Stream Ecology
FW580

Instructor Dr. Dana Warren
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Office Hours *D. Warren:* Mondays 11:00-12:00 and by appointment

Class Schedule Lecture: M/W/F: 9:00 – 9:50
Nash Hall 204
CRN: 39121

Course web site Canvas FW 580

Course Description:

This course will introduce students to major conceptual themes in ecology of running waters. People have long had a fascination with streams and rivers, which are critical for human well-being as sources of water and food, recreation, power, navigational routes, conduits for effluents, and aesthetic enjoyment. Moreover, running waters represent ideal ecosystems for understanding many ecological phenomena, hence some classic ecological studies have been conducted in stream and river systems. We will explore patterns and processes in streams and learn how the physical and ecological conditions of the system affects biota and ecosystem processes in running waters.

Student Learning Outcomes:

- Understand major physical and biological features of streams and rivers,
- Articulate the range of physical and ecological diversity of running waters around the world,
- Describe and assess fundamental processes producing patterns of riverine structure and function,
- Apply ecological concepts to critical issues associated with the conservation and management of streams and their biota.

Readings and text:

Text:

Stream Ecology: Structure and Function of Running Waters, 2nd edition, by J. David Allan and María M. Castillo (The use of this text is required but I will post chapters on Canvas so you don't have to buy the book if you don't want to)

Additional readings:

We will borrow chapters from some other books and you will be expected to read one or two additional peer reviewed papers for each lecture. These will tend to be review papers, conceptual papers or "classic" papers illustrating a key concept in stream ecology. These papers are primarily in place to supplement lecture material.

LECTURE SCHEDULE
Winter 2019

DATE	Lecture	TOPIC	CHAPTER(s)	PAPER(s)
Week 1				
M Jan 7		Introduction to the class	Allen Ch. 1	-
W Jan 9	1	Overarching concepts and common terms	-	Ward 1989; Jones et al. 2002
F Jan 11	2	Hydrology 1	Allen Ch. 2	Lytel and Poff 2004
Week 2				
M Jan 14		Hydrology 2	-	Poole 2010
W Jan 16	3	Geomorphology 1 and hyporheic zone	Harvey 2016 (from Jones and Stanley Ch 1. pp 1-21)	
F Jan 18		Quiz 1 and Discussion 1		
Week 3				
M Jan 21	4	Martin Luther King Jr. day – *No Class*	-	-
W Jan 23	5	Geomorphology 2 and properties of water	Allen Ch. 3; Dodds Ch. 2 (optional)	
F Jan 25		Quiz 2 and Discussion 2		
Week 4				
M Jan 28	6	Water chemistry and fluxes	Allen Ch. 4	Kelleher et al. 2012
W Jan 30	7	Nutrient spiralling	Allen Ch. 11	Tank et al. 2008
F Feb 1		Quiz 3 and Discussion 3		
Week 5				
M Feb 4	8	Connectivity 1	-	Fisher et al. 1998; Vannotte et al 1980; Tockner et al. 2000
W Feb 6	9	Connectivity 2	Jones Ch. 8	-

M Feb 8		Quiz 4 and Discussion 4		
Week 6				
M Feb 11	10	landscape perspective of streams	Jones Ch. 9	Benda et al. 2004
W Feb 13	11	Disturbance		Resh et al. 1988
F Feb 15		Quiz 5 and Discussion 5		
Week 7				
M Feb 18	12	Primary production 1	Allen Ch. 6	-
W Feb 20	13	Primary production 2 and Organic matter 1	Allen Ch. 12	-
F Feb 22		Quiz 6 and Discussion 6		
Week 8				
M Feb 25	14	Organic Matter 2 and C dynamics	Allen Ch. 7 (*optional*)	Rosemond et al. 2015
W Feb 27	15	Biota and food webs 1	Allen Ch. 8 (*optional*)	Power et al. 2011
F Mar 1		Quiz 7 and Discussion 7		
Week 9				
M Mar 4	16	Biota and food webs 2	Allen Ch. 9	Baxter et al. 2004
W Mar 6	17	Invasive Species		Flecker and Townsend 1994 Vinson and Baker 20008
F Mar 8		Quiz 8 and Discussion 8		
Week 10				
M Mar 11	18	River Modification/Restoration 1	Allen Ch. 13	Berhardt et al. 2005
W Mar 13	19	River Modification/Restoration 2		Beechie et al. 2008
F Mar 15		Quiz 9 and Discussion 9		
Exam week Mar. 18-22		***Schedule your 1 hr in-person final exam***		

