

Area of Interest: Construction and Skilled Trades

## Civil Engineering Technology (Co-op and Non Co-op Version)

Ontario College Advanced Diploma

Program Code: 0192X03FWO

3 Years

Ottawa Campus

### Our Program

#### **Advance your skillsets for a career in construction and civil engineering.**

The Civil Engineering Technology Ontario College Advanced Diploma is a continuation of the Construction Engineering Technician program and is open to students who already have an Algonquin College Construction Engineering Technician Ontario College Diploma and meet the admission requirements. This third year of study explores in-depth areas of civil engineering technology such as:

- project scheduling and cost control
- surveying
- design of steel structures
- foundations
- water and wastewater technology
- soils analysis
- reinforced concrete design

During the final two terms of the program you take on a year-long project in collaboration with external industry partners that gives you real-world experience and may help you develop networks within a specific industry. As part of a project team, you participate in leadership events, analyze and solve problems, create deliverables and present the results of your project to the college community and the industry through demonstrations and presentations.

OACETT (Ontario Association of Certified Engineering Technicians and Technologists) recognizes this 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.

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 may pursue careers in a number of sectors of the construction industry, including:

- cost estimating for residential, commercial and civil projects
- surveying
- project management
- building inspection

- materials testing
- quality control
- construction inspection

### **SUCCESS FACTORS**

This program is well-suited for students who:

- Can work independently to contribute to problem-solving teams.
- Enjoy using math and physics to solve technical problems.
- Seek opportunities to specialize in their career.
- Want to make a lasting difference in their community.
- Enjoy working on complex projects.
- Are able to meet challenging deadlines.

### **Employment**

Similar to the Construction Engineering Technician program, 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. There is generally more opportunity for advancement for a graduate at the technologist level compared to the technician level.

### **Learning Outcomes**

The graduate has reliably demonstrated the ability to:

- Develop and use strategies to enhance professional growth and ongoing learning in the civil engineering field.
- Comply with workplace health and safety practices and procedures in accordance with current legislation and regulations.
- Complete duties and monitor that work is performed in compliance with contractual obligations, applicable laws, standards, bylaws, codes and ethical practices in the civil engineering field.
- Promote and carry out sustainable practices in accordance with contract documents, industry standards and environmental legislative requirements.
- Facilitate the collaboration and interaction among the project team and project stakeholders to support civil engineering projects.
- Collect, process, analyze and coordinate technical data to produce written and graphical project-related documents.
- Use industry-specific electronic and digital technologies to support civil engineering projects.
- Participate in the design and modeling phase of civil engineering projects by applying engineering concepts, technical mathematics and principles of science to the review, production and/or modification of project plans.
- Contribute to the scheduling and coordination and cost estimation of civil engineering projects and monitor their progression by applying principles of construction project management.
- Coordinate and perform quality control testing and evaluate equipment, materials and methods used in the implementation and completion of civil engineering projects.
- Apply teamwork, leadership, supervision and interpersonal skills when working individually or

- Apply teamwork, leadership, supervision and interpersonal skills when working individually or within multidisciplinary teams to complete civil engineering 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
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
<b>Choose one from equivalencies: Courses</b>		<b>Hours</b>
GED0192	General Education Elective	42.0
<b>Co-op: 02 Courses</b>		<b>Hours</b>
WKT2102C	Civil Work Term 2	
<b>Level: 05 Courses</b>		<b>Hours</b>
CON8406	Project Scheduling and Cost Control	42.0
CON8425	Design of Steel Structures	42.0
CON8445	Soils Analysis	42.0
ENG4001A	Project 1	28.0
ENL4001	Technology Report Preparation	14.0
MAT8201	Calculus 1	42.0
SUR8400	Civil Surveying III	42.0
<b>Level: 06 Courses</b>		<b>Hours</b>
CAD0008	Fundamentals of 3D Modeling for Civil Engineering	42.0
CON8447	Foundations	42.0
CON8466	Highway Engineering	42.0
ENG4003A	Project 2	28.0
ENG8435	Reinforced Concrete Design	42.0
ENG8451	Water and Waste Water Technology	42.0
ENL4003	Technology Report	14.0

### 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

### Program Eligibility

- Students who have completed all the course requirements equivalent to the Construction Engineering Technician program of study with a minimum G.P.A. of 2.0 are eligible to apply to the Civil Engineering Technology program, as long as they have achieved a grade of C or better in ENL2019T and ENG8404.

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.

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## Application Information

### **CIVIL ENGINEERING TECHNOLOGY (CO-OP AND NON CO-OP VERSION)** **Program Code 0192X03FWO**

The two first years of the three-year Civil Engineering Technology program is the Construction Engineering Technician program. Students must initially apply to 0190X Construction Engineering Technician. Upon completion of the Construction Engineering Technician program, students who want to continue on to Levels 05 and 06 of the Civil Engineering Technology program may apply directly with the Coordinator.

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 <https://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 department approval, students who maintain a college-prescribed academic standing may take part in two cooperative placements. 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.

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**Note:** We do not offer Levels 05 and 06 of the Civil Engineering Technology program on weekends.

