

Area of Interest: Construction and Skilled Trades

## Building Information Modeling - Lifecycle Management Canadian Context

Ontario College Graduate Certificate

Program Code: 1529X01FWO

2 Years

Ottawa Campus

### Our Program

**One of Canada's first programs to specialize in the Building Information Modeling (BIM) sector.**

The two-year Building Information Modeling - Lifecycle Management Canadian Context (BIM-LM CC), Ontario College Graduate Certificate program is designed for international students who are new to the Canadian workforce. The BIM-LM CC program is an effective way to increase your career options in the Architecture, Engineering, Construction, and Owner/Operator (AECOO) industry. Expand your professional skills through the application of BIM technologies, data management and processes to improve productivity and make an impact in your industry.

Buildings and infrastructure projects are becoming increasingly more complex, requiring more sophisticated tools and processes. BIM uses intelligent 3D digital representations integrated with databases to enable interdisciplinary collaboration and information management for the design, construction and operation of buildings and infrastructure. By leveraging the tools and processes of BIM, project stakeholders can design, visualize, simulate, coordinate, and manage assets creating a more efficient and sustainable project lifecycle.

Learn from BIM professionals and apply skills to real-world scenarios. This program develops your knowledge and technical skills in BIM lifecycle practices to support productivity improvements in design, construction and facilities management. You develop BIM execution plans, enhance collaboration skills, hone technical abilities and apply BIM authoring and data capture tools and technologies. In the fourth semester an applied BIM project provides experiential learning opportunities and prepares you for the demands of the BIM profession.

### SUCCESS FACTORS

This program is well-suited for students who:

- Have an interest in the social and technical aspects of the built environment.
- Work well as a team member or in a leadership role.
- Are comfortable working with multiple computer software applications.
- Can apply principles to problem-solve and find unique solutions.

### Employment

Graduates of this program may work within the Architecture, Engineering, Construction and Owner/Operator industry and in various levels of government, in roles such as BIM Manager, BIM Coordinator, Virtual Design and Construction Manager, and Construction Modeling Manager.

### Learning Outcomes

The graduate has reliably demonstrated the ability to:

1. Use Building Information Modeling (BIM) processes and technologies to optimize the design, construction and management of a building and its infrastructure.

2. Develop and use BIM-based information exchange procedures to ensure data interoperability and facilitate communication among project stakeholders.
3. Develop documentation and communication strategies to improve BIM lifecycle workflows.
4. Identify and mitigate potential risks related to intellectual property, contractual obligations and regulatory compliance when sharing data with project stakeholders.
5. Recommend and justify BIM processes and tools to support design, construction and facilities management activities to meet project goals.
6. Apply leadership and communication skills to support team-building, productivity and coordination of BIM lifecycle management.
7. Develop and apply quality assurance processes to ensure BIM project delivery and lifecycle requirements follow identified standards.
8. Develop and implement a BIM Execution Plan based on stipulated project requirements to guide BIM processes and deliverables.
9. Develop and use strategies and plans to support professional development, job performance, and working relationships in a Canadian context for the AECOO industry.
10. Use Canadian building standards and practices to inform BIM projects in a variety of cultural, geographical and environmental contexts.
11. 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
BIM0001	Introduction to Canadian Aecoo Professional Practices	42.0
BIM0002	Canadian Building and Construction Standards	56.0
BIM0003	Past and Present Influences on Canadian Architecture	56.0
ENL2101	Applied Professional Communication	42.0
LFS0016	Professional Skills in Canada	42.0
Level: 02	Courses	Hours
BIM1011	Fundamental BIM Applications	42.0
BIM1020	BIM Tools and Technology for Design	56.0
BIM1030	Workflow and Collaboration for Design	84.0
BIM1040	Introduction to Project Definition and Deliverables for Design	56.0
BIM1051	BIM Standards and Guidelines	42.0
Level: 03	Courses	Hours
BIM2001	Remote Sensing Technologies for BIM	42.0
BIM2011	Advanced BIM Applications and Innovations	42.0
BIM2020	BIM Tools and Technology for Construction and Facilities Management	56.0
BIM2030	Workflow and Collaboration for Construction	84.0

BIM2040 Project Definition and Deliverables for Construction and Facilities Management 56.0

Level: 04	Courses	Hours
BIM3001	BIM Project Seminar	56.0
BIM3060	BIM Applied Project	184.0
LFS0017	Career Development in Canada	42.0

### 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:

- One (1) course pack per class (budget approximately \$50 per course).

