

Area of Interest: Construction and Skilled Trades

Construction Engineering Technician (Co-op and Non Co-op Version)

Ontario College Diploma

Program Code: 0190X03FWO

2 Years

Ottawa Campus

Our Program

Build a solid foundation for your career in residential or commercial construction.

The two-year Construction Engineering Technician Ontario College Diploma program introduces you to a wide range of knowledge and skills to work in the construction industry. This program combines both hands-on application and theory to help you secure a career in the residential and commercial construction industries.

The Ontario Association of Certified Engineering Technicians and Technologists (OACETT) recognizes this program as meeting all of the academic requirements for certification in the Certified Technician Category. Using state-of-the-art facilities in Algonquin's ACCE building, you build a solid foundation for your future career.

Take courses in surveying, construction materials, estimating and construction, building code and structural design documentation. Learn about health and safety relating to the field, hydraulics, geographic information systems and AutoCAD. Experience hands-on learning and participate in field trips.

This program has strong ties to the construction industry and may help you build contacts throughout your time at Algonquin College.

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.

Graduates of this program have the ability to work in a number of sectors within the construction industry. You may find opportunities in:

- cost estimating
- residential, commercial and civil projects
- surveying
- project management
- building inspection
- materials testing and quality control
- construction inspection
- AutoCAD

After you complete this program, you may choose to take an extra year of study in order to receive an Ontario College Advanced Diploma in Civil Engineering Technology.

SUCCESS FACTORS

This program is well-suited for students who:

- Can work independently to contribute to problems-solving teams.
- Enjoy using math and physics to solve technical problems.
- Seek a variety of opportunities to specialize in their career.
- Want to make a lasting difference in their community.

Employment

Graduates may find employment in many areas of the construction industry, including cost estimating of residential, commercial, and civil projects, surveying, project management, building inspection, materials testing and quality control and construction inspection.

Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Develop and use strategies to enhance professional growth and ongoing learning in the construction engineering field.
- Comply with workplace health and safety practices and procedures in accordance with current legislation and regulations.
- Complete duties in compliance with contractual obligations, applicable laws, standards, bylaws, codes and ethical practices in the construction engineering field.
- Carry out sustainability practices in accordance with contract documents, industry standards and environmental legislative requirements.
- Collaborate with and facilitate communication among project stakeholders to support construction projects.
- Collect, process and interpret technical data to produce written and graphical project-related documents.
- Contribute to the collecting, interpreting and applying of survey/geomatics and layout information to implement construction projects.
- Identify and use industry-specific electronic and digital technologies to support the design and construction of projects.
- Contribute to the resolution of technical problems related to the design and implementation of construction projects by applying engineering concepts, basic technical mathematics and building science.
- Assist in the scheduling and monitoring of the progression of construction projects by applying principles of construction project management.
- Assist in the preparation of accurate estimates of time, cost, quality and quantity, tenders and bids.
- Perform quality control testing and monitoring of equipment, materials and methods involved in the implementation and completion of construction projects.
- Apply teamwork, leadership and interpersonal skills when working individually or within multidisciplinary teams to complete work on construction projects.
- 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
CON8101	Residential Building/Estimating	56.0
CON8411	Construction Materials I	42.0
GIS5001	Geographic Information Systems	42.0
MAT8050	Geometry and Trigonometry	42.0
SAF8408	Health and Safety	14.0
SUR8411	Construction Surveying I	56.0
Level: 02	Courses	Hours
CON8102	Commercial Building/Estimating	56.0
CON8412	Construction Materials II	56.0
ENG8101	Statics	56.0
ENL1813T	Communications I	42.0
GEP1001	Cooperative Education and Job Readiness	18.0
MAT8051	Algebra	42.0
SUR8412	Construction Surveying II	42.0
Choose one from equivalencies:	Courses	Hours
GED0190	General Education Elective	42.0
Level: 03	Courses	Hours
CAD8400	AutoCAD I	42.0
CON8404	Civil Estimating	42.0
CON8436	Building Systems	42.0
ENG8102	Strength of Materials	42.0
ENG8411	Structural Analysis	42.0
ENG8454	Geotechnical Materials	42.0
MGT8400	Project Administration	42.0
Co-op: 01	Courses	Hours
WKT2101C	Construction Work Term 1	
Level: 04	Courses	Hours
CAD8405	AutoCAD II	42.0
CON8413	Construction Building Code	42.0
CON8476	Business Principles	42.0
ENG8328	Hydraulics	42.0

