

BIOL 2380/AGRI 2180/ENVR 2180
Introduction to Toxicology
Winter 2023

Instructor:

Dr. Elizabeth Hughes, Ph.D.

Email: Elizabeth.hughes@umanitoba.ca

Office: 120 Biological Sciences Building

Office hours: I will be available briefly immediately after class or by appointment. Please email at any time to arrange a meeting.

Time and Location:

Tuesday, Thursday 2:30 – 3:45

Location: 172 Robert Schultz Lecture Theatre

Attendance is mandatory, missing class will result in missing information. I will talk about the course materials in more depth than is shown in the lecture slides.

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.

Prerequisites: Prerequisites: [BIOL 1030 or BIOL 1031] and [(CHEM 1100 and one of CHEM 1110, CHEM 1120, CHEM 1126, or CHEM 1130) or (one of CHEM 1311, the former CHEM 1310, or the former CHEM 1320)].

Required Textbook:

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. (most of the first third of the course follows this textbook).

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

Supplementary readings may be provided through UMLearn throughout the semester.

Course Evaluation:

Assignments – 20%

There will be 4 assignments throughout the term that will require you to apply your knowledge on a range of subjects we will be studying in this course. Assignments will be made available on UMLearn at noon on the day listed in the course schedule and will be due one week later at noon on the due date listed in the course schedule.

Mid-term Exam #1 – 20%

Tuesday February 7, 2:30 pm

60 minute, in-class exam

40 multiple choice questions, beginning of the course up to materials learned Thursday Feb 2

Midterm Exam #2 – 20%

Thursday March 16, 2:30 pm

60 minute, in-class exam

40 multiple choice questions, materials learned Thursday Feb 9 to Tuesday March 14

Final Examination – 40%

2-hour exam, 80 multiple choice questions

This exam will be cumulative, covering material learned throughout the full course

Date and time will be scheduled by the Registrar's Office during the final exam period

Quizzes and exams will cover all material in the lecture PowerPoint slides, supplemental readings, information the instructor verbally communicates, and all class discussions.

Your mark at the end of the course will be out of 100%. The final grade will be assigned by converting your final cumulative percent score into a letter grade according to the following breakdown. Grades will not be rounded up under any circumstances.

90.0 – 100%	A+
80.0 – 89.9%	A
76.0 – 79.9%	B+
70.0 – 75.9%	B
60.0 – 69.9%	C+
55.0 – 59.9%	C
50.0 – 54.9%	D
49.9% or lower	F

If you must miss a midterm exam for a valid reason you must contact me, preferably before the exam, and no more than 48 hours after missing the exam. A deferred exam date and location will be determined after each exam. If you miss the final exam you will be subject to your home faculty's deferral processes. You must write the final exam to pass the course, until the deferred final exam is written your grade will appear as an F on your transcript.

Communication

All students are required to use their University of Manitoba email address for communication with their professors and instructors. When sending me an email please indicate your first and last name, and which course you are taking with me. I teach four courses this term so you need to let me know what course you are asking me questions about for me to be able to answer you!

Telegram and/or What's App and/or Group Chats Please be aware of the University of Manitoba policies regarding group chats on University sanctioned and non-University sanctioned platforms. It is strongly recommended if these groups are formed, that the instructor(s) be a part of the discussions to avoid misinformation regarding course material and exam administration and to maintain respectful and appropriate discourse. Anyone who is concerned that group chats have strayed into being disrespectful or inappropriate are encouraged to notify the instructor or the department head. All chats must be disabled during examination periods. Evidence of academic dishonesty revealed through group chats will be investigated as per University of Manitoba Student Academic Misconduct policies and appropriate disciplinary action will be taken. If you are aware of academic dishonesty revealed through group chats, it is strongly recommended that you report it, otherwise you may be considered implicit!

