

Area of Interest: Environmental and Applied Sciences

Water and Wastewater Technician

Ontario College Diploma

Program Code: 3014X04FPM

42 Weeks

Pembroke Campus

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

Learn using theoretical and applied approaches, in labs and in the field. Using industry-standard equipment, you acquire the most up-to-date skills and knowledge possible.

Graduates of this program are well positioned to become:

- water and wastewater treatment operators
- compliance officers
- water analysts with municipal or provincial governments
- lab assistants in private and public laboratories

SUCCESS FACTORS

This program is well-suited for students who:

- Enjoy paying attention to fine details without losing sight of the big picture.
- Care about the environment and public health issues, and find related work to be rewarding.
- Want to work in a lab environment, and in the field.
- Envision themselves as responsible, key members of an essential and indispensable team.

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 waste water 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 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

Level: 01	Courses	Hours
ENL1813T	Communications I	42.0
GED2012	Achieving Success in the 21st Century	42.0
MAT1062	Mathematics for Water and Wastewater	42.0
SAF8710	Health and Safety	42.0
WWT1001	Hydraulics for Water and Wastewater	42.0
WWT1100	Water and Wastewater Chemistry	42.0
WWT1101	Water and Wastewater Chemistry Lab	42.0
WWT1200	The Science of Water and Wastewater Practices	42.0
WWT2001	Preventing Waterborne Illness	42.0
Level: 02	Courses	Hours
ENL2019T	Technical Communication for Engineering Technologies	42.0
WWT2005	Water Distribution and Wastewater Collection	42.0
WWT2102	Water and Wastewater Maintenance	42.0
WWT2200	Water Resource Management	28.0

WWT2400	Water and Wastewater Microbiology	28.0
WWT2401	Water and Wastewater Microbiology Lab	42.0
WWT2500	Entry-Level Course for Drinking Water Operators	42.0
WWT3100	Environmental Law	42.0
WWT3102	Wastewater Treatment	28.0
Level: 03	Courses	Hours
WWT2202	Computer Applications in Water and Wastewater	28.0
WWT2203	Industrial Wastewater Management	42.0
WWT3007	Solid Waste Disposal and Treatment	28.0
WWT3104	Water and Wastewater Operations	42.0
WWT3111	Water Treatment	42.0
WWT3201	Water Treatment Laboratory	42.0
WWT3202	Wastewater Treatment Laboratory	42.0
WWT3500	Field Techniques	70.0

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 <http://www.algonquincollege.com/fee-estimator>

Further information on fees can be found by visiting the Registrar's Office website at <http://www.algonquincollege.com/ro>

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 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 (MAP4C or equivalent), is recommended.
- Biology, Grade 11 or 12, is recommended.
- Chemistry, Grade 11 or 12, is recommended.
- 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>

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

Application Information

WATER AND WASTEWATER TECHNICIAN Program Code 3014X04FPM

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 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>

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

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.

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 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

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

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.

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

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 systems.

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

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.

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

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.

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

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.

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

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.

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

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.

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

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

WWT3111 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.

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 learn the purpose and importance of proper sampling techniques, analytical tools that are used to evaluate properties of the collected samples, and good record-keeping. Students also participate in facilities tours where the day-to-day operation of treatment facilities are explored.

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