Limnology – Spring 2021
BIOL 5360 & BIOL 4395 (23003)

Instructors:

Dr. Vanessa Lougheed, E-mail: vlougheed@utep.edu (first 12 weeks of course)
Dr. Elizabeth Walsh, email: ewalsh@utep.edu (last 3 weeks of course)

Lectures: Tuesday 9-10:20 (Online & synchronous)
Office hours: Thursday 9-10:00

Lecture notes, labs and journal articles will be posted on Blackboard.
Classes and office hours will occur in ZOOM. The link is on Blackboard.

Grading Scheme:

	BIOL 4395	**BIOL 5360**
Assignments	60%	50%
Presentation	N/A	20%
Journal discussion & participation	15%	10%
Final	25%	20%

Course objective:

This course includes a combination of lectures, assignments, tests, classroom discussions, and student presentations focusing on limnology. The primary objectives are to:

1. Learn important and current concepts, theories, methods and technologies used in limnology.
2. Explore methods for measuring, analyzing, testing and critically evaluating these concepts and approaches. Statistical programs such as "R" and others will be used.

Required statistical software:

R & R-studio; Instructions will be provided on how to install and download this FREE software.

How do you get help?

1. Use the Q&A discussion board to see previous questions – and ask your own questions. Answers can be posted by the instructor, the TA or your fellow classmates.
2. Attend the instructor office hours
3. Send an email to the instructor or TA. If it is a problem with a lab, you should cut and paste the problem code, a screenshot, or include the HTML version of your R notebook.

Assignments (~10 assignments worth 5-6% each).

Assignments will test your ability to analyze and interpret limnological & toxicological datasets. You will be expected to analyze the data as instructed and relate it to concepts presented in lectures. Due dates will be clearly noted. Late assignments will not be accepted.

Presentations & journal discussion lead (graduate students only) (20%):

Date	**Submission**
Feb. 1	Choose topic (see last page of syllabus)
3 weeks before presentation (3%)	Outline of presentation; incl. at least 3 relevant peer-reviewed journal articles.
1 week before presentation	• Submit 1 journal article for approval for your classmates to read before your presentation. • Submit guiding discussion questions for the paper.
Day of presentation (14%)	• Present live – or create recorded presentation to be shown – to the class. • Submit list of references used.
Week of presentation (3%)	Moderate the journal discussion for your selected paper.

Suggested topics:

I have included a list of general topics (last page of syllabus). Each can only be selected by 1 student (first come first served). You should focus your paper on a specific issue within this general topic area. For example, if you select to study exotic invasive in the Great Lakes, your title could be "The Round Goby: an unwelcome intruder in the Great Lakes."

You are free to choose a topic of your choice that interests you and **is related to aquatic ecology or aquatic toxicology**; however, you must have the topic approved by the instructor.

Throughout the semester (dates TBD), you will have to make a 15 minute presentation on your selected topic. This will be followed by 5 minutes of questions. These time limits will be strictly enforced, so please prepare sufficiently to stay within the time limit.

Oral presentations will be assessed based on the following criteria:

- The clarity of the central message/s conveyed.
- Evidence of adequate research and independent thought development.
- Synthesis of multiple research papers into a coherent story (i.e. don't just summarize a bunch of papers - you must link them together!).
- Visual appeal of power point slides.
- Ability to answer questions from faculty and fellow students.

On the day of your presentation, you must also hand in a **list of references used (worth 2%)**. These must be submitted electronically – but are due by midnight on the day you present. A good project will cite at least 10 scientific articles (that you have read!). Non peer-reviewed internet resources are not acceptable as references.

Journal article discussion (10-15%):

Participate meaningfully in all the journal discussion hosted by your fellow classmates. Your discussion must show evidence that you read the assigned paper.

Final Exam (20-25%)

The final exam will cover all lecture material and lab assignments.

Attendance policy

Because this is an online course, attendance is determined by class participation online. Participation is determined by completion of the following activities:

- Reading/Viewing all course materials to ensure understanding of content
- Completing all weekly activities (assignments, quizzes, etc.)

Netiquette

- Always consider audience. Remember that members of the class and the instructor will be reading any postings.
- Respect and courtesy must be provided to classmates and to instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a F2F situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space. If students wish to do so, they have the ethical obligation to first request the permission of the writer(s).

Additional Policies

DROP DATE. The semester's drop deadline is April 1, 2021. The College of Science will remain aligned with the University and not approve any drop requests after that date.

ONLINE ASSIGNMENT SUBMISSION. All assignments will be due Fridays by midnight and must be uploaded on Blackboard.

