**University of Manitoba**
**BIOL2380/AGRI2180/ENVR2180**
**Introduction to Toxicology**

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## COURSE DETAILS

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|---|---|
| **Course Title & Number:** | BIOL2380/ENVR2180/AGRI2180: Introduction to Toxicology |
| **Number of Credit Hours:** | 3 Credit Hours |
| **Class Times & Days of Week:** | Tuesdays and Thursdays 2:30 PM to 3:45 PM |
| **Lecture location:** | Zoom – link will be provided prior to the first class. You must register the first time you sign in for class. Lectures will be recorded and made available for 72 hours after the lecture. |
| **Pre-Requisites:** | (Undergraduate level BIOL 1030 Minimum Grade of C or Undergraduate level BIOL 1031 Minimum Grade of C or BIOL 1030 - PQ Substitution 060 or Undergraduate level 071 125 Minimum Grade of C) and (Undergraduate level CHEM 1310 Minimum Grade of C or Undergraduate level CHEM 1311 Minimum Grade of C or Undergraduate level 002 131 Minimum Grade of C or CHEM 1310 - PQ Substitution 060 or Undergraduate level CHEM 1320 Minimum Grade of C or Undergraduate level 002 132 Minimum Grade of C or CHEM 1320 - PQ Substitution 060) |

## Instructor Contact Information

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|---|---|
| **Instructor Name:** | Dr. Ken Jeffries |
| **Preferred Form of Address:** | You can call me Ken. |
| **Office Location:** | Not applicable in 2021. |
| **Office Hours or Availability:** | There will be no official office hours, however I will be available immediately following lectures. You can also make an appointment by email.<br><br>The Responsibilities of Academic Staff in Regards to Students – ROASS- requires that instructors/professors must be available to students for consultation out of class or laboratory hours. |
| **Office Phone No.** | Not applicable in 2021. |
| **Email:** | Ken.Jeffries@umanitoba.ca |
| **Contact:** | You must use your official University of Manitoba email address to get a hold of me and I will try to get back to you as soon as I can. Please indicate in the email your name, student number and the course to avoid confusion. |

## Course Description

A survey of general principles underlying the effects of toxic substances on biological systems, including consideration of the history, scope and applications of toxicology, the mechanisms of toxic action, some major types of toxicants, and effects in the environment.

## Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the University's Copyright Office website at http://umanitoba.ca/copyright/ or contact um_copyright@umanitoba.ca.

## Recording Class Lectures

The student is expected to take notes during lectures and course materials, provided online, are for the participant's private study and research. Dr. Jeffries and the University of Manitoba hold copyright over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without permission from Dr. Jeffries.

## Textbook, Readings, Materials

There are no required textbooks for this course. However, there are toxicology textbooks available for free through the University of Manitoba library. The following are recommended for general background for some topics and can be used for supplementary reading:

Casarett & Doull's *Essentials of toxicology*, 3rd ed., McGraw-Hill Education LLC, 2015.

Casarett & Doull's *Toxicology: The Basic Science of Poisons*. Ninth edition., McGraw-Hill Education / Medical, 2019.

Supplementary readings may be provided through UMLearn over the semester.

## Course Technology

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting only for educational purposes approved by instructor and/or the University of Manitoba Disability Services. Student should not participate in personal direct electronic messaging/posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook) online and offline "gaming" during scheduled class time. If student is on call (emergency) the student should switch his/her cell phone on vibrate mode and leave the classroom before using it. (©S Kondrashov. Used with permission).

## Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students please visit: http://umanitoba.ca/admin/governance/media/Electronic_Communication_with_Students_Policy_-_2014_06_05.pdf

Please note that all communication between myself and you as a student must comply with the electronic communication with student policy (http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html). You are required to obtain and use your U of M email account for all communication between yourself and the university.

## Expectations: I Expect You To…

- ATTEND CLASS. The concepts of our lectures build on each other throughout the course, and it is crucial to attend all classes to learn the material. ALSO: We will cover material in class that is *not* going to be in the notes, so be there to learn it!!

- ASK QUESTIONS. The whole goal of science is to ask questions, and asking questions if you are not completely clear on the material is normal and encouraged. You can ask questions in class, but if you are uncomfortable doing this send me an email and I will try to provide an answer for everyone on UM Learn. I may cover it before lecture in the next class. If enough people indicate that they did not understand a concept, I will go over it again.

- SEEK HELP if you are experiencing difficulty, the earlier the better!

