

# Limnology

ESP 341  
Fall 2005  
Fridays 11am-5pm

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## Course objectives

The field of Limnology, or the study of inland waters, integrates aspects of biology, chemistry, physics, hydrology, and ecology. This course will combine selected information from all these fields to create a holistic view of lakes, streams and rivers. Emphasis will be on the synthesis of ideas. We'll survey a multitude of aquatic habitats and the plants and animals that live in them. In the process, I'll introduce some basic limnological techniques, emphasizing the need to quantify observations of both abiotic and biotic aspects of aquatic systems.

## Course text

Limnology by J. Kalff *Be sure you have the January 2003 reprint with corrections!*

## Course outline and readings:

*The order of topics & labs will change as course logistics are worked out!*

Date	Topic	Chapter(s) in Kalff
<b>Sept 9</b>	<b>Logistics</b>	
Sept 16	Introduction/lake origins/landscape context	6
	Characteristics of water, light, color	3, 10
<b>Lab 1</b>	<b>Introduction to abiotic sampling</b>	
Sept 24	Stratification and mixing	11
	Water movement and water budget	11, 12
<b>Lab 2</b>	<b>Introduction to biological sampling</b>	
Sept 30	Production, biomass, energy, nutrients	
	Organic carbon cycling	
<b>Lab 3</b>	<b>Laboratory techniques: primary productivity &amp; oxygen</b>	
Oct 7	<b>First Exam</b>	
	Oxygen, CO <sub>2</sub> , photosynthesis	14, 15
<b>Lab 4</b>	<b>Laboratory techniques: ANC, pH, conductivity</b>	
Oct 14	pH, acid neutralizing capacity, carbon	14
	Acid rain	27
<b>Lab 5</b>	<b>Stream sampling</b>	
Oct 21	Phosphorus	17
	Eutrophication and lake succession	
<b>Lab 6</b>	<b>Abiotic sampling: post-turnover</b>	
Oct 28	Nitrogen and redox	18
	Phytoplankton and periphyton	21
<b>Lab 7</b>	<b>Laboratory techniques: N &amp; P</b>	
<b>Nov 4</b>	<b>Second exam</b>	
	Macrophytes	24
<b>Lab 8</b>	<b>Projects</b>	
Nov 11	VETERANS DAY – no class	
Nov 18	Zooplankton	23
	Zoobenthos	25
Nov 23	THANKSGIVING – no class	

<b>Lab 9</b>	<b>Projects</b>	
Dec 2	Fishes and waterfowl	26
	Bacteria and microbial processes	22
<b>Lab 10</b>	<b>Projects</b>	
Dec 9	<b>Third Exam</b>	
	Food webs, trophic cascades, and lake ecosystems	
<b>Lab 11</b>	<b>Projects</b>	
Dec 16	Rivers and streams	5, 8
	Watersheds and land use	
<b>Lab 12</b>	<b>Project presentations &amp; final exam review</b>	
<b>Dec</b>	<b>FINAL EXAM - cumulative</b>	

*Any section with no reading assignments from the text may be supported by additional readings that will be passed out in class.*

### Grading

Lecture	Points
Lecture questions	2 pts each (20 total)
In class Exam 1	90
In class Exam 1	100
In class Exam 1	100
Final	110
Total points	320
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Laboratory	
Lab questions	10 pts each (50 total)
Seasonal change essay	50
Group project: proposal	50
Group project: paper	100
Group project: presentation	50
Total points	300

*Your final grade will be calculated as a percentage of the total possible points.*

### Other logistics

- Bring a bag lunch to class!
- Be prepared to go outdoors & get wet.
- We'll go in the field even if it's raining.
- We'll make every effort to return to campus by 5 pm, but I cannot guarantee this will happen every time, so please do not plan other activities for 5 pm sharp!
- Please note that the group project for lab is graded as a group – but that group members, by anonymous vote, will grade the contributions of group members – and that your group grade will affect your class grade – so be prepared to contribute!