

## **Biology 4380/5380 – Aquatic Toxicology**

**10-10:50am MW Zoom**

**1-3:50 M (Lab) ENV 358**

### **Spring 2021**

Dr. Aaron Roberts

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Office Hrs: By Appointment

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Office Hours: By Appointment

### **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.

Undergraduate students will be evaluated based on performance on exams.

### **Grades**

Grades will be based on three exams (100pts each), progress in lab (100pts), and participation in discussions (50pts). Graduate student grades will not be curved. Letter grades will be assigned on the following scale:

90-100% = A

80-89% = B

70-79% = C

60-70% = D

<60% = F

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. 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

doctor's note or letter from a coach/sponsor/etc. NO OTHER EXCUSES WILL BE ACCEPTED.

### **Presentations/Discussion**

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.

### **Laboratory Attendance:**

Weekly lab attendance is mandatory. If you have a conflict see me prior to missing class.

**There will also be times when you will be required to perform tasks outside of class hours.** When toxicity testing begins, a schedule will be made up to for test maintenance.

**Everyone is expected to contribute to these efforts.** More than two unexcused absences from laboratory will result in an automatic F.

### **Lab Notebook: 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 by email (in Word format) twice during the semester, March 10 and May 3. 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.

## **Guidelines for notebook entries**

1. Introduction
  1. Time, Date, and Title of Lab Exercise
  2. Brief description of material covered in lab.
2. Summary of Methods
  1. What did you do during the lab period? 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.
3. Results
  1. Offer one or two summary statements of results highlights.

2. Present data collected during the lab in a tabular or other easy to read format.
3. Make sure all tables and graphs included are properly formatted with labels, captions, etc.
4. Conclusions
  1. Brief summary of important results of work performed.
  2. Compare observed results with expected. If different, include reasons for deviation.
  3. Interpret results in terms of water quality.
4. What was the “take home” for that day?

### **Grading:**

The Lab Notebook is worth 100pts and Participation in Discussion 50pts. An F in the lab will result in an F in the course.

### **Approximate Lab Schedule:**

1. January 11 – Lab Introduction
2. January 18 – No Class
3. January 25 – Culture Methods/Basic Water Quality
4. February 1 - Serial Dilution, Standard Curves, PC Data Manipulation
5. February 8 – 48-hour Acute Toxicity Test – *Daphnia magna*
6. February 15 – 7-day Chronic Toxicity Test – *Ceriodaphnia dubia*
7. February 22 - Toxicity Test Data Analysis
8. **March 1 – Lab Notebooks due by 11:59 pm**
9. March 8 - Water Chemistry Effects on Toxicity (48-hour acute test)
10. March 15 – Water Chemistry Effects on Toxicity (48-hour acute test)
11. March 22 – Water Chemistry Effects on Toxicity (48-hour acute test)
12. March 29 – Presentations – Sea Otters
13. April 5 – Presentations - Birds
14. April 12 – Presentations - Fish
15. April 19 – Final Presentations

### **University of North Texas Policies for Courses**

#### **1. 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.

#### **2. Policy on Incompletes:**

An incomplete (I), is a non-punitive grade, given only during the last one-fourth of a semester and only if a student is (1) passing the course; (2) has a justifiable reason why the class cannot be completed on schedule; and (3) arranges with the

instructor to finish the course at a later date by completing specific requirements that the instructor must list on the grade sheet turned in at the end of the semester. All work must be completed within the time specified by the instructor (not to exceed one year after taking the course).

### 3. 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 assure that accommodations are made so that you are provided equality in your educational experience in my class.

### 4. Policy on Scholastic Dishonesty:

**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. Examples: copying, word for word, even a phrase, from a publication, including web pages, without placing quotes around the phrase and citing the source. Students found to have committed scholastic dishonesty will fail this course. Students suspected of cheating will automatically be**

assigned a grade of "I" (incomplete) until the matter is resolved through proper procedures. Students found to have committed scholastic dishonesty will fail this course. Students are expected to know their rights and responsibilities as put forth in the University of North Texas Catalog and the Student Guidebook.

### Lecture and Exam Schedule

<b>Dates</b>	<b>Topic</b>
Jan. 11, 13	Intro to Aquatic Tox, Risk Assessment
Jan. 18, 20	No Class (18); Risk Assessment
Jan 25, 27	Toxicity Testing; Mercury
Feb 1, 3	Hydrocarbons
Feb 8, <b>10</b>	<b>Exam 1</b>
Feb. 15, 17	Metals 1
Feb 22, 24	Metals 2
Mar 1, 3	Pesticides
Mar 8, 10	Go over Presentations; Catch Up
Mar 15, <b>17</b>	<b>Exam 2</b>
Mar 22, 24	Endocrine Disruptors
Mar 29, 31	Nutrients/Algal Blooms
Apr 5, 7	Emerging Contaminants
Apr 12, 14	Catch up; Guest Lecture
Apr 19, <b>21</b>	<b>Exam 3</b>