

**ENVS\*4370 Environmental Organic Chemistry**

Winter 2018

Section(s): C01

Credit Weight: 0.50

Version 1.00 - January 04, 2018

# Course Details

## Calendar Description

This course discusses the chemical processes that influence organic compounds in the environment, including both anthropogenic organic compounds, such as pollutants and pesticides, and natural organic matter, such as humic materials and biomolecules. Topics include: the occurrence of organic contamination in the environment, emerging classes of organic contaminants, the relationship between molecular structure and environmental fate, persistent organic pollutants, the transformation of organic molecules in the environment, and the origins and functionality of natural organic matter in terrestrial and aquatic environments.

### Pre-Requisite(s):

* 1. **Timetable**

ENVS\*3220

### Monday, Wednesday, Friday

11:30AM-12:20PM MCKN 225

## Final Exam

**April 20** 2:30PM-4:30PM

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

# Instructional Support

## Instructor(s)

### James Longstaffe Email:

**Office:**

**Office Hours:**

[jlongsta@uoguelph.ca](mailto:jlongsta@uoguelph.ca) Alexander Hall 307

By appointment (please email)

# Learning Resources

## Additional Resources(s)

### CourseLink (Website)

[https://courselink.uoguelph.ca](https://courselink.uoguelph.ca/)

# Learning Outcomes

## Course Learning Outcomes

By the end of this course, you should be able to:

* + 1. Identify environmentally important chemical compounds by their molecular structure and explain their functionality and environmental role/consequences through independent analysis.
    2. Predict the fate of environmental contaminants by applying an understanding of the relationships between environmental attenuation processes and molecular properties.
    3. Design solutions to environmental contamination by applying decision-making trees in case study exercises.
    4. Demonstrate a familiarity with the application of advanced molecular-level tools for understanding the structure and behaviour of organic compounds in the environment, including NMR, fluorescence spectroscopy, stable isotope analysis, and biomarker analysis.
    5. Demonstrate the importance of a molecular-level understanding of natural environmental systems as a basis from which to address contemporary environmental issues through oral and written communications to the class.

# Teaching and Learning Activities

## Lecture

### Week 1

**Topic(s):**

**Week 2**

**Topic(s):**

**Week 3**

**Topic(s):**

**Week 4**

**Topic(s):**

**Week 5**

**Topic(s):**

**Week 6**

**Topic(s):**

Introduction, The Carbon Cycle, The First Molecules of Life Organic Compounds in the Atmosphere

Organic Compounds in the Aquatic Environment

Review of Reaction Mechanisms, Kinetics, Linear Free Energy Relationships

Photochemical Transformations Hydrolysis & Other Nucleophilic Reactions

### Week 8

**Topic(s):**

**Week 9**

**Topic(s):**

**Week 10 Topic(s):**

**Week 11 Topic(s):**

**Week 12 Topic(s):**

Fluorescence & Nuclear Magnetic Resonance Organic Compounds in Soils and Sediments Microbial Transformations

Biomarkers Stable Isotopes

# Assessments

## Assessment Details

**Assignment 1 (10.00%) Date:** Mon, Jan 22

**Assignment 2 (10.00%) Date:** Mon, Feb 5

**Assignment 3 (10.00%) Date:** Fri, Feb 16

**Assignment 4 (10.00%) Date:** Fri, Mar 16

**Assignment 5 (10.00%) Date:** Mon, Apr 2

**Midterm Exam (20.00%) Date:** Fri, Mar 2

**Final Exam (30.00%) Date:** Fri, Apr 20

# Course Statements

## Grading Policies

Assignments are reduced by 20% of their evaluated grade when over 24 hours late unless prior permission is granted by instructor. A grade of 0% is assigned for any assignment not received by the final exam.

## Group Work Policy

Students are expected to complete all assignments on their own unless otherwise instructed.

# University Statements

## Email Communication

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

## 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. The regulations and procedures for [Academic Consideration](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml) are detailed in the Undergraduate Calendar.

## Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two- semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for [Dropping Courses](https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml) are available in the Undergraduate Calendar.

## 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.

## 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 book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: [www.uoguelph.ca/sas](http://www.uoguelph.ca/sas)

## Academic Misconduct

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://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml) is detailed in the Undergraduate Calendar.

## Recording of Materials

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

## Resources

The Academic Calendars are the source of information about the University of Guelph’s procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

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