Area of Interest: Construction and Skilled Trades

Building Automation System Operations

Ontario College Graduate Certificate Program Code: 1526X01FWO

1 Year

Ottawa Campus

Our Program

Develop your awareness of sustainable building operation expertise for a career in the rapidly advancing field.

The Building Automation System Operations Ontario College Graduate Certificate program builds on your industry and educational experience and deepens your understanding of technologies that support the sustainable operation of buildings and ongoing building optimization.

By working with data analysis, you gain the ability to monitor and adjust energy usage and gauge system parameters, alarms and activities within a building. The program is designed to equip you with the knowledge and skills to advance in the building technology field.

With increased awareness of sustainable measures and growing energy costs, professionals in this field are moving towards high-performance automated buildings. These Smart buildings are reducing consumption and ensuring comfort, health and safety.

In this program, you use case studies, hands-on learning, and field work to give you the knowledge to understand and apply skills in relation to building automation systems.

Graduates who are looking to work in the building technology field may find employment in many different positions, including:

- building automation system operator
- building automation technician
- HVAC automation and controls technician
- building automation process leader

SUCCESS FACTORS

This program is well suited for individuals who:

- Possess strong critical thinking and analytical skills.
- Have an aptitude for technological, electrical and/or mechanical systems.
- Are resourceful, self-motivated and enjoy challenges.
- Are committed to achieving sustainable practices.

Employment

Graduates may be employed as a building automation system operator, building operator, building controls operator, building automation coordinator, building automation process leader, building automation technician, HVAC automation and controls technician, field service technician - building controls or a building automation consultant.

Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Conduct building systems assessments to identify issues and opportunities and recommend solutions that maximize building efficiencies.

- Use information technology for system interoperability, interconnectedness and access to achieve synchronized control.

- Use benchmarking and best practices in building automation systems to ensure quality in building operations.

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

- Prepare, modify and use technical documents, reports and proposals to communicate with various audiences in relation to building automation systems.

- Facilitate building automation by integrating the electrical, mechanical and technical systems in building operations to improve overall building performance.

- Perform work in alignment with legislation, standards, regulations and guidelines, to support and maintain the effective operations of building automation systems.

- Implement project management tools to monitor resources, timelines and expenditures in relation to building automation.

Program of Study

Level: 01	Courses	Hours
BSC1204	Automated Building Systems	56.0
CST1206	Systems Programming	42.0
ELE1201	Building Automation Systems	42.0
ELE1202	Power Distribution	42.0
ELE1203	Mechanical Controls	42.0
NET1205	Building Controls Networking	42.0
Level: 02	**Courses**	**Hours**
BSC2201	Building Automation Control Systems	70.0
BSC2203	Sustainable Facilities Operations	28.0
BSC2204	Applied Building Automation	84.0
BSC2205	BAS Applied Project	56.0
ENG2202	Instrumentation and Measurement	56.0
MGT2206	Project and Information Administration	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:
Approximately $1,200 (computer storage device and software).

Admission Requirements for the 2024/2025 Academic Year

Program Eligibility

- Ontario College Diploma, Ontario College Advanced Diploma or Degree or equivalent in an electrical, instrumentation, robotics, electronics, information technology, building science, building systems, controls or mechanical-related fields; OR

- A minimum of a diploma (in a non-electrical-related field) with 3 years working experience in an electrical or mechanical-related field. 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/ .

- 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.

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Application Information

BUILDING AUTOMATION SYSTEM OPERATIONS
Program Code 1526X01FWO

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.

Note: 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 Avenue
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

Contact Information

Program Coordinator(s)

- Andrew Huddleston, mailto:huddlea@algonquincollege.com , 613-727-4723, ext. 6713

Course Descriptions

BSC1204 Automated Building Systems

Electrical-Mechanical systems account for almost two-thirds of the electricity consumed in typical industrial and commercial sectors. Students develop the skills and abilities to calculate, evaluate and judge the synergies and trade-offs in maintaining and integrating building systems. Students explore electrical and mechanical systems as well as basic energy management practices and principles to improve system performance and yield energy and cost savings. In preparation for the capstone learning experience, students begin to scope out the details of the applied project focus with industry partners.

