

Stream Ecology BIOL 4980/5040 Spring 2011

Stream Ecology has only been recognized as a major sub-discipline of ecology and limnology in the past few decades. Methods for teaching it and which core components to emphasize have therefore not been widely agreed upon among stream ecologists. In this course, our goals are relatively broad and we hope to provide an awareness of many areas and issues. Additionally, the course will provide tools that can be applied to evaluate the ecology flowing waters. Because of our location, we will be biased in using examples from prairie streams and rivers; however, we will discuss characteristics of streams from other ecoregions to familiarize you with scales, patterns, and processes in the absence of direct experience.

Goals: At the end of the semester each student is expected to be knowledgeable and competent in the following areas:

- Be familiar with terminology in the field of stream ecology
- Be familiar with equipment used in stream ecology
- Understand ecological processes in streams and how they vary over distance and time
- Understand basic stream hydrology and how to measure and calculate important metrics
- Assess a stream's physical, chemical, and biological qualities, how they interact, and what those characteristics mean in terms of stream health and proper resource management.
- Understand how and why major biological communities vary in a lotic system.

COURSE PHILOSOPHY

The course is structured to insure that students taking the course develop a set of skills that will enable them to function as effective aquatic field biologists. By the end of the course each student should be capable of

- 1) setting up a field study (which includes generating testable hypotheses and choosing appropriate equipment)
- 2) going into the field and collecting data,
- 3) analyzing, interpreting, and writing up the results of the field study in a professional manner acceptable to either an employer, a research supervisor, or a professional journal. To achieve this end the course includes a series of exercises, each of which builds upon the previous exercises

Course Outline and TENTATIVE Schedule, i.e. this schedule will vary

Week of:	Topic	Readings
January 16	Introduction and History Stream Ecology	
January 23	Hydrology, geomorphology and chemistry	Allan & Castillo & Castillo Chapters 1 & 2
January 30	Physical Factors of Importance to the biota	Allan & Castillo Chapter 4
February 6	Physical Factors of Importance to the biota	Allan & Castillo Chapter 4 continued
February 13	Energy Sources in Streams Autotrophs	Allan & Castillo chapters 6
February 20	Energy Sources in Streams Heterotrophic	Allan & Castillo Chapter 7
February 27	Evolution of the Ecosystem Approach Trophic Relationships Predation, herbivory & competition	Allan & Castillo Chapter 8
March 6	Evolution and Ecosystem Approach Con'd	
March 10	Mid Term Examination	
March 13	Spring Break	
March 20	Fish Communities	Hauer & Lamberti Chapter 22
March 27	Drift	Hauer & Lamberti Chapter 21
April 3	Turner Falls 24 hour Marathon	
April 10	Modification of Running waters by humankind	Allan & Castillo Chapter 13
April 17	Evaluating Stream Health	Hauer & Lamberti Chapter 35
April 24	Evaluating Stream health	Hauer & Lamberti Chapter 35
May 1	Conservation of streams: a prospectus on the future	
May 5	Group Presentations/Dead week	
May 10	Final Examination 10:30 - 12:30	

- Instructor:** Dr. James H. Kennedy,
Professor, Department of Biological Sciences
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Email (preferred method of contact), kennedy@unt.edu
- Office Hours:** Monday & Wednesday 08:30 - 09:30 or by appointment. See note below.
- Required Text:** *Stream Ecology Structure and Function of Running Waters* (2nd edition) by J. David Allan & Castillo and Maria M. Castillo. This is the best available, summary of stream ecology I know of and will serve as a reference text. Information about the book can be found at <http://www.springer.com/life+sci/ecology/book/978-1-4020-5582-9>
- Attendance:** Attendance is expected.
- Grading:** Short quizzes will be administered unannounced throughout the semester. They will be based on previous lectures and assigned readings. There are no make-ups for quizzes. The quizzes in part will be used to help me gauge the progress of the class and as part of the "participation score" (see below). Lecture examinations and quiz grades will account for 90% of your lecture grade. 10% of your grade will be based on attendance and class participation. The final grade is calculated by averaging your lecture and laboratory scores.

STUDENT RESPONSIBILITIES

Your responsibilities are to attend all the lectures and labs, ask questions, prepare ahead for class and laboratories, participate actively in the lab, complete assignments on time, and express yourself creatively and concisely in your work.

We will be using chemical reagents in the lab that may react adversely with your clothing should you spill on yourself. Therefore, wear "casual" clothes to the lab. Stream field work in January - March will be cold! You will need foot wear that can get wet, rain gear, and warm clothes. UNT has some chest waders in a variety of sizes (some with holes and fungal cultures with species unknown to science). Needless to say I strongly encourage each student to acquire his or her own pair of hip boots or chest waders.

Laboratory attendance is mandatory. You cannot master stream ecology from a book. If you anticipate not being able to participate in the laboratories I suggest that you drop the course. Late assignments will be downgraded 10 points for each day past the due date.

ADDITIONAL COURSE POLICIES

1. My office is open to students. If you cannot meet during my scheduled office hours contact me we can find a time to meet. If you have any problems with the course come see me right away. I will within reasonable limits work with you to help you through the course. However, I cannot help you raise a failing grade the last week of the course. In fairness to the other members of the class I cannot assign you extra credit work to pull up required course work.
2. If you don't understand something in class--raise your hand and ask a question! More than likely other students are having the same problem. There is no such thing as a stupid question.
3. Cheating and Plagiarism are forms of academic dishonesty that will not be tolerated. If a student is caught cheating it will result in a 0% for that test or assignment. A second act of cheating will result in an "F" for the course.

Disability Accommodation:

The Department of Biological Sciences, in cooperation with the Office of Disability Accommodation, complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request before the 12th class day.