Area of Interest: Environmental Science

**Water and Wastewater Technician**

**Ontario College Diploma**

42 Weeks

**Ottawa Campus**

**Academic Year:** 2019/2020

**Program Code:** 3014X04FWO

**Our Program**

*Gain the knowledge and skills to ensure the safety of Canada’s water supply.*

The Water and Wastewater Technician Ontario College Diploma program equips you with the knowledge and skills to effectively manage water and wastewater infrastructure. The water and wastewater management field has been subjected to increasingly rigid legislation, due to ongoing public health concerns. This program teaches you how to deal with the demands on water quality professionals.

This condensed 42-week program allows you to complete a two-year diploma program in only three terms, making it an intensive, but rewarding experience.

Through a series of courses in advanced chemistry, biology and mechanical systems, you are able to make informed decisions in your day-to-day career. Learn how to:

* prevent waterborne illnesses
* manage industrial waste
* operate off-site wastewater treatment units

**Employment**

This program prepares students to become water and wastewater treatment operators. Graduates may find employment as compliance officers and water analysts with municipal and provincial governments, as well as lab assistants in private and public laboratories.

**Learning Outcomes**

The graduate has reliably demonstrated the ability to:

* Work independently and with others to conduct tests related to water and wastewater in the lab and field.
* Analyze and interpret test results for clients or supervisors.
* Provide mechanical and electrical maintenance management at various water and wastewater facilities.
* Collaborate with individuals in testing and troubleshooting equipment at water and wastewater plant facilities.
* Make decisions based on an understanding of Ontario environmental legislation affecting wastewater treatment plants, scope and authority of certificates of approval, and owner/operator responsibilities.
* Collaborate on basic design concepts and operational techniques of industrial and municipal water treatment systems.
* Collaborate with others in providing emergency responses to plant issues.
* Contribute to the design of water supply pumping systems, pipe networks and distributed...
• Contribute to the design of water supply pumping systems, pipe networks and distributed storage reservoirs.

• Develop and implement risk management strategies for hazardous and non-hazardous industrial waste.

• 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

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<td>GEN1005 Ecology</td>
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<td>MAT1062 Mathematics for Water and Wastewater</td>
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<td>SAF8710 Health and Safety</td>
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<td>WWT1001 Hydraulics for Water and Wastewater</td>
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<td>WWT1200 The Science of Water and Wastewater Practices</td>
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<td>WWT2001 Preventing Waterborne Illness</td>
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<td>WWT2005 Water Distribution and Wastewater Collection</td>
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<td>WWT2401 Water and Wastewater Microbiology Lab</td>
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<td>WWT3102 Wastewater Treatment</td>
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<td>WWT3007 Solid Waste Disposal and Treatment</td>
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<td>WWT3100 Environmental Law</td>
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Choose one from equivalencies: Courses

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Fees for the 2019/2020 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](https://www.algonquincollege.com/fee-estimator).

Further information on fees can be found by visiting the Registrar`s Office site at
Fees are subject to change.

Additional program related expenses include:

Books cost approximately $600 per year. Supplies cost approximately $50 and can be purchased at the campus store.

**Admission Requirements for the 2020/2021 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 (MAP4C or equivalent), is recommended.
- Biology, Grade 11 or 12, is recommended.
- Chemistry, Grade 11 or 12, is recommended.
- International applicants must provide proof of the subject specific requirements noted above along with proof of either: (IELTS / TOEFL) 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.
- Applicants with international transcripts must provide proof of the subject specific requirements noted above and may be required to provide proof of language proficiency.

Should the number of qualified applicants exceed the number of available places, applicants will be selected on the basis of their proficiency in English.

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Application Information

WATER AND WASTEWATER TECHNICIAN
Program Code 3014X04FWO

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 https://www.ontariocolleges.ca/.

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
Email: mailto:AskUs@algonquincollege.com

Additional Information

Programs at Algonquin College are Bring Your Own Device (BYOD). To see the BYOD requirements for your program, please visit: https://www7.algonquincollege.com/byod.

