Syllabus BIOL 4105 – Aquatic Biology Laboratory

Fall 2025

Professor:
Marsha Williams, HPR 107 or BEP 129, Phone: 565-5878, Email: mwilliams@uttyler.edu
Office Hours: T Th 9:30 – 11:00 pm, or by appointment

Graduate Teaching Assistant:
Addie Munn, Graduate TA, BEP 118, Phone: 566-6149, Email: mmunn4@patriots.uttyler.edu
Office hours: M 9:00 – 11:00 am, T 10:00 – 11:00 am, or by appointment

Catalog Description: Diversity, ecology, and management of the major groups of freshwater organisms, with an emphasis on North American flora and fauna. Major focus will be placed on basic field techniques, experimental design, and identification of field-captured organisms.

Course Objectives/Student Learning Outcomes

1) Identify freshwater organisms,
2) Describe the distribution and ecology of freshwater organisms,
3) Critically read, analyze, and interpret research findings,
4) Understand how aquatic field biologists design experiments and collect quantitative data, and
5) Integrate scientific literature and data collected by each student group to present research results.

Required Texts:

1) Thomas, C., et al. 2007. Freshwater fishes of Texas. Texas A&M Press.
*Available through the library:
https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=3037871
*CHECK THE IDs WITH THE MASTER LIST. Some names have been updated but are not reflected in the field guide. The guide is good for characteristics.
2) Voshell, R. 2002. A guide to common freshwater invertebrates of North America. McDonald and Woodward Publishing Company.

Evaluation: Students will be evaluated based on the following work:

1. Participation 20%. This will include attendance in lab and on field trips, including active participation.
2. Lab practical 35%. Exam will focus on ecology and identification of field-collected organisms.
3. Project and presentation 20%. Students will be formed into groups of 2-3 to assess the ecological health of a local Tyler stream using methods and indices learned in the course. Each group will then present their research to the class. The presentation should include an introduction, study site descriptions, methodology, results, and conclusions including the overall ecological health of their study stream. The presentation will be the format of a scientific conference (15 minutes total; about 12 for presentation and 3 for questions). The

grade will be based on the instructors' evaluations and peer evaluations of within group participation.

4. Final Paper over project 25%. Students will submit a group lab report. The report will be in scientific format (intro, methods, results, discussion) and will assess the health of the same water body that the final project covers. The report rubric will be provided at a later date.

We will follow a 10-point scale for grading (I will only round up a 0.5 or above (e.g., 79.5 would round to 80):

A = 90-100% **B** = 80-89% **C** = 70-79% **D** = 60-69% **F** = 0-59%

At the end of the semester, the grade earned during the course will be the recorded grade. I cannot 'give' grades. I am professionally and ethically obligated to record the grade that was earned.

Field Trips: As this is a field-based course, attendance and active participation for field trips is required. We will make every attempt to return to campus by the end of lab, but driving time (and unforeseen circumstances) may necessitate a later return – students should make appropriate arrangements ahead of time in case we run late. Appropriate field clothing should be worn on field trips. Students should plan to bring water, bug spray, hat, and waders if they are available, etc.

Academic Misconduct: Submitting plagiarized work to meet academic requirements including the representation of another's work or ideas as one's own; the unacknowledged word for word use of another person's ideas; and/or the falsification, fabrication, or dishonesty in reporting research results shall be grounds for charges of academic misconduct. Any cheating or other type of academic misconduct will be reported to university administration and at *minimum* will result in automatic failure of the course.

Artificial Intelligence (AI) Statement:

(Written by Dr. Bill and based on a policy from Clemson University and OpenAI. (2021). GPT-3 API. Retrieved from https://beta.openai.com/docs/api-reference/introduction):

Learning to use AI is an emerging skill – the programs and web tools using it are proliferating rapidly, and I assume many will try to leverage it for your work. I look at this much as I do other tertiary sources; therefore, be aware of the limits of these software systems.

