

ENVIRONMENTAL TECHNICIAN

Program Outline

Major:	ENTN
Length:	2 Years
Delivery:	4 Semesters, plus 1 work term
Credential:	Ontario College Diploma, Co-op
Effective:	2015-2016
Location:	Barrie
Start:	Fall (Barrie)

Description

Environmental Technician graduates are trained as entry-level practitioners in the use of environmental sampling, monitoring and testing equipment and information technology tools and will be familiar with standard operating procedures for conducting environmental projects. The program provides students with applied knowledge of health, safety and environmental legislative requirements, environmental management systems; and the basic principles of ecosystem-based management for sustainability.

Career Opportunities

Given the diversity in program skills and knowledge there are a number of career options in the environmental field working for small and large corporations. Potential employers include environmental consulting firms; government agencies (municipal, provincial, federal); environmental services departments in a variety of organizations; and water, wastewater and waste management firms.

Program Learning Outcomes

The graduate has reliably demonstrated the ability to:

- collect representative environmental samples and perform routine tests, using current and relevant tools;

- use scientific concepts and models when contributing to the prevention, control and elimination of environmental hazards and remediation of contaminated sites;
- assist with analysis of water/soil/air samples and with the resolution of environmental problems through the application of scientific and engineering principles;
- follow standard procedures for conducting environmental sampling projects including the use of appropriate equipment and materials;
- promote and maintain sustainable practices by applying the elements of ecosystem-based management;
- carry out work responsibilities adhering to standards of professional conduct and principles of professional ethics;
- complete assigned tasks in adherence to occupational health and safety standards and applicable legislative requirements;
- follow established protocols in support of environmental management systems;
- provide ongoing support for project management;
- communicate technical information accurately and effectively in oral, written, visual and electronic forms;
- develop and present strategies for ongoing personal and professional development to enhance performance as an environmental technician;
- employ various information technology tools to assemble and use environmental data effectively.

Practical Experience:

Co-operative Education is a mandatory component of all Co-op programs at Georgian College; it has been designed as a process by which students integrate their academic education with work experience related to their programs of study. This integration affects much more than simply earning a salary, including the adjustment to the work environment and the development of professionalism. It also reinforces skills and theory learned during academic semesters, develops professional contacts, job knowledge and career path, improves human relations and communication skills, and promotes personal maturity and financial independence.

Students are requested to register, attend and participate in their scheduled co-operative education classes. These classes are scheduled for all first year students and are expected to be completed in order for students to proceed successfully to their first co-op work experiences. To ensure students are eligible to proceed onto any co-op work experience, students should refer to Promotional Status and Eligibility for Co-op as outlined in the College Calendar. Co-op policies and procedures can be located on our website: www.georgiancollege.ca/student-services/co-op-and-career-services/students-tab/

Georgian College follows the Co-operative Education guidelines set out by the Canadian Association for Co-operative Education (CAFCE) and Education at Work Ontario (EWO) by supporting the learning outcomes designed for the program specific graduate profile and curriculum as set out by the Ministry of Training, Colleges and Universities.

The Program Progression:

Fall Intake - Barrie

Sem 1	Sem 2	Work Term	Sem 3	Sem 4

Fall	Winter	Summer	Fall	Winter
2015	2016	2016	2016	2017

Articulation:

A number of articulation agreements have been negotiated with universities and other institutions across Canada, North America and internationally. These agreements are assessed, revised and updated on a regular basis. Please contact the program co-ordinator for specific details if you are interested in pursuing such an option. Additional information can be found on our website at <http://www.georgiancollege.ca/admissions/credit-transfer/>

Admission Requirements:

OSSD or equivalent with

- Grade 12 English (C or U)
- Grade 12 Mathematics (C or U)

Mature students, non-secondary school applicants (19 years or older), and home school applicants may also be considered for admission. Eligibility may be met by applicants who have taken equivalent courses, upgrading, completed their GED, and equivalency testing. For complete details refer to: www.georgiancollege.ca/admissions/policies-procedures/

Applicants who have taken courses from a recognized and accredited post-secondary institution and/or have relevant life/learning experience may also be considered for admission; refer to the Credit Transfer Centre website for details: www.georgiancollege.ca/admissions/credit-transfer/

Graduation Requirements:

- 22 Mandatory Courses
- 2 Communications Courses
- 3 General Education Courses

1 Co-op Work Term

Graduation Eligibility:

To graduate from this program, the passing weighted average for promotion through each semester, from year to year, 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

