

## **SPPH 533: Toxicology and Public Health**

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**Rationale:** The purpose of this course is to introduce students to the basic and clinical science of toxicology with relation to hazardous exposures of populations to intentionally manufactured substances ( e.g. industrial, agricultural, recreational) or natural substances (e.g. environmental, biological) which represent concerns for a Public Health practitioner.

**Objectives:**

- ✓ Students will be introduced to history, scope, societies, textbooks, journals, congresses, etc. related to the science of toxicology.
- ✓ Acute and chronic toxics exposure routes, media, types, regulations, disasters, and emergencies will be presented.
- ✓ Students will be instructed to basic risk assessment.
- ✓ Students will be introduced to the concepts of Pharmaco- and Toxicokinetics and dynamics.
- ✓ Students will be introduced to basic human physiological systems that are involved with detoxification or bioactivation of hazardous substances.
- ✓ The course will challenge students to think creatively about routes of exposure to populations, and potential for reducing the hazard through practice or policy.
- ✓ Students will demonstrate their ability to critically evaluate both peer reviewed scientific literature and communications intended for the general public.
- ✓ Students will enhance their ability to communicate with peers and the public by incorporating appropriate vocabulary to effectively present information to stakeholders.
- ✓ Students who complete this course will acquire knowledge and tools which will aid in advanced studies in fields such as occupational and environmental health or public health practice.

**Course format:** The class meets once a week (3 hr) for lectures and/or presentations. Additional, out-of-classroom time will be required to complete homework assignments and the term project.

- ✓ Each lecture will be introduced with a suggested reading assignment.

- ✓ Students will each accumulate a media file, and will present a short critical appraisal of a media (print or electronic) report to the class.
- ✓ There will be a midterm examination to assess acquisition of basic principles presented in class, through assigned readings, or lecture materials.
- ✓ There will be one debate in which students will be assigned roles or positions to defend in a mock public meeting.
- ✓ Students will choose a topic and write a term paper which will also be presented to the class as a 20 minute oral presentation at the end of term.

**Texts:  
suggested**

- ✓ Richards, IS. *Principles and Practice of Toxicology in Public Health*. Jones and Bartlett Publishers, Toronto. ISBN 978-1-4496-6538-8 (note: earlier edition, ISBN 978-0-7637-3823-5 is also acceptable).
- ✓ Klassen, CD. *Casarett and Doull's Toxicology: The Basic Science of Poisons* (8<sup>th</sup> Edition) 2013. McGraw-Hill, Inc. Toronto. QV 600 C335 2013.

**Other  
resources:**

Journals available on-line through UBC Library:

- ✓ Archives of Toxicology
- ✓ Asia Pacific Journal of Medical Toxicology
- ✓ BC Toxicology New Monthly Bulletin (BCTOX)
- ✓ Clinical Toxicology
- ✓ Critical Reviews of Toxicology
- ✓ Environmental Health and Toxicology
- ✓ Human and Experimental Toxicology
- ✓ Inhalation Toxicology
- ✓ Interdisciplinary Toxicology
- ✓ International Journal of Toxicology
- ✓ Journal of Analytical Toxicology
- ✓ Journal of Medical Toxicology
- ✓ Journal of Toxicology and Environmental Health Parts A & B
- ✓ Toxicological Sciences
- ✓ Toxicology and Industrial Health
- ✓ Toxicology International
- ✓ Toxicology Letters

Selected papers are available within students' teaching materials.

Recent issues of BC Toxicology News Monthly Bulletin (BCTOX) are available within students' teaching materials.

**Evaluation:** Evaluation of student performance will be based on:

- ✓ midterm exam = 30%
- ✓ debate presentation = 10%
- ✓ term paper (40%) and oral presentation (10%) = 50%
- ✓ critical appraisal of media file = 10%

The grade will reflect the student's demonstrated understanding of the course material, ability to synthesize and critically evaluate material from a variety of sources, and ability to develop innovative and effective communication with stakeholders and peers.