Course Schedule and List of Topics

This list of topics is tentative and is subject to change at any time based on time constraints

Topic

Part 1 – Introduction to toxicology

- Introduction to toxicology
- Dose response curves and bioassays
- Factors influencing toxicity
- Disposition: Absorption and distribution
- Disposition: Biotransformation and elimination
- Cellular and tissue targets of toxicity

Part 2 – Types of toxins

- Metals
- Solvents and VOCs
- Air pollution
- Bioaccumulation, biomagnification, POPs
- Pesticides
- Food Toxicology

Part 3 – Toxins in ecological systems

- Wastewater effluent and surface run-off in freshwater
- CO₂ in aquatic systems – Guest Speaker (Tentative)
- Toxicogenomics
- Toxicology of invasive sea lamprey control
- Ecotoxicology in the Arctic – Guest Speaker (Tentative)
- Oil spills – Guest Speaker (Tentative)

Quiz and Exam Schedule

Course Requirement	Date
Assignment #1	Jan 26, due Feb 2
Midterm #1	Tuesday February 7, 2:30pm, in-class exam
Assignment #2	Feb 16, due March 2
Assignment #3	March 16, due March 23
Midterm #2	Thursday March 16, 2:30pm, in-class exam
Assignment #4	April 6, due Apr 13
Final Exam	To be scheduled by the Registrar's office

Other important dates

January 9	Start of Classes
January 20/21	End of class revision period
February 7	Fee deadline
February 21 - 24	Winter break
March 22	Voluntary withdrawal deadline
April 12	Last day of classes
April 14 - 28	Final exam period

Student Responsibilities:

Punctual attendance to lectures is expected. I will cover material in more detail than it is found in the course PowerPoints. Therefore, missing class means that you will miss information. You are responsible for taking your own notes and reading the appropriate sections of the textbook and completing the assignments on time. Lectures will not be recorded and cannot be made up, you will be responsible for learning the missed material on your own. Failure to complete an assignment on time will result in a grade of zero on that assignment.

I expect that if you do not understand something or would like clarification you will ask me questions by email, after the lecture, or in lectures. I welcome interruptions to my lectures to answer content-specific questions. Doing so only improves the learning experience for everyone. I will respond to student emails as quickly as possible.

Students in the University community can freely express their thoughts, opinions, and beliefs however, they must observe the Respectful Work and Learning Environment Policy ([Respectful Work and Learning Environment \(RWLE\) policy | University of Manitoba \(umanitoba.ca\)](#)) and treat each other, staff, and faculty with respect. Students who are alleged to have breached the Respectful Work and Learning Environment Policy will be investigated and disciplined according to the Student Non-Academic Misconduct and Concerning Behaviour Procedure ([Student Non-Academic Misconduct and Concerning Behaviour Procedure - 2018 09 01.pdf \(umanitoba.ca\)](#)).

How to succeed in your science courses

Registration Revision Period: Use the Registration Revision Period to evaluate the course syllabus. During the registration revision period you will be able to drop/add courses without any financial consequence.

Evaluate Workload: Take time to consider the workload associated with the course schedule you are planning. Be realistic about other commitments and distractions that are part of everyday life and make your course selection decisions accordingly.

Commitment to Study: The faculty of science recommends committing at least three hours of studying for every hour of lecture. We have approximately 3 hours of lecture per week which means you should be studying for our course at least 9 hours per week. Make sure you keep up with studying on a consistent basis.

Reach Out for Help: If you experience issues learning the course material, reach out to your instructor or Academic Learning Centre for the course as soon as possible. Most content builds on previous content and deficiencies in understanding will cascade issues throughout the course.

Learn Efficiently, Learn to Take Notes: Review note-taking tips offered by the Academic Learning Centre which can help you learn efficiently.

Covid 19 specific requirements while on campus

Masking in Classes

The wearing of masks is mandatory for all activities on all UM campuses and while participating in UM-sanctioned activities off-campus. Please visit Latest COVID-19 Recovery Updates ([UM Today | Latest COVID-19 Recovery updates \(umanitoba.ca\)](#)) for the most up-to-date policy on acceptable mask type. Masks must be worn while you are attending lectures.

Illness

Short-Term Academic Accommodations

Please make sure you follow the University's COVID-19 Health and Safety Protocols ([COVID-19 \(coronavirus\) | University of Manitoba \(umanitoba.ca\)](#)). Notably, exercise good hand hygiene, stay home if you are ill and you must wear a mask when attending lecture on campus.

For students who are ill and test positive for COVID-19:

Please check this webpage for the most up-to-date protocols: [COVID-19 \(coronavirus\) | University of Manitoba \(umanitoba.ca\)](#).

- Do not travel to the University and follow all Manitoba Public Health directives
- Complete the COVID-19 case reporting form ([COVID-19 case reporting | University of Manitoba \(umanitoba.ca\)](#))
- Self-isolate and contact your instructor to make arrangements for extensions, deferrals or make-up assignments.
- If you miss lectures due to illness, reach out to your instructor and/or classmates to see if they have notes to share with you.