POLICY ON MAKE-UP EXAMINATIONS or ASSIGNMENTS: No make-up quizzes, exams or assignments will be given for reasons other than illness (doctor's note required), absence with the instructor's prior approval, or when a student is on official University business (documentation required). Make-up exams and assignments will be scheduled at the Instructor's convenience.

All grades of Incomplete must be accompanied by an Incomplete Contract that has been signed by the instructor of record, student, departmental chair, and the dean. Although UTEP will allow a maximum of one year to complete this contract, the College of Science requests it be limited to one month based upon completion data. A grade of Incomplete is only used in extraordinary circumstances confined to a limited event such as a missed exam, project, or lab. If the student has missed a significant amount of work (e.g. multiple assignments or tasks), a grade of Incomplete is not appropriate or warranted.

POLICY ON ACADEMIC HONESTY:
Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for possible disciplinary action. To learn more HOOP: Student Conduct and Discipline.

ACCOMMODATIONS POLICY
The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services.

MILITARY STATEMENT: If you are a military student with the potential of being called into military service and/or training during the course of the semester you are encouraged to contact the instructor regarding these matters.

STUDENT RESOURCES

UTEP provides a variety of student services and support:

- UTEP Library: Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- Help Desk: Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.
- University Writing Center (UWC): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- Math Tutoring Center (MaRCS): Ask a tutor for help and explore other available math resources.
- History Tutoring Center (HTC): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- Military Student Success Center: UTEP welcomes military-affiliated students to its degree programs, and the Military Student Success Center and its dedicated staff (many of whom are veterans and students themselves) are here to help personnel in any branch of service to reach their educational goals.
- RefWorks: A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

Week of	**Topic** *(Subject to change)*	**Assignments** *(Subject to change)*
Jan 18	**Introduction** Physical & chemical properties of water	Install R
Jan 25	Light, heat & movement of water	Light measurements
Feb 1	Physical properties of stream	Forgotten Stretch discussion
Feb 8	Lake formation, morphology and stratification	Stratification
Feb 15	Wetlands and aquatic plants	Wetland indicators
Feb 22	Aquatic chemistry I - DO, redox, pH	2 grad student presentations with journal article discussion
Mar 1	Aquatic chemistry II - Carbon	Carbon cycles 1 grad student presentation with journal article discussion
Mar 8	Aquatic chemistry III - P & N	Nutrient relationships 1 grad student presentation with journal article discussion
Mar 15	**Spring Break**	
Mar 22	Primary production & eutrophication	TSIs 1 grad student presentation with journal article discussion
Mar 29	Phytoplankton, Zooplankton	Diversity calcs 1 grad student presentation with journal article discussion
Apr 5	Life in the benthos	Grade ESCI 1310 white paper 2 grad student presentations with journal article discussion
Apr 12	Fish, Predation and trophic cascades	2 grad student presentations with journal article discussion
Apr 19	Aquatic toxicology 1	LC50 etc lab
Apr 26	Aquatic toxicology 2	2 grad student presentations with journal article discussion
May 3	Aquatic toxicology 3	Simulation lab

Suggested project topics for graduate students:

Number	General topic area
1	Use of indicator taxa in stream assessment
2	Use of indicator taxa in wetland assessment
3	Impact of climate change on aquatic ecosystems
4	Aquatic invasives in the Great Lakes (e.g. Zebra Mussel)
5	Aquatic invasives in the US Southwest (e.g. Salt cedar)
6	Biomanipulation as a tool to restore aquatic systems
7	Salmon as a keystone species in the Pacific Northwest
8	Ecology and protection of ephemeral streams
9	Harmful (or toxic) algae blooms in freshwater
10	Ecology of desert springs
11	Impact of groundwater pollution on aquatic ecosystems
12	Ecology or water quality of the Rio Grande
13	Impact of mining on aquatic ecosystems
14	Impact of acid precipitation (or acid mine drainage) on aquatic ecosystems
15	Salinization of aquatic ecosystems
16	Using paleolimnology to reconstruct past aquatic environments
17	Ecology of playa wetlands
18	Reservoir ecology
19	Impact of damming (or dam removal) on aquatic ecosystems
20	Use of created wetlands to improve water quality
21	Use of mesocosms in the study of aquatic ecology
22	Impact of levees on floodplain ecology (e.g. Mississippi River)
23	Impact of fish stocking on native species genetic diversity.
24	Molecular indicators of aquatic pollution
25	Impact of endocrine disrupting compounds on aquatic organisms
26	Impact of aquatic pollution on amphibians
27	