FISH 423

Aquatic Invasion Ecology

Instructor: Julian D. Olden
Office Location: Fisheries Science Blg., Room 318
Office hours: Th 1:30 - 2:30 or my appointment
Contact information: phone: 206.616.3112; email: olden@uw.edu
Course web page: https://canvas.uw.edu/courses/1159833
Class hours: Lecture: T & Th @ 12:30-1:20 (Rm 108), Discussion: T @1:30-2:20 (Rm 108)
Prerequisite(s): Either BIOL 162 or BIOL 180

COURSE IMPETUS

Humans have a noteworthy ability for introducing species to areas beyond their native range, giving the potential for these species to become biological invaders. The global epidemic of invasive species is rampant, representing a leading threat to national economies, human health, and cause tremendous ecological damage ranging from the extinction of native species to alteration of ecosystem processes. On the other hand, emerging evident suggests that non-native species can also positively contribute to ecosystem function and deliver important goods and services in human-impacted landscapes. Challenges associated with invasive species are particularly evident in aquatic environments, including the Pacific Northwest, whose native freshwater and marine biodiversity is under increasing threat from invasive species.

COURSE OBJECTIVES

The objective of this course is to advance your knowledge regarding the ecology, management and policy of species invasions in freshwater, estuary and marine ecosystems. We will accomplish this through a combination of lectures and discussions that examine the entire invasion process, including aspects related to management and policy strategies, illustrated using case studies from the around the world.

- The first part of the course will provide an overview of the challenge, focusing on global pathways and patterns of aquatic invaders in freshwater and marine ecosystems.
- The second part of the course will explore the entire invasion process, from initial introduction to a foreign area, to the establishment of a self-sustaining population and integration into native communities. These lectures will focus on the underlying theory and empirical evidence for each invasion stage illustrated through a number of case studies.
- The third part of the course will focus on the management approaches needed to prevent, control and eradicate invasive species, including current state and federal legislation for invasive species.

LEARNING OUTCOMES

As a result of this course, students will have a strong understanding of the patterns, processes and consequences of species invasions in aquatic ecosystems.

METHOD OF INSTRUCTION AND GRADING

Lectures: This course will consist of two 50-minute lectures per week. Lectures will emphasize main concepts from invasion ecology, illustrated with examples from freshwater and marine ecosystems.

Exams: There will be two exams - a mid-term (20% of final grade) and a final (30%) exam. They will cover the material presented in lecture and discussion section. The 50-minute midterm exam and 2-hour final exam will consist of short essay questions.

Documentaries: Two documentaries are presented during the quarter in which you are required to attend. An assignment addressing topics in the documentary is due two days (5 pm) following the documentary showing (upload on Canvas). After 5pm the Canvas upload link is automatically closed. You will be evaluated according to content and grammar. Each assignment is 5% of final grade (10% total).

Guest lectures: There are 2 discussion periods during the quarter in which a guest lecturer will speak to the class about regional invasive species issues. You are required to attend the guest lectures and submit a 500-word editorial, which is due two days (5 pm) following the lecture (upload on Canvas). After 5pm the Canvas upload link is automatically closed. Your editorial should include a discussion of the guest lecture and your thoughts on its relevance given the topics covered in class. It can include your opinion, but cannot be limited just to this. You will be evaluated according to content and grammar. Each editorial is 5% of final grade (10% total).

Final Assignment: A significant portion of your grade is based on a final assignment. Detailed instructions are provided below.

Summary	*Due date*	*Grade*
Documentary assignments	Oct 14, Nov 23	10%
Editorials	Oct 26, Nov 30	10%
Mid-term exam	Nov 2	20%
Final assignment pitch	Oct 17	5%
Final assignment demo	Dec 5	25%
Final exam	Dec 14	30%

TEXTBOOK(S) AND REQUIRED TOOLS OR SUPPLIES

Lockwood, J. L., Hoopes, M. F., and M. P. Marchetti. 2013. *Invasion Ecology*, 2nd edition. Blackwell Publishing.

