Area of Interest: Engineering and Architecture

**Architectural Technology (Co-op and Non Co-op Version)**

Ontario College Advanced Diploma
3 Years
Ottawa Campus

**Academic Year: 2020/2021**

**Program Code: 0018X01FWO**

**Our Program**

Build your career potential with an in-depth understanding of building and construction.

Architectural Technology is the third year of an Ontario College Advanced Diploma program that prepares you for a career in the architectural profession and the construction industry. The program gives you the credentials, the knowledge and the skills necessary to further define your career. Graduates of the two-year Architectural Technician Ontario College Diploma program may consider taking the third year, Architectural Technology program to build on their previous studies.

In the Architectural Technology program, you focus on commercial construction and large buildings, as defined in the Ontario Building Code. You participate in a team project that brings together all facets of building construction, including:

- design and technical resolution with the integration of building and material detailing
- structural and mechanical layout design for a commercial building assembly
- Revit Architecture is used to execute the design and technical resolution for the project.

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 version of the program are subject to availability.

Graduates of this program may find work with:

- architects’ offices
- contractors in multiple sectors
- engineering offices
- building materials sales representatives
- municipal offices such as the City of Ottawa
- federal and provincial agencies dealing with construction
- drafting service offices using AutoCAD and Revit
- real estate and facilities management companies
- companies that provide construction, maintenance, and planning services

Graduates may also consider applying for advanced standing in several Algonquin College programs such as the Bachelor of Building Science Degree program, the Green Architecture Ontario College Graduate Certificate program or the Building Information Modeling - Lifecycle Management (BIM-LM) Ontario College Graduate Certificate program.

**SUCCESS FACTORS**
This program is well-suited for students who:

- Are detail-oriented, organized and committed to achieving excellence in their work.
- Are creative and enjoy solving technical problems.
- Thrive in a dynamic and technically-driven environment.
- Think visually and creatively.
- Work well in a team environment.

**Employment**

Graduates may find employment with architects, engineers and contractors, and in municipal, provincial and federal agencies dealing with construction, real estate and facilities management.

**Learning Outcomes**

The graduate has reliably demonstrated the ability to:

- Communicate with clients, contractors, other building professionals, and approval authorities.
- Prepare, read, interpret, and revise drawings, and other graphical representations used in building projects.
- Obtain, analyze, prepare, and revise specifications and other project documents used in design and construction.
- Prepare estimates of time, costs, and quantity, and participate in the tendering process.
- Solve technical problems related to building projects through the application of principles of building science and mathematics.
- Collaborate with and coordinate information from structural, mechanical, and electrical building systems professionals.
- Contribute to the design of architectural projects.
- Contribute to the analysis, planning, and preparation of site planning documents.
- Comply with the legal and ethical requirements of an architectural technologist in the practice of building design and construct.
- Assess buildings and their interiors, and make recommendations for their repurposing and renovation.
- Ensure personal safety and contribute to the safety of others in the workplace.
- Participate in sustainable design and building practices.
- Use and evaluate current and emerging technology to support building projects.
- Assist in the planning, scheduling, and monitoring of building.
- Apply business principles to design and building practices.
- 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**
<table>
<thead>
<tr>
<th>Level: 01</th>
<th>Courses</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ARC8401</td>
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<td>ARC8421</td>
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<td>CAD8407</td>
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<td>DSN8401</td>
<td>Visual Communication I</td>
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<td>HIS8482</td>
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<td>ARC8430</td>
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<td>ARC8498A</td>
<td>Architecture Project II</td>
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<tr>
<td>BIM3000</td>
<td>Fundamental of Building Information Modeling</td>
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### Fees for the 2020/2021 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](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](https://www.algonquincollege.com/ro).

Fees are subject to change.

Additional program related expenses include:
Books and supplies cost approximately $1,200 in the first year and $450 in each of the second and third years. Most supplies can be purchased at the campus store. See [https://www.algonquincollege.com/coursematerials/](https://www.algonquincollege.com/coursematerials/) for more information about books. Students may be required to purchase CSA-approved safety footwear and safety glasses to participate in site visit activities.

### Admission Requirements for the 2021/2022 Academic Year

**Program Eligibility**

- Students must successfully complete Levels 01 to 04 of the Architectural Technician program with a minimum GPA of 2.00 before continuing on to Levels 05 and 06 of the Architectural Technology program. Students will be placed on the current program of study associated with Level 05 of the program.

The number of seats in the Technology program is limited. Should the number of students exceed the number of seats, selection will be based on academic performance in the program.