A. AI is vulnerable to discrimination because it can inadvertently (or intentionally) perpetuate existing biases present in the data it is trained on. For example, if an AI system is trained on data that contains a bias against a certain group of people, the system may make decisions that are unfair or discriminatory towards that group. There are several reasons why AI systems can perpetuate discrimination:

    i. Bias in the training data: If the training data contains biases, the AI system may learn and replicate those biases in its decision-making.

    ii. Lack of diversity in the training data: If the training data does not include a

diverse range of examples, the AI system may not perform well on diverse inputs, which may lead to discrimination.

iii. Lack of transparency: Some AI systems can be difficult to understand and interpret, making it challenging to detect and correct for biases.

iv. Lack of accountability: Without proper oversight and accountability, it can be difficult to identify and address discrimination in AI systems.

v. It is important to keep in mind that these biases can be unconscious, unintended and hard to detect, but they can have serious consequences if they are not addressed.

B. AI can be a valuable tool for augmenting human decision-making and critical thinking, but it is not a replacement.

C. AI is a tool, just like a pencil or a computer. However, unlike most tools you need to acknowledge using it. Pay close attention to whatever information you use in your own work that is produced from AI and explain how/what you used at the end of assignments. Basic attribution rules still apply. Cite everything,

i. I would suggest using your prompt as the article title in your citation manager.

ii. The software name (Open AI, ChatGPT, etc.) as the Author

iii. The date that you access the query can be the publication date – Day, Month and year.

iv. Enter the website for access.

D. If you provide minimum effort prompts, you will get low quality results. You will need to refine your prompts to get better outcomes. Prompt engineering is the most critical part of effective AI use. This will take time and practice.

E. Don't trust anything the system compiles for you. Assume it is wrong, unless you already know the answer and can verify with trusted sources. It works best for topics you deeply understand. Please note you must check sources that the AI platform provides, for example there are publicized instances that have noted the use of non-existent constructed citations using AI.

F. Use your best judgement to determine if/where/when to use these tools. They don't always make products easier and/or better. You should also realize that most of these tools are not designed to work with the scientific literature, rather they rely heavily on popular works and older works that are open to the public; therefore, content and style make be worse than what you can do yourself.

Large language models and chatbots are ""look back"" machines. They don't advance knowledge (yet). For example, ChatGPT-3 uses data from 2021 and earlier (a lot has changed since 2021).

There is no replacement for your original thought.

The use of Grammarly to help with grammar and improve language may be used, but an AI Usage disclosure must be included on your paper. Here's an example of how to declare Grammarly in your paper:

"AI Usage Disclosure: After the preparation of this document, Grammarly was used for paraphrasing to improve conciseness, language expression, and enhanced readability."

TENTATIVE CLASS SCHEDULE by week

Aug 25th & 26th	Introduction; Taxonomy-Macroinvertebrate Orders; Waivers, trainings, & waders
Sep 1st & 2nd	Labor day; Open lab Tuesday
Sep 8th & 9th	***Local field trip – Quail Creek Tyler, TX***
Sep 15th & 16th	Taxonomy – identify organisms from Quail Creek; Fish & Mussel Lecture
Sep 22nd & 23rd	***Local field trip – Sabine River Hawkins, TX***
Sep 29th & 30th	Taxonomy – identify organisms
Oct 6th & 7th	***Local field trip – Blackfork Creek Tyler, TX***
Oct 13th & 14th	Taxonomy – identify organisms
Oct 20th & 21st	***Lab Practical*** (35% of total grade)
Oct 27th & 28th	Introduction to Aquatic Community Ecology Group Study
Nov 3rd & 4th	Lab Groups--collect data and process samples
Nov 10th & 11th	Lab Groups--collect data and process samples
Nov 17th & 18th	Data Analysis and Scientific Writing
Nov 25th	***Thanksgiving Break (No classes)***
Dec 1st & 2nd	***Group Project Presentations*** (20% of total grade)
Dec 8th & 9th	***Final Lab Reports Due*** (***Date TBA***; 25% of total grade)

Note: Due to extreme weather, some rearrangements of this schedule may be necessary.