

BIOL 333 - Fish Ecology

Spring 2012

Instructor

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Course website: www.lssu.edu/faculty/gsteinhart/GBS-LSSU/BIOL333-Fish_Ecology.html

Meeting Times

8:00-8:50 AM, Monday, Wednesday and Friday, 258 Crawford Hall

Office Hours

Monday 9-11 AM, Tuesday noon-2 PM, and Thursday 10-noon. Other meeting times arranged as needed. Please feel free to stop by my office anytime - knock if my door is closed.

Course Description

This course will cover aspects of fish ecology from individual, population, community, and ecosystem levels. We will discuss the role of the environment in determining fish physiology and behavior, the interactions among fishes and their environment, food-web dynamics, and ecosystem interactions.

Learning Outcomes and Assessment

- To learn about individual, population, and community aspects of fish ecology (assessment: exams, research paper)
- To study how humans have affected fish communities (assessment: exams)
- To develop critical reading and review skills by discussing classic and current scientific papers (assessment: leading and participating in class discussions, paper critique, and peer review)
- To improve literature review, writing, and data interpretation skills (assessment: exams, discussions, paper questions, research paper)

Readings

The required text is Fish Ecology by P.B. Wootton. It is available on 2-hr reserve in the library if you do not purchase the text (but many students really like this book!). In addition, you will need to read numerous scientific papers in this course. All required papers will be available on the course web site.

Participation and Conduct

Learning is an active process, so participation is very important for your success in this course.

Attendance is **mandatory for all scheduled discussion periods** and I expect to be notified in advance if you are unable to attend a class period. You will be graded on your participation (100 points, 12.5% of your grade), so speak up and be active. **Use of mobile phones will not be tolerated in class!**

I want the class to be an open forum for discussion and learning: ask questions! If you are wondering about something, odds are there are other students wondering the same thing. For the discussion periods, be critical in evaluating what you hear and read, but be polite with your response. **Ask questions or provide comments in discussion periods to receive full participation credit.** Students are expected to treat all students and lecturers with respect: do not interrupt somebody or make fun of someone's comment or question.

Weekly discussions

Each week, we will discuss a scientific paper on a particular topic. **All students must read all the papers!** You are required to hand in **three questions** about the article **before** the discussion. Questions may be legibly written or typed and must be thoughtful for full credit (in other words, questions must reflect that you read the paper and thought about the topic, the design, and the authors' interpretation of their findings. Knit-picky questions about format or repeated questions on the same topic do not count). Discussion leaders do not need to hand in questions on the week of their discussion. During the discussions, **all students** must ask questions, make comments, or answer questions to receive full credit for class participation!

In addition, **one student will lead the discussion each week** (see the separate instructions for leading discussions, writing your critique, and writing your review paper). Discussion leaders must thoroughly read and reflect on the paper before the discussion session. The leader must provide a critical review of the paper - what did the authors do right or wrong? Did they overlook any important aspects? Was their study design correct? What were the key assumptions in the paper? During the discussion, make sure to encourage participation of other students. Don't just tell us about the paper; lead us with questions and encourage discussion. Make sure you are prepared! The leader should develop a list of questions about the paper, the topic, and make a list of good/bad things about the methods. Bringing in information from other papers and studies is **strongly** encouraged.

The leader must turn in a written critique of the paper one week after the discussion (2-3 pages, 1" margins, double-spaced, 12 pt. times or times new roman). The summary should briefly review the paper (no more than a single paragraph, similar to an abstract) and thoroughly critique the paper. No references/citations are required for the critique paper - focus on your discussion paper.

Review paper: Discussion leaders will write a research review paper on the topic they are discussing. Your paper need not be on the exact topic the paper covers, it might be only a portion of the paper, the broader topic the research addresses, or a related topic. Ask me if you need help deciding on a topic.

Your review paper must use peer-reviewed literature for background and discussion. The discussion paper may be the focal paper for the review, but you must include at least four other peer-review references (**NO internet references allowed!**). **Your topic (summarized in a few sentences) and partial list (minimum of five references) is due on 21 February.** Having five references for your final paper is a bare minimum: you should thoroughly explore the literature to find papers related to your topic. Finding **related** papers is important to combine/compare/contrast the ecology of your topic. In your review paper, you should **provide a synthesis of the topic**, not a critique of the paper. To find other papers, try looking for papers cited in your focal paper. Or use Google to search on the title of your paper to see where it has been cited. You may not be able to access all articles online, but you can find (or inter-library loan) any papers you find. Ask me if you are having any trouble finding papers.

