WATS 4520: Aquatic Ecology Practicum II: Analysis
(Fall 2020)

Instructor: Dr. Soren Brothers

Maximum Enrollment (undergraduate and graduate level): 12

Course Time: Mondays, 2:00-5:00 PM

Location: Online / Virtual

Course Objectives:

This course will introduce students to techniques in compiling, analyzing, and interpreting environmental data in aquatic ecosystems. We will focus primarily on Bear Lake (ID/UT) and Tony Grove Lake (UT). Students will work on independent research topics, and be taught how to write up data in the format of scientific papers and how to effectively present their results, translating raw data into meaningful assessments of water quality and environmental health. Students will furthermore hear from local stakeholders and policymakers to understand how environmental data can be communicated to inform effective lake management strategies.

COVID-19 Modification:

This course was previously taught as a weekly three hour in-person lecture/lab period. Due to the COVID pandemic, to increase the safety of all involved, in 2020 it will be taught as a “hybrid-style” online class. This will involve short (typically 20-30 minute) asynchronous lectures that the professor will record remotely and upload each week to the internet, the week prior to each designated class period (Monday 2-5PM). All students are to watch these videos prior to the class period, as they will provide necessary information for the materials and tasks at hand. Within the first week of the class, each student will also have a one-on-one Zoom meeting with the professor to discuss ideas for their independent class research project (due November 30th). The Monday class period will be kept free for group Zoom meetings, including remote guest presentations, opportunities for students to ask questions directly to the professor, or potential additional direct instruction on assignments from the professor. These in-person meetings will typically be 2-3PM on Mondays, though on occasion they may be longer. If so, this will be communicated in advance by the professor.

Primary Learning Outcomes:

- Learn how to organize and analyze data sets using Excel and statistical software provided by in situ monitoring stations.
- Learn about aquatic management, and effective ways of communicating limnological data to non-limnologists.
Assignments and Grading:

#1- Participation 20%
#2- Exploratory Essay 20%
#3- Excel Data Sheet 10%
#4- Final report 30%
#5- Final presentation 20%

**Participation:**

20% of your grade will come from participation. This grade will be determined through your presence and active participation in weekly Zoom meetings (Monday, 2PM), as well as by having a one-on-one Zoom meeting with the professor to discuss the project.

**Exploratory Essay:**

Your exploratory essay (worth 20% of your grade) is essentially a literature review of the topic for your final report, including at least one key hypothesis or research question you will ask. It should be apparent from the essay what the current state of knowledge is on this topic, and why this research question or hypothesis is valid and important. The essay should be approximately 3 pages long (max. 5 pages), double spaced, and can be adapted later as the introduction section of your final report. Essentially, this essay is a chance for you to show that you've done sufficient research on your topic - you understand its fundamental significance, you have preliminary expectations of what the data might show, and you've lined up your key hypotheses or questions that are interesting. This essay will be graded according to language/grammar (20%), breadth and quality of literature review (60%), and presence/quality of hypotheses/research questions (20%).

**Excel Data Sheet:**

You must submit a data sheet on Excel (10% of total grade), including all of the data you will use for your final report analyses. This data sheet will be graded by the following criteria: Does it contain sufficient data for the final report and all required analyses (50%)? Do all data contain (correct) units (20%)? Are clear and complete sources provided for each source of data so that the data sheet could be independently verified and recreated by the professor (30%)?

**Final Report:**

Thirty percent of the course grade will rest on the final report. This report will be an exercise in organizing, synthesizing, analyzing, and summarizing data provided from available sources. It will be written up in the style of a scientific paper, including figures and tables. A detailed rubric and instructions will be provided concerning how the final report will be graded.

**Final Presentation:**
Students will be required to present the primary conclusions of their final report in group 15-minute online presentations with questions, to an audience consisting of fellow students, USU faculty, and local stakeholders. A detailed rubric and instructions will be provided concerning how the final presentation will be graded.

**Required Materials:**

This course will incorporate readings from the primary literature, though the acquisition of an aquatic sciences textbook such as Freshwater Ecology (Dodds, 2002), is highly recommended. This textbook is also freely available as an Ebook from the Merrill-Cazier Library.


We will also be using Canvas to share assignments, readings, student grades, and any additional announcements.

**Course Policies:**

- Late reports will have a grading penalty of 10% per day late. Final presentations can only be rescheduled with a doctor’s note.

**Departmental and University Policies:**

*Academic Freedom:*

Academic freedom is the right to teach, study, discuss, investigate, discover, create, and publish freely. Academic freedom protects the rights of faculty members in teaching and of students in learning. Freedom in research is fundamental to the advancement of truth. Faculty members are entitled to full freedom in teaching, research, and creative activities, subject to the limitations imposed by professional responsibility.

*Students with Disabilities:*

Accommodations are collaborative efforts between students, faculty and the Disability Resource Center (DRC). Students with accommodations approved through DRC are responsible for contacting me prior to or during the first week of the semester to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DRC should contact DRC immediately at 797-2444.

*Academic Dishonesty:*

Final reports are to be completed individually. This course follows the University rules on civility and honesty. These can be found at [http://www.usu.edu/policies/PDF/Acad-](http://www.usu.edu/policies/PDF/Acad-)
Integrity.pdf. Cheating, falsification, or plagiarism in this class will result in a zero grade for the report. In addition, the offense will be reported to the Office of Student Conduct for inclusion in the student’s permanent record.

**Important Dates:**

Monday, Nov. 9\textsuperscript{th}: Exploratory essay due  
Monday, November 16\textsuperscript{th}: Excel data sheets due  
Monday, November 30\textsuperscript{th}: Final reports due  
Monday, December 7\textsuperscript{th}: Final presentations

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