### Admission Requirements for 2020/2021 Academic Year

**Program Eligibility**

- Students must successfully complete Levels 01 to 04 of the Architectural Technician program with a minimum GPA of 2.00 before continuing on to Levels 05 and 06 of the Architectural Technology program. Students will be placed on the current program of study associated with Level 05 of the program.

The number of seats in the Technology program is limited. Should the number of students exceed the number of seats, selection will be based on academic performance in the program.

### Application Information

**ARCHITECTURAL TECHNOLOGY (CO-OP AND NON CO-OP VERSION)**

**Program Code 0018X01FWO**

The two first years of the three-year Architectural Technology program is the Architectural Technician program. Students must initially apply to 0188X Architectural Technician or 0188W Architectural Technician (weekend offering). Upon completion of the Architectural Technician program, students who want to continue on to Levels 05 and 06 of the Architectural Technology program may apply directly with the Coordinator.

**Note:** Levels 05 and 06 of the Architectural Technology program are not offered on weekends.

For further information on the admissions process, contact:

Registrar’s Office
Algonquin College
Additional Information

Programs at Algonquin College are Bring Your Own Device (BYOD). To see the BYOD requirements for your program, please visit: https://www7.algonquincollege.com/byod/.

Apply directly to the non co-op version of this program through OntarioColleges.ca or our International Application Portal. Qualified students may elect to participate in the co-op version, two terms prior to the first co-op work term. Subject to availability.

Cooperative 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 online readiness activities and in-person 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 and other Canadian and international colleges and universities. Algonquin College’s Co-op Department provides assistance in developing co-op job opportunities and facilitates 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 re-locate 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.

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 a mandatory part of an academic program.

For more information, please visit https://www.algonquincollege.com/coop.

With department approval, students who maintain a college-prescribed academic standing may take part in two cooperative placements during the Summer months. Co-op Work Term 1 is at the end of Level 03 and Co-op Work Term 2 is at the end of Level 04.

Architectural Technology graduates are eligible to apply to the following Ontario College Graduate Certificate programs: Green Architecture, Building Information Modelling - Lifecycle Management (BIM-LM).

Graduates may also be eligible for Advanced Standing in the Bachelor of Building Science degree program.

For standard delivery, students will be scheduled for two consecutive semesters followed by a one semester break. Exceptions must be approved by the Academic Chair.

Degree Pathways allow graduates to use their college education towards the completion of a degree in partnership with a university. View current articulation agreements at: https://www.algonquincollege.com/degree-pathways/list/.

For more information, please contact Marjan Ghannad, Program Coordinator, 613 727-4723 ext. 5807 or mailto:ghannam@algonquincollege.com.

Course Descriptions

ARC8401 Working Drawings I

Manual drawing skills are used to develop a set of basic working drawings including plans, elevations, sections and details for a wood-frame house. Emphasis is placed on communicating
information through the use of hand drawn graphics.

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

**ARC8402 Working Drawings II**

Using AutoCAD, students prepare building permit caliber working drawings for a typical two-storey residence. Hand sketching is used to resolve a variety of construction details.

Prerequisite(s): ARC8401 and CAD8407
Corequisite(s): ARC8422 and CAD8409

**ARC8403C Working Drawings III**

Students apply Part 3 and Part 9 of the Ontario Building Code to the renovation of a small wood frame multi-unit residential and commercial building, including the design of simple floor plans. Detailing includes existing wall construction, new wall assemblies and the connections between them. Students produce a final, coordinated partial set of working drawings.

Prerequisite(s): ARC8402 and CAD8409
Corequisite(s): ARC8423

**ARC8404C Working Drawings IV**

Students apply Part 3 of the Ontario Building Code to examine various building envelope assemblies for commercial buildings. Students gain an understanding of the relationship between architectural, structural, mechanical and electrical systems.

Prerequisite(s): ARC8403C and ARC8430
Corequisite(s): ARC8424 and ENG8491

**ARC8405C Working Drawings V**

Students explore the relationship between architectural and structural design and building envelope detailing for a renovated project under Part 3 of the Ontario Building Code. As-Found conditions for an existing building are examined.

Prerequisite(s): ARC8404C and ENG8491
Corequisite(s): ARC8425 and ARC8497

**ARC8406C Working Drawings VI**

Continuing with their project started in ARC8405C, students complete construction documents for a project under Part 3 of the Ontario Building Code using Revit Architecture. Detailing, barrier-free compliance and integration of mechanical and electrical systems are also addressed.