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

BSC2201 Building Automation Control Systems

Building automation attempts to achieve occupant comfort, efficient operation of building systems and reduction in energy consumption and operating costs. Students examine strategies and methodologies used to achieve and maintain energy efficiency, reliability and ease of operation. Different manufacturers' systems and components are analyzed and programmed. Students study leading examples of system integration in the area while developing working solutions for the automation of proposed energy efficiency projects.

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

BSC2203 Sustainable Facilities Operations

Sustainability, as it relates to social, economic and environmental responsibility, is a central concern in operations of facilities. Focus is on maintenance, energy management systems, occupant's well-being and existing industry standards. In regards to building automation systems and operations,

students critically analyze the triple bottom line, Computerized Maintenance Management Information System, LEED and overall sustainable operations. Students also research and promote sustainable building practices.

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

BSC2204 Applied Building Automation

Having the opportunity to practise the theories and skills related to building automation is a vital component of the learning experience. Students work directly with industry-simulated systems to gain hands-on experience with building automation using standard building automation backbones and protocols. Opportunities to work with building system components including pumps and drives, electrical, lighting, controllers and HVAC systems also exist.

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

BSC2205 BAS Applied Project

Employers recognize the benefits of industry experience in the field. Students work in teams to seek an appropriate and approved industry partner to collaboratively propose solutions to an identified applied research project. Through this process, students develop practical hands-on knowledge and skills in the BAS industry. Students become better informed about the industry itself while also networking with professionals in the field through a combination of research and industry-related interactions.

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

CST1206 Systems Programming

Building integration relies on the ability to control mechanical and electrical systems through system programming. Automation software is used to regulate mechanical and electrical equipment, fluid and air flows based on environmental variables, sensor inputs and building/user needs. Students focus on the technological aspects of energy controls and also operate, maintain and upgrade energy management systems and related software and components. Students simulate the design, programming, creation and demonstration of an automated, efficient building system.

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

ELE1201 Building Automation Systems

The ability to automatically control systems within buildings is the cornerstone of building automation. Students examine the principles and components of the Building Automation Systems (BAS) industry. Topics include a history of BAS, industry influencers and leaders, industry scope and trends, careers in the field, skillsets as well as system types and architecture.

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

ELE1202 Power Distribution

Building automation integrates electrical theories and principles throughout the interconnected systems. Students investigate power systems, components and operation to facilitate maintenance, diagnostics and repair within an automated building system. Focus is on power supplies, reactive electrical components, power distribution, circuit protection, electric motor theory, types of electric motors, motor starters, switching devices, electrical symbols, pictorial diagrams, schematics, sequences of operation and basic electrical troubleshooting.

Prerequisite(s): none

Corerequisite(s):none

ELE1203 Mechanical Controls

The interconnected relationship between controls and the controlled environments have a significant impact on the physical state of a building. Students deconstruct the physics of conditioned fluids in choosing strategies aligned with appropriate American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) standards enabling anticipation and control of the conditioned space.

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

ENG2202 Instrumentation and Measurement

Operating and monitoring conditions and energy in building performance is an integrated component requiring consistent measuring and verifying of system performance using instrumentation tools and devices. Students incorporate necessary tools and techniques required to support energy audits and to monitor and assist in evaluating project savings strategies initiated in-house or by an energy savings company agreement. Technology is used to verify and calibrate end devices, sensors and data interfaces essential in building commissioning and recommissioning to reach desired energy efficiency and comfort goals.

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

MGT2206 Project and Information Administration

Possessing the ability to understand and communicate with other professionals about the execution and management of projects is a requirement in the building automation field. Through practical applied experiences, students examine the basic principles of project management related to building automation, as well as the essential components of project planning, organizational methodologies and structures specific to project needs. Focus is also on proper documentation of building details, as well as the assembling of data to generate predictive reports for various stakeholders.

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

NET1205 Building Controls Networking

A network provides the ability for connected devices and controllers to communicate efficiently. Students examine network terminology and protocols, security, local and wide-area networks, topologies, cabling, Open System Interconnection (OSI) model, router programming, IP addressing and network standards. Students deploy sensors, controllers and networking technologies to measure, monitor and control devices relevant to building controls including temperature, pressure, air flow and power usage. Students also work with various transmission types, routers, switches and Building Automation protocols.

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