



TOX*4000 Medical Toxicology

Fall 2020

Section(s): 01

Department of Biomedical Sciences

Credit Weight: 0.50

Version 2.00 - September 03, 2020

1 Course Details

1.1 Calendar Description

This course will focus on the toxicology of mammalian body systems with emphasis on dose-response, mechanisms and the sites of action of major groups of chemical toxicants and biological toxins. The course is designed for students majoring in Bio-Medical Sciences, Biomedical Toxicology and Toxicology.

Pre-Requisites:

BIOM*3090

Restrictions:

This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations. See department for more information.

1.2 Course Description

The goal of this course is to provide students with a detailed understanding of the effects that toxicants may have on mammalian body systems. The initial series of classes will focus on toxicological principles including toxicokinetics and cellular mechanisms of toxicity. The remainder of the semester will focus on the toxicology of major organ and non-organ systems, with a special focus on neurotoxicology. Detailed discussion of toxicological mechanisms and prototypical example toxicants will be explored. Information will be provided via lectures and student-led discussion of case studies. In addition students will have opportunities to participate in communication of toxicological findings and principles in the form of a popular media article and a multi-platform group capstone project.

1.3 Timetable

Class Time: Monday, Wednesday, Friday: 9:30 a.m. to 10:20 a.m.

Class will be held via zoom

at: <https://zoom.us/j/98029183889?pwd=Z3BEM0d1enk2M2FaMEpKNzZkUzkwUT09>

Password: 778597

1.4 Final Exam

There is no final exam for this course. Instead, there will be a group capstone project at the end of the course.

2 Instructional Support

E-mail Policy: We will strive to respond to emails within two business days.

2.1 Instructional Support Team

Course Co-ordinator: Jibran Khokhar PhD
Email: jkhokhar@uoguelph.ca
Telephone: +1-519-824-4120 x54239
Office Hours: Monday 11-1 pm and Wednesday 11-1 pm

Done via Zoom
at <https://zoom.us/j/94198697349?pwd=b01uMVViaUZJWmF6OFBCS1pETQ>

Password: **207587**

2.2 Teaching Assistants

Teaching Assistant: Kiera McCahill
Email: kmccahil@uoguelph.ca
Office: Virtual Office Hours
Office Hours: Monday 10:30-11:30

Thursday 3:00-4:00

Link:
<https://zoom.us/j/99492475853?pwd=aHRnZmhKOG5mL2FoZ0FldmptYlJp>

Password: **138296**

3 Learning Resources

3.1 Recommended Resources

Casarett & Doull's Toxicology: The Basic Science of Poisons, 8th ed. (Textbook)

- Some of the lecture material is taken from this textbook.
- Physical copies of the textbook are available at the library.

3.2 Case Studies in Medical Toxicology

Download PDF from here: <https://link.springer.com/content/pdf/10.1007%2F978-3-319-56449-4.pdf>

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Read primary toxicological literature and understand it and distill it for a broader audience. Understand basic and complex toxicological principles. Discuss and resolve toxicological case studies. Apply toxicological principles in establishing differential diagnoses in clinical case studies.
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5 Teaching and Learning Activities

Class Time: Monday, Wednesday, Friday: 9:30 a.m. to 10:20 a.m.

Class Location: MacKinnon (MCKN), Room 29

Summary of Important Dates:

Sept 11 (in class during the first class): Introduction and overview of class format; How to sign-up for group presentation dates

Oct 26 (in class): Midterm examination

Dec 4 (via dropbox by 11:59 p.m.): Capstone Projects Due

Below is the Class Schedule:

- **Class days for Case Studies are listed as such.**
- **The last class is Friday, Dec 4**

5.1 Lecture

Fri, Sep 11

Topics:

Instructor: Khokhar

Introduction and Course Overview

Mon, Sep 14

Topics:

Instructor: Khokhar

Toxicology Principles and Risk Assessment

Wed, Sep 16

Topics:

Instructor: Khokhar

Toxicokinetics: ADME

Fri, Sep 18

Topics:

Instructor: Khokhar

Biotransformation: Phase 1 Reactions

Mon, Sep 21

Topics:

Instructor: Khokhar

Biotransformation: Phase 2 Reactions

Wed, Sep 23

Topics:

Instructor: Khokhar

Toxicodynamics: Mechanisms of Toxicity

Fri, Sep 25

Topics:

Special Lecture by CESI and Guelph Wellington Drug Strategy

Adrienne Crowder followed by Q&A with Adrienne and Lindsey from CESI.

