

EV 311, Block 8, 2016
Barnes

Water: Hydrology, Aquatic Chemistry & Ecology
Stream Ecology

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Office hours: We will be together a lot – if you need to meet with me outside of class time just set up a meeting via email or in class, I am happy to meet with you.

This course examines the interactions between the physiochemical and biotic components of lotic ecosystems. Streams and rivers provide an excellent setting to think about ecological concepts around disturbance and connectivity. We will examine how the geology of a region controls stream habitat quality and in turn the stream community (algae, macroinvertebrates, fish), in addition to nutrient cycling. These ideas will be explored through field study, data analysis, and peer reviewed literature.

Objectives:

- For you to acquire a fundamental understanding of physical, chemical, and biological processes of streams and rivers.
- For you to understand commonly used stream ecology field and laboratory methods
- For you to acquire the skills to conduct and analyze scientific methods and data relevant to stream and river ecology
- For you to be able to critically evaluate and synthesize information from multiple sources

Course Format:

Class will begin every morning at 9:15 AM unless otherwise noted (we will leave earlier on all field trip days) and we will be in the field in the afternoon many days. Morning sessions will usually last until about noon and will rely on you doing the reading so that class discussions are not completely boring. We will also work through problems in class and in many instances it will be helpful for you to have a laptop with you. There will be a lab/field session most afternoons starting at 1:15 PM so please be prepared to be outside for all types of weather. It is Colorado.

Attendance:

We will be covering a lot of material in this course, with every day building on the previous day. Therefore I believe you should come to all classes – but I understand that sometimes things happen. If you have two unexcused absences, the Dean of Students will be notified. If you have three unexcused absences you are in serious jeopardy of failing the class.

If you need to miss class for any justifiable reason during the block (e.g., athletic team travel, religious observance), please notify me **today** so we can make arrangements on how you will receive the material so as to not fall behind.

Canvas:

I will use Canvas extensively throughout the course. I will do my best to have everything posted multiple days in advance but always by 4 PM for the following day.

Projects & Labs:

Labs are due at the start of class on the day specified on the schedule. Please note that neat assignments are expected – if you are someone who has handwriting that most can barely read, please type out answers. All problem sets are available electronically on canvas so you can do this (if necessary). Partial credit is given generously for calculation based problems resulting in the incorrect answer. However, to receive partial credit I must be able to read and follow your calculations (i.e. show your work and be neat!).

Stream Reach Project: For approximately 1.5 weeks you will work with a group of students to apply the various methodologies you learn throughout the block to your stream reach (along Mesa Creek or in the headwaters of Monument Creek): survey the system, measure discharge, nutrients, organic matter, primary productivity, macroinvertebrate community, ecosystem metabolism AND synthesize this information to characterize the multiple components and interactions of the ecosystem to address an ecological question of interest. Darren, Kelsey and I will be available to groups throughout the block for assistance in the field.

Grading:

Labs	35%
Stream Reach Project	30%
Midterm: Lab Practicum & Paper	20%
Oral Final	15%

Grade Assignment ("+" and "-" will also be given when appropriate):

A = 90-100%

B = 80-89%

C = 70-79% S = 70-100%

D = 65-69% CR= 65-69% NC = below 65%

D+, D, CR, and NC does not fulfill EV Department major requirements.

Late assignment policy:

Late assignments will get a deduction of 1/3 of a letter grade for every day it is late (part of 1 day counts as a day). For example, if the paper is due Monday at 9AM and you turn it in at 3PM on Monday, that would count as being 1 day late and the grade would go from a B to B-.

Honor Code:

Failure to properly document sources in papers, plagiarism, copying from other student's work, or turning in assignments that have already been submitted for credit in other courses are among

some of the actions considered intellectual theft under the Colorado College Honor System. I encourage you to work together and talk through issues, but your final written work must be your own. I will give you further information on how the honor code applies to specific assignments as we go. If you are uncertain about the Honor Code's application to a particular project, please ask me. If you have questions or to read further details of the Honor Code see:

<http://www.coloradocollege.edu/other/honorcouncil/constitution-bylaws/constitution.dot>

Disability Accommodations

If you have a disability and require accommodations for this course, please speak with me privately as soon as possible so that your needs may be appropriately met. If you have not already done so, you will need to register with Accessibility Resources (Learning Commons in Tutt Library, 227-8285), the office responsible for coordinating accommodations and services for students with disabilities.

Tentative Course Schedule (next page)

- Week 1: Hydrology & Geomorphology
- Week 2: Stream Biota
- Week 3: Nutrients, Metabolism & Fish!
- Week 4: Celebration of Learning

Everything on the syllabus and schedule is subject to change.

Date	9:15 AM - 12 PM (unless otherwise noted)	1:15 - 3:30 PM (unless otherwise noted)	Reading (to be done before class)	Assignments
18-Apr	Hydrologic cycle & water budgets	waders & field notebooks		
19-Apr	Mt. Princeton Field Trip - Discharge, Flood Frequency, Channel structure, Stream Classification (<i>tentative: meet at 9 AM, definitely back by 3 PM Thurs</i>)		Allan Ch. 3, Rosgen 1994	
20-Apr			Leopold: The River Channel (3 part pdf)	
21-Apr			Allan Ch. 5 (thru section 5.1)	<i>end of trip: hand in field notebooks for feedback</i>
22-Apr	Data Discussion, work on project			
25-Apr	Fountain Creek Field Trip: stream biota and the physiochemical environment (8:30 to 1:30 PM)	Lab: Nutrients, alkalinity, TSS, chlorophyll	Allan Ch. 5.2-end & 6	Chalk Creek Lab due 8:30 AM
26-Apr	Physical Factors & Stream Biota, Functional Feeding Groups	Lab: Macroinvertebrates, Biotic Indices, measure chl a	Allan Ch. 8 (<i>Cummins & Klug 1979, Wallace & Webster 1996</i>)	
27-Apr	Biotic Interactions & Drift	<i>Lab: work on Macro Lab</i>	Allan Ch. 9 + one paper from canvas	
28-Apr	River Continuum	Start Reach Project	Vannote et al. 1980	Macro Lab due 9 AM
29-Apr	Lab Practicum	<i>Work on Reach Project</i>		
2-May	Ecosystem metabolism	Work on Reach Project	Ch. 28 Bott (2 part pdf)	Mid-term due 9 AM
3-May	Organic Matter Budgets	Work on Reach Project	Allan Ch. 12, Webster & Meyer 1997	
4-May	Bear Creek Field Trip: Fish Assessment (<i>tentative: meet at 8:30 AM, back by 2:30 PM</i>)		Anderson & Neumann 1996	NEP Lab due 9 AM
5-May	Nutrient Spiraling	Work on Reach Project	Allan Ch. 11, Peterson et al. 1985	
6-May	Elevenmile Canyon Field Trip: Habitat Restoration and Assessment (<i>tentative: meet at 9, back by 3 PM</i>)			Fish Lab due 9 AM
9-May	<i>Work on Reach Project</i>			
10-May	Oral Final	<i>Work on Reach Project</i>		
11-May	Reach Project Papers due 9 AM			Field notebook due 12 PM

italicized readings are available in the "background readings" folder