

# EEB 470: Aquatic Ecology

## University of Tennessee, Spring 2018

<b>Instructor:</b>	Xingli Giam, PhD 527 Hesler Biology Building	e: <a href="mailto:xgiam@utk.edu">xgiam@utk.edu</a> t: 865-974-2189
<b>Class Hours:</b>	Monday, 1.25 – 2.15 pm, Hesler 427 Wednesday, 1.25 – 4.25 pm, Hesler 603 (usually 1.25 – 3.05 pm unless noted otherwise)	
<b>Office hours:</b>	Monday, 2.15 am – 3:15 pm, Hesler 527 I highly encourage students to stop by during office hours, individually or in small groups.	
<b>Teaching Assistant:</b>	Sam Borstein 528 Hesler Biology Building	e: <a href="mailto:sborstei@vols.utk.edu">sborstei@vols.utk.edu</a>

**Course website:** You will find the EEB 470 web page on *Canvas* at <https://utk.instructure.com/>. Please check *Canvas* frequently for new announcements, schedule changes, and assignments.

**Course description:** In this class, we will learn about the physical, chemical, and biological characteristics of streams, lakes, and seas. We will discover how anthropogenic activities are threatening these systems and the biodiversity therein. Coding and big data analyses will be an important part of this class. We will learn how to harness publicly available datasets to answer important questions in aquatic ecology and conservation.

**Course objectives:** This course is designed to develop your understanding of the physical, chemical, and biological characteristics of the different types of aquatic environments found on Earth. Importantly, by the end of the course, you should be able to apply a variety of skills needed for post-graduate employment as an aquatic ecologist, research technician, or graduate student in ecology and environmental science. These skills include (but are not limited to):

- Summarizing information from a wide variety of sources including textbooks, websites, and scientific papers
- Interpreting and critically evaluating research papers
- Knowing what types of data are publicly available and how to access and use them
- Analyzing real data to answer important ecological questions
- Coding in an open-source statistical environment (R; <https://cran.r-project.org/>)
- Engaging in the scientific peer-review process

**Course format:** We will meet on Mondays and Wednesdays. Monday classes are always 50 mins long. Wednesday classes are 1 hr 40 min long for most weeks. There will be one or two field trips (scheduled on a Wednesday) that may last 3 hrs. This is why the Wednesday meeting time is officially listed as 3 hrs.

Monday classes will take a lecture/discussion format whereas Wednesday classes will be a mixture of lecture/discussion and hands-on computer coding time. Lecture slides will be uploaded to *Canvas* after class. Sample computer code will be available on *Canvas* before the start of each class.

In some weeks, we will discuss new and exciting research papers. You will be taught how to search for and download papers (if you do not already know). **As your instructor, my expectations are for you to read and understand assigned papers before class. I recommend that you to meet up in groups to read and discuss these papers ahead of class.**

**Required Books/Resources:** You are not required to purchase a text-book. We will use open-source (free!) resources and scientific papers that can be downloaded via your UT library account. Links to resources will be provided in class or via *Canvas*. You need to bring your laptops to class for statistical analysis. Please let me know if you need to borrow one.

**Assessment:** Assessment will be based on the following:

- Participation during class (30%). Participation includes asking questions, taking part in discussions, answering questions (including those from your classmates).
- Assignments (30%). In-class and take-home assignments will be assigned regularly to evaluate your understanding of important concepts and techniques covered in class.
- Final Paper and Peer-Review (40%). Students are required to submit a paper at the end of the semester and complete peer-reviews of papers submitted by two of your classmates. More information about this paper will be provided in the course of the semester.

Late assignments and papers will be penalized (Penalty: <2 days = 25%; 2-7 days = 50%; > 7 days = 100%). Any excuse or concern for absence or tardy work should be discussed with me within one week.

I will use the standard UT grading scale. A = 93-100%; A- = 90-92%; B+ = 87-89%; B = 83-86%; B- = 80-82%; C+ = 77-79%; C = 73-76%; C- = 70-72%; D+ = 67-69%; D = 63-66%; D- = 60-62%; F = <60%.

**Academic integrity:** Academic dishonesty of any sort will not be tolerated. Plagiarism includes the copying of answers, phrases, portions of sentences or the main ideas from **anyone** (including a classmate or friends who had taken the class previously) and on **any work** submitted for a grade.

