

Area of Interest: Construction and Skilled Trades

## Electrical Engineering Technician (Co-op and Non Co-op Version)

Ontario College Diploma

Program Code: 0317X03FWO

2 Years

Ottawa Campus

### Our Program

**Use state-of-the-art equipment to obtain valuable career-ready skills.**

The two-year Electrical Engineering Technician Ontario College Diploma program provides you with the essential knowledge and skills sought by employers in the industry. Develop skills in the design, installation, maintenance and repair of electrical systems from cable loops, phone and fire suppression systems to robotics and machinery.

Through a series of theory courses and extensive practical labs, you learn to use scientific and engineering principles, including:

- the foundation of electrical principles, codes and regulations
- how to design, install and troubleshoot electromagnetic controls, electrical machinery and programmable controllers
- the different instrumentation options available and the applicable use for them
- an understanding of robotics and controls as well as industrial telecommunications
- critical thinking skills and an understanding of the environmental impact of technology
- AutoCAD and applications
- the different infrastructure requirements of distributed electrical systems or fire alarm system codes and standards, installation and maintenance
- fundamentals of mathematics, calculus, technical communications for engineers, programming and computer applications
- project management and leadership skills

OACETT (Ontario Association of Certified Engineering Technicians and Technologists) recognizes this program as meeting the academic requirements for certification in the Certified Technician (C. Tech) category. While a student, you are encouraged to register as an Associate member of 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 of the Electrical Engineering Technician program may pursue the Electrical Engineering Technology Ontario College Advanced Diploma to further open career options in the electrical engineering field. The advanced diploma also creates an opportunity to transfer into Year 3 of the Electrical Engineering program at Lakehead University.

This program prepares you to work in a wide variety of careers in the electrical industry, including in areas such as electrical testing and maintenance, manufacturing and electrical automation.

Graduates may work in the electrical engineering field as a(n):

## Employment

Graduates may find employment as Electrical Engineering Technicians in the following areas: design and testing, manufacturing, installation and/or supervision, diagnostics and analysis of electrical, communication, utilities, and fire protection equipment and systems.

## Learning Outcomes

The graduate has reliably demonstrated the ability to:

- Interpret and produce electrical and electronics drawings including other related documents and graphics.
- Analyze and solve routine technical problems related to electrical systems by applying mathematics and science principles.
- Use, verify, and maintain instrumentation equipment and systems.
- Assemble, test, modify and maintain electrical circuits and equipment to fulfill requirements and specifications under the supervision of a qualified person.
- Install and troubleshoot static and rotating electrical machines and associated control systems under the supervision of a qualified person.
- Verify acceptable functionality and apply troubleshooting techniques for electrical and electronic circuits, components, equipment, and systems under the supervision of a qualified person.
- Analyze, assemble and troubleshoot control systems under the supervision of a qualified person.
- Use computer skills and tools to solve routine electrical related problems.
- Assist in creating and conducting quality assurance procedures under the supervision of a qualified person.
- Prepare and maintain records and documentation systems.
- Install, test and troubleshoot telecommunication systems under the supervision of a qualified person.
- Apply health and safety standards and best practices to workplaces.
- Perform tasks in accordance with relevant legislation, policies, procedures, standards, regulations and ethical principles.
- Configure installation and apply electrical cabling requirements and system grounding and bonding requirements for a variety of applications under the supervision of a qualified person.
- Assist in commissioning, testing and troubleshooting electrical power systems under the supervision of a qualified person.
- Select electrical equipment, systems and components to fulfill the requirements and specifications under the supervision of a qualified person.
- Apply project management principles to assist in the implementation of 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