Arrangements must be made in advance with the instructor for any planned absences.

**Criterion standards:**

**"A" level work (80 – 100%):** *is reserved for exceptional work that greatly exceeds course expectation on every criterion. In addition, the work must show a level of creativity and initiative that goes well beyond what is provided or discussed in class. Work deserving of an "A" is distinguished in virtually every aspect. For example, "A" level work will show accuracy and depth of understanding, as well as initiative, insight, and probing analysis. In addition, the work must show there was careful attention to detail in every regard. (A+ = 90 – 100%; A = 85 – 89%; A - = 80 – 84%).*

**"B" level work (68 – 79%):** *this category of work is typified by adequate understanding, analysis and representation of the concepts, principles, and theoretical perspectives explored during the term. It is distinguished from "A" level work by any one of four things: (1) one or more significant errors in understanding; (2) superficial understanding or representation of course content; (3) lack of initiative; or (4) multiple problems with presentation, e.g. writing that lacks clarity or contains multiple spelling, grammatical or punctuation errors. For example, the top level (76 – 79%) will be awarded if the work shows adequate and accurate understanding and analysis, and goes beyond what was provided, but is not professional in its presentation. (B+ = 79 – 79%; B = 72 – 75%; B - = 68 – 71%).*

***The lowest grade acceptable to maintain graduate student academic standing is 68%.***

**General  
Notes**

Some notes on Critical Thinking:

Thinking reasonably about problems as opposed to mindless following rules and memorization. To prepare a rational argument:

- ✓ look for evidence and reasons
- ✓ proportion conviction to the strength of the evidence
- ✓ be aware of tendencies to:
  - Over-generalize evidence
  - Use personal experience and anecdotal evidence
  - Be swayed by personalities or perceived motives

Consider objections and contrary views

- ✓ proportion this consideration to the strength of evidence (again)

- ✓ search for additional information where evidence is incomplete
- ✓ be prepared to make decision in the face of incomplete evidence, making limitations clear

**Student misconduct** **Disrupting** instructional activities, including making it difficult to proceed with scheduled lectures, seminars, etc. and with examination and tests. Note: this includes disruption caused by electronic forms of communication.  
**Injuring** a person or damaging property in any way which demonstrates or results from hate, prejudice or bias against an individual or group based on race, national or ethnic origin, language, colour, religion, sex, age, mental or physical disability, sexual orientation or any other similar factor.

**Religious Holidays** Policy #65  
Purpose: To enable students and members of faculty and staff to observe the holy days of their religions.  
Policy: Recognizing the religious diversity of the UBC community, UBC permits students who are scheduled to attend classes or write examinations on holy days of their religions to notify their instructors in advance of the holy day of their wish to observe it by absenting themselves from class or examination.  
Procedure summary: Students are required to give two weeks' notice of their intention to absent themselves under the terms of this policy. They shall notify the instructor of each course, or, where this cannot be done, the Head or Director of the unit concerned.



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## **Suggested Academic Integrity Statement**

Faculty members are encouraged to include the academic integrity statement below in course syllabi distributed to students.

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

## Assignments:

### 1) Media file:

- ✓ Find an interesting current media report or story about a hazardous substance. The target audience is the general public, and the hazardous substance should be something a member of the public could potentially be exposed to.
  - Critique the article. Salient features might include: who is the source of the information (is this a reliable source)? What is the nature of the hazard? Is there corroborating evidence in the peer reviewed literature of the nature of the hazard (e.g. what organ systems are involved? Does dose-response data exist? Is this an acute or chronic hazard? What population(s) are most at risk? What is the expected endpoint: Death? Disability? Cancer? (You may find other pertinent information of interest to add.)
  - How accurate was the article? Was there follow-up? Did the follow-up information correct any misinformation from previous reports?
  - Annotate in point form the most salient features you would want to have at your fingertips in case you are the person the media will come to next for an interview regarding exposure to this substance.
- ✓ You will present your article + critique to the class in an oral presentation. There will be a sign-up sheet to determine the date of your presentation. You may want to use visual aids (example, Powerpoint) or not, your choice. You will have 10 minutes for your presentation, and 5 minutes for questions.
- ✓ You will submit a written copy of your presentation to me on the day of your oral report.

