systems, and providing broad-based support to key stakeholders. Responsibilities • Establish good working relationships with various business units while working on process improvements, integrations, business systems deployment and support. • Analyze and document current and future processes, systems, requirements, and data. Develop business intelligence reports for users. • Research the latest technology, methodology, and best practices available to support evolving business systems and processes. Maintain networking relationships in the greater business systems community. • Identify and propose systems solutions to process automation and be able to communicate how they can be used to improve operations. • Maintain and support current and future CRM, ERP, MDM and other management systems, and ensure users' support requests are responded to promptly and	Desired qualifications ▪ Degree or Diploma in Computer Science, Computer Systems Technology, Information Systems, or an equivalent combination of education and experience ▪ Certification in Business Analysis would be an asset

Position and Organization	Location	Job Descriptions	Education Requirements
		resolved within turnaround time targets. • Act as both project manager and project resource on a variety of Business Systems projects. • Assist in developing Business Systems initiatives, goal planning, and roadmaps. • Foster an open and positive working environment through regular communication with the team, positive contribution, and sharing of knowledge and feedback. • Ensure that project schedules and personal performance requirements are met, that tasks are completed according to quality, budget, and schedule needs, and that goals are in alignment with team and operational goals. • Contribute to and maintain internal knowledge base.	
Bilingual Enterprise Application Security Analyst – PrecisionERP	Ottawa, ON	About the Job PrecisionERP is a North American leader in providing contract based services to ERP markets including SAP, PeopleSoft, Oracle and JD Edwards. We are seeking a Sr Bilingual Enterprise Application Security Analyst for our Ottawa based client RESPONSIBILITIES: - As the hands-on "go to" Security analyst, technically lead the design, dev and implementations of upgrades, as well as integration, testing and management of apps and ERP systems security. - Assume a leadership role in security for a variety of	▪ BS or Diploma(in CS or similar IT related) ▪ 5+ years of experience in the design, dev, implementation and management of applications and systems, related to information security in a large IT environment ▪ Solid knowledge and experience with enterprise level software application security ▪ Able to design end-to-end security solutions in a complex application and technology environment ▪ Project Management knowledge/experience/abilities

Position and Organization	Location	Job Descriptions	Education Requirements
		applications, vulnerability management, access management, and threat assessment - Configure, monitor, investigate and resolve IT security issues	▪ Strong analytical and trouble-shooting skills ▪ Good leadership/mentoring abilities ▪ Organized, independent, innovative self-starter ▪ Ability to work well with a team ▪ Good communication skills in both English and French(oral and written)
Software Engineer/Developer - Pricedex Software	Brockville, ON	Pricedex Software is a growing Canadian software technology company, a leader in the global automotive aftermarket. We develop and provide Product Information Management (PIM) software on Microsoft platforms to the industry to manage all aspects of its product, part and pricing management processes; as well as its part cataloguing and publishing processes. Our development team is growing, and we are seeking an Intermediate-to-Senior Software Developer to join our team at our corporate headquarters in Brockville, Ontario. Essential Duties and Responsibilities Reporting to the Manager of Technical Operations, the main responsibilities of these positions will include but not be limited to the following: •Complex Client/Server Web Application prototyping, design and development •Preparation and Creation of Technical Specifications and Design Documentation •Modeling and development of data interfaces to back-end systems	▪ Degree/Diploma in Computer Science or equivalent work experience ▪ Minimum 3+ years working in software development ▪ Advanced knowledge of SQL and T-SQL ▪ Strong knowledge of technologies such as C#, ASP, HTML, XML, XSLT, CSS, Ajax, jQuery, JavaScript, and VB Script ▪ Proven experience using .NET

