GEORGIAN COLLEGE

ELECTRICAL TECHNIQUES

Program Outline

Major: ELTQ
Length: 1 Year
Delivery: 2 Semesters
Credential: Ontario College Certificate
Effective: 2012-2013
Location: Midland, Owen Sound
Start: Fall (Midland, Owen Sound), Winter (Midland)

Description

This program provides students with the theoretical and practical training to perform most basic electrical techniques. At the completion of the program, students are ready to apply for work as an Electrician's helper or apprentice, or they may choose to continue their education and apply for an Electrical Engineering Technician or Technologist post secondary program. Students will be exposed to topics including health and safety, reading of drawings, applied math, communications, electrical theory, electronic theory, installation practices, CAD and rotating machine principles.

Career Opportunities

Graduates pursuing an apprenticeship may find a range of occupations in the electrical field, including construction, maintenance, service and industrial. Graduates choosing to continue their education will find opportunities in power generation and transmission, alternate energy, green technologies and the automation sectors.

Program Learning Outcomes

The graduate has reliably demonstrated the ability to:

- identify, select, and use various electrical products, supplies, and materials commonly found in residential and commercial settings;
- use required work site tools in a proper and safe manner;
- use basic electrical test equipment in a proper and safe manner

- read and interpret wiring and schematic diagrams and drawings;
- complete safety certification in a number of related areas including, and not limited to: WHIMIS, Fall Arrest, Basic First Aid/CPR, etc.;
- use basic electrical measuring instruments to test, troubleshoot and diagnose electrical problems;
- identify, select and organize the necessary tools and equipment in preparation for common electrical installations;
- perform most aspects of residential wiring installations with guidance of the site electrician;
- read and interpret the Ontario and Canadian Electrical Codes as they apply to residential installations;
- use the correct techniques for various electrical installations;
- discuss the advantages and disadvantages of traditional and renewable energy sources, current resources, technologies, and their limitations and a realistic appreciation of what energy sources and technologies will be in the future.

The Program Progression:

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Fall Intake - Midland, Owen Sound

Sem 1 | Sem 2
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Fall  | Winter
2012  | 2013

Winter Intake - Midland

Sem 1  | Sem 2
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Winter | Summer
2013   | 2013
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Admission Requirements:

Applicants must meet ONE of the following requirements to be eligible for admission to this program:

- OSS Curriculum: OSSD or equivalent with Grade 12 English (C) or (U) (ENG 4C, ENG4U)
- Academic and Career Entrance Certificate (ACE) program with: Communications
- Ontario High School Equivalency Certificate (GED)
- Mature applicant with standing in the required courses and/or mature student testing that meets the minimum standards for admission

Applicants who are 19 years of age or over by the first day of classes, and who lack the academic entrance qualifications, may be considered for entrance to an appropriate post-secondary diploma or certificate program as mature applicants. Each applicant will be considered on an individual basis and acceptance will be determined by counselling, Communication Placement Assessment (CPA), previous post-secondary education and evaluation of experience. Some programs also have specific prerequisite requirements that must be met prior to admission. Mature applicants must meet all program specific prerequisites. Those applying as mature students and having no documentation of Grade 12 education must supply, if required, proof of age, such as a copy of an official birth certificate or driver's licence. Refer to Section 2.5 and 2.6 of the Academic Calendar for further details.

Graduation Requirements:

10 Mandatory Courses
1 Communications Course
1 General Education Course

Graduation Eligibility:

To graduate from this program, the passing weighted average for promotion through each semester, and to graduate is 60%. Additionally, a student must attain a minimum of 50% or a letter grade of P (Pass) or S (Satisfactory) in each course in each semester unless otherwise stated on the course outline.

Mandatory Courses

DRFT1003 Introduction to Technical Drafting
ELEC1001 AC Circuit Fundamentals
ELEC1003 Electrical Installations
ELEC1004 Electronics 1
ELEC1005 Electronics 2
ELEC1006 Prints and Electrical Code
ELEC2005 Electrical Machines
ELEN1000 DC Circuit Fundamentals
ENVR1003 Environmental Health and Safety
MATH1018 Introduction to Technical Mathematics

Communications Course

To be selected at time of registration from the College list, as determined by testing.

General Education Course
To be selected from College list

Course Descriptions:

DRFT1003 Introduction to Technical Drafting 42.0 Hours
This course will introduce the student to reading and understanding engineering drawings and the use of the computer as a drafting tool. Emphasis will be on creating accurate, clear drawings. Standards and conventions will be presented and their applications will be shown using CAD.

ELEC1001 AC Circuit Fundamentals 56.0 Hours
A study of single and three phase power systems with various resistive and reactive loads; the relationship between real, apparent and reactive power - including the use of power, phasor and impedance diagrams; methods of measuring power; calculations power factor.

ELEC1003 Electrical Installations 42.0 Hours
In this course students perform installation methods for various electrical wiring methods and safely perform their tasks according to Code rules. Topics covered in this course include raceways and wireways, cabling methods, service entrance installations, low voltage and extra-low voltage circuits.

ELEC1004 Electronics 1 42.0 Hours
In this course students interpret the symbols, basic operation and correct circuit configurations for logic gates, resistors, N and P type semiconductors, diodes and transistors. Topics covered in this course include testing of components, soldering and de-soldering procedures, troubleshooting and common applications for digital and semiconductor components.

ELEC1005 Electronics 2 42.0 Hours
In this course students use meters and test equipment to check electronic components, test circuits, verify power supply outputs and interpret waveforms. Topics covered in this course include testing and isolation procedures, rectification, capacitor operation, thyristors and phase shifting.

ELEC1006 Prints and Electrical Code 42.0 Hours
In this course students are required to interpret and obtain information from architectural, structural and electrical drawings. Students determine which electrical code and building code rules apply to various installations. Topics covered in this course include deciphering of alpha numeric lines, reading of measurement scales, common building materials and building methods, reading of specifications, equipment selection, ordering and scheduling.

ELEC2005 Electrical Machines 56.0 Hours
This course examines the basic theory, characteristics, construction operation and application of rotating electrical machines. It includes the study of direct current motors, direct current generators, alternators, synchronous motors, polyphase induction motors and single phase motors.

ELEN1000 DC Circuit Fundamentals 56.0 Hours
This course introduces the student to the fundamental concepts of direct current electricity using power related applications where possible. Topics include: series and parallel DC circuits, magnetism, inductance, capacitance, DC metering applications and an introduction to network analysis.

ENVR1003 Environmental Health and Safety 42.0 Hours
This course provides an overview of the requirements of current legislation and standards pertaining to environmental health and safety in the workplace. Health and safety management systems, hazardous materials management, WHMIS, biological, physical and chemical hazards, environmental monitoring devices, confined space entry, personal protective equipment, and emergency response will be examined.

MATH1018 Introduction to Technical Mathematics 42.0 Hours
This course provides a foundation in mathematics in engineering technology and related programs. Students will develop skill in mathematical thinking and problem solving, and appropriately apply technology in the solution of engineering related problems using algebra, geometry, right angle trigonometry, trigonometric functions of any angle, systems of linear equations, and exponential and logarithmic functions. Additional time to strengthen and reinforce mathematical competencies will be made available to those students who require it.

Course Description Legend
P = Prerequisite; C = Concurrent prerequisite; CO= Corequisite

Information contained in College documents respecting programs is correct at the time of publication. Academic content of programs and courses is revised on an ongoing basis to ensure relevance to changing educational objectives and employment market needs. The college reserves the right to add or delete programs, options, courses, timetables or campus locations subject to sufficient enrolment, and the availability of courses.