

**ESCI 429/529 STREAM ECOLOGY (5 cr.)**  
**Huxley College of the Environment,**  
**Western Washington University**  
**Spring 2017**

**Lectures:** MWF 11:00 – 11:50 am, PH 244  
**Labs:** W or R 1:00 – 4:50 pm, ES 322

**Instructors:**

James M. Helfield	Chris Trinies (TA)	Matt Sturza (TA)
<i>Office:</i> ES 338, Tel. 650-7285,	<i>Office:</i> ES 341	<i>Office:</i> ES 303
<i>Email:</i> james.helfield@wwu.edu	<i>Email:</i> triniec@wwu.edu	<i>Email:</i> sturzam@wwu.edu
<i>Office hrs.:</i> M 2:00 – 4:00 pm, or by appt.		

**Course Objectives:**

This course examines the ecology of rivers and streams from a watershed perspective, with emphasis on Pacific Northwest ecosystems. Topics covered include hydrology, geomorphology, organic matter and trophic dynamics, biogeochemical cycles, aquatic insects, fish, riparian ecology and hyporheic processes. The primary goal of this course is to provide students with an understanding of the physical and biological factors that shape the structure and dynamics of stream ecosystems, and the ways in which these factors are interrelated. Another goal is to help students become informed, critical thinkers able to (1) collect and analyse ecological data, (2) interpret the results of ecological studies, (3) use theoretical knowledge in real world applications, and (4) write and speak effectively to professional and lay audiences about ecological issues.

**Prerequisites:**

ESCI or BIO 325; ESCI 361 (may be taken concurrently).

**Recommended Texts:**

There is no required text for this course, although various references will be cited and/or recommended during lectures and labs. Readings and other course materials can be downloaded from the [ESCI 429/529 Canvas site](#).

**Field Trips:**

Most of the lab sessions for this course will be conducted outside in the field. In addition to weekly Wednesday/Thursday lab sessions, there will be one weekend field trip. For all lab sessions and field trips, students should be prepared to be outside regardless of weather conditions. If you do not have any rain gear, now would be a good time to invest in a set.

**Assignments and Grading:**

ESCI 429: Midterm Exam	25%	ESCI 529: Mid-term Exam	25%
Lab Assignments	25%	Group Project	50%
Lab Practical Exam	25%	Final Exam	25%
Final Exam	25%		

Late assignments will be penalized 5% per day if turned in without a valid excuse. Students who miss a test without a valid excuse will be given a grade of 0% for that test. If you have a valid excuse for missing a test or a deadline, you should contact the instructor beforehand so that alternate arrangements can be made.

Grades will be assigned as follows:

Grade	%	Grade	%	Grade	%	Grade	%	Grade	%
		B+	87 – 89.9	C+	77 – 79.9	D+	67 – 69.9	F	0 – 59.9
A	93 – 100	B	83 – 86.9	C	73 – 76.9	D	63 – 66.9		
A-	90 – 92.9	B-	80 – 82.9	C-	70 – 72.9	D-	60 – 62.9		

**Schedule:**

Week	LECTURE		LAB	
	Date	Topic	Date	Topic
1	W 3/29	Introduction: A Watershed Perspective	W 3/29;	Introduction and Wader Fitting
	F 3/31	Watershed Hydrology I: Streamflow Generation	R 3/30	
2	M 4/3	Watershed Hydrology II: Streamflow	W 4/5; R 4/6	Hydrology Lab
	W 4/5	Channel Hydraulics		
	F 4/7	Channel Morphology and Fluvial Geomorphology		
3	M 4/10	Channel Morphology (cont'd)	W 4/12; R 4/13	<u>Padden Cr. Sampling:</u> Discharge, Substrate, Inverts
	W 4/12	Channel Morphology (cont'd); Stream Classification		
	F 4/14	Food Webs		
4	M 4/17	Aquatic Insects I: Life Histories and Adaptations	W 4/19; R 4/20	Aquatic Insect Lab I
	W 4/19	Aquatic Insects II: Thermal Ecology		
	F 4/21	Organic Matter Dynamics I: DOM, POM, LWD		
5	M 4/24	Organic Matter Dynamics II: C Spiralling and Seston	W 4/26; R 4/27	Aquatic Insect Lab II
	W 4/26	Nutrient Dynamics		
	F 4/28	<b>MIDTERM EXAM</b>		
6	M 5/1	Fish I: Life Histories and Habitat Ecology	W 5/3; R 5/4	<u>Chuckanut Cr. Sampling:</u> Hab. Assmt., Inverts., Fish
	W 5/3	Fish II: Diversity and Distributions		
	F 5/5	Riparian Ecology I: Dynamics and Adaptations		
7	M 5/8	Riparian Ecology II: Riparian Functions, LWD and the River Continuum Concept	W 5/10; R 5/11	<u>Nooksack R. Gravel Bar:</u> Floodplain Ecology & Periphyton
	W 5/10	Large Animals		
	F 5/12	The Hyporheic Zone I: Definitions and Hydraulics		
8	M 5/15	The Hyporheic Zone II: Biogeochemistry	<u>WEEKEND:</u> F 5/19 – Su 5/21	<u>Elwha R. Field Trip</u>
	W 5/17	The Hyporheic Zone III: Biota; Stream Ecosystem Theory		
	F 5/19	Anthropogenic Influences I: Dams		
9	M 5/22	Anthropogenic Influences II: Land Use	W 5/24; R 5/25	<u>Urbanization &amp; Restoration</u> <u>at Whatcom Cr.:</u> Hab. Assmt. & Inverts.
	W 5/24	Stream Ecosystem Theory; Lab Practical Exam Study Guide		
	F 5/26	<b>ESCI 529 GROUP PROJECT PRESENTATIONS</b>		
Dead	M 5/29	Memorial Day (no class)	W 5/31; R 6/1	<b>LAB PRACTICAL EXAM</b>
	W 5/31	Loose Ends		
	F 6/2	Summary and Review		
Finals	M 6/5	<b>FINAL EXAM 10:30 am – 12:30 pm</b>		