Students who successfully complete the Ministry exam as a component of WWT2500 with a grade of 70% or greater will receive credit for the Ministry of the Environment and Climate Change Entry-Level course for Drinking Water Operators.

For more information, please contact Dr. Sean Beingessner, Program Coordinator, at 613-727-4723 ext. 5359 or mailto:beinges1@algonquincollege.com.

Course Descriptions

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 practice 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

**GED2012 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

**GED3014 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

**GEN1005 Ecology**

Understanding the impact humans have on the environment is an important aspect of a student's education. Students review and discuss current topics, such as water quality, climate change, energy options and technology's place as a solution to environmental problems.

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

**MAT1062 Mathematics for Water and Wastewater**

Mathematics is important for environmental technology fields. Students learn technical functions, algebraic manipulations and statistics. These basic skills are essential to operating in laboratories, environmental plants and field work.

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

**SAF8710 Health and Safety**

Technicians and operators are required to have Workplace Hazardous Materials Information System (WHMIS 2015) and occupational health and safety training. Students acquire a sociological and historical perspective on health and safety issues in industrial environments. Through a combination of discussions, readings and training students are prepared to work in industry, laboratory environments and with organisms up to Biosafety level 2.
### WWT1001 Hydraulics for Water and Wastewater

Operator certification requires detailed knowledge of the hydraulic systems that are used to move water in treatment plants. Students learn about flow measurement, pressure losses in pipes, and gravity flow systems, such as sewers. Through real-world examples students learn about well types and pump characteristics.

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

### WWT1100 Water and Wastewater Chemistry

Understanding chemistry is essential for practitioners in the water and wastewater treatment sector. Students learn the basic principles of chemistry and the use of chemicals in the water and wastewater treatment processes. Through practical experience, students apply their knowledge to this sector.

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

### WWT1101 Water and Wastewater Chemistry Lab

In the water and wastewater treatment sector, chemical treatments are used to purify water. To prepare students for a career in this sector, they are trained to be proficient with laboratory equipment, safe laboratory practices and data collection. Students conduct basic chemical analysis that is used in the industrial and municipal water treatment sectors.

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

### WWT1200 The Science of Water and Wastewater Practices

Employment in the water and wastewater field requires an understanding of fundamental principles of mechanics and electromagnetism. Students gain introductory knowledge of simple machines, mechanics, electrical circuits and the fundamentals of electromagnetic theory. Through activities students learn the fundamental scientific principles behind the current practices in this sector.

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

### WWT2001 Preventing Waterborne Illness

Water treatment operators must understand how to prevent illness and the mechanisms by which water can be contaminated by biological agents. Students learn about various drinking water treatment technologies and the critical role they play in preventing waterborne illness in developed countries. They closely examine certain pathogens, such as Cryptosporidium, Giardia and E. coli and the risk they pose to drinking water sources. Through case studies students come to understand the importance of drinking water operators and the role they play in ensuring the safety of drinking water supplies.

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

### WWT2005 Water Distribution and Wastewater Collection

Careers in this sector require a basic understanding of how water is collected and distributed. Students gain a comprehensive overview of the field of water distribution and wastewater collection. Students learn design concepts and the operations of water distribution and collection.
WWT2102 Water and Wastewater Maintenance

The sheer size of industrial operations often presents unique problems that must be fully understood by those who work in the field. Students explore electrical and mechanical aspects relating to the maintenance and operations of pumps, pipes, valves and other elements found in water and wastewater systems, as well as industrial plants.

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

WWT2200 Water Resource Management

Assessing potential water resource issues before water becomes scarce is essential for leaders in this sector. Focus is on management and conservation of water supplies in North America. Students explore environmental, social and economic issues surrounding events, such as droughts, floods, dams, water quality, and water scarcity and their impact on drinking water sources. Through case studies students explore emerging trends and solutions that address local, regional and global water concerns.