SCHEDULE*

Week 1	Th 28 Sept	Invasive species – what's the big deal?
Week 2	T 3 Oct	Conceptual models and ecological theory of the invasion process (Ch. 1**)
	T 3 Oct	Discussion: Class introductions, etc …
	Th 5 Oct	Vectors and pathways of species introductions (Ch. 2)
Week 3	T 10 Oct	Vectors and pathways, continued (Ch. 3) (guest lecture)
	T 10 Oct	Working session for final assignment
	Th 12 Oct	PBS Documentary – Silent Invasion
Week 4	T 17 Oct	Propagule pressure (Ch. 4)
	T 17 Oct	Invasive Species Game Pitch
	Th 19 Oct	Species establishment: Species' profiling

Week 5	T 24 Oct	Species establishment: Environmental controls (Ch. 5)
	T 24 Oct	Discussion with Kurt Beardslee (Wild Fish Conservancy)
	Th 26 Oct	Species establishment: Biological controls (Ch. 6)
Week 6	T 31 Oct	Species spread: Theory, models and empirical evidence (Ch. 7 & 8)
	T 31 Oct	Discussion: Exam review session
	Th 2 Nov	MID-TERM EXAM
Week 7	T 7 Nov	Ecological impacts of invasive species (Ch. 9)
	T 7 Nov	Working session for final assignment
	Th 9 Nov	Ecological impacts of invasive species (Ch. 10)
Week 8	T 14 Nov	Evolutionary impacts of invasive species (Ch. 11)
	T 14 Nov	Economic impacts of invasive species
	Th 16 Nov	Preventative approaches (risk analysis) to species invasions (Ch. 12)
Week 9	T 21 Nov	PBS Making Waves: Battle for the Great Lakes documentary
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	Th 23 Nov	Holiday: Thanksgiving
Week 10	T 28 Nov	Invasion species mitigation (Ch. 13)
	T 28 Nov	Green crabs in the Puget Sound, Sean McDonald (UW)
	Th 30 Nov	Invasion policy, Justin Bush (WA Recreation and Conservation Office)
Week 11	T 5 Dec	Final assignment demos
	T 5 Dec	Final assignment demos
	Th 7 Dec	Exam review session
Final Exam	Th 14 Dec	FINAL EXAM: 10:30-12:20pm (Room 108)

* Refer to Canvas for the most up-to-date schedule
** Chapters in Lockwood et al. (2013) are indicated and are required reading.

ACADEMIC INTEGRITY

Plagiarism, cheating, and other misconduct are serious violations of your contract as a student. We expect that you will know and follow the University's policies on cheating and plagiarism. Any suspected cases of academic misconduct will be handled according to University regulations. More information can be found at: http://www.washington.edu/cssc/for-students/student-code-of-conduct/. Be advised, the instructors of this course have the right and responsibility to notify University Conduct committees about ANY suspected student misconduct. Exam cheating might come immediately to your mind when you hear this, but by FAR the most prominent form of cheating at UW is plagiarism.

It is YOUR responsibility to inform yourself of what plagiarism means. Students will receive NO credit for an assignment that contains plagiarized portions.

Typical plagiarism "oversights" are:
(1) Copying an assignment from a friend with whom you study, OR working so closely with this friend that both your assignments LOOK copied (same words and ideas in the same order).

(2) Copying whole sentences from a web site without restating in student's words or without quotation/citation.
(3) Paraphrasing ideas of another author without attempting to write an "original" sentence.

DISABILITY ACCOMMODATIONS

It is crucial that all students in this class have access to the full range of learning experiences. At the University of Washington, it is the policy and practice to create inclusive and accessible learning environments consistent with federal and state law. Full participation in this course requires the following types of engagement:

Course component	***Requirements***
Lectures	The ability to attend bi-weekly lectures of 50 minutes with 25 other students.
Discussion	The ability to participate in group discussion for 50 minutes. The ability to collaborate in teams; includes 10-15 minute data presentations and discussions
Research project	The ability to work independently to analyze and interpret data and primary literature; involves computer work, creating text, uploading assignments and writing a final report.
Exams	The ability to write a set of short-answer questions designed to be completed within 50 minutes in a room with 25 other students.

If you anticipate or experience barriers to your learning or full participation in this course based on a physical, learning, or mental health disability, please immediately contact the instructor to discuss possible accommodation(s). A more complete description of the disability policy of the College of the Environment can be found at https://environment.uw.edu/intranet/academics/teaching/disability-accommodation/. If you have, or think you have, a temporary or permanent disability that impacts your participation in any course, please visit Disability Resources for Students (DRS) at http://depts.washington.edu/uwdrs/.