ENG8404	Introduction to Structural Design	42.0
ENL2019T	Technical Communication for Engineering Technologies	42.0
Choose one from equivalencies: Courses		Hours
GED0190	General Education Elective	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:

- Books and supplies cost approximately \$1,200 per year and can be purchased from the campus store. For more information visit <https://www.algonquincollege.com/coursematerials> .
- Students are expected to purchase CSA-approved safety footwear and safety glasses, which are required at the start of the term.

Admission Requirements for the 2024/2025 Academic Year

College Eligibility

- Ontario Secondary School Diploma (OSSD) or equivalent. Applicants with an OSSD showing senior English and/or mathematics courses at the Basic Level, or with Workplace or Open courses, will be tested to determine their eligibility for admission; OR
- Academic and Career Entrance (ACE) certificate; OR
- General Educational Development (GED) certificate; OR
- Mature Student status (19 years of age or older and without a high school diploma at the start of the program). Eligibility may be determined by academic achievement testing for which a fee of \$50 (subject to change).

Program Eligibility

- English, Grade 12 (ENG4C or equivalent).
- Mathematics, (Grade 12 MCT4C) or (Grade 11 MCR3U) or (MAP4C with a grade of 60% or higher) or Grade 11 (MCF3M with a grade of 50% or higher) or equivalent.
- A background in science (especially physics and chemistry) is recommended.
- 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 Overall band of 6.0 with a minimum of 5.5 in each band; OR TOEFL-Internet-based (iBT)-overall 80, with a minimum of 20 in each component: Reading 20; Listening 20; Speaking 20; Writing 20; OR Duolingo English Test (DET) Overall 110, minimum of 110 in Literacy and no score below 95.

Not sure if you meet all of the requirements? Academic Upgrading may be able to help with that: <https://www.algonquincollege.com/access/> .

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.

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Application Information

CONSTRUCTION ENGINEERING TECHNICIAN (CO-OP AND NON CO-OP VERSION) **Program Code 0190X03FWO**

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

Students currently enrolled in an Ontario secondary school should notify their Guidance Office prior to their online application 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 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

CO-OP INFORMATION:

All applicants apply directly to the co-op version of this program through 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>.

With departmental approval, students who maintain a college-prescribed Academic Standing may take part in a co-operative placement. The Co-op Work Term is at the end of Level 03.

OACETT (Ontario Association of Certified Engineering Technicians and Technologists) recognizes the Construction Engineering Technician program as meeting all the academic requirements for certification in the Certified Technician (CTech) category and recognizes the Civil Engineering Technology program as meeting all of the academic requirements for certification in the Certified Engineering Technologist (CET) or Applied Science Technologist (AScT) category. Graduates and final year students are immediately eligible to be registered as Associate members of OACETT upon submission of the Graduate Application form available through the Placement Office or OACETT. Additional requirements to become fully certified (work experience, the OACETT Professional Practice Examination, peer references, etc.) will be requested once the application has been received. Requirements for certification are the jurisdiction of OACETT.

Students who begin Level 01 in January take Level 02 in the spring term.

Note: Students who are not successful in SUR8411-Construction Surveying 1 and/or CON8411-Construction Materials 1 and/or GIS5001-Geographical Information Systems will be withdrawn from the program and must reapply to level 01 through ontariocolleges.ca.