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

WWT2202 Computer Applications in Water and Wastewater

Computers are a necessary tool in most careers. Students become acquainted with the software tools and methods used in water treatment, water distribution, wastewater collection and wastewater treatment. Standard office utilities are used, as well as specialized simulation packages to model natural and manmade hydraulic systems.

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

WWT2203 Industrial Wastewater Management

The size of industrial operations presents unique challenges for wastewater management. Students enhance their knowledge of wastewater treatment for industrial facilities with an emphasis on microbiological remediation of wastewater. Students develop strategies for waste minimization, pollution prevention and waste treatment.

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

WWT2400 Water and Wastewater Microbiology

Knowledge of microscopic life and biological principles is indispensable for careers in this field. Students gain knowledge of the world of microscopic life, including human pathogens, small scale aquatic ecosystems and industrial applications. Students focus on the interactions of microorganisms within biofilms and microbiological ecosystems under different conditions.

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

WWT2401 Water and Wastewater Microbiology Lab

Proper laboratory skills are required by nearly every career in this sector. Students acquire the necessary laboratory skills for microbial analysis and manipulation. Students learn to use the phase contrast and light microscopes to observe and identify microorganisms in water and wastewater.
WWT2500 Entry-Level Course for Drinking Water Operators

The Entry-Level Course (ELC) is a mandatory course for all drinking water operators developed by the Ministry of the Environment. It provides new operators with a basic understanding of water characteristics and pathogens, treatment and distribution processes, and the regulations that govern water quality.

WWT3007 Solid Waste Disposal and Treatment

Knowledge of solid waste disposal is indispensable for many careers in this field. Students become familiar with the key concepts of solid waste disposal and treatment with particular emphasis on biological solids. The major topics include legislation, regulations and protocols of disposal and the science behind treatment processes.

WWT3100 Environmental Law

A basic understanding of environmental law is necessary for most careers in this sector. Students examine the Canadian environmental legal process focusing on source water and drinking water regulations and policies in Ontario. Students examine the Canadian legal framework, discuss how new laws are drafted and passed, and discuss the importance of regulations in an environmental management context at the Federal and Provincial levels.

WWT3101 Water Treatment

Effective water treatment is essential for the health of Canadians. Students explore how to treat water using physical and chemical processes. As students examine the basic design concepts and the operational techniques of industrial and municipal water treatment systems, they learn the mechanisms to optimize the production of treated water.

WWT3102 Wastewater Treatment

Virtually all careers in this field require the knowledge of how wastewater is treated. Students explore how to treat wastewater using physical and chemical processes. They examine the basic design concepts and the operational techniques of industrial and municipal wastewater treatment systems.

WWT3104 Water and Wastewater Operations

Producing meaningful reports and assessments requires a good understanding of math and science. Students collect qualitative and quantitative data to determine optimal treatment performance. Students focus on statistical concepts in data collection, quality control and quality assurance procedures necessary for the operation of a water or wastewater plant.
Prerequisite(s): none
Corerequisite(s): none

**WWT3201 Water Treatment Laboratory**

Practical experience in water treatment is vital for careers in this sector. Students practise how to treat water using physical and chemical processes, engaging in onsite visits and completing laboratory exercises. Through experiments involving chemical coagulation, precipitation and oxidation, students learn how to purify water supplies.

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

**WWT3202 Wastewater Treatment Laboratory**

Practical experience in wastewater treatment is essential for technicians and operators working in this sector. Students practise treating wastewater using physical and chemical processes, engaging in onsite visits and completing laboratory exercises. Through field trips and laboratory experience, students conduct the basic operational techniques used in industrial and municipal wastewater treatment systems.

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

**WWT3500 Field Techniques**

Environmental professionals require a variety of hands-on, practical skills in order to succeed in this diverse sector. Students develop plans for sample acquisition, produce chain of custody documents, collect field samples and install sampling systems. Students gain experience employing industry best practices for documenting and sampling.

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