### Admission Requirements for the 2024/2025 Academic Year

#### Program Eligibility

- Ontario College Diploma, Ontario College Advanced Diploma or Degree or equivalent in a related building construction industry; OR
- A diploma (in a non-related building construction field), with 3 years working experience in a Building Construction industry. These applicants will be assessed individually and will be required to complete an Eligibility Package.
- Eligibility Package submission details can be found on the Algonquin College Additional Admission Requirements website: <https://www.algonquincollege.com/packages> .
- 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 90, with the minimum in each component: Reading 22; Listening 22; Speaking 22; Writing 24; OR Duolingo English Test (DET) Overall 120, minimum of 120 in Literacy and no score below 105.
- Applicants with international transcripts must provide proof of the subject-specific requirements noted above, and may be required to provide proof of language proficiency.

### Admission Requirements for 2023/2024 Academic Year

#### Program Eligibility

- Ontario College Diploma, Ontario College Advanced Diploma or Degree or equivalent in a related building construction industry OR
- A diploma (in a non-related building construction field) with 3 years working experience in a Building Construction industry. These applicants will be assessed individually and will be required to complete an Eligibility Package. Eligibility Package submission details can be found on the Algonquin College Additional Admission Requirements website:

- A diploma (in a non-related building construction field) with 3 years working experience in a Building Construction industry. These applicants will be assessed individually and will be required to complete an Eligibility Package. Eligibility Package submission details can be found on the Algonquin College Additional Admission Requirements website:  
<http://www.algonquincollege.com/packages> .
- 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).
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- Applicants with international transcripts must provide proof of the subject-specific requirements noted above, and may be required to provide proof of language proficiency.

## Application Information

### **BUILDING INFORMATION MODELING - LIFECYCLE MANAGEMENT CANADIAN CONTEXT** **Program Code 1529X01FWO**

International applicants please visit this link for application process information:  
<https://algonquincollege.force.com/myACint/> .

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

Experience with BIM authoring tools (e.g., REVIT, ArchiCAD, MicroStation) is recommended for learners entering this program.

## Contact Information

### Program Coordinator(s)

- James Hayes, <mailto:hayesj@algonquincollege.com> , 613-727-4723

## Course Descriptions

### **BIM0001 Introduction to Canadian Aecoo Professional Practices**

Professional conduct contributes to the reputation of both the worker and the organization they represent. Therefore, it is crucial to understand the various standards, rules and expectations that exist in various AECOO workplace settings. This understanding can contribute towards career advancement, repeat business and a safe and positive work environment. Students explore various Canadian workplace safety standards, codes of conduct and the potential legal and ethical issues they could encounter in the field. Furthermore, student examine the typical roles and responsibilities of AECOO professionals within a Canadian context. Through discussions, case studies, guest lectures and research projects, students develop an understanding of the roles, contractual structures and professional expectations within their industry.

Prerequisite(s): none  
Corequisite(s):none

**BIM0002 Canadian Building and Construction Standards**

Canada's building standards and materials reflect the climate, resources and local regulations being enforced. It is crucial for professionals working within Canada's AECOO industry to adhere to these standards to ensure safe, efficient and lasting buildings and infrastructure. Students explore Canada's various regulatory systems at the national, provincial and municipal levels and how they contribute to safety and accessibility. Students also explore the various construction methods and materials and how they reflect regional requirements. Through case studies, presentations and research, students become familiar with Canada's broad construction standards, methods and materials.

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

**BIM0003 Past and Present Influences on Canadian Architecture**

To work effectively in the Canadian AECOO industry, it is important to understand the broader contexts of how the built environment came to be and the cultural and economic underpinnings that influenced their development. This knowledge can inform future decision making and help to navigate the dynamic AECOO industry. Students explore the political, economic, cultural and environmental factors that have shaped Canadian Architecture and the built environment. Students research topics concerning heritage and significant movements with design styles and sustainability. Through case studies, field trip(s), and research projects, students develop an understanding of Canada's architectural influences and contexts, providing insight into their industry.

