

ES 305: The Biology, Identification, and Management of Invasive Species

Fall 2013 Syllabus

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Course Description:

Invasive species frequently cause serious ecologic, social, and economic effects. This course will explore the individual biology, identification, and management of invasive species on a case-by-case basis. Terrestrial and aquatic plants and animals, both native and nonnative, will be covered. Invasive species with the most notable ecological and economic impacts in the U.S. Midwest will be emphasized, but examples from and around the world will be covered. We will also consider potential impacts and rapid response strategies for impending introductions.

Course Objectives:

1. Understand mechanisms of biological invasions.
2. Learn how to assess impacts of biological invasions.
3. Assessment of ecologic, social, and economic effects of invasive species.
4. Learn research approaches for studying invasive species.
5. Identify and describe the life history of specific invasive species.
6. Describe current laws and regulations regarding invasive species.
7. Learn management techniques for controlling invasive species.

Expectations:

What I expect of you

- To be familiar with the course policies.
- To come to class prepared and on time. (one hour of class = two hours of study time)
- To actively participate in class.
- To seek help with the course material if you need it.
- To communicate with me regarding special needs, tardiness and absences.
- To be respectful of your classmates.

What you can expect from me

- To start and end class on time.
- To be enthusiastic and knowledgeable about course material.
- To be respectful of your perspectives on an issue.
- To present factual and organized information.
- To objectively grade your assignments and exams.
- To set high standards and help you meet those standards.

Required Materials:

Posted on D2L.

Recommended Books:

Czarapata, E.J. 2005. Invasive Plants of the Upper Midwest: An Illustrated Guide to their Identification and Control. University of Wisconsin Press. <http://uwpress.wisc.edu/books/3601.htm>

Skawinski, P.M. 2011. Aquatic Plants of the Upper Midwest: A Photographic Field Guide to Our Underwater Forests.

<http://www4.uwsp.edu/cnr/uwexlakes/publications/aquaticPlantsWi/aquaticPlantsUpperMidwest.asp>

Policies:

- Attendance is required. Appropriate documentation must be provided for excused absences such as illness, medical emergency, university events, or bereavement. (<http://www.uwosh.edu/stuaff/studenthandbook/ClassAttend.htm>)
- Arrangements for any special need must be made *in advance*, except in the case of unforeseen circumstances. Late assignments will be accepted if arrangements were made in advance, but with a point reduction of 10% per day.
- Email and D2L will be used throughout the term. Emails constitute legal, official University communication. Not checking your email is not an excuse for performance problems in the class. Contact Academic Computing or any Campus Computer Lab supervisor for assistance with email and D2L.
- As a courtesy to others - and to yourself - please turn off all electronic distractions during class. Texting and other electronic distractions are not allowed during class and may be grounds for a reduction of your final grade.
- Laptops may be used in this class, but I do not recommend them. Your final grade may be lowered if I see that are using your laptop for anything outside of class.
- Writing assignments are expected to be of the highest quality. Anything turned in shorthand will be given a 0 until you hand in a legitimate version (at which point penalties for handing in the work late will apply).

Academic Integrity:

Academic dishonesty will not be tolerated. If you decide to engage in academic misconduct you will be subject to the Student Academic Disciplinary Procedures as outlined in the Student Disciplinary Code (<http://www.uwosh.edu/dean>). Under Chapter UWS 14 (Student Academic Disciplinary Procedures), “academic misconduct” means an act in which a student (UWS 14.03):

- a) seeks to claim credit for the work or efforts of another without authorization or citation;
- b) uses unauthorized materials or fabricated data in any academic exercise;
- c) forges or falsifies academic documents or records;
- d) intentionally impedes or damages the academic work of others;
- e) engages in conduct aimed at making a false representation of a student’s academic performance; or
- f) assists other students in any of these acts.

Disabilities:

Students who have physical or learning disabilities that wish to request academic adjustments should notify the Disabilities Office so that appropriate accommodations can be made. For more information contact the Counseling Center or Disabilities Services (424-2404).

Field Trips:

We will be going on 2-3 field trips by bus (special course fees apply). Make sure to dress for the outdoors.

Grading:

	Exams (2)...200 pts	Assignments (5)...200 pts	
<i>Grading Scale</i>	93 – 100% = A	80 – 82.9% = B-	67 – 69.9% = D+
	90 – 92.9% = A-	77 – 79.9% = C+	63 – 66.9% = D
	87 – 89.9% = B+	73 – 76.9% = C	60 – 62.9% = D-
	83 – 86.9% = B	70 – 72.9% = C-	< 60% = F

Exams:

Exams will primarily be in the format of short answer/essay, so study accordingly. A portion of the exams will include species identification. If you will miss an exam due to a University-sponsored activity (e.g. athletics contest), your coach should have provided you with a letter. Bring a copy of that letter to permit a make-up exam. If you miss an exam for any other UWO-approved reason (e.g. illness or bereavement), go to the Dean of Students Office in Dempsey Hall, obtain a written excuse, and bring the written excuse to permit a make-up exam. **Absolutely NO** late exams will be scheduled for reasons of holiday or end-of-term travel.

Lectures

Because this is a three hour class, I will do my best to break up the lectures with breaks, activities and discussions. PowerPoints will be made available, but will generally not be posted before lectures.

Guest Lecturers

We will be having guest lecturers who are professionals on various topics of invasive species. Please make them feel welcome. Questions from these lectures will be included on the exams.

Individual Assignments

There will be two short individual assignments worth 25 points each: a short essay and a photojournal of 10 invasive species. Specific instructions will be provided in class.