Long-Term Academic Accommodations

Students with long-term academic accommodations are usually registered with Student Accessibility Services. The long-term academic accommodations are usually to accommodate long term physical or mental illness and accommodations can be in the form of notetaking, interpreting, assistive technology, and assessment accommodations.

Missed Course Work

Please follow these guidelines if you are unable to meet an academic requirement for your course (assignments, quizzes, exams):

- Contact your instructor for term work such as a class, quiz, midterm/test within 48 hours of missing the work
- Contact an advisor in your faculty of registration for a missed final exam no later than 48 hours after the missed exam

Students who are unable to meet a course requirement due to medical circumstances are currently not required to submit medical notes. However, students are required to contact their instructor or academic advisor by email to inform of the missed work and make arrangements for extensions, deferrals, or make-up assignments. Please follow these guidelines, if you are unable to meet an academic requirement for this course.

*Please note that circumstances that result in missing multiple course assignments/tests/classes may require medical documentation (e.g., Authorized Withdrawal, Tuition Fee Appeal, Leave of Absence, or [accessibility-related accommodations](#)). Students are advised to speak with an [advisor in their faculty/college/school of registration](#) in this case.

If Your Instructor Becomes Ill

Should I become ill, I may post video lectures on UM Learn for you to watch for up to two consecutive lectures so that we do not fall behind. If I need to miss class, I will inform you by posting an announcement on UM Learn.

Academic Integrity:

Academic integrity is taking responsibility for and being honest with your work and respecting the work of others. Since you are a member of the university community, we want you to learn what that responsibility and honesty entails and how we respect the work of others. The Faculty of Science continues to uphold high standards of academic integrity. We know that you, our students, support us in this and we count on each and every one of you to do your part.

Please view information with regards to academic integrity: **be aware; be proactive; be smart and be honest.**

- Academic Integrity Message from Associate Dean Krystyna Koczanski:
<https://youtu.be/Ok-lilm4SeE>
- The Student Discipline By-Law may be accessed at:
[http://umanitoba.ca/admin/governance/media/Student Discipline Bylaw - 2009 01 01.pdf](http://umanitoba.ca/admin/governance/media/Student_Discipline_Bylaw_-_2009_01_01.pdf)
- The list of suggested minimum penalties assessed by the Faculty of Science for acts of academic dishonesty is available on the Faculty of Science webpage:
[http://umanitoba.ca/faculties/science/resources/Acad Dishon TABLE RevCSS AdminC Jul2012 WEB.pdf](http://umanitoba.ca/faculties/science/resources/Acad_Dishon_TABLE_RevCSS_AdminC_Jul2012_WEB.pdf)
- All Faculty members (and their teaching assistants) have been instructed to be vigilant and report all incidents of academic dishonesty to the Head of the Department.
<https://universityofmanitoba.desire2learn.com/d2l/le/content/6606/viewContent/1463719/View>

Using Copyrighted Material

Course materials are the property of myself (Elizabeth Hughes) and the University of Manitoba. I am using copyrighted content in this course and have ensured that the content we use is copied and acknowledged in accordance with copyright laws and University guidelines. Copyrighted works, including materials created by me (ex. Course PowerPoint slides, study guides, assignments, quizzes, and exams), are made available for private study and research and must not be shared, copied or distributed in any format without my permission. Violation of these and other Academic Integrity principles will lead to serious disciplinary action.

Students may not record lectures (video or audio) without my express permission.

Student Accessibility Services

The University of Manitoba is committed to providing an accessible academic community. [Accessibility | University of Manitoba \(umanitoba.ca\)](http://umanitoba.ca) offers 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. I am always happy to accommodate any student in whatever way I can as needed.

Student Accessibility Services

520 University Centre

Phone: (204) 474-7423

Email: Student_accessibility@umanitoba.ca

Learner Supports

Writing and Learning Support

The Academic Learning Centre (ALC) offers writing and learning supports to help you throughout your academic program. These supports are offered online during the Covid-19 pandemic.

Consult an ALC learning specialist or attend an academic skills workshop to improve your time management, learning strategies and test-taking strategies. Get support in select courses by making an appointment with an ALC content tutor. In addition to one-to-one and group sessions, you can also find writing and study tip sheets and videos on the ALC website.