### 2) Debate/Townhall meeting:

- ✓ On March 28<sup>th</sup> there will be a mock Townhall meeting. The week before, you will all pull a “role” out of a hat, and that will be the position you will be defending at the meeting, the subject of which will also be revealed the week before. Your evaluation will be based on your ability to present the point of view and cogent argument of your “role”.

### 3) Term paper:

- ✓ You may pick any hazardous substance that interests you as the subject of your term paper. Elements that must be covered in the paper include: chemical structure, mode of action, route of exposure or uptake, effects on mammalian (human preferably) circulating blood/immune cells; liver/kidney; respiratory; reproductive/developmental systems. What are the potential outcomes of exposure to the substance? Are there regulatory limits on exposure (e.g. ADI, TLV®, NAAQS)?
- ✓ It is strongly recommended that you check with the instructor regarding your term paper subject early in term to avoid duplication of subject matter with other class members.
- ✓ You will present your term paper as an oral presentation to the class on April 4<sup>th</sup>. You will have 15 minutes plus 5 minutes for questions for your talk. There will be a sign-up sheet to determine the order in which the papers will be presented. The written paper is due April 11<sup>th</sup>.
- ✓ Selected papers may be published in BCTOX. As well, Asia Pacific Journal of Medical Toxicology has agreed to review the most exceptional papers from this assignment for possible publication.

## SPPH 533 Class Schedule Spring 2019:

**Thursdays 1:00 – 4:00**

**(424 is located on the 4<sup>th</sup> floor of the School of Population and Public Health, 2206 East Mall)**

Date	Room	Time	Topic
Jan 3	424	1:00 – 2:30	Introduction: ✓ History, scope, societies, textbooks, journals, congresses, epidemiology
		2:45 – 4:00	✓ Acute and Chronic exposure, routes, media, types, regulations, emergencies
Jan 10			Cascadia Conference OEH classes cancelled
Jan 17	424	1:00 – 2:30	Basic Toxicology (Risk Assessment and the Perception of Risk) ✓ Hazard identification, dose response
		2:45 – 4:00	✓ Exposure assessment, risk characterization
Jan 24	424	1:00 – 2:30	Pharmacokinetic and Toxicokinetic Principles ✓ Absorption, Distribution, Biotransformation, Elimination
		2:45 – 4:00	✓ Absorption, Distribution, Biotransformation, Elimination
Jan 31	424	1:00 – 2:30	Basic and Clinical Toxicology ✓ Respiratory system, liver, kidney systems
		2:45 – 4:00	✓ Endocrine, blood, immune systems
Feb 7	424	1:00 – 2:30	Basic and Clinical Toxicology ✓ Skin, nervous systems
		2:45 – 4:00	✓ Reproductive, developmental systems
Feb 14	424	1:00 – 2:30	<b>Midterm exam</b>
		2:45 – 4:00	
Feb 21			Reading week : Classes cancelled
Feb 28	424	1:00 – 2:30	Agents: ✓ Heavy metals
		2:45 – 4:00	✓ Pesticides
Mar 7	424	1:00 – 2:30	Agents: ✓ Ambient air pollution
		2:45 – 4:00	✓ Radiation
Mar 14	424	1:00 – 2:30	Agents: ✓ Pharmacological agents
		2:45 – 4:00	✓ Biologic toxins
Mar 21	424	1:00 – 2:30	Environmental: ✓ Issues and industry
		2:45 – 4:00	✓ Justice and ethics
Mar 28	424	1:00 – 2:30	
			<b>Townhall meeting debate</b>
		2:45 – 4:00	
Apr 4	424	1:00 – 2:30	Term project presentations
		2:45 – 4:00	Term project presentations
Apr 11	364	4:00	<b>Written term papers due</b>