

Environmental Toxicology
11:375:407
Fall Semester
Cook/Douglass Campus

Instructor: Dr. George Van Orden
gvanorde@rci.rutgers.edu
973-428-2485

Office Hours: By Appointment
Classes: Monday 5:35 PM to 8:35 PM

Learning Goals:

The goal of this course is to introduce the student to the field of Environmental Toxicology where the basic principles of toxicology are applied to environmental problems. Basic concepts will be covered including chemical and physical disease causing agents, fate and transport of xenobiotics in the environment, mechanisms by which xenobiotics interact with the biosphere, dose-response relationships, toxicity testing, pharmacokinetics and metabolism of xenobiotics, adverse effects associated with exposures and risk assessment. This course will include case studies and some of the most common methods of remediation used to clean-up contaminated sites in New Jersey.

Students completing this program will be able to:

- 1) Apply the knowledge obtained from this course to evaluating exposure and solving problems associated with environmental contaminants.
- 2) Use the skills, techniques and tools necessary for a successful career in the field of environmental toxicology.
- 3) Conduct assessments of the environment, analyze data and evaluate health impacts from exposure to contamination.
- 4) Understand professional ethical responsibilities.
- 5) Understand contemporary environmental issues and the impact of environmental toxicology in a global and societal context.
- 6) Understand the need, and have the ability, to engage in lifelong learning and to participate in professional organizations.

Textbook: "Principles and Practice of Toxicology in Public Health," by Ira S. Richards, 2008, Jones and Bartlett Publishers, Inc.

Grading:

Assignments 10% of the final grade
Class Participation 10 % of final grade
Hourly Exams 2 exams that count for 40% of the final grade (20% each)
Final exam 40% of the final grade (cumulative)

Grading is based on the timely and correct submission of assignments, class participation as well as performance on two hourly examinations and a final. While the hourly exams cover recent information, the final exam is cumulative and includes all information covered in class lectures, the text and the additional required readings.

Guidelines for Assignments

Assignments that involve calculations should be completed in pencil. Please show all work to ensure full credit for the assignment. Correct answers alone will not be given full credit.

Homework assignments that say “write” must be prepared using a word processor with 11 or 12 point font, 1-inch margins (all around) and double spacing.

Full Credit: The assignment must be complete, correct, and submitted on time (“on time” means the assignment is turned in during the class period when it is due).

Half Credit: Homework that is complete, correct, and submitted within one week of the due date (including that which is turned to my office/mailbox on the same day but after the class period has begun).

No Credit: Homework that is submitted more than 7 days after the due date.

Academic Integrity

Honesty and integrity are an essential part of the educational experience. It is expected that students will complete all quizzes, exams, and assignments in accordance with Rutgers University’s academic rules and regulations (See the 2005-2007 Rutgers University academic catalog).

Any evidence of academic misconduct, including cheating, failure to cite sources, plagiarism, stealing ideas, or deliberately slanting research results will result in appropriate action as dictated by Rutgers University. Please note that taking information from an Internet site and placing it into text without proper citation is plagiarism and students are subject to the same consequences as they would face for copying information from a text or journal article without proper citation. If you are unsure of the rules of citation, please ask! Rutgers provides a wealth of resources to help students understand proper citation format and coping with the pressures of academic life.

Class Rules

NO CELL PHONE DISRUPTIONS! Be sure to check your cell phone before you enter the class.

EXAMINATIONS require simple calculators and pencils. Cell phones will NOT be allowed to be used as calculators under any circumstances. All cell phones and other materials must be under your seat or zipped into a backpack during examinations. I do not carry spare calculators and calculators may not be shared during examinations.

All examination scheduling conflicts must be discussed at least 1 week prior to the scheduled date of the hourly/exam. In the event of an emergency or illness on the day of an hourly or exam, you must notify me before the exam. If requested, students must provide verification of the absence in order to schedule a make-up hourly/exam. Students who do not make alternate arrangements prior to the hourly/exam will be given a grade of "0" for that hourly/exam.

Students are expected to attend all classes; if you expect to miss one or two classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me.

Course Schedule

Class		Reading From Text
1	Introduction/video (In Our Water)	Chap. 1, 5.
2	Chemical/Physical Agents of Disease/ video (One Night in Bhopal)	Chap. 3, 10, 11, 12.
3	General Review of Water Resources/Groundwater/Surface Water	
4	General Review of Chemical Properties/Effects from Toxic Substances	Chap. 2
5	Hourly Exam/ Toxicology and Review of Pharmacological Concepts	Chap. 6.
6	Toxicology and Review of Pharmacological Concepts	Chap. 13, 14, 15, 16, 17, 20.
7	Risk Assessment	Chap. 19, 23
8	Pharmacokinetics and Metabolism of Xenobiotics	Chap. 7, 8, 9
9	Toxicity of Chemicals	
10	Chemodynamics and Ecotoxicology	
11	Hourly Exam/ Environmental Epidemiology	
12	Air Pollution/Video – "The Disappearing Male"	
13	Water Pollution	
14	Land Pollution/ Clean-up of Contaminated Sites	
	Final Exam	

Readings From Text: "Principles and Practice of Toxicology in Public Health," by Ira S. Richards, 2008, Jones and Bartlett Publishers, Inc.

Additional Powerpoints/Documents (posted on sakai):

- 1 Public Laws Regulating Environmental Exposure.pdf
- 2 Carcinogens – Cancer.ppt
- 3 Definitions of Carcinogens.pdf

- 4 CDC 4th Report Exposure to Hazardous Chemicals.pdf (pages 1 thru 10)
- 5 Global Climate Change.ppt

Additional References:

- 1) "Casarett and Doull's Toxicology, 4th Edition"; Pergamon Press, Inc., 1991.
- 2) "Principles of Environmental Toxicology"; Sigmund F. Zakrzewski; American Chemical Society, 1991.
- 3) "The Dose Makes the Poison"; M. Alice Ottoboni; Vincente Books, 1986.
- 4) "Basic Environmental Toxicology," Edited by Lorris G. Cockerham and Barbara S. Shane; CRC Press; 1994.
- 5) Reducing Environmental Cancer Risk 2008-2009 (pdf on sakai)
- 6) CDC 4th Report Exposure and Hazardous Chemicals (pdf on sakai)