Prerequisite(s): ARC8405C
Corequisite(s): ARC8426 and ARC8498

**ARC8421 Construction Methods and Materials I**

Students are introduced to the physical characteristics of construction materials including their manufacture and use in wood-frame construction. Various structural components in a typical residential building are designed to ensure compliance with Part 9 of the Ontario Building Code. Residential stair systems are also examined.

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

**ARC8422 Construction Methods and Materials II**
Ensuring compliance with Part 9 of the Ontario Building Code, students examine issues involving the location of a building on a site, soils, building envelopes, basic building science including prescriptive energy specifications and interior space requirements for residential construction. Students acquire Workplace Hazardous Materials Information System training.

Prerequisite(s): ARC8421
Corerequisite(s):ARC8402

ARC8423 Construction Methods and Materials III

Students apply building code requirements and engineered framing systems for Part 9 of the Ontario Building Code, Small Buildings. The fundamental concepts of sustainability are explored as well as alternate construction materials and methods. Construction sequencing and timelines are examined for a typical residential project. Finally, teamwork is emphasized as students work in groups to produce a detailed architectural model.

Prerequisite(s): ARC8422
Corerequisite(s):ARC8403C

ARC8424 Construction Methods and Materials IV

The construction methods and materials used in commercial construction are introduced. Students review the Building Code Act, Part 10 (Change of Use) and Part 11 (Renovations) of the Ontario Building Code.

Prerequisite(s): ARC8423
Corerequisite(s):ARC8404C

ARC8425 Construction Methods and Materials V

Students learn the theory and application of commercial building envelope design. Emphasis is on the assembly of building components and systems for buildings under Part 3 of the Ontario Building Code.

Prerequisite(s): ARC8424
Corerequisite(s):ARC8405C

ARC8426 Construction Methods and Materials VI

Students study the methods and materials used in commercial construction with a focus on interior finishes and fit-up. Students write a formal technical report.

Prerequisite(s): ARC8425
Corerequisite(s):ARC8406C and ENL1001

ARC8430 Codes and Standards

An introduction to the structure and content of the Ontario Building Code with emphasis on Division B Part 3 “Fire Protection, Occupant Safety and Accessibility” and Part 9 “Housing and Small Buildings” is provided. Students participate in in-class sessions and online worksheets.

Prerequisite(s): ARC8422
Corerequisite(s):none

ARC8497 Architectural Project I

During the first term of this two-term design project, students work in teams to develop a renovation/addition project under Part 3 of the Ontario Building Code. Students define objectives for their project, explore options and make decisions towards meeting their goals. The team performs in-depth research into functional programming and site analysis, then explores innovative and sustainable design strategies in their projects. Applied Research Option: Student teams may opt to work with a community or industry partner on a real-world project. Under this option, the
project objectives, deliverables and methods of evaluation would be adjusted to suit the individual project.

Prerequisite(s): DSN8442
Corerequisite(s): ARC8405C

ARC8498A Architecture Project II

Continuing work on the third year project, students perform additional research and data gathering, and finalize their project design. Focus is placed on the technical integration, coordination and resolution of the Architectural, Structural, Mechanical, Electrical and other systems. Student teams are required to explore and use sustainable strategies and technologies. Project management skills are applied in scheduling and costing activities. Students present their final project submissions to a review panel of industry professionals. Research Option: Student teams may opt to work with a community or industry partner on a real-world project. Under this option, the project objectives, deliverables and methods of evaluation would be adjusted to suit the individual project.

Prerequisite(s): ARC8497
Corerequisite(s): ARC8406C

ARC8510 Construction Documentation I

An overview of the construction industry and related documentation is presented. Students are introduced to industry stakeholders, project delivery methods, standard industry contracts, the Project Manual and specifications and basic estimating techniques.

Prerequisite(s): ARC8423 and MAT8050 and MAT8051
Corerequisite(s): none

ARC8511A Construction Documentation II

Student expand their knowledge of the architectural and construction industry and the related documentation and procedures. Strategies for organizing construction information, estimating methodologies, Project Management and Construction Insurance concepts are explored.

Prerequisite(s): ARC8510
Corerequisite(s): none

BIM3000 Fundamental of Building Information Modeling

Building Information Modeling is a process that involves all stakeholders in a building project from owners/users, designers, consultants, builders, and operation and management groups. It looks at the life of a building from design to construction to operations using a range of software. This course will introduce the theory of the BIM process and some of the software that allows a BIM project to take place.