Position and Organization	Location	Job Descriptions	Education Requirements
		•Development and design of data exports, reports and published catalogs •Unit and Regression Testing to meet design specifications •Third-level Technical Support	
Application Designer/Developer - IBM	Toronto, ON	IBM Interact Application Designer/Developer- GTA or Montreal- contract / perm Speaking directly to each individual customer or prospect is the key to successful marketing. The key objective is to target thousands or millions of individuals with just the right message, constructing interaction strategies to determine, in real time, the right message to present in inbound marketing channels. The IBM Interact Application Developer will play both a data analyst and Campaign Interact developer role. As an engineer, he/she will design, develop and automate the execution of inbound campaigns using IBM Interact (formally Unica). As an analyst, he/she will utilize the appropriate technologies to analyze the campaign effectiveness and response rates.	▪ Post-Secondary education in Computer Science, mathematics or engineering background ▪ Experience using IBM Interact (formally Unica Interact). ▪ Experience using SQL against relational databases. ▪ Solid Linux/Unix skills. ▪ Experience with agile/scrum methodologies ▪ Strong English verbal and written communication skills ▪ Knowledge of MS Office (Word, Excel, PowerPoint and Outlook) ▪ Familiarity with companion products to IBM Interact (e.g. Campaign). ▪ Web application design and implementation. ▪ Java and/or scripting languages (Python, Ruby, Perl or similar) ▪ Financial or communications industry experience

Position and Organization	Location	Job Descriptions	Education Requirements
Application Developer - Farm Boy	Ottawa, ON	Reporting to the Director of I.T, the incumbent is responsible for designing and developing custom web applications for internal company processes. The successful candidate will learn all internal applications and processes in order to be able to provide support to the stores when required. The performance of the duties must ensure a quality service approach to all employees, customers and suppliers. All responsibilities must be performed in a manner consistent with the Farm Boy vision, mission, and the Farm Boy Way.	▪ Typically requires completion of a post-secondary program with an emphasis in Computer Science, a related technical discipline or equivalent technical experience ▪ Minimum 2-3 years' experience in .NET environment and MS SQL ▪ Ability to work in a support environment providing assistance to all user levels ▪ Ability to work under tight deadlines with excellent teamwork and communication skills ▪ Flexibility with regard to hours or work and on-call support situations
Developer, Applications – Bank of Canada	Ottawa, ON	The Information Technology Services (ITS) Department's Currency Portfolio provides the applications, software, hardware and technical support to the business functions of the Bank's Currency Department. As the Applications Developer, you work within the Applications and Business Services Team under the direction of the Manager to support software applications and their integration. Your main responsibilities are to perform in-depth analysis to support new software applications and to provide troubleshooting support for new and existing software applications. You also coach colleagues and clients at different levels of expertise and contribute to the development of best practices.	▪ Bachelor's degree in computer science ▪ A minimum of five years of relevant work experience in the IT field with software and database development ▪ An equivalent combination of education and experience may be considered

Position and Organization	Location	Job Descriptions	Education Requirements
Developer – Ampitek Consulting	Ottawa, ON	Key Responsibilities: - Participate in requirements analysis and feature definition - Contribute to system architecture design - Work in teams and individually to implement product functionality design, code, unit tests, integration tests - Participate in story estimation and iteration planning - Find simple ways to solve complex problems that provide high customer value - Help to continually refine the companys Agile development process - Leverage knowledge of virtualization and systems management industries to help shape product design and direction - Diagnose and find resolutions/workarounds for customers issues discovered in the field	▪ University degree or college diploma in Computer Science ▪ Minimum 5 years of Java programming experience in a product development environment ▪ Knowledge of OO design techniques, design patterns, and experience in Windows and Linux ▪ Development experience with unit testing ▪ Motivation with strong interpersonal and problem-solving skills ▪ Experience working in an Agile Development team
User Interface Web Developer / Architect – Iceberg Networks	Ottawa, ON	In this role, you will design compelling Web-based UI/UX for Management and monitor the firm's software products. You will create architecture specifications, user stories and prototypes, and work with cross-functional teams to create products based on those requirements. In this environment where creative and new experimental ideas are encouraged, you will also maintain awareness of the latest industry trends and technologies, and provide technical advice to other departments. Please note that you must be able to operate with limited supervision as you will	▪ 5+ years of experience in delivering world-class, compelling Web-based UI/UX ▪ Experience in User Guided Design (UGD) and Behavior-Driven Development (BDD) ▪ Experience in prototyping ▪ Experience in Responsive Web Design (RWD), showing success in actually crafting sites to provide an optimal viewing experience (easy reading and navigation with a minimum of resizing, panning, and scrolling) ▪ Iteratively develop prototypes, wireframes,

