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-Requisite(s): BIOM*3090
Restriction(s): 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, including the heart, brain, lungs, skin and immune system. Detailed discussion of toxicological mechanisms and prototypical example toxicants will be explored. Information will be provided via lectures and student-led Practical Application classes. The Practical Application classes will have groups of students (i) present recent media articles that highlight “real-world” applications of toxicological topics (ii) present primary research literature related to these same toxicological topics, and (iii) lead class discussions on their chosen toxicological topics.

1.3 Timetable

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

1.4 Final Exam

The final examination will be held on Tuesday, December 4, from 2:30 pm to 4:30 pm. The location for the final examination will be announced on the News board of the CourseLink website for this course, once it is available.

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

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

### 2.1 Instructor(s)

Craig Bailey DR.

- **Email:** baileyc@uoguelph.ca
- **Telephone:** +1-519-824-4120 x54954
- **Office:** OVC 2602
- **Office Hours:** Monday 1-2 pm and Thursday 2-3 pm

Bettina Kalisch Dr.

- **Email:** bkalisch@uoguelph.ca
- **Telephone:** +1-519-824-4120 x54939
- **Office:** OVC 1646F

### 2.2 Instructional Support Team

**Course Co-ordinator:** Craig Bailey Dr.

- **Email:** baileyc@uoguelph.ca
- **Telephone:** +1-519-824-4120 x54954
- **Office:** OVC 2602
- **Office Hours:** Monday 1-2 pm and Thursday 2-3 pm

3 Learning Resources

### 3.1 Recommended Resource(s)

**Casarett & Doull’s Toxicology: The Basic Science of Poisons, 8th ed. (Textbook)**
- Some of the lecture material is taken from this textbook.
- Physical and electronic copies of the textbook are on reserve at the library.

4 Learning Outcomes

5 Teaching and Learning Activities

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

**Class Location:** Animal Science and Nutrition Building (ANNU), Room 156

**Summary of Important Dates:**

Sept 7 (in class during the first class): Introduction and overview of class format; How to sign-up
for group presentation dates

Oct 19 (in class): Midterm examination

Nov 2: 40th Class day

Nov 30 (via dropbox by 11:59 p.m.): Written evaluation of a research article due

Dec 4 (location TBD): Final examination

Below is the Class Schedule:

• Class days for Practical Application group presentations have (1) in parenthesis
• The last class is Friday, November 30

5.1 Lecture

Fri, Sep 7
  Topic(s): Introduction and Course Overview
  Instructor: TBD

Mon, Sep 10
  Topic(s): Toxicology Principles and Risk Assessment
  Instructor: Bailey

Wed, Sep 12
  Topic(s): Toxicokinetics: ADME
  Instructor: Bailey

Fri, Sep 14
  Topic(s): Biotransformation: Phase 1 Reactions
  Instructor: Bailey

Mon, Sep 17
  Topic(s): Biotransformation: Phase 2 Reactions
  Instructor: Bailey

Wed, Sep 19
  Topic(s): Toxicodynamics: Mechanisms of Toxicity
  Instructor: Bailey

Fri, Sep 21
  Topic(s): Principles/ADME/Mechanisms Student Presentations (1)
  Instructor: Bailey

Mon, Sep 24
  Topic(s): Genetic Toxicology and Carcinogenesis
  Instructor: Bailey

Wed, Sep 26
  Topic(s): Genetic Toxicology / Carcinogenesis Student Presentations (1)
  Instructor: Bailey

Fri, Sep 28
  Topic(s): Gastrointestinal Toxicology
  Instructor: Bailey
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic(s)</th>
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<tbody>
<tr>
<td>Mon, Oct 1</td>
<td>Gastrointestinal Toxicology Student Presentations (1)</td>
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<tr>
<td>Wed, Oct 3</td>
<td>Respiratory System Toxicology</td>
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<tr>
<td>Fri, Oct 5</td>
<td>Respiratory System Toxicology Student Presentations (1)</td>
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<tr>
<td>Mon, Oct 8</td>
<td>Thanksgiving - No Class</td>
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<td>Wed, Oct 10</td>
<td>Dermal Toxicology</td>
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<tr>
<td>Fri, Oct 12</td>
<td>Dermal Toxicology Student Presentations (1)</td>
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<tr>
<td>Mon, Oct 15</td>
<td>Hepatic Toxicology</td>
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<tr>
<td>Wed, Oct 17</td>
<td>Hepatic Toxicology Student Presentations (1)</td>
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<tr>
<td>Fri, Oct 19</td>
<td>Midterm Examination (in-class)</td>
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<td>Mon, Oct 22</td>
<td>Cardiac Toxicology</td>
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<td>Wed, Oct 24</td>
<td>Vascular and Blood Toxicology</td>
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<tr>
<td>Fri, Oct 26</td>
<td>Cardiovascular/Blood Toxicology Student Presentations (1)</td>
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<tr>
<td>Mon, Oct 29</td>
<td>Immune System Toxicology</td>
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<tr>
<td>Wed, Oct 31</td>
<td>Immune System Toxicology</td>
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<tr>
<td>Fri, Nov 2</td>
<td>Immune System Toxicology Student Presentations (1)</td>
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<tr>
<td>Mon, Nov 5</td>
<td>Neurotoxicology</td>
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</tbody>
</table>
Instructor: Kalisch

Wed, Nov 7
Topic(s): Neurotoxicology
Instructor: Kalisch

Fri, Nov 9
Topic(s): Neurotoxicology
Instructor: Kalisch

Mon, Nov 12
Topic(s): Neurotoxicology Student Presentations (1)
Instructor: Bailey

