BIO 341: Limnology Fall 2010

Lecture (Cowley 100): TH 12:05 - 1:00 pm
Lab (Cowley 316): T or H 2:15 - 5:20 pm

Instructor:
Dr. Eric A. Strauss
Office: Cowley Hall 2033
Office Hours: MW 11:00 am – 12:00 pm
W 4:00 – 5:00 pm
Th 10:00 – 11:00 am

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Texts:
Kalff, J. 2003. Limnology. Prentice Hall. Upper Saddle Hill, New Jersey.
Needham, J.G. and P.R. Needham. 1962. A Guide to the Study of Freshwater Biology. McGraw-Hill.

Course Description:
Limnology is the interdisciplinary study of inland waters including lakes, wetlands, ground water, and streams. This lecture portion of this course will serve as an introduction to the geological, physical, chemical, and biological processes that form and maintain these aquatic systems. Environmental threats to these systems will also be covered. Students will gain hands-on field and laboratory experience sampling aquatic systems, measuring and interpreting important limnological variables, and identifying aquatic organisms during the laboratory portion of the course.

Course Objectives:
Specific objectives/goals for this course include:

- Learn the basic terminology used by limnologists and other aquatic scientists.
- Learn and integrate multidisciplinary concepts to understand how aquatic systems function.
- Develop an understanding of how living organisms survive and interact in aquatic environments.
- Learn to identify common aquatic organisms, particularly algae, zooplankton, and macroinvertebrates.
- Learn how to collect, analyze, interpret, and report limnological data.

Website:
The website (on Desire2Learn [D2L]) is where you will find class notes, reading assignments, the most up to date copy of this syllabus, your current grade, and other important information and documents. It is vital you check the website regularly. I highly recommend you print the notes, put them in a binder, and bring them to class. You should consider the class notes as an outline for lecture, in other words, you should still take notes during lecture.

Attendance:
Official attendance will not be taken during class, however I will have a pretty good idea of attendance by looking at the clicker data. During lecture cell phones must be turned off and listening to music devices is not allowed. An important aspect of student performance is being attentive during class. Anything presented in lecture is fair game on the exams. We will not cover everything in the text and there will be much in lecture that is not in the text (or in the downloadable notes). If you do miss class, be sure to ask someone who was there about what you missed.

Students with disabilities
UW-L policies concerning students with disabilities will be observed. Any student with a documented disability (e.g., physical, learning, psychiatric, vision, or hearing, etc.) who needs to arrange reasonable accommodations must contact the instructor and the Disability Resource Services office (165 Murphy Library, 785-6900) at the beginning of the semester. Students who are currently using the Disability Resource Services office will have a copy of a contract that verifies they are qualified students with disabilities who have documentation on file in the Disability Resource Services office. It is the student's responsibility to communicate their needs with the instructor in a timely manner.

Grading:
Grades will be assigned based on performance on in-class exams, an in-class case study, readings, a laboratory notebook, and a laboratory exam. Below is a current list of items that will be graded. I reserve the right to make modifications to this list. The grading scale used in this class is also listed below.

Item	Points
Mid-terms (3)	300
Reading Questions	50
Final	150
Lab Notebook	110
Group Lab Reports	60
Group Lake Report	100
Lab Practical	100
Total	870

Grade	%
A	92-100
AB	88-91
B	81-87
BC	77-80
C	67-76
D	55-66
F	<54

Exams:
There will be three 100-point midterm exams and one 150-point final exam. The first two midterm exams will correspond with the Unit number associated with the class notes, e.g., Exam 1 will be over Unit I notes. What we cover of Unit IV will be on the final exam. The final exam will also be comprehensive over information from the entire semester. All exams will be multi-format (multiple choice, T/F, matching, short answer, short essay, diagrams, etc). Exams will be handed out as you walk in the classroom and will be collected at the end of the class period.

Missing Exams:
My policy on being absent for exams is that you may schedule (with me) to take an exam prior to scheduled exam time without penalty. If you miss an exam without notifying me prior to scheduled exam time you may take the exam late with a 10% per day penalty, as long as you take the exam before I return graded exams to the class (usually the next class period). After I return the graded exams to the class there will be no make up. Missing an exam because of illness or family emergency can be taken late with proper written documentation. Exceptions to this policy will be very rare and dealt with on a case-by-case basis.