Position and Organization	Location	Job Descriptions	Education Requirements
		have extensive latitude for independent judgment.	graphics from user stories
Web Developer	Ottawa, ON	An Ottawa-based National Union is looking for an outstanding Web Developer to be responsible for the innovative design, layout and maintenance of our websites. Additional responsibilities include administration of our existing data base and some network administration support. Write well designed, testable, efficient code by using best software development practices ▪ Create website layout/user interface by using standard HTML/CSS practices ▪ Ability to match visual design intent and create site goals and potential content ▪ Integrate data from various back-end services and databases ▪ Gather and refine specifications and requirements based on technical needs ▪ Be responsible for maintaining and expanding our site ▪ Stay plugged into emerging technologies/industry trends, advise executive and staff and apply them into operations and activities ▪ Maintain domain purchases ▪ Create and maintain documentation and train end users in usage and content creation	▪ Bachelor degree in computer science or a related field or a combination of experience and education with a minimum of three years' experience as a web developer ▪ Proven working experience in web development and maintenance ▪ Top-notch programming skills and in-depth knowledge of modern HTML/CSS ▪ Familiarity with at least one of the following programming languages: PHP, MySQL ▪ Experience with Drupal or another LampCMS ▪ Familiarity with Joomla and WordPress would be an asset ▪ A solid understanding of how web applications work including security, session management, and best development practices

Position and Organization	Location	Job Descriptions	Education Requirements
		▪ Work with other staff on creating and maintaining style guides to keep print and digital products consistently branded	
Systems Integration Analyst - ICAM	Ottawa, ON	The Systems Integration Analyst possesses and applies expertise in the integration of Identity, Credential, and Access Management (ICAM), and Information Security Management applications and systems. As part of this team, the Applications Delivery and Engineering Support function provides COTS software product and custom Applications software Integration, Operations Support Systems, delivery and deployment services, and the ongoing technical and engineering support to Services Operations teams who deliver these mission and business–critical services reliably and dependably to Governments and large enterprises. Job Duties/Accountabilities: ▪ Deliver and deploy applications into service implementations, based on specifications, designs, systems and platforms ▪ Maintain, support, and sustain these service implementations across both the In-House and Lab environments, and Production environments ▪ Configuring and validating secure systems, to identify potential weaknesses	▪ Bachelor's Degree with Major in Computer Science, Electrical Engineering, or Telecommunications. ▪ Minimum 2 years of experience in a similar role, with server systems administration or networking systems administration, systems integration, and/or software design & development or verification. ▪ A track record of results and effectiveness in applications technical support, trouble-shooting and analysis, problem resolution, and service availability and reliability improvement roles. ▪ Expert knowledge of Windows Server and UNIX (Linux)

Position and Organization	Location	Job Descriptions	Education Requirements
		▪ Assist with the delivery of releases and changes to Test & Verification, along with any needed Applications Support; and, the Transition to In-Service Operation to meet contracted SLA goals and objectives ▪ Responsive and effective integration services for ongoing project, application software release development & verification, and change development activities. ▪ Specification and development of systems monitoring capabilities that will provide for improved applications supportability, maintainability, and reduction of availability or reliability –affecting incidents	
Software Developer - Business Analyst Desktop - ERSI	Ottawa, ON	Are you an enthusiastic individual looking to help develop a system used worldwide by thousands of users and organizations? Work with a passionate and talented team of engineers to design and build a next generation software system that extends the ArcGIS platform with business analysis capabilities and provides access to a wide range of data from demographic to landscape. Responsibilities Create software components that follow industry-standard design patterns, development methodologies, and deployment models Solve and articulate complex problems with application design, development, and user experiences Assist in bringing excellent software to the users Work in a team environment to design and develop quality software products and	Requirements ▪ A minimum of five years of software development experience ▪ Three or more years of development experience using ArcObjects ▪ Experience with Esri products, specifically ArcGIS for Desktop, ArcGIS for Server, and ArcPy ▪ Expertise with standard programming languages and technologies (C/C++ and C#, Python, COM, STL, Boost) ▪ Expertise with Microsoft technology (Visual Studio, .NET Framework, WinForms, WPF ▪ Knowledge of OLAP systems and technologies (SAS OLAP, MAS, SAP OLAP, MDX) ▪ Knowledge of software development