Contact Information

Program Coordinator(s)

- Nahlah Al-Ogaidi, <mailto:alogain@algonquincollege.com> , 613-727-4723,

Course Descriptions

CAD8400 AutoCAD I

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

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

CAD8405 AutoCAD II

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

Prerequisite(s): CAD8400
Corerequisite(s):none

CON8101 Residential Building/Estimating

The principles of residential building and estimating are essential tools for the modern workplace. Plan reading and construction methods for residential wood-frame construction are introduced. Examples of residential plans are used, along with the Ontario and/or National Building Code, to explain construction procedures. Students learn an organized approach to properly take off the quantities of materials required, price the items and assemble a complete cost estimate.

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

CON8102 Commercial Building/Estimating

The principles of commercial building and estimating are essential tools for the modern workplace. Plan reading and construction methods for commercial construction are introduced. Examples of commercial plans are used, along with the Ontario and/or National Building Code, to illustrate construction procedures. Students gain an organized approach to properly take off the quantities of materials required, price the items and assemble a complete cost estimate.

Prerequisite(s): CON8101
Corerequisite(s):none

CON8404 Civil Estimating

The principles of estimating civil engineering projects allow planners and contractors to accurately predict the costs and the impact of their activity. Building on the organized approach learned in earlier estimating courses, students focus on the theories and practices related to civil projects, such as roads, bridges and municipal services, such as sewers and water mains.

Prerequisite(s): CON8102
Corerequisite(s):none

CON8411 Construction Materials I

Grounding in the physical characteristics and standard testing methods of materials, such as soils and aggregates, is essential to students of construction engineering disciplines. Lectures are reinforced with labs to provide a foundational level of competence in the vocabulary and vocational skills related to materials used in construction projects. Students learn about strength of materials testing, as well as standard sieve, compression and Proctor testing methods.

Prerequisite(s): none

Corerequisite(s):none

CON8412 Construction Materials II

A grounding in the physical characteristics and standard testing methods of materials, such as concrete, asphalt, steel and wood are essential to students of construction engineering disciplines. Students attend lectures and labs that provide a more advanced level of competence in the vocabulary and vocational skills related to materials used in construction projects.

Prerequisite(s): CON8411
Corerequisite(s):none

CON8413 Construction Building Code

An understanding of the standards and legal responsibilities associated with planning and building is essential to working successfully in Ontario. Students' survey and gain knowledge about various legal instruments (principally the Ontario Building Code [OBC]) through lectures and practical assignments. An introduction to the structure and content of the OBC with an emphasis on Division B, Parts 3 and 9 (commercial buildings) is provided.

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

CON8436 Building Systems

A building is a complex structure, made up of many systems that must work in harmony to produce a working environment. Students are introduced to the theoretical concepts of Air Distribution Systems, Hydronic Heating Systems, Electrical Power Distribution and building protection equipment. Students learn how these interact with the design of a building.

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

CON8476 Business Principles

Students learn the fundamentals of business strategy and innovation, business creation, financing, costing, marketing, management, safety, law and ethics for a variety of business types, culminating in the completion of a professional Business Proposal and Plan.

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

ENG8101 Statics

Statics is the study of bodies at rest, or of forces in equilibrium. Students explore the physics of forces acting on simple structures, such as beams and trusses, as well as more complex structures, such as fluid vessels. The effects of loads on these structures is calculated, analyzed and illustrated with standard representation techniques used in the industry.

Prerequisite(s): MAT8050 or MAT8100 or MAT8050P
Corerequisite(s):none

ENG8102 Strength of Materials

Students learn about the importance of understanding how materials react to the environment in which they are used. This introductory theory course lays the necessary foundation for the more advanced structural design courses. The internal axial load, shear and bending moment on simple structural members is studied. The effects are expressed quantitatively in terms of stress and strain. Students assess the adequacy of typical members, such as beams, columns and shafts to theoretically predict various failure modes in these members.

