Molecular and Environmental Toxicology 632, 633, 634

Ecotoxicology: Toxicant Effects on Ecosystems

Fall 2017

No.	Module Name	Coordinator*	Contact Information
632	**Ecotoxicology: the chemical players** September 6 – October 4	Dr. William Karasov	Forest & Wildlife Ecology (263-9319) wkarasov@wisc.edu
633	**Ecotoxicology: impacts on individuals** October 6 – November 8	Dr. William Karasov	Forest & Wildlife Ecology (263-9319) wkarasov@wisc.edu
634	**Ecotoxicology: impacts on populations, communities, and ecosystems** November 10 – December 13	Dr. Rick Lindroth	Dept. of Entomology (263-6277) richard.lindroth@wisc.edu

Note: all students are required to be knowledgeable of the fundamental conceptual information (general mechanisms, processes, and theory) presented in each of the preceding modules, whether or not they are taken for credit.

Teaching Assistant: Morgan Walcheck (mwalcheck@wisc.edu)
Office Hours: Mondays 1-3pm (right after lecture) in room 221 McArdle Building (1400 University Ave) OR by appointment.

Time and Place:

12:05-12:55, Monday, Wednesday and Friday
Soil Sciences, Room 270

Background:

Ecotoxicology is a multidisciplinary science that deals with the study of natural and synthetic toxicants, and the hazards they pose for biological systems. Ecotoxicology is unique within the field of toxicology for two reasons. First, it addresses the effects of toxicants on not only individual organisms, but also on populations, communities and ecosystems. Second, rather than emphasizing human health-related concerns, it emphasizes how toxicants affect the functioning of biological systems, including natural (e.g., lake, forest) and managed (e.g., food crop) systems. Natural and synthetic toxicants are increasingly recognized for their impact on the fundamental mechanisms and interactions of biological systems - their occurrence is ubiquitous, and their influence is pervasive.

Objectives:

The overall objective of this modular course is for students to understand the means by which natural and synthetic toxicants mediate interactions between and among organisms and their environment. Specific objectives are that students will understand:

1. General modes of action of toxicants affecting organisms.
2. Mechanisms of organisms that defend against natural and synthetic toxicants, and the consequences of these for species-selective action of toxicants.
3. Similarities and dissimilarities between natural and synthetic toxicants and their impact on organisms.

4. Impacts of toxicants on population dynamics, community organization, and ecosystem structure and function.
5. Fundamental principles of risk assessment and uncertainty analysis.
6. Effects of toxicants on the population genetics and evolution of biological systems.
7. Present active research by UW faculty on the actions of toxicants in natural and model ecosystems.

Lectures, Discussions, Examinations:

In addition to lectures, each module contains at least one discussion period. These will be used to review and integrate preceding lectures and reading materials, and to provide overall synthesis; they are not review sessions for examinations. A list of discussion questions will be handed out prior to the meeting to be used as a framework for these discussions. Attendance and participation in discussions will be considered at the time of assignment of final grades.

Each module has one or more examinations (dates provided in module schedule). Exams will contain short-answer and essay questions, and may include an additional take-home synthesis question(s). Work turned in for take-home examinations must be solely your own. You must not discuss examination material with other students or examine their materials.

Module #2 (633) includes an assignment in which students in small groups organize a classroom presentation.

Course Web Page:

Course materials will be available via Canvas (https://canvas.wisc.edu/courses/64756). The lecture sequence, lecture handouts, assigned readings, problem sets and related information will be available at this site. *Be sure to bring a printed set of the relevant lecture handout(s) to every class!* Handouts available via the web will not be provided in class.

Readings:

The required text for the course is: Newman, M.C. (2014) *Fundamentals of Ecotoxicology*, CRC Press, 4th edition. An eBook version of this book is on reserve for your use via the UW Library Website. Please follow the directions below to access the book. Additional reading assignments (book chapters, primary literature) will be made by participating faculty throughout the semester. Reading assignments will be listed on lecture outlines or on the course lecture schedule on Canvas.

To Access eBook online:

1. Go to the UW Madison Library Website/Catalog (https://www.library.wisc.edu/)
2. Then in the search bar on the page, search the title of the book "Fundamentals of Ecotoxicology: Fourth Edition by Michael C. Newman"
3. It will be the second option that pops up (the first option is the third edition). Click on the book title and this will bring you to the books library information page.
4. Once here, look in the right hand column and you will see "Online Access" and a link underneath that states "ProQuest Ebook Central eBooks". Click this link and it will bring you to the online access of the eBook. If you are not on the UW Internet, you will be prompted to log in with your UW NetID and Password.