| <b>Level: 01</b>                              | <b>Courses</b>  | <b>Hours</b> |
|---|---|--------------|
| DAT8942                                       | Computer Applications - Electrical                        | 42.0         |
| ELE8909                                       | Electrical Principles I                                   | 84.0         |
| ELE8913                                       | Codes and Regulations                                     | 42.0         |
| ELE8919                                       | Achieving Success in the 21st Century                     | 42.0         |
| ENL1813T                                      | Communications I  | 42.0         |
| MAT8100P                                      | Essential Mathematics                                     | 70.0         |
| <b>Level: 02</b>                              | <b>Courses</b>  | <b>Hours</b> |
| DAT8921                                       | Introduction to Programming                               | 42.0         |
| ELE8922A                                      | Electrical Principles - II                                | 84.0         |
| ELE8923                                       | Electrical Machinery                                      | 84.0         |
| ELE8937                                       | Electromagnetic Control                                   | 56.0         |
| GEP1001                                       | Cooperative Education and Job Readiness                   | 18.0         |
| PHY8201                                       | Environmental Impact of Technology                        | 42.0         |
| <b>Level: 03</b>                              | <b>Courses</b>  | <b>Hours</b> |
| ELE8932                                       | Programmable Controllers                                  | 84.0         |
| ELE8935                                       | Digital Electronics                                       | 56.0         |
| ELE8936                                       | Analog and Power Electronics                              | 56.0         |
| ELE8944                                       | Building Electrical Systems with AutoCAD                  | 56.0         |
| MAT8101                                       | Differential Calculus                                     | 42.0         |
| <b>Choose one from equivalencies: Courses</b> | <b>Hours</b>  |              |
| GED0317                                       | General Education Elective                                | 42.0         |
| <b>Co-op: 01</b>                              | <b>Courses</b>  | <b>Hours</b> |
| WKT2101E                                      | Co-Op Work Term Electrical                                |              |
| <b>Level: 04</b>                              | <b>Courses</b>  | <b>Hours</b> |
| ELE8931                                       | Industrial Instrumentation                                | 56.0         |
| ELE8940                                       | Industrial Telecommunications                             | 70.0         |
| ELE8941                                       | Robotics and Controls                                     | 56.0         |
| ELE8949                                       | Project Management for Electrical Engineering Technicians | 14.0         |
| ENL2019T                                      | Technical Communication for Engineering Technologies      | 42.0         |
| <b>Elective: choose 1</b>                     | <b>Courses</b>  | <b>Hours</b> |
| ELE8945                                       | Distributed Power Systems                                 | 42.0         |

|          |                    |      |
|----------|--------------------|------|
| ELE8946  | Fire Alarm Systems | 42.0 |
| ELE8942T | Technician Skills  | 42.0 |
| MAT8102  | Integral Calculus  | 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 total approximately \$1,200 in the first year and \$750 in the second year and can be purchased from the campus store. For more information visit <https://www.algonquincollege.com/coursematerials> .
- Students are responsible for parking and locker fees, if applicable.
- All students are responsible to supply their own personal protective equipment, such as CSA-approved safety footwear, protective eyewear, hearing protection, gloves, hard hat, as required in each lab environment.

## 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) will be charged.

### Program Eligibility

- English, Grade 12 (ENG4C or equivalent).
- Mathematics, (Grade 12 MCT4C) or (Grade 11 MCR3U) or (MAP4C with a grade of 65% or higher) or Grade 11 (MCF3M with a grade of 65% or higher) or equivalent.
- Applicants with international transcripts must provide proof of the subject-specific requirements noted above and may be required to provide proof of language proficiency. Domestic applicants with international transcripts must be evaluated through the International Credential Assessment Service of Canada (ICAS) or World Education Services (WES).
- IELTS-International English Language Testing Service (Academic) Overall band of 6.0 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> <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.

## Admission Requirements for 2023/2024 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) will be charged.

### 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.
- Applicants with international transcripts must provide proof of the subject specific requirements noted above and may be required to provide proof of language proficiency. Domestic applicants with international transcripts must be evaluated through the International Credential Assessment Service of Canada (ICAS) or World Education Services (WES).
- IELTS-International English Language Testing Service (Academic) Overall band of 6.0 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.

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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.

## Application Information

### ELECTRICAL ENGINEERING TECHNICIAN Program Code 0317X03FWO

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/> .

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 <http://www.algonquincollege.com/coop>.

Students are trained on a Windows-based platform which is the industry standard in the field of engineering. Mac platforms are not acceptable because they are not compatible with the hardware and software used in this program.

OACETT (Ontario Association of Certified Engineering Technicians and Technologists) recognizes this program as meeting the academic requirements for certification in the Certified Technician (C. Tech) category. Students are encouraged to register as Associate members of OACETT. Additional requirements to become fully certified (work experience, the OACETT Professional Practice Examination, peer references, etc.) are the jurisdiction of OACETT.

Visit <http://www.cctt.ca/english/accred> or <http://www.oacett.org/> for more information.