Team Assignments

We will assemble in teams of ~3 people for three projects. As a group, you will 1) write a lab report and 2) create outreach material, and 3) write a formal paper and presentation. **Team member evaluations will be factored into your team grades.**

1. Lab Report (25 pts)

We are going to examine the effects of buckthorn on tree diversity for which you will write a brief scientific report.

2. Outreach (25 pts)

Children

Create a children's game, story or other activity. For example, you can take an existing game and modify it for invasive species.

-OR-

General Audience

Create a brochure, poster, sign, or video. Keep this assignment in mind as we look at outreach materials throughout the semester. You may either choose to create something new or you may choose to redo an old one.

3. Term Paper and Presentation (100 pts)

Each team will be assigned a geographical region for which you may cover any aspect of invasive species. You should select an ecosystem or several different ecosystems that have been degraded by invasive species and provide in-depth coverage of ecological, social, and economic impacts. You will receive a group grade for your paper and an individual grade for your presentation

A. Your paper and presentation should contain:

- life histories of each species
- vector(s) and propagule pressure
- impacts (ecological, social, and/or economic)
- control techniques
- elements of the 3 pillars
 - Ecological –e.g., How specific native species that have been/could be affected and their outlook.
 - Social – e.g., Were the species intentionally introduced for social benefits – gone awry? Describe effects (past, current or future) human health and welfare.
 - Economic – e.g., Were the species introduced for monetary profits, economic losses related to the species due to damage and/or cost for control.
- Original schematics of ecological interlinkages (people like pictures!)
- 10 formal citations (at least 3 of these must be peer-reviewed) (APA style)
- Papers should be at least 10 pages (double spaced size 12 font 1 inch margin) (this *does* include references and original illustrations)
- A paper assigned to the class to read and discuss

- B. You will each receive an individual grade for the presentation, so each member needs to participate. Grades will be based upon
- Organization
 - Appearance (attire and enthusiasm)
 - Slides (clarity of font and illustrations, references are cited)
 - Eye contact/confidence
 - Pace and timing

Breakdown:

An outline of your project and reference list is due the 5th week of the semester (10 pts)
 45 minute presentations will be given throughout the second half of the semester (45 pts)
 Group papers are due in the D2L dropbox by the start of class the last day of class (45 pts)

Team Term Paper

The following is a rough outline of the qualities you will be graded on for your group paper.

Exemplary (90-100%)	Paper is organized, clearly presented and fully developed, facts are strongly supported by pertinent literature, paragraphs are logically organized with good transitions, paragraphs begin with topic sentences, redundancy is absent, citations are properly and consistently used, grammar/spelling/punctuation/capitalization is correct. Illustrations are clear.
Good (80-89%)	Paper organization is structured and understandable, facts are mostly supported by pertinent literature, redundancy is mostly absent, citations are generally correctly used, grammar/spelling/punctuation/capitalization is mostly correct. Illustrations are included.
Average (70-79%)	Paper is understandable but organization is poor, there is redundancy, citations are inconsistently used or improperly formatted, grammar/spelling/punctuation/capitalization has regular errors. Illustrations are unclear.
Below Average (69% & below)	Paper is poorly organized, sentence structure has errors, citations are absent or references unclear, there is considerable redundancy, directions are not followed, grammar/spelling/punctuation/capitalization has several errors. Illustrations are not included.

Proposed Schedule

Part I: Plants and Aquatic Animals

Date	Topics/Activities	Assignment due
4 Sept	General introduction Campus biodiversity observation and dichotomous key exercises Terrestrial plant ID	Read Pearce 2013 "True Nature: Revising Ideas On What is Pristine and Wild" Pearce 2013 "On a Remote Island, Lessons In How Ecosystems Function"
11 Sept	Field trip to Waukau Creek Forest Preserve Evaluate biodiversity impacts from buckthorn	Invasive Species Significance Essay due (25 pts)

18 Sept	Field trip to WILD Center (native vs nonnative)	Invasive Species Biodiversity Report due (25 pts)
25 Sept	Beginnings of Invasive Research Methods of Invasive Plant Control Guest Speaker Steve Peznick? Herbarium Tour – learn how to make a plant press/voucher specimen	Read Cook 2012 “Hailing the arrival of alien predators” Photojournal and uploads to GLEDN due (25 pts)
2 Oct	Aquatic invasions Aquatic animal ID Guest Speaker AIS Coordinator Diane Schauer – Outreach and ID	Outline of project due, including at least 5 references (10 pts)
9 Oct	Great Lakes case study Aquatic plants ID Guest Speaker Graduate Student Andrew Sabai – cattail ID and research	Read Kitchell and Sass 2008 “Great Lakes Ecosystems: Invasions, Food Web Dynamics, and the Challenge of Ecological Restoration”
16 Oct	Guest Speaker from UW Extension Chad Cook “Economic Impacts of Aquatic Invasive Species”	Outreach projects due (25 pts)

Part II: Terrestrial Animals, Worldwide Case Studies, and Special Topics

23 Oct	Exam I	Work on team projects
30 Oct	Invasive Species Laws and Regulations Department of Natural Resources Guest Speaker Bob Wakeman	Africa presentation (45 pts) Reading assigned by students
6 Nov	Video “Cane Toads: An Unnatural History” Island invasions Invasion Theory and Rapid Response Strategies	Australia/New Zealand presentation (45 pts) Reading assigned by students
13 Nov	Agriculture and invasive species - Pests and their management Guest Speaker?	Europe presentation (45 pts) Reading assigned by students
20 Nov	Microbes and disease Earthworms in the northern forests	Southeast Asia presentation (45 pts) South America presentation (45 pts) Reading assigned by students
27 Nov	Thanksgiving Break	
4 Dec	Ocean invasive species/HABs Climate change and invasive species	Mexico/Central America presentation (45 pts) Reading assigned by students
11 Dec	Exam II	Team paper due (45 pts)