## Contact Information

### Program Coordinator(s)

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

## Course Descriptions

### CAD0008 Fundamentals of 3D Modeling for Civil Engineering

The students are introduced to 3D modeling concepts using the AutoCAD Civil 3D and Revit software as tools to support solutions for civil engineering design, conception and documentation. This software package was specifically created to support the civil engineering industry. This course will introduce the fundamental knowledge required to use Civil 3D and Revit in practical civil engineering applications such as surveying, road and various infrastructure.

Prerequisite(s): none  
Corerequisite(s): CAD8405

### 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

**CON8406 Project Scheduling and Cost Control**

Students learn how a project manager monitors critical aspects of a project through the importance of project management concepts, such as project cost and scheduling.

Prerequisite(s): MGT8400

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

**CON8425 Design of Steel Structures**

Using knowledge and principles from previous structural courses, students design basic steel structural elements, such as beams, columns and connections. They also analyze construction and shop drawing including looking at structural steel and reinforcing steel layout.

Prerequisite(s): ENG8404  
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

**CON8445 Soils Analysis**

Students are introduced to the analysis and design of civil earthwork projects. Students calculate the bearing capacity and hydraulic properties of soils and soil constructions. An introduction is also made to the principles of slope stability.

Prerequisite(s): ENG8454  
Corerequisite(s):none

**CON8447 Foundations**

Students learn to apply the basic theory of soil mechanics to the analysis of the more common foundation types. The bearing capacity and settlement problem is examined as it applies to shallow (spread footings), as well as deep foundations (piles and caissons). Analytical as well as field techniques are introduced for the analysis of foundations.

Prerequisite(s): CON8445  
Corerequisite(s):none

**CON8466 Highway Engineering**

The student is introduced to the terminology, theory and practices used in the development of a



highway design from its conception to the detailed horizontal and vertical alignment design. The detailed design includes the selection of radii, superelevation and visibility standards for a particular design speed or road classification and the calculation of data for horizontal curves (circular arcs and transitional spirals), vertical curves and superelevation.

Prerequisite(s): SUR8412

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

### **ENG4001A Project 1**

Experience with practical projects provides students with learning opportunities to gain insight and experience, thereby making connections to industry. Through collaborative participation in applied research projects or self-directed in-class projects, student groups undertake problems of significant technical complexity and work towards solutions. Student groups initiate projects working closely with stakeholders in real-world workplace environments. Note: Project 1 and Project 2 must be successfully completed in two consecutive terms.

Prerequisite(s): none

Corerequisite(s):ENL4001

### **ENG4003A Project 2**

The ability to identify and satisfy stakeholder expectations is essential for the successful completion of a Civil Engineering project. Following up on topics selected in Project 1, student groups continue to execute projects of significant technical complexity in an applied research context. Student groups work in consultation with faculty and/or external stakeholders to create deliverables by monitoring and controlling the project resources. The solutions developed are defended in formal oral and written presentations. Note: Project 1 and Project 2 must be successfully completed in two consecutive terms.

Prerequisite(s): ENG4001A

Corerequisite(s):ENL4003

### **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

**ENG8435 Reinforced Concrete Design**

The design procedure for reinforced concrete is detailed. The design of reinforced concrete elements of a structure is carried out including slabs, simple and continuous beams, and includes the selection and placement of reinforcing steel.

Prerequisite(s): ENG8404  
Corerequisite(s):none

**ENG8451 Water and Waste Water Technology**

Students are introduced to water and waste-water technology including principles and construction procedures. They study design concepts for community piped storm and sanitary sewer systems, water treatment principles, waste water treatment principles and storm water management.

Prerequisite(s): ENV8400  
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

**ENL4001 Technology Report Preparation**

Students define and describe a problem of significant technical complexity and present a suitable technological solution. Drawing upon skills previously acquired, students plan, conduct research for and begin the creation of a written report that is based upon the guidelines established by the Ontario Association of Certified Engineering Technicians and Technologists (OACETT).

Prerequisite(s): ENL1819T or ENL2019T  
Corerequisite(s):ENG4001

**ENL4003 Technology Report**

Students complete the report defined in ENL4001. The completed report forms the basis of an oral presentation to faculty, peers and interested industry personnel in the final weeks of the term. ENL4001 and ENL4003 must be taken in the same academic year unless an exception is approved.

Prerequisite(s): ENL4001  
Corerequisite(s):ENG4003

**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

**GED0192 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

**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 ant 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

**MAT8201 Calculus 1**

Calculus is used to determine many important physical quantities. Students differentiate algebraic and transcendental functions and sketch various curves. Students integrate simple algebraic and transcendental functions. Students use integration to solve applications relating to their program of study, such as the area under a curve.

Prerequisite(s): MAT8050 and MAT8051 or MAT8050P and MAT8051 or MAT8100 or MAT8100P or MAT8001C  
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

**SUR8400 Civil Surveying III**

Students apply the principles learned in previous surveying courses using total station electronic surveying equipment and digital hand-held data collectors.

Prerequisite(s): SUR8412  
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

**WKT2102C Civil Work Term 2**

With departmental approval, students complete a second optional paid full-time work term during the Spring/Summer months. The placement is monitored by the College and assignments, including a final report must be completed for a pass/fail mark. The College provides assistance in finding a placement.

Prerequisite(s): WKT2101C  
Corerequisite(s):none