Position and Organization	Location	Job Descriptions	Education Requirements
		components for the management, manipulation, and display of a wide variety of data	methodologies (Agile and SCRUM) ▪ Ability to master new technology quickly and to work in a constantly evolving environment ▪ Excellent communication skills and the ability to work with a diverse team ▪ Bachelor's or master's in computer science, engineering, mathematics, or related field, depending on position level

Section 14: Duplication

The material presented in this section addresses the Board's standards and benchmarks for Duplication. The proposed Bachelor of Technology (Business Systems Development) (Honours) program, with its focus on applied knowledge, has been developed as a parallel educational path to programs offered at Ontario Universities, not as a duplication of existing educational opportunities.

This proposed Bachelor of Technology (Business Systems Development) (Honours) program:

1. surpasses the standards of related diploma programs,
2. is related to, but sufficiently different from, existing degree programs offered at Ontario universities, and
3. meets a need, by virtue of the preceding two facts, that is not adequately addressed by other postsecondary programs in Ontario.

Section 14.1: Analysis of Similar College Programs

Based on a review of the Ontario College's Application Service program listing for secondary school students and other undergraduate applicants, the most similar or related programs to the proposed Bachelor of Technology (Business Systems Development) (Honours) offered by colleges have been identified. The following table (see TABLE 14.1) provides an analysis of the similarities and differences that exist between the proposed program and the identified related programs. At this point in time, no other college in Ontario offers a diploma, advanced diploma, certificate, or applied degree which addresses the Business Technology Management learning outcomes of our proposed program. Therefore, there are no closely associated programs to our proposed program. The closest program that can be found is a degree program from Seneca (see table 14.1). We have concluded that the proposed program offers an education opportunity that is entirely unique, in that other college programs do not offer the same blend of knowledge and skills.

TABLE 14.1: Comparison of Bachelor of Technology (Business Systems Development) (Honours) to Similar College Programs

College Program (Credential)	Similarities	Differences	Analysis
Bachelor of Technology - Software Development (Honours) **Seneca College** (Bachelor's Degree)	• Provides students with a basic analysis and programming foundation • Allows for specialization in a number of programming areas with the selection of 2-3 "professional options" • Some focus on systems analysis and design from a programming perspective • Contains a co-op experience for students	• Focuses on software development and programming ***concepts*** without the requisite business foundation • Lacks the depth to provide a solid business foundation to students with programming/analysis skills. • Does not provide students with a focus on data analytics or	Seneca's program is focused primarily on software development and programming without the business foundation. Students in this program are not meant to develop business analysis and data analytic skills or strategic business thinking. Our proposed program aims to develop skilled business software developers who have the knowledge required to design, analyze and develop the digital solutions necessary to drive the strategic business needs of business organizations. Though there is some overlap between the two programs they are quite different in their goals.

Section: 14.2: Analysis of Similar Ontario University Programs

Based on a review of the Ontario Universities' Application Center program listing for secondary school students and other undergraduate applicants, the most similar or related programs to the proposed Bachelor of Technology (Business Systems Development) (Honours) offered by universities have been identified. The following table (see TABLE 14.2) provides an analysis of the similarities and differences that exist between the proposed program and the identified related programs. Computer science degrees have not been included as our program is not a computer science program with a focus on advanced mathematics and physics but rather a heavy focus on software development and programming technologies for the business enterprise. Students are targeted at entry level programming, systems development, database administration jobs, and entry level technology management positions. We have concluded that the proposed program offers an education opportunity that is entirely unique, in that other university programs do not offer the same blend of knowledge and skills.