Readings:
There are five articles listed on the schedule as non-text readings. The articles are posted on D2L and you are responsible for reading the articles outside of class and answering the questions associated with that article. The questions are also posted on D2L. The due date will be listed on the sheet of questions. You may discuss the papers with each other, but answer the questions on your own. Your answers must be written in complete sentences and deposited into the D2L dropbox before the due date/time. Late answers will not be accepted. Each reading is worth 10 points.

Academic Dishonesty
Strict adherence to UW-L policies will be maintained, consult the Eagle Eye (student handbook) (http://www.uwlax.edu/studentlife/eagle_eye.htm) for full details. What is academic dishonesty? Here is the official UW-L definition:

Academic misconduct is an act in which a student:

a. Seeks to claim credit for the work or efforts of another without authorization or citation;
b. Uses unauthorized materials or fabricated data in any academic exercise;
c. Forges or falsifies academic documents or records;
d. Intentionally impedes or damages the academic work of others;
e. Engages in conduct aimed at making false representation of a student's academic performance; or
f. Assists other students in any of these acts.

How to do well in this class:

1. Read through the notes prior to class and after class
2. Ask questions
3. Attend class - be attentive and take notes
4. Be sure to get the easy points (readings and lab notebook)
5. Study for the exams (and not just for an hour or two)
6. Don’t just coast through lab – spend some time on your lab notebooks and really make a point of understanding what you are doing
7. Don’t procrastinate - start early on the organism drawings and final lab report

Tentative Limnology Class Schedule:

Date		Day	Topic	Kalff	Reading
Sept	7	T	Introduction	13-26	
	9	H	Properties of Water	35-40; 179-180	
	14	T	Light	136-153	
	16	H	Groundwater and Wetlands	53-60; 410-411	Baron Due
	21	T	Lake Origins	72-84	
	23	H	Lakes and Reservoirs	85-93;	
	28	T	Lakes and Reservoirs	154-171; 523-536	
	30	H	Water Movement in Lakes	179-201	
Oct	5	T	Streams and Rivers		
	7	**H**	**Unit I Exam**		
	12	T	Streams and Organism Classification	94-106	
	14	H	Microbes		Meyer Due
	19	T	Algae	349-375	
	21	H	Fungi, Plants, Animals	309-332	
	26	T	Animals	408-410	
	28	H	Animals and Chemistry	376-407	
Nov	**2**	**T**	**Unit II Exam**	435-438	
	4	H	Chemistry, Oxygen, and Redox	202-225	
	9	T	Chemistry, Oxygen, and Redox	239-246; 226-238	
	11	H	Production, Respiration		
	16	T	Carbon, Phosphorus Cycles	333-334	Clarke Due
	18	H	Phosphorus, Nitrogen Cycles		
	23	T	Nitrogen, Sulfur, Iron and Silica Cycles		
	25	H	Thanksgiving Break – No Class		
	30	T	Nutrient Use and Remineralization		Carpenter Due
Dec	**2**	**H**	**Unit III Exam**	247-255; 270-291	
	7	T	Trophic State and Eutrophication		
	9	H	Eutrophication and Food Webs	341-343; 427-428	Dybas Due
	14	T	Food Webs		
	18	**Sat.**	**Unit IV/Final Exam (4:45 – 6:45 pm)**		

This schedule is tentative and subject to change.

Limnology Laboratory Schedule:

Date		Lab Activity	Reports Due
Sept	7/9	Field Gear Introduction and Practice at Myrick Marsh*	
	14/16	Hydrodynamics	
	17-19	Pigeon Lake Field Trip (14 students)	
	21/23	Organisms – Macroinvertebrate emphasis	Hydrodynamics
	24-26	Pigeon Lake Field Trip (14 students)	
	28/30	Lake Models	
Oct	5/7	Field Trip – Mississippi River*	Lake Models
	12/14	Organisms – Zooplankton emphasis	*Intro & Methods*
	19/21	Field Trip – Stream Sampling*	
	26/28	Diatom Clearing, Organisms – Algae emphasis	
Nov	2/4	Diatom Mounting, Organisms	*Results & Graphs*
	9/11	Case Study: Lake Nyos	Case Study
	16/18	Primary Production & Respiration**	
	23/25	Thanksgiving Break - No Lab	
Dec	30/1	Summary of collected data, Organisms	Primary Production
	7/9	Wrap up lab notebooks	*Discussion*
	14	Lab Practical – Lab Notebooks Due	Final Lab Report.