Academic Learning Centre services are free for U of M students. For more information, please visit the Academic Learning Centre website at: <http://umanitoba.ca/student/academiclearning/>

Contact the Academic Learning Centre by calling 204-480-1481 or emailing academic_learning@umanitoba.ca.

University of Manitoba Libraries (UML)

Research begins at [UM Libraries](#). [Learn at the Libraries](#) is a great place to start, with information for students on academic writing, how to search the library, evaluating resources, and writing citations. As the primary contact for all research needs, your [liaison librarian](#) can play a vital role when completing academic papers and assignments. Liaisons can answer questions about locating appropriate resources or managing citations, and will address any other concerns you may have regarding the research process. Liaisons can be contacted by email or phone, and are also available to meet with you online. When working remotely, students can also receive help online through [Ask Us!](#) chat. For further detail about the libraries' services and collections, [visit the Libraries' web site](#).

For 24/7 mental health support, contact the Mobile Crisis Service at 204-940-1781.

Student Counselling Centre

Contact SCC if you are concerned about any aspect of your mental health, including anxiety, stress, or depression, or for help with relationships or other life concerns. SCC offers crisis services as well as individual, couple, and group counselling. *Student Counselling Centre:* <http://umanitoba.ca/student/counselling/index.html>

474 UMSU University Centre or S211 Medical Services Building
(204) 474-8592

Student Support Case Management

Contact the Student Support Case Management team if you are concerned about yourself or another student and don't know where to turn. SSCM helps connect students with on and off campus resources, provides safety planning, and offers other supports, including consultation, educational workshops, and referral to the STATIS threat assessment team.

<http://umanitoba.ca/student/case-manager/index.html>

520 UMSU University Centre

(204) 474-7423 (Student Support Intake Assistant)

University Health Service

Contact UHS for any medical concerns, including mental health problems. UHS offers a full range of medical services to students, including psychiatric consultation.

University Health Service <http://umanitoba.ca/student/health/>

(204) 474-8411 (Business hours or after hours/urgent calls)

Health and Wellness

Contact our Health and Wellness Educator if you are seeking information on health topics, including physical and mental health concerns, alcohol and substance use harms, or sexual violence. You can also access peer support from a *Healthy U* peer health educator.

Health and Wellness Educator

<https://umanitoba.ca/student/health-wellness/welcome-about.html>

britt.harvey@umanitoba.ca

469 UMSU University Centre

(204) 295-9032

Sexual Violence Resource Centre (SVRC)

Contact SVRC if you have experienced sexual violence or are seeking information about how to help somebody else. SVRC provides inclusive, survivor-centred, trauma-informed services, such as consultation, referrals, safety planning, and a range of on-site supports, including counselling by Klinik.

Sexual Violence Resource Centre

<https://umanitoba.ca/student-supports/sexual-violence-support-and-education>

svrc@umanitoba.ca

537 UMSU University Centre

(204) 474-6562 (Sexual Violence Intake and Triage Specialist)

Violent or Threatening Behaviour

http://umanitoba.ca/admin/governance/governing_documents/community/669.html

Sexual Assault

If you experience Sexual Assault or know a member of the University community who has, it is important to know there is a policy that provides information about the supports available to those who disclose and outlines a process for reporting. The Sexual Assault policy may be found at: http://umanitoba.ca/admin/governance/governing_documents/community/230.html

More information and resources can be found by reviewing the Sexual Assault site <http://umanitoba.ca/student/sexual-assault/>

Intellectual Property

For information about rights and responsibilities regarding Intellectual Property view the policy: https://umanitoba.ca/admin/governance/governing_documents/community/235.html

For information on regulations that are specific to your academic program, read the section in the Academic Calendar and on the respective faculty/college/school web site <http://umanitoba.ca/faculties/>

Academic Program Questions

Contact an Academic Advisor within our faculty/college or school for questions about your academic program and regulations <http://umanitoba.ca/academic-advisors/>

Student Advocacy

Contact Student Advocacy if you want to know more about your rights and responsibilities as a student, have questions about policies and procedures, and/or want support in dealing with academic or discipline concerns. <http://umanitoba.ca/student/advocacy/>

520 University Centre
204 474 7423
student_advocacy@umanitoba.ca