- Use cellphones and laptops in lecture *only if you are following along with the lecture slides*. Doing other things on your electronic devices is very distracting to your learning *and* to those around you. Studies have shown that a student using their laptop distracts those around them to the point that their final grade is reduced.

- BE RESPECTFUL to me and your peers.

## Expectations: You Can Expect Me To…

- BE AVAILABLE after class for questions.

- BE AVAILABLE for you to ask questions if make an appointment by booking a time via email.

- HAVE LECTURE SLIDES POSTED to UMLearn *at least* the night before lecture at the latest.

- ANSWER YOUR EMAILS as quickly as I can. If it gets lost in the deluge of emails, send me another email after 48 hours to remind me.

- PROVIDE you with test grades within one week.

## Students Accessibility Services

If you are a student with a disability, please contact Student Accessibility Services (SAS) for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a

disability (e.g., mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.
http://umanitoba.ca/student/saa/accessibility/
520 University Centre
(204) 474-7423
Student_accessibility@umanitoba.ca

## Class Schedule

This schedule is subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to Section 2.8 of the – ROASS-Procedure).

| Lecture | Date | Topic |
|---|---|---|
| 1 | Jan 19 | Introduction to toxicology |
| 2 | Jan 21 | Dose response curves |
| 3 | Jan 26 | Dose response curves & bioassays |
| 4 | Jan 28 | Factors influencing toxicity |
| 5 | Feb 2 | Disposition: Absorption and distribution |
| 6 | Feb 4 | Disposition: Biotransformation and elimination |
| 7 | Feb 9 | Cellular and tissue targets of toxicity |
| | Feb 11 | **Exam I (Covering lectures 1-6)** |
| | Feb 16 | **Winter Break!** |
| | Feb 18 | **Winter Break!** |
| 8 | Feb 23 | Metals |
| 9 | Feb 25 | Solvents and PAHs |
| 10 | Mar 2 | Food toxicology |
| 11 | Mar 4 | Air pollution |
| 12 | Mar 9 | Pesticides |

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|---|---|---|
| | Mar 11 | **Exam II (Covering lectures 7-11)** |
| 13 | Mar 16 | Pesticides |
| 14 | Mar 18 | Bioaccumulation and biomagnification |
| 15 | Mar 23 | Wastewater effluent and surface run-off in freshwater |
| 16 | Mar 25 | Pollution in the Arctic |
| 17 | Mar 30 | Tentative: Oil spills and fracking |
| | Apr 1 | **Exam III (Covering lectures 12-16)** |
| 18 | Apr 6 | Toxicogenomics |
| 19 | Apr 8 | Tentative: Toxicology and invasive species control |
| 20 | Apr 13 | Tentative: $CO_2$ pollution in aquatic systems |
| 21 | Apr 15 | Finish remaining topics |

## Course Evaluation Methods

**TESTS/EXAMS:**

**a.** There will be three non-cumulative midterm exams (**Feb. 11th, Mar. 11th, Apr. 1st**) and a final exam, which may consist of multiple choice, multi-select and true or false questions. The three midterm exams will be online through UM Learn during the normal scheduled class time. The final exam (date and time to be announced) will be comprised of two parts – one part covering material specific to the last quarter of the lectures, and the other part will be comprised of questions that cover content from the entire course.

**b.** If you are going to miss one of the midterms for a valid reason (i.e, sick, family emergency), you may write a deferred exam (date to be announced). If you need to notify me BEFORE the exam. Failure to write the exam without prior arrangements with me, will result in a grade of zero for the exam.

**c.** You must write the final exam to pass the course.

**d.** If you miss the final exam, you must apply and provide other documentation to your home Faculty in order to qualify to write a deferred final exam.

| Date: | Assessment Tool | Value of Final Grade* |
|---|---|---|
| Feb 11, 2021 | Exam I | 25% |
| March 11, 2021 | Exam II | 25% |
| April 1, 2021 | Exam III | 25% |
| TBD | Final exam | 25% |

## Grading

Letter grade calculations for this course follow the standard Department of Biological Sciences scale:

| Letter Grade | Percentage out of 100 | Grade Point Range | Final Grade Point |
|---|---|---|---|
| A+ | 90-100 | 4.25-4.5 | 4.5 |
| A | 80-90 | 3.75-4.24 | 4.0 |
| B+ | 74-79 | 3.25-3.74 | 3.5 |
| B | 68-73 | 2.75-3.24 | 3.0 |
| C+ | 62-67 | 2.25-2.74 | 2.5 |
| C | 56-61 | 2.0-2.24 | 2.0 |
| D | 50-55 | Less than 2.0 | 1.0 |
| F | Less than 50 | | 0 |