Wed, Nov 14
Topic(s): Nephrological Toxicology
Instructor: Bailey

Fri, Nov 16
Topic(s): Nephrological Toxicology Student Presentations (1)
Instructor: Bailey

Mon, Nov 19
Topic(s): Reproductive Toxicology
Instructor: Bailey

Wed, Nov 21
Topic(s): Reproductive Toxicology Student Presentations (1)
Instructor: Bailey

Fri, Nov 23
Topic(s): Developmental Toxicology
Instructor: Bailey

Mon, Nov 26
Topic(s): Developmental Toxicology
Instructor: Bailey

Wed, Nov 28
Topic(s): Developmental Toxicology Student Presentations (1)
Instructor: Bailey

Fri, Nov 30
Topic(s): Optional Review Class
Instructor: Bailey

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:

20% Practical Application group presentations
5% Two peer evaluations of group presentations
20% Written evaluation of a research article
20% Midterm examination
35% Final examination

__________________________________________________________________________

100% Final Grade

6.2 Assessment Details

Practical Application Group Presentations (20%)
Students will form groups of 3-4 people and deliver a Practical Application presentation in
class on their assigned topic and day. There will be two group presentation per assigned day.
Presentations will be related to the corresponding (preceding) series of lectures.
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. Media Report Groups will present one media report from the past five years (2013-2018)
that can be taken from a newspaper, magazine, or reputable website. The purpose of
this presentation is to show a “real-world” application of a medical toxicology topic. The
report will be related to the corresponding (preceding) lecture series topic(s), and can be
related to the lectures in any way. As a guide, aim to have this part of the presentation
take no longer than 5 minutes.
Example media reports could include discussion on: the regulation of new e-cigarettes,
the recall of a drug from the marketplace because of adverse effects, or effects of
pollution smog on human respiratory systems.
The format for the media report should include:
• Introduction / background information
• Description of the story that is being reported
• Significance to people (why does this story matter to us?)

ii. Primary Research Literature Report Groups will present one piece of primary literature
that has been published as a research article in a scientific journal. The article can
describe either basic (lab bench / laboratory) or clinical (human / animal) studies, so
long as it has been published in a reputable journal. The article can be related to the
Media Report in any way, but the more closely they relate to the story in the report, the
better. As a guide, aim to have this part of the presentation take no longer than 10
minutes. It can be a challenge to present a research paper in 10 minutes, so pay
attention to your timing.
The format for this section of the presentation should include:
• Introduction / background information for the research article
• Research methods employed
• Results
• Conclusion / discussion (including relevance to the media report)

You may insert figures/data from the primary research articles, 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, so it will be good to have a few questions and discussion topics ready at the end of the slide show.

Each group will choose its media report and its primary research article for the presentation. **These must both be forwarded to the instructor for approval no later than one week before your presentation.** Other notes for the presentations:

- Each group is responsible for managing its 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 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
- Each member of the group will receive an equal 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.

**Peer Evaluations of Group Presentations (5%)**

Students will each (individually) prepare and submit written evaluations/critiques for two Practical Application group presentations. You can choose which presentations to critique but cannot critique your own group’s presentation. One critique is required for the first half of the semester (before the midterm examination) and one critique is required for the second half of the semester (after the midterm examination). Critiques are to be submitted by Dropbox on the CourseLink website, within one week of the presentation being evaluated. The penalty for submitting critiques after that date will be 10% per day deducted from the grade for this assignment. Each evaluation is worth 2.5% of your final grade and will be graded as pass/fail so long as the requirements below are all met.

Each critique should include:

- A brief summary of the presentation in approximately 3-5
- One aspect of the presentation that you liked, and explain why you liked
- One piece of constructive criticism for the
- Once question that you would pose to the

Peer evaluations will be forwarded to the presenting group anonymously (without your name).

**Written Evaluation of a Published Research Article (20%)**

**Due: Fri, Nov 30, 11:59 PM**

Students will each (individually) prepare and submit a written evaluation/critique 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 30. You cannot select an article that has been presented in
a Practical Application group presentation. Your selected article should be emailed to the instructor for approval no later than Friday, November 9, and you will receive a reply email within one week of your email.

Each written evaluation of a research article should be written in your own words and should include a description of the following sections of the article, along with your critique:

- Introduction / background information
- Methods employed
- Results
- Conclusion / discussion
- Your critique: Provide your impression of the research study and article, making sure to include: (i) two things that you liked about the research study and why you liked them; and (ii) two aspects of the study/experiments that you feel could be improved, along with your suggestions for

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.

**Midterm Examination (20%)**
**Date:** Fri, Oct 19
A midterm examination will be held in class on Friday, October 19. This examination will cover material presented in all lectures and in all Practical Application student group presentations up to and including Friday, October 12 (Dermal Toxicology student presentation class).

**Final Examination (35%)**
The final examination will be held on Tuesday, December 4, from 2:30 pm to 4:30 pm. The location for the final examination will be announced on the News board of the CourseLink website for this course, once it is available. This examination will be non-cumulative, so it will cover all material not included in the midterm examination, i.e., starting from class on Monday, October 15 (Hepatic Toxicology) onward. Material from lectures and Practical Application student presentations will be tested in this examination.

**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
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 regulations and procedures for Academic Consideration are detailed in the Undergraduate Calendar.

8.3 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 are available in the Undergraduate Calendar.

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.

More information: www.uoguelph.ca/sas

8.6 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 is detailed in the Undergraduate Calendar.

8.7 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.

8.8 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.