BIOL1008 Biological Systems
CHEM1003 Introduction to Applied Chemistry
CHEM2002 Applied Organic Chemistry
COMP1059 Computer Technology for Environmental Applications
ENVR1000 Environmental Science and Sustainability
ENVR1004 Geospatial Technology
ENVR1005 Workplace Safety and Employment Readiness
ENVR1006 Earth Science
ENVR1007 Water Treatment
ENVR2004 Waste Management Strategies
ENVR2012 Ecosystems and Environmental Sampling
ENVR2013 Limnology and Watershed Management
ENVR2014 Environmental Management Systems and Audits
ENVR2017 Soil Properties
ENVR2018 Environmental Assessment and Contaminants in the Environment
ENVR2019 Environmental CAD
ENVR2020 Wastewater Treatment
LAWS2010 Environmental Law and Policy
MATH1018 Introduction to Technical Mathematics
PHYS1004 Physical Systems in the Environment
STAT2006 Applied Statistics for Environmental Applications
SURV2002 Environmental Surveying

Communications Courses

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

General Education Courses

To be selected from College list

Co-op Work Term

COOP1023 Environmental Work Term 1

Course Descriptions:**BIOL1008 Biological Systems 42.0 Hours**

This laboratory and theory course will introduce students to the complexities of living organisms including the structural and functional aspects of life. Emphasis will be placed on biological systems from the molecular level upwards and students will have an opportunity to apply their theoretical knowledge to hands on applications in the laboratory.

CHEM1003 Introduction to Applied Chemistry 70.0 Hours

This course covers the fundamentals of chemistry such as atomic structure, properties and nomenclature of compounds, chemical bonding and reactions, and stoichiometry concepts including mole concept, solutions and gases. Related laboratory experiments will be performed.

CHEM2002 Applied Organic Chemistry 42.0 Hours

This course will introduce students to basic organic chemistry. Topics will include structures, properties and nomenclature of classes of organic compounds as well as carbon bonding of compounds. Mechanisms of organic reactions will also be discussed and related laboratory experiments will be performed.

P- CHEM1003 Introduction to Applied Chemistry

COMP1059 Computer Technology for Environmental Applications 42.0 Hours

Effective computer technology skills are essential for student success. This laboratory course provides students with hands-on application of the computer technology that is standard in the environmental industry.

COOP1023 Environmental Work Term 1 560.0 Hours

Co-operative Education will provide students with the skills to conduct a college directed and self-directed job search in their chosen field of study. Students will obtain a co-op work experience with an employer for a period of 14 weeks. All students are responsible to submit a work term report indicating achievement of specific learning outcomes during their 1st co-op work term. Georgian College follows the Co-operative Education guidelines set out by the Canadian Association for Co-operative Education (CAFCE) and Education at Work Ontario (EWO) by supporting the learning outcomes designed for each program.

ENVR1000 Environmental Science and Sustainability 42.0 Hours

Students will be introduced to ecological principles, population dynamics and energy resources in order to assess their impact on the environment. The major types of pollution are examined and their effects on the various components of the ecosphere analyzed. Strategies for pollution control and the conservation of the Earth's resources are examined in the context of economic considerations and sustainable development.

ENVR1004 Geospatial Technology 56.0 Hours

This hands-on laboratory course will provide students with an opportunity to utilize geospatial technology and complete assignments using Geographic Information Systems (GIS) software. Field application using Global Positioning Systems (GPS) will be incorporated and students will manipulate digital maps and various forms of spatial data including satellite imagery and aerial photographs for environmental applications.

P- COMP1059 Computer Technology for Environmental Applications

ENVR1005 Workplace Safety and Employment Readiness 42.0 Hours

Health and safety along with employment readiness is a necessity for all students entering the workforce. This course provides an overview of current legislation and standards pertaining to environmental health and safety and the process of preparing students for entry into the workplace. Historical perspective, 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. Personal workplace development will also be examined.

ENVR1006 Earth Science 42.0 Hours

This course provides an introduction to geological concepts such as the composition and structure of the earth; plate tectonics; geological time scale; geological processes and the landforms they produce. Principles of soil science are investigated including soil formation, taxonomy, biological components, and the chemical and physical properties of soils.

ENVR1007 Water Treatment 42.0 Hours

This course provides an introduction to the study of water treatment processes and distribution. The physical, chemical and biological characteristics of source water will be examined along with current regulations, methods of treatment and issues surrounding the provision of potable water. Students will participate in the evaluation of common physical, chemical and bacteriological testing. The content of the Ontario Ministry of the Environment (MOE) Entry Level Drinking Water Operator course will be covered.