References:

Please watch attached video from CESI.

Mon, Sep 28

Topics:

Instructor: Khokhar

Neurotoxicology

Wed, Sep 30

Topics:

Instructor: Khokhar

Neurotoxicology

Fri, Oct 2

Topics: Neurotoxicology

Instructor: Khokhar

Mon, Oct 5

Topics: Genetic Toxicology and Carcinogenesis

Instructor: Khokhar

Wed, Oct 7

Topics: Genetic Toxicology and Carcinogenesis

Instructor: Khokhar

Fri, Oct 9

Topics: Guest Lecture: CyclicaRx with Naheed Kurji (CEO and Co-founder)

Instructor: Khokhar

Mon, Oct 12

Topics: Thanksgiving

Mon, Oct 14

Topics: Developmental Toxicology

Instructor: Bailey

Fri, Oct 16

Topics: Developmental Toxicology

Instructor: Bailey

Mon, Oct 19

Topics: Immune System Toxicology

Instructor: Khokhar

Wed, Oct 21

Topics: Immune System Toxicology

Instructor: Khokhar

Fri, Oct 23

Topics: Immunotoxicity and the Brain

Instructor: Khokhar

Mon, Oct 26

Topics: Midterm Exam

Wed, Oct 28

Topics: Overview/Instructions on how to do Case Presentations

Group Working Time

Fri, Oct 30

Topics: Guest Lecture: Rebecca Rogerson (Intertek)

Mon, Nov 2

Topics: Case Presentations Groups 1 and 2

Wed, Nov 4

Topics: Case Presentations Groups 3 and 4

Fri, Nov 6

Topics: Case Presentations Groups 5 and 6

Mon, Nov 9

Topics: Case Presentations Groups 7 and 8

Wed, Nov 11

Topics: Case Presentations Groups 9 and 10

Fri, Nov 13

Topics: Case Presentations Groups 11 and 12

Mon, Nov 16

Topics: Case Presentations Groups 13 and 14

Wed, Nov 18

Topics: Case Presentations Groups 15 and 16

Fri, Nov 20

Topics: Case Presentations Groups 17 and 18

Mon, Nov 23

Topics: Case Presentations Groups 19 and 20

Wed, Nov 25

Topics: Case Presentations Groups 21 and 22

Fri, Nov 27

Topics: Case Presentations Groups 23 and 24

Mon, Nov 30

Topics: Case Presentation Groups 25 and 26 (If needed).

Capstone Time Otherwise

Wed, Dec 2

Topics: Capstone Project Group Time

Fri, Dec 4

Topics: Capstone Project Showcase/Due Date

Instructor: Khokhar

6 Assessments

The final grade in this course will be determined by five main components:

6.1 Marking Schemes & Distributions

Grades in the course will be determined according to the following format:

- 15% Case Study Presentation
 - 15% Quizzes on group presentations
 - 15% Press Release
 - 25% Midterm examination
 - 30% Capstone Project
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100% Final Grade

6.2 Assessment Details

Press Release for a Published Research Article (15%)

Due: Fri, Nov 13, 11:59 PM

In an attempt to improve science communication (#scicomm), students will pick an article and create a press release related to it exploring its impact on the lay public or policy, while maintaining scientific accuracy. Students will each (individually) prepare and submit a Press Release of a published research article that is related to any topic in this course. The selected article can describe either a basic (lab bench / laboratory) or clinical (human / animal) study, so long as it has been published in a reputable journal. This report should be no longer than 4 double-spaced pages and is to be submitted electronically using Dropbox on the CourseLink website by 11:59 p.m. on Friday, November 13. Your selected article should be emailed to the instructor for approval no later than Friday, October 16, and you will receive a reply email within one week of your email.

