

# Chemical and Environmental Toxicology

---

## **M.Sc. (Biology, Chemistry or Earth Sciences) with Specialization in Chemical and Environmental Toxicology**

### **About the Program**

Toxicology is the study of effects of toxic substances on living systems. These toxic substances can either be organic or inorganic, synthetic or natural materials. The study of toxicology crosses traditional disciplinary boundaries such as chemistry, biology, and the environmental sciences. Environmental toxicology further extends to aspects of chemical transport, fate, persistence and biological accumulation of toxic substances and their effects at the population and community levels. While individual researchers usually specialize in a particular area, toxicologists must be able to appreciate significant research in other fields and therefore require an understanding of the basic principles of other disciplines. To meet this challenge the University of Ottawa and Carleton University offer a Collaborative Program in the supporting Institutes (OCIB, OCCI, and OCGC) leading to a M.Sc. with Specialization in Chemical and Environmental Toxicology.

### **Academic Regulations**

See the General Regulations (<http://www.carleton.ca/calendars/2012-13/grad/gradregulations>) section of this Calendar.

### **Admission Requirements**

Applications should be directed to the primary participating unit (i.e. departments of Biology, Chemistry, or Earth Sciences) that is the most appropriate to the student's research interests. Once sponsored and accepted into one of the Institutes, students must be sponsored into the Collaborative Program in Chemical and Environmental Toxicology by a faculty member involved in the program. This will normally be the student's supervisor.

The requirements for admission to the Master's in the Collaborative Program in Chemical and Environmental Toxicology are as follows:

1. Prior admission to the Master's program in one of the supporting Institutes participating in the program.
2. A letter of recommendation from the participating faculty member of the collaborative program, which both recommends admission and indicates the willingness of the faculty member to supervise the candidate's research program in Chemical and/or Environmental Toxicology.

### **Program Requirements**

The student is responsible for fulfilling both the Institute and departmental requirements for the Master's degree, and the requirements of the Collaborative Program.

The minimum requirements of the Collaborative Program include completing at least three courses, which include:

1. A relevant introductory course in toxicology (The suitability of any introductory toxicology courses as a prerequisite for the Collaborative Program will be decided by the executive committee, comprised of the Coordinator and Associate Coordinator of the Collaborative Program. It is the student's responsibility to provide justification for an exemption. This can be either:
  - i. Prior to admission to the Collaborative Program in Chemical and Environmental Toxicology, or
  - ii. By taking one of the two introductory courses, Principles of Toxicology (BIOL 6402/BIO 9101 - CHEM 5708/CHM 8156) or Ecotoxicology (BIOL 6403/BIO 9104 - CHEM 5706/CHM 9109), while registered in the Collaborative Program.
2. The Seminar in Toxicology (BIOL 6405/BIO 9105 - CHEM 5805/CHM 8167).
3. Additional courses required by the Master's Program and approved by the Collaborative Program.
4. Thesis Requirement - a research thesis on a topic in toxicology supervised by a faculty member of the Collaborative Program in Chemical and Environmental Toxicology.

Note: In addition, the student's Advisory Committee may direct the student to take or audit further courses to complement the student's background and research program. Other courses offered in the programs of the primary academic units of biology or chemistry may be taken as options, with the permission of the student's supervisory committee, in addition to the basic requirements of the Collaborative Program in Chemical and Environmental Toxicology.

## **Ph.D. (Biology, Chemistry or Earth Sciences) with Specialization in Chemical and Environmental Toxicology**

### **About the Program**

Toxicology is the study of effects of toxic substances on living systems. These toxic substances can either be organic or inorganic, synthetic or natural materials. The study of toxicology crosses traditional disciplinary boundaries such as chemistry, biology, and the environmental sciences. Environmental toxicology further extends to aspects of chemical transport, fate, persistence and biological accumulation of toxic substances and their effects at the population and community levels. While individual researchers usually specialize in a particular area, toxicologists must be able to appreciate significant research in other fields and therefore require an understanding of the basic principles of other disciplines. To meet this challenge the University of Ottawa and Carleton University offer a Collaborative Program in the

supporting Institutes (OCIB, OCCI, and OCGC) leading to a Ph.D. with Specialization in Chemical and Environmental Toxicology.

### Academic Regulations

See the General Regulations (<http://www.carleton.ca/calendars/2012-13/grad/gradregulations>) section of this Calendar.

### Admission Requirements

Applications should be directed to the primary participating unit that is the most appropriate to the student's research interests. Once accepted and registered in one of the Institutes, students must be sponsored into the Collaborative Program in Chemical and Environmental Toxicology by a faculty member involved in the program; this will normally be the student's thesis supervisor. Application forms and further information can be obtained by writing directly to any of the participating Institutes or Departments or to the program Coordinator.

The requirements for admission to the Collaborative Program in Chemical and Environmental Toxicology at the Ph.D. level are as follows:

1. Prior admission to the Ph.D. program in one of the supporting Institutes participating in the program.
2. A letter of recommendation from a participating faculty member who is a member of the Collaborative Program, which both recommends admission and indicates the willingness of the professor to supervise the candidate's research program in Chemical and Environmental Toxicology.

### Program Requirements

Students are responsible for fulfilling both the Institute and Departmental requirements for the Ph.D. degree, and the requirements of the Collaborative Program.

The requirements of the Collaborative Program are as follows:

1. All courses required by the primary program and approved by the Collaborative Program. If an introductory course (either Principles of Toxicology (BIOL 6402/BIO 9101/CHEM 5708/CHM 8156 or Ecotoxicology (BIOL 6403/BIO 9104/CHEM 5705/CHM 9109 [0.5 credit] ), or an approved alternative) has not been completed prior to admission, it must be included among these courses.
2. The Seminar in Toxicology (BIOL 6405/BIO 9105 - CHEM 5805/CHM 8167 [0.5 credit] (see Note, below)
3. In addition, students may be directed by their Advisory Committee to take or audit further courses to complement their background and research program. A list of approved electives is provided under 'Graduate Courses'.
4. Thesis Requirement - a research thesis on a topic in toxicology supervised by a faculty member of the Collaborative Program in Chemical and Environmental Toxicology.

Item 2 above is not required for students who have already completed the Seminar in Toxicology for the Master's specialization.

### Chemical and Environmental Toxicology Courses

See departmental course lists for full descriptions.

Other courses listed in the calendar under the primary academic units of psychology, biology, or chemistry may be taken, with the approval of the student's advisory committee, as options in addition to the basic requirements of the degree in chemical and environmental toxicology.

BIOL 6402/CHEM 5708 [0.5] (BIO 9101)	Principles of Toxicology	0.5
BIOL 6403/CHEM 5705 [0.5] (BIO 9104)	Ecotoxicology	0.5
BIOL 6405/CHEM 5805 [0.5] (BIO 9105)	Seminar in Toxicology	0.5
BIOL 5709/CHEM 5709 [0.5] (BIO 8113)	Chemical Toxicology	0.5