

**Environmental Toxicology
Fall 2016**

- Instructor:** Lawrence K. Duffy, 246 WRRB, lkduffy@alaska.edu, 474-7525
- Office Hours:** Tuesday and Thursday following lectures. However students are encouraged to contact the instructor by phone or email at any time
- Lecture:** Tuesdays and Thursdays, 11:30 am – 1:15 pm. Location Murie 103
- Textbook:** Fundamentals of Ecotoxicology 4th Edition (ISBN 978-14-666-58-2293) by Michael C Newman, CRC Press, Taylor and Francis Group. No supplementary reading required for purchase. Primary literature will be provided by instructor.

Course Description: This 3 credit course will discuss the basic components of environmental and ecotoxicology, and explores exposure of toxic chemicals to animals and plants and their impact on health and the ecosystem, using a One Health model. Environmental Toxicology will focus on the general properties and principles of persistent and/or toxic chemicals commonly encountered in air, water, fish and wildlife. Numerous natural and synthetic chemicals in the environment will be discussed from a global perspective with some bias towards arctic and subarctic regions. This toxicology course combines aspects of environmental science, vertebrate biochemistry and physiology and environmental chemistry in a manner to understand how systems are impacted and function.

Student Learning Outcomes:

- increase understanding of biochemistry with respect to environmental contaminants
- increase understanding of the chemical-biotic interactions
- gain an understanding of how biota alters the structure and dynamics of contaminants in the diverse ecosystems of the North

Course Goals:

This course will provide the basic foundations for Environmental Toxicology
The class will focus on specific aspects of Environmental Toxicology that interest the student
Develop an appreciation of the complex system of contaminant interactions in high latitude systems

Instructional Methods:

The teaching methods employed in this course will consist of lectures and “chalk talk” by the instructor. It is absolutely crucial that reading (see schedule) of sections is done in advance. Student essays and presentations on specific topics will also be used.

Grading:

Exams: There will be four term exams (100 points each); one for each major section of the course.
Participation: Class participation in the form of essays and discussions will be included in the final grade (100 points). This entails an active involvement into the regular lecture materials discussed. Quiz/Class participation (100 points).

Undergraduate Students

Exams	400 points
W and O assignments	200 points
Discussions/Short essays	200 points (2 essays and 2 discussions. 50 points per discussion package).
Undergraduate total	800 points (400 points of W or O 50%)

Exams:

Four examinations that will focus on the three major sections

Each exam is 100 points (3*100 points = 300 points for exams) and will be multiple choice, true or false, and/or short essay format.

The oral presentations (O, 15 minutes each = 10 points to present + 5 minutes for questions) and written exercises (W, expected number pages based on graduate or undergraduate status) will count as 100 or 200 points each (200-400 points total based on graduate or undergraduate status). Each student will have 2 O and two W assignments (mandated by the university for full O and full W). Topics must be presented to the instructor for approval. During oral presentations we will have the entire class present and invite other students and faculty with the expectation to have > than 12 members in the audience (minimum of 5). Part of the grade for students will be participation during the Q and A session; they must be engaged for credit. Presentations must have a clear "introduction-body-conclusion" organization, appropriate to Environmental Toxicology and all will include visual aids. All presentations will receive evaluation by the instructor on oral communication including responsiveness to audience questions and subject mastery. The written exercise (W, 10-12 pages double spaced, 1 inch margins, Arial 11 font) will undergo stages of review (with feedback to students) and at least one meeting to speak with the student about his or her writing. The review will comprise 33.3% of the grade.

Essay and essay-like assignments will be an additional 100 points and are mostly based on discussion activities and will typically cover the past week of lectures/presentations to highlight major points, involve specific questions (current events), and/or reading assignments (journal articles) the students will be expected to discuss as well as turn in reviews (essays). For example, we distribute a controversial paper on mercury in fish and ask students to choose a position on whether they should allow human consumption or not. They must then defend their decision. It is not the decision they make that is graded but how they can articulate their perspective and defense of the decision.

Support Services

Writing Center (<http://www.uaf.edu/english/writing-center>): The center is located on the eight floor of the Gruening Building. Students can receive help at the center at any stage in their writing process, from brainstorming to final editing. Tutors are available for one-on-one sessions and can help students with grammar, spelling, punctuation, organization, and style. Students who visit the center should bring a clean draft of the paper they are working on (double spaced) and a copy of the instructor's assignment sheet.

801 Gruening Building., PO Box 755720, Fairbanks, AK 99775-5720, Phone: (907) 474-5314

Email: uaf-writing-center@alaska.edu

Course Policies

Attendance: Regular student attendance is expected to ensure consistent group activities and discussions.

Exams: Four exams will be given. These exams will be a combination of multiple choice/short answer and essay questions (take home or in class). Makeup exams will only be allowed with pre-approval of the instructor or with an acceptable, documented reason such as unexpected illness, family emergencies or other unavoidable events.

Participation: Class participation entails an active interest aside from paper discussion/presentations. This includes but is not limited to answering questions during lectures, asking for clarifications, or contributing to ad hoc discussions.

Ethical Considerations: The Chemistry "Department Policy on Cheating" is as follows: "Any student caught cheating will be assigned a course grade of F. The student's academic advisor will be notified of this failing grade and the student will not be allowed to drop the course."

Plagiarism Policy

Plagiarism is defined as the use of "other" intellectual property without proper reference to the original author. Intellectual property includes all electronic (Internet), spoken or print media. Students are expected to cite all sources used in oral and written presentations. Cases of plagiarism will be taken seriously with a grade 0 for the particular assignment. Severe cases may be referred to the Department Chair or Dean or class failing considered.

Support Services

Support services will be provided by the University of Alaska Library system, online resources and the instructor. Additional services are available through Student Support Services (<http://www.uaf.edu/sssp/>) at UAF.

Disabilities Services

Students with a physical or learning disability are required to identify themselves to Mary Matthews in the Office of Disabilities Services (203 WHIT, 474-7043) located in the Center for Health and Counseling in order to receive special accommodations. The student must provide documentation of the disability. Disability Services will then notify me of special arrangements for taking tests, working homework assignments, and doing lab work.

See academic calendar on website for important dates.

Lecture	Chapter	Topic
1		Syllabus
2	1.1	History
3	1.2	Science, Technology and Current Practice
4	1.3/1.4	Ecotoxicology and Precaution
5	2.1/2.2	Types of Contaminants
6	3	Uptake 1
7	3	Uptake 2
8	3	Biotransformation 1
9	3	Elimination 2,3
10	3	Accumulation
11	Chapters 1-3	Exam 1
12	4	Bioavailability
13	4	Chemical Influences (Water)
14, 15	4	Biological Influences (Solids)
16	4	Other Factors
17	5	Assimilation from Food
18	5	Trophic Transfer 1
19	Chapters 4-5	Exam 2
20	6	Molecular Effects
21	6	Phase 1
22	6	Phase 2
23	6	Biomarkers
24	6	Enzyme Dysfunction
25	7	Necrosis/Apoptosis/Inflammation
26	Chapters 6-7	Exam 3
27	8	Sublethal Effects
28	8	Selyean Stress
29	9	Life Stage Lethality
30	9	Factors Influencing Lethality
31	11	Effects on Communities
32	12	Landscapes and Regions
33	Chapters 8,9,11,12	Exam 4