You are expected to abide by The University of Tennessee honor statement in Biology and in all of your university activities as pledged in the honor code:

***“An essential feature of the University of Tennessee, Knoxville, is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.”***

Depending on the offence, penalties for academic dishonesty range from a minimum of a zero for the assignment, to an F for the course, to the filing of formal academic dishonesty charges seeking dismissal from The University of Tennessee. These choices are at the discretion of the instructor.

You should be familiar with the requisites of academic honesty and what constitutes academic dishonesty as outlined in the UT Undergraduate Catalog (<http://catalog.utk.edu/>).

### **Other information**

**Disability Services:** If you need course adaptations or accommodations because of a documented disability, please contact me privately to discuss your needs. If you have questions or concerns about disabilities or emergency information to share, please contact Disability Services: 2227 Dunford Hall; 974-6807 or 865-622-6566 for video phone; Email: [ods@utk.edu](mailto:ods@utk.edu); Website: <http://ods.utk.edu/>.

### **Technical Assistance:**

Canvas or general information technology assistance:

- Help Desk: 865 974 9900 (M – F, 8:00 – 5:00)
- OIT Walk-In Help Desk: Commons, 2<sup>nd</sup> floor Hodges Library

Tentative Schedule (please bring laptops on class days shaded orange):

Week	Date	Class Number	Topic Area
<b>One</b>	Jan 10	1	Introduction
<b>Two</b>	<b>Jan 15</b>	No Class	<b>MLK Day</b>
	Jan 17	2	The Global Water System
<b>Three</b>	Jan 22	3	Physical and Chemical Characteristics of Streams
	<b>Jan 24</b>	<b>4</b>	<b>Accessing Publicly Available Aquatic Datasets (Bring Laptop)</b>
<b>Four</b>	Jan 29	5	Biotic Communities and Interactions in Streams 1
	<b>Jan 31</b>	<b>6</b>	<b>Geographic Information Systems (Bring Laptop)</b>
<b>Five</b>	Feb 5	7	Biotic Communities and Interactions in Streams 2
	<b>Feb 7</b>	<b>8</b>	<b>Visualizing Data and Comparison of Means (Bring Laptop)</b>
<b>Six</b>	Feb 12	9	Anthropogenic Impacts to Streams
	<b>Feb 14</b>	<b>10</b>	<b>Correlations and Regressions (Bring Laptop)</b>
<b>Seven</b>	Feb 19	11	Physical and Chemical Characteristics of Lakes
	<b>Feb 21</b>	<b>12</b>	<b>Climate Change Impacts to Streams (Bring Laptop)</b>
<b>Eight</b>	Feb 26	13	Biotic Communities and Interactions in Lakes
	Feb 28	14	Anthropogenic Impacts to Lakes
<b>Nine</b>	Mar 5	15	Physical and Chemical Characteristics of Marine Environments
	<b>Mar 7</b>	<b>16</b>	<b>Discussion of Final Projects and Review Stat. Techniques (Bring Laptop)</b>
<b>Ten</b>	<b>Mar 12</b>	No Class	<b>SPRING BREAK</b>
	<b>Mar 14</b>	No Class	<b>SPRING BREAK</b>
<b>Eleven</b>	Mar 19	17	Biotic Communities and Interactions in Marine Environments
	<b>Mar 21</b>	<b>18</b>	<b>Generalized Linear Models (Bring Laptop)</b>
<b>Twelve</b>	Mar 26	19	Anthropogenic Impacts to Open Oceans
	<b>Mar 28</b>	<b>20</b>	<b>Machine Learning (Bring Laptop)</b>
<b>Thirteen</b>	Apr 2	21	Anthropogenic Impacts to Nearshore Environments
	<b>Apr 4</b>	<b>22</b>	<b>Multivariate Analyses (Bring Laptop)</b>
<b>Fourteen</b>	Apr 9	23	Conservation Strategies in Aquatic Environments
	<b>Apr 11</b>	<b>24</b>	<b>Open Discussion/Computer Lab for Final Paper (Bring Laptop)</b>
<b>Fifteen</b>	Apr 16	25	Ecology of Tennessee Streams and Fishes
	<b>Apr 18</b>	<b>26</b>	<b>Open Discussion/Computer Lab for Final Paper (Bring Laptop)</b>
<b>Sixteen</b>	Apr 23	27	Finalize Paper (Bring Laptop) <b>Final Paper Due (Electronic Submission) by 5 pm</b>
	Apr 25	28	Field Trip (TBA) – 3 hrs
	Apr 27	No Class	<b>Peer Reviews Due (Electronic Submission) by 5 pm</b>