* We will be outside regardless of weather (except significant ice or thunderstorms)

** This labs will run longer than normal, plan accordingly

Italics represent optional due dates for segments of group lake report

General Laboratory Requirements:

Limnology Lab is designed to complement the material presented in lecture portion of the course. A significant portion of the points in the course will be generated in Lab, therefore Lab attendance is highly recommended. Many of the labs simply cannot be "made up" if you miss the activity. If you do miss a lab, see the instructor as soon as possible. If the lab is something you cannot make up, you will probably have to take a zero on that lab.

Arrive to lab on time. If you are late, not only will you irritate the lab instructor, but you may miss the class leaving for the field or you will miss important information regarding the laboratory exercise.

Read through the lab handout (if available) prior to coming to lab. You will have a much better idea of what to expect and how to do the lab exercise for the day.

Lab Notebook

Each student will be required to maintain a laboratory notebook.

A. The notebook can be any kind of permanently bound notebook (not spiral bound and pages cannot have perforations).
B. Notebooks should have a detailed table of contents – leave the first two pages blank and fill them in as the semester progresses.
C. Every page should be numbered and dated.
D. Don't write on the back of pages because ink can bleed through pages making the book difficult to read.
E. Notes should be taken during every lab and field trip.
F. For each lab indicate what is to be accomplished (i.e., objective of lab).
G. All writing and drawing in notebook should be in pen at the time of lab or field trip, not copied over after the lab or field trip is over.
H. Place all of your organism drawings in the back of your lab book. Start on the last page and move forward.

Points for the lab notebook will be allocated with the following breakdown:

<u>Field gear intro (5 pts)</u>

Take field notes about the study site (Myrick Marsh) and how to use all equipment including Secchi disk, Ekman dredge, Van Dorn sampler, plankton net, filtration unit, light meter, multiparameter probe, DO meter, conductivity meter.

<u>Hydrodynamics (5 pts)</u>

Take notes on what you are doing and enter raw data into your lab book. There is an additional group lab report with this lab.

<u>Pigeon Lake field trip (15 pts)</u>

Take field notes at all sites visited. Record any data that was collected at any site. You have to be there to earn the points.

<u>Lake models (5 pts)</u>

Take notes on what you are doing and enter raw data into your lab book. There is an additional group lab report with this lab.

<u>Mississippi River field trip (5 pts)</u>

Take field notes at all sites visited. Record any data that was collected at any site.

<u>Stream sampling field trip (5 pts)</u>

Take field notes at all sites visited. Record any data that was collected at any site.

<u>Diatom mounting (5 pts)</u>

Take notes on theory and procedure.

<u>Primary production (5 pts)</u>

Take notes on what you are doing and enter raw data into your lab book. There is an additional group lab report with this lab.

Organisms (60 pts)

A. Sketches of at least 30 species of algae and 30 species of invertebrates (zooplankton, insects, protozoa, crustaceans, etc. – but no mussels) should be drawn in the notebook.
B. Accompanying each sketch should be an indication of organism identification and size and a note of collection location and date (see examples).
C. Place all of your organism drawings in the back of your lab book. Start on the last page and move forward.
D. Completing this requirement may take time outside of the normal laboratory schedule.

Group Lab Reports

Throughout the semester there will four group lab reports associated with lab activities (see lab schedule). The lab groups will be determined based on lab benches and the same groups will be used for all reports. It is up to you to ensure group harmony and participation. If one or more group members simply do not participate, you can inform me through email. The reports must be computer generated. Submit the completed assignments in the appropriate drop-box folder in D2L and on time. Please, only one submission per group per report (each student does not need to submit the assignment).

Point value for the reports will be:

Hydrodynamics (20 pts)
Lake Models (20 pts)
Lake Nyos Case Study (10 pts)
Production/Respiration (10 pts)

Group Lake Report

Over the course of the semester, you will use some of the data collected from the Pigeon Lake field trip to generate your final group lab report. The lab report will follow the style of a journal article published in the professional journal, Limnology and Oceanography.

This is a large undertaking and will require substantial group participation, but if you start early and spread the work out over the semester, it will not be too bad. To help you with this, I encourage you to turn in segments of your report at specific times throughout the semester (see lab schedule). At these times (and only these times), I will review what you have written and provide comments and suggestions back to you. Do not procrastinate with this report – a rushed paper of this type at the end of the semester is not something you want.

For a detailed description of their style I recommend that you look at a few example articles and read through their online instructions to authors (http://aslo.org/lo/instructions/authors.html). In addition to those instructions, I will provide you with handouts with additional assignment details and information highlighting the key components of a scientific paper.