Prerequisite(s): CAD8416
Corerequisite(s): none

BSC8451 Environmental Systems I

Students learn the basic concepts of water flow and heat transfer. Students are introduced to pipe terminology, pipe design logic and pipe systems functions. Students are also introduced to the concepts of building heat loss, the functions of the residential heating systems and the advantage of using one fuel relative to another.

Prerequisite(s): MAT8050 or MAT8051
Corerequisite(s): none

BSC8452 Environmental Systems II

Students are introduced to the concepts of ductwork, air conditioning equipment, hydronic heating
systems, electrical systems and building protection equipment. Students learn how these interact with the design of a building.

Prerequisite(s): BSC8451
Corerequisite(s): none

BSC8453 Environmental Systems III

Students are introduced to the concepts of Heat Gain, Lighting and Acoustics. All examples and calculations are referenced to buildings under Part 3 of the Ontario Building Code.

Prerequisite(s): BSC8452
Corerequisite(s): none

BSC8454 Environmental Systems IV

Mechanical and electrical consultation for an architectural project is offered to the students. Students produce partial mechanical and electrical working drawings.

Prerequisite(s): BSC8453
Corerequisite(s): none

CAD8407 Architectural Cad I

Students are introduced to computer-aided drafting using AutoCAD. Focus is placed on the drawing and editing commands required to produce two-dimensional architectural drawings.

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

CAD8409 Architectural Cad II

Building on the basic AutoCAD skills acquired in CAD8407, students learn how to produce professional two-dimensional architectural drawings.

Prerequisite(s): CAD8407
Corerequisite(s): ARC8402

CAD8414 Revit Architecture I

Students are introduced to Revit Architecture. Basic creation, editing commands, annotation and view controls are learned as students complete several in-class assignments dealing with residential buildings. A final in-class exam creates a basic residential model and drawing set. Basic concepts of Building Information Modeling (BIM) are discussed.

Prerequisite(s): ARC8402 and CAD8409
Corerequisite(s): none

CAD8415 Revit Architecture II

Students build on the basic tools and skills learned in CAD8414. More advanced features of Revit Architecture such as detailing, curtain walls, parametric families, site features and rendering are explored. Students create a Revit model and a partial drawing set for a commercial building project.

Prerequisite(s): CAD8414
Corerequisite(s): none

CAD8416 Revit Architecture III

Building on the basic Revit skills learned in 2nd year, students will examine more advanced and broader aspects of Revit Architecture such as worksharing, linked files, phasing, and massing.
Some aspects of structural and systems tools will also be looked at. Discussions will support creation of 3rd year working drawings sets.

Prerequisite(s): CAD8415
Corerequisite(s):none

DSN8401 Visual Communication I

Students are introduced to a variety of skills necessary to communicate visually. Emphasis is placed on hand drawing/sketching while developing an understanding of how to analyze and perceive 3-dimensional shapes and forms. Formal presentation techniques and physical model building are also explored.

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

DSN8402 Visual Communication II

Students further study graphic communication skills for architecture. Emphasis is placed on the creation of simple 3D digital models, as well as architectural graphic presentations using a variety of current computer applications.

Prerequisite(s): DSN8401
Corerequisite(s):none

DSN8441 Design I

Students are introduced to the theory of architectural design through an analysis of Form and Space. The fundamental elements of architecture, spatial concepts and organizational principles and the urban context are explored using built form examples. Students design and prepare an architectural presentation for a residential project.

Prerequisite(s): DSN8402
Corerequisite(s):none

DSN8442 Design II

The design process is explored through a series of architectural design problems. Students are introduced to architectural design influences, such as context, zoning, programming, accessibility and aesthetics. Students design and prepare an architectural presentation for a small commercial building.

Prerequisite(s): DSN8441
Corerequisite(s):none

ENG8491 Structures I

The fundamental principles of structural systems and load analysis for large buildings are explored. Students undertake preliminary sizing of structural members, trace gravity loads and develop hand drawn sketches to resolve technical issues brought forward in their Working Drawings IV course.

Prerequisite(s): MAT8050 and MAT8051
Corerequisite(s):ARC8404C

ENG8495 Structures II

Students analyze and calculate forces in structural systems using the principles of statics.

Prerequisite(s): ENG8491
Corerequisite(s):none
ENG8496 Structures III

Students consult with an engineer to get guidance on the structural requirement in the development of an architectural project.

Prerequisite(s): ENG8495
Corerequisite(s): none

ENL1001 Report Advising

Students draw upon skills acquired in previous communications courses to plan and create a technical report based upon a topic in their field of study.