**Note:** Students who are unsuccessful in ELE8909 - Electrical Principles I are withdrawn from the program and must reapply to Level 01 through ontariocolleges.ca.

**Note:** Students will not be admitted to Level 03 unless they have completed MAT8100.

## Contact Information

### Program Coordinator(s)

- Keith Murray-Sutcliffe, <mailto:murrayk@algonquincollege.com>, 613-727-4723

## Course Descriptions

**DAT8921 Introduction to Programming**

Programming provides opportunities to solve problems and innovate solutions in the engineering field. Students are introduced to structured programs in a high-level language and develop the ability to write appropriate user functions, code control structures and supported data-types. They explore problem-solving strategies, program design, debugging methods and program documentation. Students are also introduced to available standard (std) library resources for a particular programming language. Through lab exercises, students apply programming language skills to solve engineering problems.

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

**DAT8942 Computer Applications - Electrical**

Students are introduced to the College computer network, spreadsheet applications, word processing software and electrical design software, including Multisim electronic workbench and AutoCAD. Focus is on AutoCAD, in particular electrical applications.

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

**ELE8909 Electrical Principles I**

To understand how electrical circuits, systems and equipment work, knowledge of electrical principles is essential. Students study safe practices for working with electrical systems. Students explore electrical measurement standards and develop the ability to design, construct, test and document circuits. Through applied activities and labs, students apply the skills required to analyze, test and troubleshoot electrical systems.

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

**ELE8913 Codes and Regulations**

Codes and Regulations serve to ensure electrical systems are consistent, reliable, safe and effective. Students locate and interpret the Canadian Electrical Code rules that ensure that electrical systems and equipment do not create hazardous conditions to human life or property. This forms the basis for building electrical system design. Through case studies and in-class activities, students practice applying various regulatory codes to ensure safe practices.

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

**ELE8919 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

**ELE8922A Electrical Principles - II**

Understanding the fundamental of electrical principles is essential for design, analysis and troubleshooting of electric circuits and systems. Resistive, inductive and capacitive circuits in both DC and AC (including power factor correction) are covered. Operation of basic electronic components, such as diodes, zener diodes, SCRs, voltage regulators, single phase and three phase rectifiers and power supplies are also studied. Students learn to design, construct, analyze and test

electronic circuitry at the "breadboard" level. Via hands-on activities, students apply their skills to design, construct, analyze and test various electric circuits.

Prerequisite(s): ELE8909  
Corerequisite(s):none

### **ELE8923 Electrical Machinery**

The energy conversion between the electrical and mechanical power is performed by electric machines. Therefore, understanding electric machine principles is crucial to the modern technology in developing more energy efficient systems. Beginning with electromagnetism and induction, single phase and three phase transformers are studied. Schematic representation using single line diagrams is introduced. Students learn the construction, selection and operational characteristics of the most common single phase and three phase motors and generators, including high efficiency designs. The operation of primary and secondary batteries and related technologies are covered. The time-current characteristics of fuses and breakers are studied. Via lab activities, students reinforce their applied skills by exploring, testing and troubleshooting various electric machines.

Prerequisite(s): ELE8909  
Corerequisite(s):none

### **ELE8931 Industrial Instrumentation**

Instrumentation, process monitoring and control are crucial for the automation of industrial and manufacturing processes, resulting to an improved operational efficiency. The procedures for the selection, connection and calibration of instruments are covered. Instruments are used to measure quantities, such as temperature, pressure, fluid flow and level. Students explore standard testing and calibration procedures of instrumentation and sensing devices. Students also connect and program PLCs to measure and control temperature, pressure, flow and level. In addition, students are introduced to process control systems and to the design of instrumentation systems. Via hands-on activities, students acquire skills and techniques to measure, calibrate, test, setup and analyze a variety of sensing devices and instrumentation systems.

Prerequisite(s): ELE8932  
Corerequisite(s):none

### **ELE8932 Programmable Controllers**

Programmable Logic Controllers (PLC) are specialized computers adapted for control and monitoring of complex manufacturing and industrial applications. This PLC course extends the principles learned in the first year and applies them to programmable logic controllers. Emphasis is placed on programming and installing current generation PLC technology. Industrial ladder diagrams, structured text and sequential function chart software are covered. Students develop programs to solve typical industrial applications using relay logic, counters, timers, sequencers, mathematical functions and move commands. Through hands-on activities, students acquire skills to configure and connect digital and analog input/output modules and to develop programs for various industrial applications.