Your paper must be at least 5-pages long and no more than 8 pages (with 1" margins, double-spacing, 12 pt. times or times new roman). See the Skulason and Smith (1995) paper on the course web site for an example of a review paper. Follow TAFS format for citations unless you have a different format approved by me. **See the writing tips and TAFS formatting instructions** on the course web site. **Your paper is due 16 March.** Each student will review another student's paper, due 28 March. If you chose, you may revise your paper and earn up to 10 extra points (not to exceed 100 points total). **Revisions are due 9 April.**

Grading

Grades will be scored without curving as:

100 > A+ ≥ 98	90 > B+ ≥ 88	80 > C+ ≥ 78	70 > D+ ≥ 60
98 > A ≥ 92	88 > B ≥ 82	78 > C ≥ 72	60 > F
92 > A- ≥ 90	82 > B- ≥ 80	72 > C- ≥ 70	

For specific assignments, see the grading rubrics on the course web site.

All written assignments are due at the start of the period. If you cannot take an exam or turn in an assignment on time because of illness or emergency, I expect to be notified in advance. **Late assignments will be docked 10% for each late day, except at my discretion.**

The Americans with Disabilities Act & Accommodations:

In compliance with Lake Superior State University policy and equal access laws, disability-related accommodations or services are available to students with disabilities. Students who desire such services should meet with professors in a timely manner, preferably during the first week of class, to discuss disability-related needs. Students are eligible to receive services after they are registered with Disability Services. Proper registration allows Disability Services to verify the disability and determine individual reasonable academic accommodations. Disability Service is located in the KJS Library Room 103, 906-635-2355 (from on campus - 2355). Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss specific needs.

IPASS (Individual Plan for Academic Student Success):

If at mid-term your grades reflect that you are at risk for failing some or all of your classes, you will be contacted by a representative of IPASS. The IPASS program is designed to help you gain control over your learning through pro-active communication and goal-setting, the development of intentional learning skills and study habits, and personal accountability. IPASS is located in the KJS Library, Room 106, (906) 635-2887 or x2294 on campus, or email ipass@lssu.edu if you would like to sign up early in the semester or if you have any questions or concerns.

Honor Pledge:

As a student of Lake Superior State University, you have pledged to support the Student Honor Code of the College of Engineering & Technology. You will refrain from any form of academic dishonesty or deception such as cheating, stealing, plagiarism or lying on take-home assignments, homework, computer programs, lab reports, quizzes, tests or exams, which are Honor Code violations. Furthermore, you understand and accept the potential consequences of punishable behavior.

Assignments and due dates

Due date	Assignment	Point value
Feb. 15	Lecture exam 1	100
Feb. 20	Report topic and references	25
Mar. 16	Report	100
Mar. 23	Lecture exam 2	100
Mar. 28	Peer review	25
Apr. 9	Revised report	Up to 10 extra
All term	Discussion questions (10, 10 pts. each)	100
TBD	Discussion leader	50
TBD	Discussion critique (1 week after discussion)	50
Apr. 23	Final exam (7:30-9:30 AM)	150
All term	Class participation (including discussions)	100
TOTAL		800

Lecture Outline

Topic	Date	Readings
Introduction	Jan. 9	None
Feeding	Jan. 11, 13	27-64
Growth	Jan. 16, 18	107-140
Discussion (Dr. Steinhart leads)	Jan. 20	Arendt and Wilson 1999
Reproduction	Jan. 23, 25	141-174
Discussion 1	Jan. 27	Munoz and Warner 2003
Bioenergetics	Jan. 30, Feb. 1	65-86
Discussion 2	Feb. 3	Kraft 1993
Movement	Feb. 6	87-106
Movie	Feb. 8	
Discussion 3	Feb. 10	Scheuerell and Schindler 2003
Review	Feb. 13	
Lecture exam 1	Feb. 15	
Aquatic nuisance species	Feb. 17	
Predation	Feb. 20, 22	175-194
Discussion 4	Feb. 24	Domenici et al. 2008
Competition	Mar. 5, 7	195-216
Discussion 5	Mar. 9	Jansen et al. 2002
Life history strategies/adaptive radiation	Mar. 12, 14	259-284
Discussion 6	Mar. 16	Hori 1993
Discussion 7	Mar. 19	Neff et al. 2003
Review	Mar. 21	
Lecture exam 2	Mar. 23	
Population and trophic dynamics	Mar. 26, 38	217-258
Discussion 8	Mar. 30	Ellis et al. 2011
Fish assemblages	Apr. 2, 4	285-320
Discussion 9	Apr. 6	Sale 2004
Gradients	Apr. 9	
Discussion 10	Apr. 11	Leggett and Carscadden 1978
Humans and fish		
Discussion 11	Apr. 13	Walsh et al. 2006
Homogenization of fishes	Apr. 16	Rahel 2000
Climate change and fishes	Apr. 18	Winder and Schindler 2004
Review	Apr. 20	
Final exam	Apr. 23	7:30-9:30 AM