Biology 4380/5380 – Aquatic Toxicology

10-10:50am MW Lang 304
1-3:50 M (Lab) ENV 358

Spring 2026

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Course Description:
The goal of this course is to introduce students to the fundamentals of aquatic toxicology. This will include covering concepts in toxicology, ecology, chemistry, and physiology. The course will include a discussion of a variety of aquatic contaminants, techniques used in aquatic toxicology, and a discussion of current toxicological research literature.

Grades:
Grades will be based on three regular exams (100 pts each), lab notebook (100 pts), a final lab project (100 pts), and oil debate presentation and discussion (100 pts). Graduate student grades will not be curved. Letter grades will be assigned on the following scale:

90-100% = A (537-600 pts)
80-89% = B (477-536 pts)
70-79% = C (417-476 pts)
60-70% = D (357-416 pts)
<60% = F (<357 pts)

If you do poorly on an exam or are concerned about your grade, I encourage you to come see me. It is much easier to get a student back on track for a good grade earlier in the semester than later.

Exams:
Exams will consist of a mixture of definition, short answer, and essay questions. Each student will be allowed to correct 1 exam during the semester. Exam corrections are due 1 week after the exam is returned. Make-up exams will only be allowed in case of medical emergency or conflict with another university-sponsored activity. The student MUST notify the instructor either prior to the exam or within 24 hours of the original exam time AND provide the instructor with a letter from a coach/sponsor/etc for all university related reasons. NO OTHER EXCUSES WILL BE ACCEPTED.

Extra Credit: A total of 9 points of extra credit will be offered over the course of the semester.

Lecture and Exam Schedule

Dates	Topic
Jan. 12	Intro to Aquatic Tox
Jan. 14, 21	Risk Assessment
Jan. 26, 28	PAHs
Feb. 2, 4, 9	Metals Toxicity
Feb. 11	Review 1
Feb. 16, 18	Guest Lecture, Exam 1
Feb. 23	Oil Debate Intro
Feb. 25	Harmful Algal Blooms
Mar. 2, 4	Endocrine Disrupters
Mar. 9, 11	Spring Break
Mar. 16, 1	Mercury
Mar. 23, 25	Review, Exam 2
Mar. 30, Apr. 1	Pesticides/Legacy Contaminants
Apr. 6, 8	Guest Lecture/Emerging Compounds
Apr. 13, 15	Microplastics/Nanotox
Apr. 20, 22	Behavioral Tox. /Guest Lecture
Apr. 27, 29	Review, Exam 3

Laboratory Attendance:
Weekly lab attendance is mandatory. If you have a conflict, contact me, your TA, and your group prior to missing class. There will also be times when you will be required to perform tasks outside of class hours, a schedule will be made that the beginning of the semester. **Everyone is expected to contribute to these efforts.** Each group's schedule will be written down and provided to the TA. Any alterations or changes to that schedule need to be communicated to the group and the TA. If you miss multiple culture/test checks, they will count as an absence. More than two unexcused absences from the laboratory will result in an automatic F.

Lab Grading:
The Lab Notebook is worth 100 pts (6 lab entries), the Final Lab Project 100 pts (including all 5 weeks), and Participation in Discussion 100 pts (Group presentation 75 pts, Questions 25 pts). An F in the lab will result in an F in the course.

Lab Notebook (100 pts): Typed – Typed – Typed - Typed
The purpose of the notebook is to help organize what was done in the lab and create a methods resource. Typed lab notebooks are due through Canvas (Word) on March 8. You will be required to write 1 entry per lab period. Students should keep a notebook that will be used each lab period to record necessary information and data that will be included in the typed lab notebook. As you write these, PRETEND the instructor is not knowledgeable in Aquatic Toxicology and did not witness lab activities.

General Guide for Lab Notebooks:

1. Title of Lab
2. Introduction
    a. Brief description of material covered in lab.
3. Summary of Methods
    a. Be sure to include species you worked with, the chemical you tested, how you measured the chemical out (show your math), what sort of testing procedures did you use, how did you evaluate toxicity, etc.
4. Results
    a. Offer one or two summary statements of results highlights.
    b. Present data collected during the lab in a tabular or other easy to read format.
    c. Make sure all tables and graphs included are properly formatted with labels, captions, etc.
5. Discussions
    a. Brief summary of important results of work performed.
    b. Compare observed results with expected. If different, include reasons for deviation.
    c. Interpret results in terms of water quality

Lab Project (100 pts):

As a group, you will conduct a series of assays to determine the toxicity of an "unknown". Each group member will submit a typed lab notebook (same format as the previous lab notebook) with all 5 weeks' worth of data. There can be on introduction and one discussion encompassing all labs, but methods and results need to be included for each individual week. Lab project notebooks are due through Canvas on May 3.

Presentations/Discussion (100 pts):

Students will be broken into two groups to present/debate "real world" aquatic toxicology data in a litigation scenario. Students are expected to take turns presenting the view of their group and ask questions of the other group for credit. If you do not participate, you will not receive any points. Assignment Introduction: Feb. 23 (lecture), 3 Species Debates: Mar. 23, 30, April 6, Final Debate: Apr. 20 (all in lab)

Approximate Lab Schedule:

January 12 – Lab Introduction
January 26–Basic Water Quality/Culture Methods
February 2 - Serial Dilution, Standard Curves, PC Data Manipulation
February 9 – 48-hour Acute Toxicity Test – *Daphnia magna*
February 16 – Toxicity Test Data Analysis
February 23 - Water Chemistry Effects on Toxicity (48-hour acute test)
March 2 – Water Chemistry Effects on Toxicity (48-hour acute test)
March 8 - Lab Notebooks due by 11:59 pm, submit through Canvas
March 9 – Spring Break
March 16 – Project Introduction
March 23 – Class Project: Ranger Finder
March 30 – Class Project: Range Finder
April 6 – Class Project: 48-hour Acute Toxicity
April 13 – Class Project: Humic Acid
April 20 – Class Project: Altered RHW
April 27 – Present Class Project Results
May 3 – Lab Project Notebooks Due by 11:59pm, submit through Canvas

Attendance:
Regular and punctual class attendance is expected. It is foreseen that occasionally you may be sick, have other obligations, or have some other reason for not attending class. There is no *a priori* penalty for absences in the lecture. More than two unexcused absences from the lab will result in an automatic F.

Disability Accommodation:
The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. If you have a verified disability, please see me at your earliest convenience so that we can discuss your needs. I will ensure that accommodations are made so that you are provided equality in your educational experience in my class.

Policy on Scholastic Dishonesty and AI:
Scholastic dishonesty will not be tolerated. Students who are found to be cheating (all forms, including but not limited to copying from another student's exam or homework, or plagiarism) will fail this course. The term 'plagiarism' includes but is not limited to: (1) the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and (2) the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials. Submissions may not contain AI written material. Any student with a submission with high AI percentages may lose points on the assignment and will be required to meet with the instructor. AI resources may be used in initial stages but everything should be written by the student that is submitted.