Prerequisite(s): ELE8921  
Corerequisite(s):none

### **ELE8935 Digital Electronics**

Digital electronics are considered the building blocks and backbone of modern electronics, computer systems, smart systems and devices. Therefore, it is essential to understand the basics of digital electronics principles and applications. In this course, students are introduced to the theoretical and practical principles of digital electronics. Students develop the methods and skills required to use and perform Boolean algebra, analysis, design and implementation of combinational and sequential circuits. Students explore the functionality of various digital circuit components, and through lab activities, focus on circuit building, troubleshooting and design. Students also verify and test their circuits via lab equipment and simulation tools. Students are introduced to Finite State Machines (FSM), Hardware Description Language (HDL) and Field-Programmable Gate Array (FPGA) design. Through in-class and lab activities, students gain the theoretical and applied knowledge of digital electronics.



Prerequisite(s): ELE8922A  
Corerequisite(s):none

### **ELE8936 Analog and Power Electronics**

The digital world relies heavily on analog and power electronics to condition, amplify and switch signals to function efficiently. Therefore, understanding the basic principles of analog and power electronics are of vital importance in the engineering field. Students are introduced to analog and power electronics by studying the principles of semiconductor devices and circuits. Students explore analog to digital interfaces, signal conditioning and amplification and apply their skills by building and testing various circuits. Students also explore power electronics applications for safety, reliable control and efficient management of electrical energy. Students also examine the functionality of various analog components and circuits. Through in-class and lab activities, students gain the theoretical and applied knowledge of analog and power electronics and safe work practice.

Prerequisite(s): ELE8922A  
Corerequisite(s):none

### **ELE8937 Electromagnetic Control**

Electromagnetism is widely used in modern technology and industry; it is the foundation of electric power engineering. Students cover the design, installation and troubleshooting of relay logic, electronic logic, electromagnetic controls and AC motor control methods using full voltage starters and selection and installation of variable frequency drivers (VFD's). Students also study the design of motor power circuits, using the Canadian Electrical Code. Students strengthen their knowledge and skill through hands-on lab activities, troubleshooting of motor control circuits, and programming for motor control applications.

Prerequisite(s): ELE8909  
Corerequisite(s):none

### **ELE8940 Industrial Telecommunications**

Industrial telecommunication plays an important role in modern technology and the future of electronics. Therefore, fundamental knowledge and skill in various aspects of telecommunications, including various communication protocols, devices, systems and networks is essential. Students are introduced to the basic concepts and theories utilized in modern electronic communications. This includes basic signal and information theory, analog and digital modulation, and data communications technologies. In the lab, students gain hands on experience using industry standard communications test equipment. Students conduct experiments in frequency response measurement, signal power measurement, time domain reflectometry, and data communications at both the protocol and physical level. Through hands-on lab activities, measurement, testing and troubleshooting, students develop the required technical skills for the industrial telecommunications domain.

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

### **ELE8941 Robotics and Controls**

Robotics and controls are at the core of many engineering system designs, and require technicians to use their acquired skills to plan, interface and integrate a functional robotics unit. In this capstone course, robotics is approached as a special case within the larger area of interactive, software-driven devices. Students are introduced to the basics of robotics and feedback control, setting up and programming a microcontroller, designing and programming actuation and sensing devices associated with a robot, analogue and digital control and DC motor control using Pulse Width Modulation (PWM). Via hands-on lab activities, students explore and gain the skills required to integrate and develop a mobile robot for practical applications.

Prerequisite(s): DAT8921  
Corerequisite(s):none

**ELE8942T Technician Skills**

Technicians work in a variety of settings that require the ability to safely and reliably test, install and maintain electrical equipment and circuits. Therefore, it is important to have a strong understanding of best practices to apply these technical skills in the field. Students are introduced to installing lighting, conduit and various forms of telecommunications wiring. Students develop skills in knot tying for rigging and explore safe operation best practices for tools commonly used in their profession. Through a series of guided, hands-on exercises, students acquire the practical technician skills sought by employers.

