

WATER AND HUMAN HEALTH

Purpose and Philosophy

NOTE: ADMISSION TO THIS PROGRAM HAS BEEN TEMPORARILY SUSPENDED.

The Beaty Water Research Centre (BWRC), Queen's University, has established the Graduate Diploma in Water and Human Health. The BWRC is an inter-disciplinary research centre dedicated to furthering the critical interest in the diversity of water-related research and education initiatives at Queen's University, the Royal Military College of Canada and its partner organizations, and to encouraging collaborative research spanning both traditional water-related disciplines, as well as non-traditional and emerging disciplines.

This fully online graduate diploma will bring depth to the study of the chemical, biological and physical components of water, while also capturing the policy environment to understand the impacts to public health. Because the diploma is 100% online and primarily asynchronous in fashion, students will drive their own learning regardless of their work-life-studies balance. This diploma targets both recent graduates of relevant BASc, BSc, and BA programs, as well as early career professionals in a domestic and international context.

The Graduate Diploma in Water and Human Health may be laddered to other degree programs such as an MEng, MASc or MSc.

Admissions Requirements

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Applications are accepted under the general regulations of the School of Graduate Studies and Postdoctoral Affairs.

The minimum qualification for admission to the Graduate Diploma in Water and Human Health is second class standing in one of the following degrees, awarded by an eligible institution according to the criteria of the Queen's University Policy on the Basis of Admission for Advanced Study:

1. an honours bachelor degree in Arts or in Science,
2. or a bachelor degree in Applied Science or Law,
3. or the degree of Doctor of Medicine,
4. or equivalent.

Applicants whose native languages do not include English must obtain a passing score in one of the accepted tests of English language proficiency. Information can be found in the

General Regulations of the School of Graduate Studies and Postdoctoral Affairs here: International Students.

The qualifications of an applicant who has a bachelor's general degree with not less than a B grade average and has completed one academic year of satisfactory full-time study as a qualifying graduate student may be considered as equivalent.

The Graduate Diploma in Water and Human Health is intended for students who have completed a bachelor's degree in a related field, including, but not limited to engineering, biology, chemistry, public health, health sciences and environmental studies. Technical knowledge of chemistry and mathematics will be required for some courses in the diploma such as *Watershed Hydrology*, and *Chemistry and Biology of Natural waters*. For those applicants without evidence of relevant introductory undergraduate courses, bridge courses may be required on a case-by-case basis to fulfill the technical knowledge gap that may exist. Bridging courses offered through the Faculty of Engineering and Applied Sciences may be used when necessary, to ensure that students have adequate background to complete the courses of the Graduate Diploma in Water and Human Health.

Programs

- Water and Human Health - Graduate Diploma (<https://queensu-ca-public.courseleaf.com/graduate-studies/programs-study/water-human-health/water-human-health-graduate-diploma/>)

All courses are 100% online and are 3.0 credit units.

BWRC 801 Chemistry and Biology of Natural Waters

Water within the natural environment both drives and supports a complex web of chemical and biological processes and populations. This course covers several topics in the area of natural water chemistry including: dilute aqueous solution chemistry of surface and groundwater systems; chemical kinetics and equilibrium; acid-base chemistry; coordination chemistry; precipitation, dissolution and complex formation; carbonate, phosphate and chlorine chemistry; oxidation-reduction reactions and corrosion; and solution of multi-equilibria problems. In addition, biological processes and populations will be explored by this course, including microorganism dynamics.

BWRC 802 Watershed Hydrology

This course will introduce the concept of a watershed, covering general aspects such as surface water hydrology, groundwater, ecosystems, anthropogenic and meteorological



influences. Large and small scale watersheds will be discussed, along with the interactions of sub-watersheds within larger systems. Extensive background information on the ecology, surface water flows, topography and meteorological information of the field site will be used to illustrate these watershed aspects.

BWRC 803 Water and Human Health

Water and Health is designed to give recent graduates and professionals an enhanced understanding of the role of water in driving health outcomes and ultimately the sustainability of populations and communities. This course will investigate water in its natural state and the roles of contaminants on human health. In addition, the public health aspects of drinking and recreational water will be investigated. Finally, the geospatial implications for differing water qualities and their potential health outcomes will be explored.

BWRC 804 Water Policy and Governance

This course will investigate water governance from the science, engineering and policy aspects found around the world. This course is designed to engage students in discussions on a wide range of governance issues relating to water in a way that is relevant to their current field of study. Specific policies and governance that are relevant world-wide will be covered and include climate change, water quality, water supply, water and the environment, and water and human health. Current regulatory requirements, both provincial and federal, will be discussed as the second module in order to set the stage for future modules. Students will examine the different legislation and agency jurisdictions for each aspect of a watershed. These will include such topics as fisheries and aquatic habitat regulations, environmental protection laws and requirements for environmental assessments. Students will examine the competing interests associated with most watersheds near developed areas in Ontario. These will include such strategies as restoration, water flow management and flood mitigation, flora and fauna protection and enhancement, and selected development zoning, etc.