Prerequisite(s): ENG8101

Corerequisite(s):none

ENG8328 Hydraulics

Hydraulics is the study and the practical application of fluids in motion. Students become familiar with the principles of hydrostatic forces exerted on objects by fluids, such as the use of Bernoulli's equation, fluid properties, energy losses, generic energy equation, buoyancy and forces due to fluid motion.

Prerequisite(s): ENG8101
Corerequisite(s):none

ENG8404 Introduction to Structural Design

An understanding of structural design is essential to creating buildings that are safe, economical and aesthetically interesting. This introductory theory course builds upon principles and knowledge gained in earlier courses. Using the limit states design approach, Canadian design and building code, students gain experience calculating dead and live loads on structures. Students analyze statically determinate structures involving the design of simple members subjected to tensile or compressive forces.

Prerequisite(s): ENG8102 and ENG8411
Corerequisite(s):none

ENG8411 Structural Analysis

It is important to understand how human-made structures react to the environment in which they are used. Students are introduced to the relationship between the applied loads on structures, and the resulting stress and deformation (expressed as strain). Other topics introduced include the relationship between stress, strain, and the Modulus of Elasticity in materials and an introduction to elementary design of structural members. Finally, an analysis of statically determinate and indeterminate beams, deflections and column buckling is carried out.

Prerequisite(s): ENG8101
Corerequisite(s):none

ENG8454 Geotechnical Materials

Knowledge of the properties and qualities of earthen material is a key element of construction engineering proficiency. Students learn about the science of geotechnical materials as they are used in human constructions. The analysis of soils, the engineering of foundations and the safe excavating of earth in construction activity is introduced. Topics covered include soil typology, classification, and characterization, as well as the various methods of testing soils and evaluating results.

Prerequisite(s): CON8412
Corerequisite(s):none

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

GED0190 General Education Elective

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

Prerequisite(s): none

Corerequisite(s):none

GED0190 General Education Elective

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

Prerequisite(s): none

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

GIS5001 Geographic Information Systems

Geographic information affects many decisions made by businesses, communities and increasingly, by individuals. By exploring basic geographic concepts, such as location, coordinate systems, thematic mapping and Geographic Information Systems (GIS), students are introduced to scientific and analytical geography. Topics include historical settlement patterns, spatial relationships between multiple geographic phenomena and the ethical use of geographic information. Students examine geographic data to analyze and reflect on patterns in social and physical geography.

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 using a table of values and intercepts. 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 - F,K,M,N,S and T.

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

MGT8400 Project Administration

The quality of planning, preparation, and oversight is a key factor in the success or failure of construction projects. Students are introduced to the principles of planning, administering, scheduling and monitoring the costs of a construction project. Topics include types of contractual arrangements, the stages and components of the tendering process, and the typical steps and processes involved in the administration of a construction project from planning to completion.

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

SAF8408 Health and Safety

Knowledge of occupational health and safety is increasingly important as a means of maintaining the functionality of a well-educated and highly-trained workforce. Through a combination of case studies, individual assignments, and analytical activities, students are exposed to regulations and standards related to the Occupational Health and Safety Act (OHSA) and the Workplace Hazardous Materials Information System (WHMIS).

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

SUR8411 Construction Surveying I

The use of tapes, levels, transits/theodolites, and total stations to determine distances, angles, and elevations for survey applications, such as level loops, profiles, cross sections and traverses are covered. Students work in groups to carry out survey exercises.

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

SUR8412 Construction Surveying II

Students demonstrate the practical application of survey theory and skills to the civil engineering field. Topics include horizontal, vertical and spiral curve calculations and calculating roadway super elevations.

Prerequisite(s): SUR8411
Corerequisite(s):none

WKT2101C Construction Work Term 1

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 to construction engineering or civil engineering. 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 Construction Engineering 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 Co-op office assists in finding a placement; however, it is the student's responsibility to find, apply and get the work term as if they were applying for a job.

Prerequisite(s): none

Corerequisite(s):none