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

**ELE8944 Building Electrical Systems with AutoCAD**

Proficiency in the use of CAD tools is important for the design of electrical systems, and engineering design in general. AutoCAD software is an essential tool for creating electrical drawings, schematics, wiring diagrams, etc. and is widely used for the electrical system design of residential and commercial buildings. Students develop their AutoCAD skills including the use of layers, blocks, PaperSpace, ModelSpace, block attributes, dynamic blocks, templates (DWT), drawing standards and DWF (Drawing Web Format). The application of standards, particularly the Canadian Electrical Code, specifications, and manufacturers' data to the design of both residential and commercial building electrical systems are included. Through in-class activities and projects, students develop AutoCAD skills to design electrical systems for residential and commercial buildings in compliance with the Canadian Electrical Code.

Prerequisite(s): DAT8942  
Corerequisite(s):none

**ELE8945 Distributed Power Systems**

Students examine power generation, transmission and distribution with particular emphasis on the province of Ontario. This includes an understanding of standard voltage levels, energy sources, cost of electricity, environmental impact, major system components, reactive loads, power quality, arc flash safety, effects of weather on the delivery of electricity and organizational structures that control electricity in Ontario.

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

**ELE8946 Fire Alarm Systems**

Fire alarm systems are an essential element ensuring protection and life safety of people, homes and buildings. The knowledge and skill in the fire alarm industry regulations and design is of vital importance in the overall engineering design of our living spaces. Students are introduced to the fire alarm industry, the applicable codes and standards, the nature of fire and extinguishment processes, different types of systems, verification and inspections. An overview of fire alarm systems emphasizes requirements for initiating devices, signal appliances, and control panels together with the different types of field wiring and microprocessor-based systems. Through in-class activities and group discussions, students acquire the knowledge and skills to interpret, investigate and determine various important elements in the design of fire alarm systems, according to the rules and regulations as set in the Canadian Electrical Code, National Building Code and the National Fire Code of Canada, and the respective dedicated standards for the Fire Alarm Systems.

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

**ELE8949 Project Management for Electrical Engineering Technicians**

Students develop the planning, scheduling, budgeting and organizing skills required to manage projects. Relevant industrial examples are used.

Prerequisite(s): ENL1813T

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

### **GED0317 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

### **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

### **MAT8100P Essential Mathematics**

The study of algebraic and transcendental functions is an essential prerequisite to Calculus. Students manipulate algebraic expressions, solve algebraic equations and linear systems, and learn the properties of algebraic and transcendental functions. Students graph a variety of functions and solve problems involving complex numbers, trigonometry and vectors. Delivered in a modular format, this course is equivalent to the completion of all of the following math modules MAT8100 - A, B, C, D, E, F, G, H, and I.

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

### **MAT8101 Differential Calculus**

Differential Calculus is the mathematical study of rates of change. Students study derivative, its

definition and interpretation and its applications. Stud limits and use first principles to find simple derivatives. The product, quotient and chain rules are used to find derivatives of algebraic functions. Students use differentiation rules to find derivatives of transcendental functions. A variety of applications of derivatives, such as curve sketching, finding the tangent to a curve and finding an approximate solution to an equation using Newton's method, are also studied.

Prerequisite(s): MAT8100 or MAT8100P or MAT8050 and MAT8051 or MAT8050P and MAT8051  
Corerequisite(s):none

### **MAT8102 Integral Calculus**

Integral calculus is the study of the definitions, properties and applications of two related concepts, the indefinite integral and the definite integral. Students find the area under a curve and the area between two curves. Students calculate both indefinite and definite integrals, and use the Trapezoidal Rule and Simpson's Rule to perform numerical integrations. Students integrate polynomial, exponential, logarithmic and trigonometric functions by substitution. Integration by parts and partial fractions are employed to perform complex integrations.

Prerequisite(s): MAT8101  
Corerequisite(s):none

### **PHY8201 Environmental Impact of Technology**

Every day newspaper headlines, movies, and television have warnings of the dire consequences of some environmental issues, such as global warming, acid rain, climate change and a host of other problems. Students are provided some of the science behind the headlines so they can make informed decisions as citizens, consumers and professionals.

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

### **WKT2101E Co-Op Work Term Electrical**

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 an electrical related industry, preferably to electrical 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 Electrical 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 Coop office assist 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): none  
Corerequisite(s):none