



**University of Guelph, School of Environmental Sciences  
ENVS\*4000 [0.50 credits]**



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**Instructor: Dr. Aaron Fairweather (They/Them)**

**Class Times and Location:**

LECTURES: Mon, Wed 11:30am - 12:50pm  
Start: Jan 5<sup>th</sup>  
End: April 6th

**In person:** MINS (McDonald Institute) 106

**EXAM:** Tuesday, April 14th, 2026 (Due date, take-home exam)

**Contact details:**

**Instructor Contact:**

Dr. Aaron Fairweather (They/Them)  
[fairweaa@uoguelph.ca](mailto:fairweaa@uoguelph.ca)

**TA Contact:**

Ryan Rosniak, MSc Student (He/Him)  
[rrosniak@uoguelph.ca](mailto:rrosniak@uoguelph.ca)

**Office Hours:**

Instructor: By Appointment Only. Please contact by e-mail.

**Land Acknowledgement: Guelph**

The University of Guelph resides on the ancestral lands of the Attawandaron people and the treaty lands and territory of the Mississaugas of the Credit. We recognize the significance of the Dish with One Spoon Covenant to this land and offer respect to our Anishinaabe, Haudenosaunee and Métis neighbours. Today, this gathering place is home to many First Nations, Inuit, and Métis peoples and acknowledging them reminds us of our important connection to this land where we work and learn.

**Calendar Description**

This advanced course will give students a working knowledge of current processes and techniques for toxicological risk characterization. The course material will cover problem definition, effect characterization, exposure characterization, risk assessment and risk management decision making.

**Prerequisite(s):** TOX\*2000

**Department(s):** School of Environmental Sciences

**Course Description:**

This course explores the diverse modes of action of botanical, microbial and synthetic insecticides, acaricides and nematicides. Detoxification mechanisms, selectivity, resistance management and the process of pesticide discovery and development are also considered. The course includes a review of insect physiological systems and discussion of the stability and distribution of pesticides in the environment.

**Statement of Learning Outcomes:**

**Additional Support**

**Course Website**

CourseLink (powered by D2L's Brightspace) is the course website and will act as your classroom. It is recommended that you log in to your course website every day to check for announcements, access course materials, and review the weekly schedule and assignment requirements.

<https://courselink.uoguelph.ca/shared/login/login.html>

**Recommended textbook for further learning**

Suter GW, II, Barnthouse LW, Bartell SM, Cormier SM, Mackay D, Mackay N, Norton SB. 2007. Ecological Risk Assessment. Boca Raton, FL: CRC Press/Taylor and Francis. 634 p.

**Learning Resources**

**Campus Resources**

If you are concerned about any aspect of your academic program: Make an appointment with a Program Counsellor (<https://www.uoguelph.ca/uaic/programcounsellors/>) in your degree program. If you are struggling to succeed academically: There are numerous academic resources offered by the Learning Commons (<https://www.lib.uoguelph.ca/using-library/spaces/learning-commons/>) including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills.

**Cost of Textbooks and Learning Resources**

No required resources.

## **Course Learning Outcomes**

1. Define and evaluate problems in ecological and human toxicology
2. Explain how to measure and be able to characterize effects
3. Distinguish between assessment endpoints, effect measures, and test endpoints
4. Explain how to measure and be able to characterize exposure
5. Explain how to calculate hazards and risks and be able to distinguish between a hazard and a risk assessment
6. Explain the integration of risk assessment and risk management in decision making
7. Apply these principles to a real-life, hands-on problem with a chemical chosen by the student from a supplied list

## **Teaching and Learning Activities**

### **Assignments 1 to 3**

Assignments 1 to 3 are meant to prepare you for the term paper that is due at the end of the course. The term paper requires you to complete an ecological risk assessment on a pesticide to aquatic ecosystems. Assignments I to III will prepare you to complete a number of components of an ecological risk assessment. A description of each assignment is provided on Courselink. The assignments will be submitted to the Courselink dropbox by 11:59 pm on the assigned due date.

### **Ecological Risk Assessment or Human Health Risk Assessment**

The term paper will involve the student completing an ecological risk assessment or human health risk assessment on a chemical to aquatic ecosystems or humans. A description of the ecological risk assessment or human health risk assessment that will be completed by the student for the term paper is described on Courselink. It will be due to the Courselink dropbox by 11:59 pm on Sunday, April 5th.

Each student needs to choose one of the chemicals below to complete their independently written ecological risk assessment or human health risk assessment. They will tell Dr. Fairweather which chemical they wish to choose for their term paper. Chemicals will be assigned on a first-come-first-serve basis. Limit of 2 students per chemical. Sign ups are completed in a shared google sheet here:

<https://docs.google.com/spreadsheets/d/1jDxOxy5v0Wga5du3ZFObkmHaD3qr5e6eTaBcw55i80Y/edit?usp=sharing>

- 2,4-D
- Thiamethoxam
- Imidacloprid

- Clothianidin
- Chlorpyriphos
- Cypermethrin
- Metolachlor
- Captan
- Atrazine
- Azoxystrobin
- Boscalid
- Chlorothalonil
- Pyraclostrobin
- Dicamba
- Bromoxynil
- Malathion
- Carbaryl
- Glyphosate
- Triclosan
- Triclopyr
- Bifenthrin
- Metformin\*
- Venlafaxine\*
- Carbamazepine\*
- Perfluorooctane sulfonate (PFOS)
- Perfluorooctanoic acid (PFOA)
- N1-(4-Methylpentan-2-yl)-N4-phenylbenzene-1,4-diamine (6PPDQ)
- Perfluorohexane sulfonate (PFHxS)
- Microcystin-LR
- Fluoxetine\*
- Sertraline\*
- Citalopram\*
- Tributyltin
- Bisphenol A

\* Human pharmaceutical, so extensive human health risk assessment already performed on these active ingredients. Only available for ecological risk assessment

### **Midterm Examination**

The midterm examination will be a take-home exam. It will be available on Courselink on Monday, February 23rd at 12:00 am. The completed mid-term exam needs to be submitted to dropbox on Courselink by Wednesday, February 25th at 11:59 pm. The midterm examination will cover all material (including guest lectures) up to and including the lecture on Friday, February 12th.