TABLE 14.2: Comparison of Bachelor of Technology (Business Systems Development) (Honours) to Similar University Programs

University Program	Similarities	Differences	Analysis
Bachelor of Commerce (Business Technology Management) **Ryerson University**	• Strong focus on Business and Commerce • co-op option	• Ryerson is strongly focused on commerce, management, and leadership with little to no focus on business software development and programming • Minor focus on technology management • No large team-based IT projects	This program prepares students in business commerce with a minimum focus on technology management and leadership. This program provides a narrow focus on technology management without an understanding of the underlying practical details of information technology and business systems development. Our proposed program adds the depth of business systems software development, systems analysis and the details of programming with exposure to large scale projects on an enterprise level, mobile level and business intelligence level. These programs are quite different.

University Program	Similarities	Differences	Analysis
Digital Enterprise Management (DEM**)** Specialist Post graduate **certificate University of Toronto**	• Technology management focus • Business commerce depth	• No strong business software development or programming focus • Little to no business analysis as it relates to business software systems • Strong focus on digital media	This program has a focus on digital media. It does not focus on business systems development and programming making them quite different in their intent and focus.
Bachelor of Business Technology Management (BBTM) **Wilfred Laurier University**	• Strong focus on business and commerce • Strong focus on technology management • Co-op option	• Little to no focus on the details of software development and programming • No programming or database • Very focused on commerce	The Laurier program is targeting graduates at entry level business positions and technology management positions. It provides no significant coverage of programming and business software development. Our program targets entry level systems development and programming positions. These programs are quite different.
Bachelor of Business Administration Operations Management and Information Systems (**York University)**	• Strong focus on business and commerce • BTM program	• Strong focus on operations management • No strong business software development or programming focus	This program is designed like a typical business administration degree with an operations management focus and some information systems, depending on electives taken. This is a very different degree from the proposed Bachelor of Technology (Business Systems Technology) degree program.

University Program	Similarities	Differences	Analysis
Bachelor of Business Administration and Bachelor of Computer Science Double Degree (BBA/BCS) **University of Waterloo and Wilfrid Laurier University**	• Strong component focus on business and commerce • Strong focus on technology management • Focus on fundamentals of computer science	• Very strong math focus typical of computer science programs • Laurier component is a typical business commerce program with a heavy focus on business and technology management • Minimal coverage of database • BI from a management perspective as opposed to programming/development perspective	This program is probably the closest aligned with the proposed program however the computer science stream is heavily math oriented with very little database. On the business side the focus is on traditional commerce with a secondary focus on technology management. This program does not provide the breadth and depth of business systems development that our proposed program does. It allows the student to pick amongst several computer science and business streams.

Section: 14.3: Conclusion

The proposed Bachelor of Technology (Business Systems Development) (Honours) degree program presents a unique offering in the landscape of business and technology education. There are no other programs currently being offered by either colleges or universities that we are aware of focusing specifically on business software systems development and technology management to the extent that is being proposed. While somewhat related to programming in software offered by other colleges and universities, this proposed degree is unique in that it provides a strong focus on business systems development, technology management and strategic business thinking including business analytics. This program will benefit students who are interested in developing next-generation business solutions, and employers who need graduates that possess the unique skills in technology management and business systems solutions.

Algonquin College is ideally positioned to deliver the proposed Bachelor of Technology (Business Systems Development) (Honours) degree program. The labour market and applicant demand analyses, as well as the letters of support conveyed within this Application for Ministerial Consent, indicate that the regional market for this degree is substantive. Furthermore, it is anticipated that the program will have a broader provincial, and potentially a national appeal.