

School of Public Health

Syllabus and Course Information



UNIVERSITY OF MINNESOTA
Driven to DiscoverSM

PubH 8160-01 Advanced Toxicology Fall 2015

Credits: 2
Meeting Days: Wednesdays
Meeting Time: 4 – 6 pm
Meeting Place: Mayo 1155

Instructor: Lisa Peterson
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Office Hours: by appointment

Instructor: Elizabeth Wattenberg
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Instructor: William Toscano
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Office Hours: by appointment

I. Course Description

Students will read, discuss, and present current primary literature in toxicology, with an emphasis on modern methods in toxicology and the development of critical thinking skills.

II. Course Prerequisites

PubH 6160 and one course in biochemistry, one course in molecular biology

III. Course Goals and Objectives

Learn to think critically about experimental design and data interpretation in current approaches to toxicology

Develop strategies to investigate issues in toxicology

Apply toxicology principles learned in other courses to real world research questions

Learn to read and analyze primary literature in toxicology

Learn to make scientific presentations to your peers

IV. Methods of Instruction and Work Expectations

Students will prepare a series of initiating event presentations on one of the three chemicals: dimethylnitrosamine, aflatoxin B1 and benzo[a]pyrene, focusing on what is known for humans. The presentations should cover the following information:

1. Bioactivation presentation – 15 min
 - a. What is the chemical structure of the reactive metabolite(s)
 - b. What are the human enzymes involved in the bioactivation process(es)?
 - c. What are the detoxification pathways?
2. DNA adducts presentation – 15 min
 - a. How does the reactive metabolite interact with DNA?
 - b. What are the DNA adducts formed?
 - c. What factors influence which DNA adducts are formed? Site and sequence specificity
 - d. Have the DNA adducts been detected in humans? By what method?
3. DNA repair pathway – 20 min
 - a. Which DNA repair pathways are involved for all the DNA adducts that are formed?
 - b. What is the biochemical mechanism of repair? What is the sequence of enzymes/proteins?
4. Role of DNA damage in the cytotoxic and mutagenic properties of the chemical – 30 min
 - a. Which adducts are involved in the cytotoxic properties? The mutagenic properties?
 - b. What is the mechanism by which the DNA adduct causes the cytotoxic and/or mutagenic effects?
 - c. For the studies you find -were they performed in vivo or in vitro? What are the pros/cons to those experiments?

The students will also make a presentation on an Adverse Outcome Pathway of their choice for a chemical of their choice. Each student will have an entire class period for their presentation. Expectations for these presentations will be discussed in class on October 14. Please submit the topic for your AOP assignment to both Drs. Wattenberg and Peterson by email by September 30.

V. Course Text and Readings

Primary literature and appropriate published review articles

VI. Course Outline/Weekly Schedule

September 9, 2015	Orientation to class: Overview of Adverse Outcome Pathways Watch Tox21 video Discuss presentation expectations Assign chemical	Betsy Wattenberg and Lisa Peterson
September 16, 2015	No class, work on assignment	
September 23, 2015	DNA damage pathway I: Presentations on metabolic activation (presentation 1 – 15 min) and DNA adduct formation (presentation 2 – 15 min)	Lisa Peterson
September 30, 2015	DNA damage pathway II: Presentations on DNA repair pathways for the DNA damage formed by chemical (presentation 3 – 20 min)	Lisa Peterson
October 7, 2015	DNA damage pathway III: Presentations on the role of DNA damage in the cytotoxic and mutagenic properties of the chemical (presentation 4 – 20 min)	Lisa Peterson
October 14, 2015	Discuss the OECD guidelines for AOP and expectations for the AOP presentations	Betsy Wattenberg/Lisa Peterson
October 21, 2015	Developmental Toxicology	William Toscano
October 28, 2015	Week off to work on AOP	
November 4, 2015	Present an AOP	Betsy Wattenberg
November 11, 2015	Present an AOP	Betsy Wattenberg
November 18, 2015	Present an AOP	Betsy Wattenberg
November 25, 2015	No class?	
December 2, 2015	AOP in Environmental Toxicology	Mark Jankowski, MPCA
December 9, 2015	Case study in AOP development- Acetylcholinesterase inhibition leading to acute mortality Environmental Toxicol. Chem. 33: 2157-2169, 2014.	Carlie LaLone, EPA
December 16, 2015	Explore Tox21 dashboard Bring your computer to class	Lisa Peterson

VII. Evaluation and Grading

A/F letter grade will be determined by total effort as follows:

A = 92-100%	(4.0) Represents achievement that is outstanding relative to the level necessary to meet course requirements.
A- = 88-91.5%	
B+ = 84-87.5%	
B = 80-83.5%	(3.0) Represents achievement that is significantly above the level necessary to meet course requirements.
B- = 76-79.5%	
C+ = 72-75.5%	
C = 68-71.5%	(2.0) Represents achievement that meets the minimum course requirements.
C- = 64-67.5%	
D+ = 60-63.5%	
D = 56-59.6%	(1.0) Achievement below minimum course expectations but sufficient to be awarded credit.
D- = 52-55.5%	
F = <51.5	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

S/N option must complete all assignments to a C- level (70%):

S	Achievement that is satisfactory will be expected to complete all assignments and receive a minimum of 70% to receive a passing score (achievement required for an S is at the discretion of the instructor but may be no lower than a 70%).
F	Represents failure (or no credit) and signifies that the work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I.

Course Evaluation

Beginning in fall 2008, the SPH will collect student course evaluations electronically using a software system called CourseEval: www.sph.umn.edu/courseeval. The system will send email notifications to students when they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade in SPHGrades: www.sph.umn.edu/grades. All students will have access to their final grades through OneStop two weeks after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are an important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

Incomplete Contracts

A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to SPHGrades at: www.sph.umn.edu/grades.

University of Minnesota Uniform Grading and Transcript Policy - A link to the policy can be found at onestop.umn.edu.

VIII. Other Course Information and Policies

Grade Option Change (if applicable)

For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester courses) can be found at onestop.umn.edu.

Course Withdrawal

Students should refer to the Refund and Drop/Add Deadlines for the particular term at onestop.umn.edu for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Office of Admissions and Student Resources at sph-ssc@umn.edu for further information.

Student Conduct Code

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see:

http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Use of Personal Electronic Devices in the Classroom

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference:

<http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Scholastic Dishonesty

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code:

http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see:

<http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html>.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <http://www1.umn.edu/oscai/integrity/student/index.html>. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

Makeup Work for Legitimate Absences

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see:

<http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html>.

Appropriate Student Use of Class Notes and Course Materials

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: <http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

Sexual Harassment

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy:

<http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf>

Equity, Diversity, Equal Opportunity, and Affirmative Action

The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf.

Disability Accommodations

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. Disability Services (DS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DS at 612-626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DS website, <https://diversity.umn.edu/disability/>.

Mental Health and Stress Management

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: <http://www.mentalhealth.umn.edu>.

Academic Freedom and Responsibility: *for courses that do not involve students in research*

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost. *[Customize with names and contact information as appropriate for the course/college/campus.]*

**Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*