### **Final Examination**

The final examination will be a take-home exam. It will be available on Courselink on Monday, April 6th at 12:00 am. The completed final exam needs to be submitted to dropbox on Courselink by Tuesday, April 14th, 11:59 pm. The final examination will cover all material presented in the course.

**Mark Allocations:**

Assignment/Exam	Value	Due Date	Learning Objectives
Take-home Assignment #1: Hazard Assessment	10%	Dropbox, Sunday, January 25th, 11:59 pm	All*
Take-home Assignment #2: Species Sensitivity and Exposure Distributions	10%	Dropbox, Sunday, February 15th, 11:59 pm	All*
Take-home Mid-term Examination	20%	Available, Monday, February 23rd, 12:00 am Dropbox, Wednesday, February 25th, 11:59 pm	All*
Take-home Assignment #3: Species Sensitivity Distributions from Interspecies Correlation Estimate	10%	Dropbox, Sunday, March 22nd, 11:59 pm	All*
Ecological or Human Health Risk Assessment	25%	Dropbox, Sunday, April 5th, 11:59 pm	All*
Final Examination	25%	Available, Monday, April 6th, 12:00 am Dropbox, Tuesday, April 14th, 11:59 pm	All*

\*Each grade has components assessing each of the course learning outcomes.

- Re-evaluations: Students have 5 class-days upon receiving the evaluated assignment to appeal the grade received. The entire assignment will be re-evaluated for accuracy.

**Last Day to Drop Course**

The final day to drop Winter 2025 courses without academic penalty is the last day of classes: April 06

After this date, a mark will be recorded, whether course work is completed or not (a zero is assigned for missed tests/assignments). This mark will show on the student's transcript and will be calculated into their average.

**Policy on Late Assignments:**

All take-home assignments are due by midnight (00:00 EST) to the Counselink dropbox the night they are due. A penalty of 10% per day will be deducted for late assignments without excuse. Great leniency and consideration will be given to due dates, **however an email requesting extension is a must.**

**Course Policy on Group Work:**

All students must submit independently written assignments.

**Standard Statements for Undergraduate Courses**

**Academic Integrity**

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community – faculty, staff, and students – to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

The Academic Misconduct Policy (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-misconduct/>) is outlined in the Undergraduate Calendar.

**Accessibility**

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability. Use of the SAS Exam Centre requires students to make a booking at least 10 days in advance, and no later than the first business day in November, March or July as appropriate for the semester. Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time. For students at the Guelph campus, information can be found on the SAS website. (<https://www.uoguelph.ca/sas/>)

### **Accommodation of Religious Obligations**

If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor within two weeks of the start of the semester to make alternate arrangements. See the Academic calendar for information on regulations and procedures for Academic Accommodations of Religious Obligations (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-accommodation-religious-obligations/>).

### **Copies of Out-of-class Assignments**

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

### **Drop Date**

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all undergraduate students except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in the Undergraduate Calendar - Dropping Courses (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/dropping-courses/>)

### **Email Communication**

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

### **Health and Wellbeing**

The University of Guelph provides a wide range of health and wellbeing services at the Vaccarino Centre for Student Wellness (<https://wellness.uoguelph.ca/>). If you are concerned about your mental health and not sure where to start, connect with a Student Wellness Navigator(<https://wellness.uoguelph.ca/navigators/>) who can help develop a plan to manage and support your mental health or check out our mental wellbeing resources (<https://wellness.uoguelph.ca/shine-this-year/>). The Student Wellness team are here to help and welcome the opportunity to connect with you.

## **Illness**

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g., final exam or major assignment). Recording of Materials

Presentations that are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## **Resources**

The Academic Calendars (<http://www.uoguelph.ca/registrar/calendars/?index>) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

## **When You Cannot Meet a Course Requirement**

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the Undergraduate Calendar for information on regulations and procedures for Academic Consideration. (<https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-consideration-appeals-petitions/>)

## **Course Evaluations:**

The School of Environmental Sciences takes student feedback seriously. The SES Director sees all student feedback and discusses this feedback with the faculty where appropriate. Numerical scores and *signed* student comments are reviewed by the School's Tenure & Promotion Committee, and are considered in our evaluation of the faculty member for the granting of tenure, advancement in rank, and performance related salary increases. This committee will NOT see comments that are not signed by the student. *Faculty members are not able to access their own teaching evaluations until after their final grades are submitted to the registrar.*

## **Writing and Learning Services at McLaughlin Library:**

The University of Guelph McLaughlin Library offers a variety of writing and learning services for students that want help with any stage of writing, presentation, or managing their workload. Taking advantage of these free services is highly encouraged.

### **Appointments for Writing Support**

- Services at all stages in the writing process (from brainstorming to completed drafts) to build skills and create action plans
- Specialized consultations for English language learners

[Appointments](#) are available online and in-person. Questions? Email [writing@uoguelph.ca](mailto:writing@uoguelph.ca)

### **Appointments for Studying, Time Management, and Presentation Skills**

- Strategies for creating a study plan, managing a heavy courseload, and reducing procrastination
- New approaches to note-taking and studying for exams
- Opportunities to practice your presentations and receive feedback

[Appointments](#) are available online and in-person. Questions? Email [learning@uoguelph.ca](mailto:learning@uoguelph.ca)