ENVR2004 Waste Management Strategies 42.0 Hours

This is course is a study of the complexities associated with waste management and environmental effects; relevant legislative requirements; integrated waste management strategies; disposal and diversion methods and site selection; site closure and post-operational uses. This course will have both a classroom component where solid waste management issues and practices will be learned and a non-classroom component where students will apply these practices in real-life situations.

ENVR2012 Ecosystems and Environmental Sampling 42.0 Hours

This course identifies the components of ecosystems and analyses the interrelationships of biotic and abiotic factors. Physical, chemical and biological parameters are measured in order to assess the health of both terrestrial and aquatic ecosystems. Planning, sampling, collecting, measuring and evaluating various environmental parameters will be emphasized.

ENVR2013 Limnology and Watershed Management 42.0 Hours

This course provides students with practical applications relating to the natural workings of fresh water aquatic ecosystems. It incorporates physical limnology including characteristics such as secci depth and thermocline; chemical characteristics including nitrates, phosphates, dissolved oxygen and pH; and the biological characteristics that can be used to measure the health of aquatic ecosystems.

ENVR2014 Environmental Management Systems and Audits 28.0 Hours

This course is a study of the current practices and policies pertaining to the development, implementation and maintenance of environmental management systems (EMS) in an organization. ISO standards will be examined and case studies will be used to highlight the key factors involved with EMS implementation. The process of assessing environmental impacts and aspects and implementing continuous improvement measures will be addressed. Comparable health and safety management systems will be examined to reinforce management system concepts.

ENVR2017 Soil Properties 42.0 Hours

This experiential course builds on the foundational principles of soil science by introducing students to field sampling and the laboratory analysis of soils. Students learn sampling methodologies and descriptive techniques, sample preparation, analytical methods and instrumentation for various chemical, physical and biological soil parameters; as well as data analysis and reporting. Emphasis is placed on developing field, laboratory and technical communication skills.

P- ENVR1006 Earth Science

ENVR2018 Environmental Assessment and Contaminants in the Environment 56.0 Hours

This course examines the nature and behaviour of environmental contaminants and practices used in the protection and conservation of water and land. Students will review environmental assessment legislation and use case studies to illustrate ecological complexity to develop skills to assess and mitigate the impacts of various projects. Students will prepare environmental assessment reports based on field investigations. Site remediation techniques and Record of Site Condition requirements will be examined.

P- CHEM1003 Introduction to Applied Chemistry

ENVR2019 Environmental CAD 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. Students will prepare and interpret environmental land survey and civil engineering drawings. Emphasis will be placed on contours, plan and profile, cross-section and earthwork quantities, topographical survey and structures as it relates to environmental engineering. Specific CAD techniques and procedures will be applied to the creation of these drawings.

P- COMP1059 Computer Technology for Environmental Applications

ENVR2020 Wastewater Treatment 42.0 Hours

This course provides theory related to the conceptual design and operation of a variety of wastewater treatment processes with an emphasis on fundamental principles. The course will cover physical, chemical, and biological processes as well as sludge processing. In addition, discussions of engineered and natural processes for wastewater treatment are examined. Students will also examine the testing required for performance evaluation of a variety of wastewater treatment processes.

LAWS2010 Environmental Law and Policy 42.0 Hours

The course is designed to develop working knowledge of statutory and common law practices that apply to the environment. Students will have an opportunity to apply this knowledge to case studies to illustrate how environmental law applies in real situations. The course incorporates on-line use of current Acts, Regulations and Guidelines and students will become familiar with Municipal, Provincial and Federal environmental law including duty, breach and liability.

MATH1018 Introduction to Technical Mathematics 42.0 Hours

Students will develop foundational skills 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.

PHYS1004 Physical Systems in the Environment 42.0 Hours

This course is designed to introduce students to the basic concepts of physics including mechanical motion, energy and matter; wave motion and sound; heat and temperature; and electromagnetic waves, and light optics. Emphasis is placed on practical examples to illustrate these principles in the environment. Laboratory experiments may be used to illustrate and investigate the principles involved.

STAT2006 Applied Statistics for Environmental Applications 42.0 Hours

Elementary statistical methods and applications to environmental problems; samples and populations; frequency distributions; probability theory; basic distributions; random sampling; point and interval estimation; hypothesis testing; and linear regression and correlation are studied.

P- MATH1018 Introduction to Technical Mathematics

SURV2002 Environmental Surveying 42.0 Hours

This course is an introduction to survey concepts, measurements, computations and automated surveying. It covers the required mathematical concepts, the theory and operation of survey instruments, the measurement of distances and angles, leveling and all associated calculations. Emphasis will be placed on field surveying where students will learn to capture electronic field data and utilize that information for environmental applications.

P- MATH1018 Introduction to Technical Mathematics

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.