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

**BIM1011 Fundamental BIM Applications**

BIM improves the quality of design, construction and the operation of buildings. Therefore, it is essential to understand BIM's capabilities and its role in the project lifecycle. Students explore the history and evolution of BIM concepts, principles and processes and how they are applied to the project lifecycle. Through historical and present-day scenarios, students build a sound foundation and understanding of current BIM practices, and their roles and responsibilities as leaders in the field.

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

**BIM1020 BIM Tools and Technology for Design**

BIM tools and technologies and their capacities are critical to the design, execution and management of the various stages of a project lifecycle. Students explore and evaluate the nature and goals of interoperability and information sharing through the use of BIM design tools. Students work independently and in groups to research tools commonly adopted for their use from the idea to design phases in local and international markets. Through the application of BIM design and authoring tools, research projects and presentations, students develop a foundation in the use of BIM.

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

**BIM1030 Workflow and Collaboration for Design**

Planning and communication are critical to minimizing the cultural shifts that arise with the transition to a BIM-centric environment. Students gain concrete experiences with various communication mediums and planning frameworks, and apply tool-specific knowledge and skills to develop and implement workflows for planning and collaboration activities used during the design phase. Through discussions, presentations and real-world scenarios, students gain the fundamental skills for workflow development.

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

### **BIM1040 Introduction to Project Definition and Deliverables for Design**

Successfully defining and delivering a project in BIM requires client buy-in and supporting contract language relative to its delivery method and options. Students explore the context of BIM, its contract language, project delivery methods, information exchange standards and contractual requirements that ensure successful project delivery for various stages of the project lifecycle. Through authentic activities, discussions and collaborative projects, students identify the requirements and deliverables that comprise a BIM Execution Plan.

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

### **BIM1051 BIM Standards and Guidelines**

Successfully defining and delivering a project in BIM requires client buy-in and supporting contract language relative to its delivery method and options. Students explore the context of BIM, its contract language, project delivery methods, information exchange standards and contractual requirements that ensure successful project delivery for various stages of the project lifecycle. Through authentic activities, discussions and collaborative projects, students identify the requirements and deliverables that comprise a BIM Execution Plan.

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

### **BIM2001 Remote Sensing Technologies for BIM**

Remote sensing technology is becoming increasingly indispensable in the AECOO industry for the ability to accurately measure complex objects, spaces and buildings that would otherwise be extremely challenging or impossible to accurately capture. BIM professionals understand how this data is captured and utilized and how to verify its quality. Students explore 3D laser scanning and photogrammetry and UAV technologies and their applications for design, construction and facilities management activities. Students participate in simulations and develop skills to identify required information, produce data-capture specifications, and leverage technology to capture and manipulate data from buildings or locations for various outputs. Through hands-on activities, scenarios and presentations, students develop the ability to procure, manipulate and implement 3D scanning and photogrammetry data in BIM lifecycle projects.

Prerequisite(s): BIM1020  
Corerequisite(s):none

### **BIM2011 Advanced BIM Applications and Innovations**

Unique projects are advancing BIM's capabilities through their innovative approaches and applications. Understanding how BIM is being used on these complex projects can provide users with a model of how BIM could be applied in ways that have not yet been considered or adopted in modern AECOO industry practices. Students explore advanced applications of BIM and determine where distinct achievements have been made and identify how similar practices could be introduced in other AECOO projects. Students find innovative ways to leverage available technologies and solve problems through BIM. Through reviews of case studies, research and presentations, students identify and evaluate where BIM productivity improvements have occurred and could be applied to advance the AECOO industry.

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

### **BIM2020 BIM Tools and Technology for Construction and Facilities Management**

The processes of traditional delivery methods are being transformed by the adoption of BIM and digital tools. Students develop a practical understanding of information flows between applications

in a BIM environment during the construction and operations phases. Students cover the usage of BIM tools and technologies applied to activities such as coordination, scheduling, cost estimating and facility management.