Prerequisite(s): ENL2019T
Corerequisite(s): ARC8426

ENL1813T Communications I

Communication remains an essential skill sought by employers, regardless of discipline or field of study. Using a practical, vocation-oriented approach, students focus on meeting the requirements of effective communication. Through a combination of lectures, exercises, and independent learning, students practise writing, speaking, reading, listening, locating and documenting information and using technology to communicate professionally. Students develop and strengthen communication skills that contribute to success in both educational and workplace environments.

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

ENL2019T Technical Communication for Engineering Technologies

The ability to communicate effectively in a technically-oriented interdisciplinary workplace is a foundational skill in an innovation-driven economy. Students are exposed to exercises and assignments designed to foster independent and collaborative critical thinking, research, writing, visual communication and presentation skills related to technical topics.

Prerequisite(s): ENL1813T
Corerequisite(s): none

GED0188 General Education Elective

Students choose one course, from a group of general education electives, which meets one of the following five theme requirements: Arts in Society, Civic Life, Social and Cultural Understanding, Personal Understanding, and Science and Technology.

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

GED2012 Achieving Success in the 21st Century

Rapid changes in technology have created new employment and business opportunities that challenge each of us to find our place as citizens in the emerging society. Life in the 21st century presents significant opportunities, creates potential hazards and demands that we face new responsibilities in ethical ways. Students explore the possibilities ahead, assess their own aptitudes and strengths, and apply critical thinking and decision-making tools to help resolve some of the important issues present in our complex society with its competing interests.

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

HIS8482 History of Architecture
Students explore the major cultural trends and technological events, which have influenced the development of western architecture, from pre-history to present day. Students develop a general understanding of the origins of architectural styles and the evolution of building technology.

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

**MAT8050 Geometry and Trigonometry**

Students study the manipulation of algebraic expressions as a foundation for advanced mathematical concepts and solve a variety of measurement problems involving U.S. Customary and SI units. Students learn to graph simple polynomials and sinusoidal curves using a table of values or by using shifts, shrinks and stretches. They calculate the perimeter and area of basic geometric figures and calculate the surface area and volume of solid geometric figures. Students manipulate trigonometric functions of acute angles and solve problems involving the trigonometry of right triangles and vectors. Delivered in a modular format, this course is equivalent to the completion of all of the following math modules MAT8100 - a, d, m, n, k, and f.

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

**MAT8051 Algebra**

Students review the manipulation of algebraic expressions as a foundation for advanced mathematical concepts. Students solve 2x2 and 3x3 systems of linear equations, and factor algebraic expressions using common factors and techniques for factoring trinomials. They simplify, add, subtract, multiply and divide rational expressions and solve equations involving algebraic fractions. Students also manipulate radicals and algebraic expressions with fractional exponents, and solve exponential and logarithmic equations. Delivered in a modular format, this course is equivalent to the completion of all of the following math modules MAT8100 - b, c, e, g, and h.

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

**WKT2101A Architecture Work Term 1 (Optional)**

This course includes a work placement, a weekly recording of the activities done in a journal and a final summary report of the overall experience to be submitted before returning to school. The placement has to be in a construction-related industry, preferably architecture. The timing of the placement depends on the progression pattern of the program and cannot be done before completion of the second level of the Architecture Technician program. The placement is monitored by the College. Feedback from the employer is considered in the final evaluation of the course. All assignments (journal entries and final report) must be provided to pass the course. The College Coop office assists in finding a placement however, it is the students responsibility to find, apply and get the work term as if they were applying for a job.

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

**WKT2102A Architecture Work Term 2 (Optional)**

This course includes a work placement, a weekly recording of the activities done in a journal and a final summary report of the overall experience to be submitted before returning to school. The placement has to be within the architectural industry. The timing of the placement depends on the progression pattern of the program and can not be done before completion of the fourth level of the Architecture Technician program and the student has to have been accepted in the technology program. The placement is monitored by the College. Feedback from the employer is considered in the final evaluation of the course. All assignments (journal entries and final report) must be provided to pass the course. The College Coop office assists in finding a placement however, it is the student responsibility to find, apply and get the work term as if they were applying for a job.

Prerequisite(s): WKT2101A
Corerequisite(s): none
WKT8400 Architecture Work Placement

Students are placed in a related agency to assist with the integration of their academic skills to industry. The theory portion of the course provides guidance in making the transition from the school environment to the workplace.

Prerequisite(s): ARC8405C
Corerequisite(s): none