Assignments, exams and grading

1) **Quizzes:** We will have a quiz at the start of class every Friday (except 1/11 the first Friday of classes). Quizzes will be short (5 questions) and will cover key points from the lecture and reading earlier in the week. Each quiz is worth a total of 10 points. You will take a total of 9 quizzes but only 8 will count toward your grade. Your dropped quiz score will be added to the total point count at the end of the quarter as extra credit.
2) **Problem sets:** You will have 2 problem sets over the duration of the course. Each set will reinforce a concept we discussed or help you explore ideas in stream ecology.
3) **Class Discussion papers:** Our textbook is about 11 years old and many of my lectures will focus on core and "classic" concepts in stream ecology. However, as a graduate student you should also be aware of more current work in this field. Therefore we will have ½ of a class on Fridays (after quizzes) to bring some more recent papers into the discussion. Each person will be responsible for finding a paper that updates one idea, concept, or example from lecture or reading that week. (see detailed instructions).
4) ***Meta-analysis/Review paper*:** You will be required to do a literature review/meta-analysis to answer a concise question in stream ecology. See additional details
5) **Final exam:** The final exam will be an individual oral exam, focusing on integration of the ideas covered in the class.

Value of Each Portion of the Course:

	Percent of grade
Quizzes (8 at 10 pts each) – 80 pts.	24.3%
Problem sets (2 at 20 pts each) – 40 pts.	12%
Update/Discussion papers (8 at 5 pts each) – total of 40 pts.	12%
Meta-Analysis paper topic and 5 core papers – 10 pts.	3%
Meta-Analysis paper – 80 pts.	24.3%
Final Exam – 80 pts.	24.3%
Extra credit from dropped quiz (add up to 10 pts to total)	Add up to 3%
Total potential points: 330	

Assignments timeline

Paper updates – post to discussion board by Friday each week (starting in week 2)
Meta-analysis topic and 5 core papers – DUE February 1
Problem set 1 – DUE Feb. 8
Problem set 2 – DUE March 3
Final paper – DUE March 8

Course Policies

Attendance:
Poor attendance is often the cause for poor grades. Please attend all lectures and laboratory sessions.

Readings:
Students should prepare for lecture by reading the relevant chapter in the textbook or the primary literature for that lecture which will be provided well ahead of time on the course website.

Tardiness:
I intend to start classes on time. Arriving late disturbs other students already present and disrupts the learning process. Please be considerate and plan to be on time.

Cell phones:
Please remember to turn off audible cell phones and pagers during class. Repeated issues of cell phone problems will be treated on a case-by-case basis. Regular or continued disruption of the class after two warnings will affect your grade.

Incomplete grades:
A grade of incomplete will only be assigned for students who are physically unable to complete the course due to serious illness or injury. Students are responsible for understanding and following all university and departmental policies that apply to removing a grade of incomplete from their record, and for understanding the circumstance that can cause an incomplete grade to convert to a grade of F.

College Policies

Students with Disabilities:

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately.

Rules on Civility and Honesty:

Please follow the College rules on civility and honesty. These can be found at (insert here). Cheating or plagiarism by students is subject to the disciplinary process outlined in the Student Conduct Regulations. Students are expected to be honest and ethical in their academic work. Academic dishonesty is defined as an intentional act of deception in one of the following areas:

- **CHEATING** - use or attempted use of unauthorized materials, information or study aids or an act of deceit by which a student attempts to misrepresent mastery of academic effort or information. This includes unauthorized copying or collaboration on a test or assignment or

using prohibited materials and texts.

- **FABRICATION** - falsification or invention of any information (including falsifying research, inventing or exaggerating data and listing incorrect or fictitious references.
- **ASSISTING** - helping another commit an act of academic dishonesty. This includes paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, or taking a test/doing an assignment for someone else (or allowing someone to do these things for you). It is a violation of Oregon state law to create and offer to sell part or all of an education assignment to another person (ORS 165.114).
- **TAMPERING** - altering or interfering with evaluation instruments and documents.
- **PLAGIARISM** - representing the word or ideas of another person as one's own OR presenting someone else's words, ideas, artistry or data as one's own. This includes copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project, then submitting it as one's own.
- **BEHAVIOUR** - Behaviors disruptive to the learning environment will not be tolerated and will be referred to the Office of Student Conduct for disciplinary action.

Diversity, Equity and Inclusion:

As a course focused on ecology, this class may seem to operate outside issues of diversity equity and inclusion; and in an ideal world, science would indeed be entirely and unequivocally objective. However, much of science can be subjective, and scientific fields have been historically built on a small subset of privileged voices. Therefore, even though the material in this course is primarily of a scientific nature, I acknowledge that it is possible there may be both overt and covert biases in the material due to the lens with which it was written. Ultimately, integrating a diverse set of experiences is important as we advance our field and develop a more comprehensive understanding of ecology.