Prerequisite(s): BIM1020  
Corerequisite(s):none

### **BIM2030 Workflow and Collaboration for Construction**

Using BIM for construction management and facilities management requires adapting processes and defining deliverables distinct from the design phase. Students determine the model requirements and manage process variables and how project information will be shared or delivered to the stakeholders and project participants. Through authentic activities, presentations, discussions and collaborative projects, students identify the requirements and deliverables for the construction and operations phases.

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

### **BIM2040 Project Definition and Deliverables for Construction and Facilities Management**

Strategic re-tooling of processes and production techniques are required for effective use of BIM to achieve production efficiencies and improvements. Students determine the model requirements, how to manage the variables that exist during the process and how the information will be shared or delivered to the various parties. Students work collaboratively through various hands-on and class activities with a focus on construction through to the operations lifecycle phases.

Prerequisite(s): BIM1040  
Corerequisite(s):none

### **BIM3001 BIM Project Seminar**

BIM projects require planning, collaboration and communication with various team members and stakeholders. Therefore, it is important to ensure a project has clear goals and that appropriate supports are in place from start to completion. With professor guidance, students are supported through group development processes, explore communication strategies for teams and stakeholder liaison, develop project goals and priorities and reflect on ways to improve project performance and deliverables. Students assemble a portfolio of completed work developed throughout their program to showcase to future employers in the AECOO industry. Through group presentations, discussions, case studies, guided reflections and portfolio development, students develop competencies in working collaboratively to support the completion of BIM projects.

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

### **BIM3060 BIM Applied Project**

BIM is a complex activity requiring both technological competence and leadership skills. As such, students are engaged in a series of real-world scenarios encompassing the complete BIM lifecycle through a simulated BIM consultancy firm. Activities include working in teams to develop workflows, information exchanges and creating deliverables to support design, construction and facilities management activities using appropriate software. Emphasis is placed upon supporting project requirements through organized BIM management, interoperability, recognized standards and sound decision making. Strategies to facilitate communication and collaboration among project stakeholders are applied.

Prerequisite(s): BIM1020 and BIM1040 and BIM2020 and BIM2030  
Corerequisite(s):none

### **ENL2101 Applied Professional Communication**

The application of advanced communication skills, specific to the Canadian workplace, plays a principal role in career success and in the smooth functioning of any organization. Students build

on existing language skills, applying them to a Canadian professional context. Students explore how academic integrity is maintained in Canadian contexts through the proper documentation of research. By delivering presentations and engaging in speaking activities, students hone and develop confidence in their interpersonal communication skills for Canadian academic and workplace environments.

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

### **LFS0016 Professional Skills in Canada**

In addition to technical skills, professional skills are critical for professionals to effectively adapt and contribute to highly competitive and changing Canadian work environments. Students reflect on the difference between professional contexts in Canada and abroad. Students explore basic strategies, tools, and services that support their personal branding, networking and entry into the Canadian workforce. Through research, professional development activities, and reflection, students compare the professional skills they already possess and identify areas for growth that are valuable in Canadian work and study contexts. Topics include key Canadian skills such as leadership, emotional intelligence, teamwork, conflict resolution, communication, presentation skills, and adaptability. Students build professional skills as a foundation for entry or advancement in their field of choice in Canada.

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

### **LFS0017 Career Development in Canada**

Developing and managing a career in Canada requires an intentional and proactive approach. Students identify the difference between career development in Canada and other courses in order to create a strategy appropriate to the Canadian context. Students become better equipped to meet their career goals and transition into their field in different types of organizations in Canada. Students build a career development strategy using the tools and approaches relevant to entry into the Canadian labour market. Students research the self-employment and employment landscape of their chosen field and the types of career opportunities that exist in Canada. Students identify opportunities for professional development offered by training providers or accrediting bodies, key players in the industry, and different career pathways in the Canadian labour market. Students practise tailoring their cover letter, curriculum vitae, networking, and interviewing to specific Canadian self-employment and employment opportunities. Through research and in-class activities, students examine the features of Canadian work environments and the complexities of the Canadian labour law.

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