Business Intelligence Systems Infrastructure (Co-op and Non Co-op Version)

Ontario College Graduate Certificate

Program Code: 1514X03FWO

1 Year

Ottawa Campus

Our Program

Gain specialized technical knowledge to further a career in the Business Intelligence field.

The one-year Business Intelligence System Infrastructure (BISI) Ontario College Graduate Certificate provides you with specialized knowledge and skills to support the corporate use of Business Intelligence (BI), Data Visualization, Data Science, Cloud Services, and Agile Project Management. Research and evaluate current BI trends and theory as you specialize your career.

A technical program, BISI is ideal for students who have existing degrees or advanced diplomas in Computing Science, Engineering, Business, Mathematics or a similar relevant business-science-technology field.

BISI provides you with hands-on experience in:

- database design, implementation and SQL

- data warehouse design and D development

- data modelling and rendering

- operating systems and programming fundamentals

- data science essentials

- cloud fundamentals

- agile project management

- selected current topics

As a student in this program, you collect, analyze, design, build, integrate and manage systems in order to facilitate data-driven decision-making. Use current versions of in-demand, enterprise grade software to access multiple data sources, including complex databases and data warehouses, for application and/or enterprise Cloud/Hybrid/on-premises solution delivery.

Undertake a project, as part of a small team, to use and build upon your acquired knowledge and skills while addressing client requirements. An optional paid cooperative (co-op) work term opportunity exists at program end for qualified students that meet employer requirements.

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

BISI graduates may work in the public or private sector. They have the knowledge and skills to become Business Intelligence Systems specialists liaising with IT technical support and subject matter experts, as well as Technical Business Analysts designing, developing, and implementing responsive data models. In some situations, the graduate`s previous field of study opens specialized opportunities in emerging markets.

Based on the foundational knowledge and skills acquired throughout the program, BISI graduates may choose to pursue various certifications, in areas like:

- IBM Cognos CA and related disciplines

- Tableau data visualization

- Cloud foundations

- Python programming

SUCCESS FACTORS

This program is well-suited for students who:

- Are problem solvers and critical thinkers.

- Have an interest in working with integrated software to deliver and support business solutions.

- Are able to effectively work independently with little supervision.

- Have the ability to professionally collaborate and achieve team deliverables.

- Possess organization and time-management skills.

- Are able to translate design models to implementation details.

Employment

Graduates may find a variety of employment opportunities as BI specialists in IT technical support and customer service support. Training in database design and administration may also present job opportunities in those areas. Employment may be found in organizations of all sizes in both the public and private sectors.

Depending on the previous education and experience of the students, graduates may be positioned to move into managerial or other positions of authority and/or responsibility overseeing or collaborating with technically aware professionals in a business solutions delivery environment.

Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Analyze and resolve complex and non-routine information technology problems, associated with Business Intelligence (BI) infrastructure, through critical thinking and the application of diagnostic tools, to support secure enterprise BI strategies.

- Install, configure, troubleshoot, customize, maintain and upgrade BI platforms.

- Apply knowledge of networking concepts to develop strategies to integrate and deploy proprietary BI platforms and architectures with existing consumer and open source applications.

- Provide efficient and effective communications and technical support to guide clients in a manner that promotes safe computing practices and reduces risk.

- Analyze, design, build, query, maintain and manage the data integrity of databases and data warehouses.

- Identify, analyze and document a client`s business needs and use BI platforms to generate reliable benchmarks and indicators that support business decision making and the corporate strategic plan.

- Create programs and customize scripts to support evaluated needs of a client`s customized software environment.

- Research and analyze legal and ethical issues to develop criteria surrounding the personal, professional and business use of BI in a business environment.

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- Plan, implement and lead BI IT team projects using project management techniques and software.

- Identify and apply discipline-specific practices that contribute to the local and global community through social responsibility, economic commitment and environmental stewardship.

Program of Study

Level: 01	Courses	Hours
CST2100	Strategic Use of Business Intelligence	42.0
CST2101	Business Intelligence Programming	56.0
CST2102	Database Analytics	70.0
CST2103	Networking Strategies for Business Intelligence Platforms	56.0
CST2105	Data Science Foundations for BISI Students	42.0
CST2106	Data VIsualization Topics	28.0
CST2107	Operating System Component of BI Platforms	28.0
GEP1001	Cooperative Education and Job Readiness	18.0
Level: 02	**Courses**	**Hours**
CST2200	Database Systems Administration and Management	56.0
CST2203	Security and Administration of Business Intelligence Platforms	20.0
CST2204	Report Authoring	40.0
CST2205	Data Modeling	56.0
CST2206	Troubleshooting Business Intelligence Platforms	40.0
CST2208	Data Science Topics for BISI Students	42.0
CST2210	Introduction to Business Intelligence Architecture	20.0
CST2212	Business Intelligence Project	70.0
Co-op: 01	**Courses**	**Hours**
WKT8001	Work Term I	

Fees for the 2023/2024 Academic Year

Tuition and related ancillary fees for this program can be viewed by using the Tuition and Fees Estimator tool at https://www.algonquincollege.com/fee-estimator .