Each Press Release article of a research article should be written in your own words and should ensure the following:

- Engaging Title as appropriate for press release
- Introduction / background of the issue
- Accurate summary of the findings without Hyperbole
- How these findings fit into the current understanding on the issue
- Your critique: Are the authors justified in making the conclusions that they are?

The penalty for submitting written evaluations after the deadline will be 10% per day deducted from the grade for this assignment. Figures and references may be included in this report, and do not count in the 4-page of maximum writing; these should be placed after your main text.

Great Resource: <https://www.sciencedirect.com/science/article/pii/S0161813X14000345>

Case Study Group Presentations (15%)

Students will form groups of 3-4 people and deliver a Case Study presentation in class on their assigned topic and day. There will be two group presentation per assigned day. Presentations will be related to cases that will be assigned individually to the groups (without the other class members knowing of the topics) . Presentations should be no longer than 15 minutes total, followed by 5 minutes of discussion involving the whole class. The format for the presentation is as follows:

- i. Description of the case report (History of Present Illness and Physical Examination)
- ii. Differential Diagnoses (provide a list) and ask the class for what the most likely diagnosis is?
- iii. Diagnostic Testing Results
- iv. Treatment Course
- v. Broader Discussion of Symptoms, Causes and Diagnosis.

You may insert figures/data from the primary case reports, or from other research articles, into your presentation. Each group will be evaluated for their ability to initiate and continue a discussion with the class at the end of the presentation.

Other notes for the presentations:

- Each group is responsible for either finding a published case study or creating a fictional one based on their research on the diagnosis. The presentation must be completed within 15 minutes and marks will be deducted if it is too short or too long by more than 2 minutes. The instructor will moderate timing for the discussions.
- The presentation slides should be made using Powerpoint. You may run your slides off of your own computer or from a USB drive plugged into the classroom computer.
- The division of labour will be decided among group members, however all group

members must speak during the presentation.

- Each member of the group will receive the same grade. If there are significant issues with the contribution of an individual group member, this must be brought to the instructor's attention before the presentation date.
- Presentations will be evaluated for content, style, timing and teamwork, in addition to the effort made to foster good class discussion.

Quizzes on Case Presentations (15%)

There will be 3 quizzes worth 5% each on the content covered in the clinical case presentations. These quizzes will happen in class on October 30th, November 13th and November 27th. There will be 5 questions on each quiz.

Midterm Examination (25%)

Date: Mon, Oct 26

A midterm examination will be held in class on Friday, October 26. This examination will cover material presented in all lectures up to and including Wednesday, October 23.

Capstone Project (30%)

Students will work in groups of 5-6 to produce 4 separate deliverables (1 per group) related to one of four topics:

- Toxicology and COVID-19.
- Drug Testing and Safe Supply of Drugs
- Methamphetamine Toxicity
- Alcohol: Forgotten Risks and Toxicity

This will give students the opportunity to help create social change, especially in the context of current lack of evidence-based resources on these topics. Students are encouraged to join the groups that would complement their interests and skillset. The four proposed deliverables are: website; public service announcements (video); white paper outlining potential solutions or evidence-based strategies to combat each topic; and a set of infographics tackling different aspects of each topic. The scientific integrity of these deliverables is most important. Each group will also submit a 1-page "Contributions" document outlining the contributions from each team member that will be signed and agreed upon by all members.

7 Course Statements

7.1 Turnitin

In this course, your instructor will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph.

All submitted assignments will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site.

A major benefit of using Turnitin is that students will be able to educate and empower themselves in preventing academic misconduct. In this course, you may screen your own assignments through Turnitin as many times as you wish before the due date. You will be able to see and print reports that show you exactly where you have properly and improperly referenced the outside sources and materials in your assignment.

8 University Statements

8.1 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.

8.2 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 grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

8.3 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 students (undergraduate, graduate and diploma) 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 their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

8.4 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.

8.5 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.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website

<https://www.ridgetownc.com/services/accessibilityservices.cfm>

8.6 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 encourages academic integrity. 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.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 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.

8.8 Resources

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

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

8.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings and academic schedules. Any such changes will be announced via CourseLink and/or class email. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

8.10 Illness

The University will not require verification of illness (doctor's notes) for the fall 2020 or winter 2021 semesters.