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

Fees are subject to change.

Additional program related expenses include:

- Books and supplies can be purchased from the campus store.

- For more information visit https://www.algonquincollege.com/coursematerials .

- Approximately $250 related to rental of statistics software and purchase of specified Raspberry Pi and related components.

Admission Requirements for the 2024/2025 Academic Year

Program Eligibility

- Ontario College Diploma, Ontario College Advanced Diploma, Degree or equivalent in a related technical field such as a technical areas of business, information systems, computer science or engineering including, but not limited to courses showing technical skills in programming, database, math, statistics or operations research.

- Examples include, but are not limited to: Computer/Computing Science, Computing Engineering Science, Computer Programming, Applied Information Technology, Systems and Computer Engineering, Computer Engineering, Computer Applications, Aerospace Engineering, Artificial Intelligence or Machine Learning, Science or Applied Science in a relevant concentration (Mathematics, Physics, Business with multiple relevant technical courses).

- Applicants with international transcripts must provide proof of the subject-specific requirements noted above and may be required to provide proof of language proficiency. Domestic applicants with international transcripts must be evaluated through the International Credential Assessment Service of Canada (ICAS) or World Education Services (WES).

- IELTS-International English Language Testing Service (Academic) Overall band of 6.5 with a minimum of 6.0 in each band; OR TOEFL-Internet-based (iBT)-overall 88, with a minimum of 22 in each component: Reading: 22; Listening: 22; Speaking: 22; Writing: 22; OR Duolingo English Test (DET) Overall 120, minimum of 120 in Literacy and no score below 105.

Admission Requirements for 2023/2024 Academic Year

Program Eligibility

- Ontario College Diploma, Ontario College Advanced Diploma, Degree or equivalent in the related field. (especially in technical areas of business, information systems, computer science, engineering).

- Applicants with international transcripts must provide proof of the subject-specific requirements noted above and may be required to provide proof of language proficiency. Domestic applicants with international transcripts must be evaluated through the International Credential Assessment Service of Canada (ICAS) or World Education Services (WES).

- IELTS-International English Language Testing Service (Academic) Overall band of 6.5 with a minimum of 6.0 in each band; OR TOEFL-Internet-based (iBT)-overall 88, with a minimum of 22 in each component: Reading: 22; Listening: 22; Speaking: 22; Writing: 22.

Application Information

BUSINESS INTELLIGENCE SYSTEMS INFRASTRUCTURE (CO-OP AND NON CO-OP VERSION) Program Code 1514X03FWO

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

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

Applications are available online at http://www.ontariocolleges.ca/ .

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

basis as long as places are available.

International applicants applying from out-of-country can obtain the International Student Application Form at https://algonquincollege.force.com/myACint/ or by contacting the Registrar`s Office.

For further information on the admissions process, contact:

Registrar`s Office
Algonquin College
1385 Woodroffe Ave
Ottawa, ON K2G 1V8
Telephone: 613-727-0002
Toll-free: 1-800-565-4723
TTY: 613-727-7766
Fax: 613-727-7632
Contact: https://www.algonquincollege.com/ro

Additional Information

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

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

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

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

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

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

Several courses can assist in the preparation for industry standards examinations (CST2102, CST2200, CST2203, CST2204, CST2205, CST2206 and CST2212).

Program curriculum is reviewed annually to reflect evolving industry trends and standards in this information technology field.

Applicants should have intermediate computer skills, such as experience installing software, writing basic SQL queries, as well as understanding basic operating system and programming concepts and commands. Candidates without this background, that are otherwise from a relevant discipline and are confident in their ability to learn these skills, are also encouraged to apply.

Contact Information

Program Coordinator(s)

- Jim Myronyk, mailto:myronyj@algonquincollege.com , 613-727-4723, ext. 3478

Course Descriptions

CST2100 Strategic Use of Business Intelligence

In order to get the most out of business data, it is important to ask the right questions. Business principles and practices need to be placed in their operational context. Students examine legal, ethical and strategic uses of BI by businesses, to make sound decisions. Communications skills are refined to comprehend the client's requirements and provide guidance to appropriate solutions. In-class assignments and discussions along with case studies and group presentations explore how businesses use BI to gain competitive advantage in the marketplace. Predications of future applications are debated.

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

CST2101 Business Intelligence Programming

Students learn to use problem-solving methodologies, critical thinking and hands-on practice to support the design and development of correct computer programs to meet client requirements, using Python, Java and JavaScript. Basic programming constructs are implemented. Students also explore web-based applications.

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

CST2102 Database Analytics

Students develop knowledge of object-relational database management system software, relational database design including normalization, design implementation in an enterprise class dbms and writing SQL queries. This material positions the student to better understand software and models generated. Students install an enterprise version of a major dbms, such as Oracle, then create users, assign basic privileges, create tables, insert data, specify indexes and write basic to intermediate SQL queries. Students write queries involving inner and outer joins, aggregation, materialized views, Top-n results, subqueries, correlated subqueries, rollups, cubes, set operations, substitution variables and a variety of relevant functions (e.g., regression coefficients, string manipulation, output formatting, correct null value handling). Transaction control commands and triggers are introduced.

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

CST2103 Networking Strategies for Business Intelligence Platforms

Students learn the important concepts necessary to understand modern LAN and Internet networking with a particular focus on understanding the BI environment. Topics include a detailed study of the terminology and concepts related to the implementation, operation, basic structure and design of modern converged networks; layered communications models; IP addressing and subnetting, and industry network standards and protocols (with an emphasis on TCP/IP protocol suite and Ethernet). The use of common networking tools to diagnose and troubleshoot typical network problems is explored and practiced in a lab environment. The major components of a BI network are examined in depth from a networking perspective. Students practice and apply their networking skills and knowledge to the BI world in a lab environment by planning, implementing, deploying, testing and troubleshooting a network that incorporates the major BI components. Students are introduced to a structured approach to identifying and resolving network issues in a BI environment.

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

CST2105 Data Science Foundations for BISI Students

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A focused examination of major data science techniques (regression, clustering, classification, and association)is provided. Analysis frameworks are also examined using a market leading model and software.

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

CST2106 Data VIsualization Topics

Students are provided with an introduction to core and key evolving visualization considerations and techniques applied to multi-dimensional data, within the context of the BISI program.

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

CST2107 Operating System Component of BI Platforms

Students explore the concepts and core functions of the Windows operating system as they relate to BISI program requirements. A BISI-focused review of Linux is provided as required.

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

CST2200 Database Systems Administration and Management

Students continue their exploration of an enterprise class dbms, with an emphasis on administration, security and performance. A database is created and key configuration parameters are examined. Special topics and technologies related to typical and advanced Business Intelligence, Business Analytics, big data environments are introduced. Students create a data warehouse and are exposed to key concepts associated with implementing a dimensional model and populating it with data extracted, transformed and loaded from relational and other sources.

Prerequisite(s): CST2102
Corerequisite(s):none

CST2203 Security and Administration of Business Intelligence Platforms

Students gain valuable experience with the tools needed to responsibly install, configure, administer and secure servers and content in Cognos BI. Students set up a Cognos BI system, implement security, integrate the BI platform with enterprise mail and authentication provider and manage the server components. Students also learn and practise creating security roles and groups, assigning access rights, scheduling tasks and managing, deploying and securing content.

Prerequisite(s): CST2103
Corerequisite(s):none

CST2204 Report Authoring

Students use report building techniques based on relational data models to enhance, customize, manage and distribute professional reports. Using Cognos Connection, Cognos BI portal interface, and Report Studio, students author reports that navigate and manipulate dimensional data structures.

Prerequisite(s): CST2102
Corerequisite(s):none

CST2205 Data Modeling

Students model various operational and dimensional representations of data appropriate for addressing business requirements. They design, import, manage and publish meta data models for use with IBM Cognos BI software.

Prerequisite(s): CST2102
Corerequisite(s):none

CST2206 Troubleshooting Business Intelligence Platforms

Ongoing relationships with customers are a crucial component of successful BI platforms, through effective technical support either onsite or remotely. Students explore advanced topics that assist in resolving issues with Cognos BI; requiring in-depth investigation of the architecture.

Prerequisite(s): CST2203
Corerequisite(s):none

CST2208 Data Science Topics for BISI Students

This course extends the knowledge gained in CST2105 by considering methods appropriate for more complex requirements (e.g. Neural Networks, Artificial intelligence, etc.) including an introduction to analytical techniques and natural language processing for the mining of unstructured data.

Prerequisite(s): CST2105
Corerequisite(s):none

CST2210 Introduction to Business Intelligence Architecture

Students are provided with a conceptual framework for studying BI systems. This course assists students in understanding the subsystems and their communication protocols, as well as providing a structured approach to comparing and contrasting available systems.

Prerequisite(s): CST2102
Corerequisite(s):none

CST2212 Business Intelligence Project

Students are provided with the tools and strategies for managing technical projects. Students use strategies relating to team building, requirements gathering, goal setting, leadership skills, scheduling and assessing performance. Students participate as a team member responsible for successfully delivering a client-focused project involving requirements gathering and prioritization, data discovery and cleansing, modelling, analysis and rendering. Students utilize an agile project management framework and complete work in a timely fashion, ensuring that problems and solutions are well documented.

Prerequisite(s): CST2100 and CST2101 and CST2102 and CST2103 and CST2107
Corerequisite(s):none

GEP1001 Cooperative Education and Job Readiness

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

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

WKT8001 Work Term I

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

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