



BIO 412 Ecology of Plant Invasions - Syllabus Summer Session I – 2011

Instructor: Dr. Jason Kilgore
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Office Hrs: by appointment

Course Objectives: In this course, you will become familiar with the ecology of invasive plants, including history, theory, plant and environmental characteristics, and community and ecosystem effects. We will focus on plants found in southwestern Pennsylvania, with the primary focus on garlic mustard (*Alliaria petiolata*), a common invasive forb in Pennsylvanian forests. We will use lectures, discussion, library research, a common project, and independent research projects to study invasive plant species.

Learning Outcomes: At the conclusion of this course, you will:

- 1) Be familiar with current primary literature on ecological theory, methods, and analyses for invasive plant species;
- 2) Become more comfortable critically evaluating and presenting a scientific paper;
- 3) Be familiar with the identification and ecology of invasive plant species in southwestern Pennsylvania, especially garlic mustard (*Alliaria petiolata*); and
- 4) Design an original research project, including researching online databases for primary literature, developing a proposal, collecting and analyzing data, generating figures and tables, and writing a coherent manuscript appropriate for publication.

Course Format: This 20-day course will be compact, dense, and vibrant with assigned readings from the primary literature, faculty- and student-led discussions about these readings, a class-based project, and an independent research project conducted at Abernathy Field Station (AFS). As a Biology major, successful completion of this course will fulfill your Capstone project requirement in Biology (if applicable).

This class is scheduled for 8am to 3pm every day of the week for the duration of the semester. On-campus meetings will occur in Swanson 101 (see **Schedule**), and field meetings will start in Dieter-Porter 311 before leaving for AFS. You will be expected to complete readings, prepare for discussion, and do research project tasks outside of this class time, as well. In general, we will go to AFS in the morning (8:00-11:30am), return to campus for lunch, and hold lecture, discussion, and project work sessions in the afternoon (1:00-3:00pm). An immediate exception is the first day of class when we will meet in the morning (8:00-11:00am) for the course introduction and lecture, with the afternoon (12:30-3:00pm) spent at AFS. See **Schedule** for specific activities.

Your course grade will depend on your demonstrated completion of all assigned course readings, participation in class discussions, leading of discussion for three primary literature articles, participation in the class project, and completion of all requirements for the independent research project. See **Course Grade** for more details.

Course Readings and Supplies: All readings will be posted to Sakai or distributed in class for students to read prior to the discussion session; no text is required for this course. You will need a field databook, such as the ~\$3 books available at the W&J Bookstore. You may wish to purchase a plant field guide, such as *Trees of Pennsylvania* (Rhoads and Block 2005), *The Ferns and Fern Allies of Pennsylvania* (Lord and Travis 2006), or the comprehensive *The Plants of Pennsylvania* (Rhoads and Block 2007), depending on your research project, but we can discuss relevant guides later.

Since we will be working in the field almost every day, rain or shine, you are responsible for determining appropriate clothing for the weather and location. I strongly recommend long pants, field shoes or boots, and rainwear for every day in the field. You should also pack your own drinking water and food in a daypack in which you will also carry field equipment. Confidentially notify the instructor if you have any medical conditions that could affect your or others' experience in this course.

Primary Literature Article: Each student will be responsible for leading discussion for three assigned primary literature articles. This opportunity will enhance your ability to critically read, summarize, and present primary literature. Your presentation will be assessed based on quality of the summary, critique, and stimulation of discussion.

Class Project: In Summer 2009, the Long-term Ecological Monitoring (LEM) interns and supervising faculty established transects for monitoring plant populations and quantity of light and litter at AFS, with the intent to quantify biotic and abiotic interactions and effects of garlic mustard (*Alliaria petiolata*). Students in BIO 101 (Fall 2009, 2010) and BIO 200 (Spring 2010, 2011) and Summer 2010 LEM interns have collected additional *A. petiolata* data. Using this species as a case study in invasive plant ecology, we will continue the annual summer data collection.

Research Project: All students will individually develop and implement their own research project to test invasive plant species ecological theory or methods, or to investigate ecological relationships of an invasive plant species. Projects will take place at AFS and will be composed of an initial proposal, a progress benchmark, and a final paper, including all data files. See **Course Grade** for percentage allocation of each component.

The body of the proposal will include the rationale for the project, an outline of the methods and data analyses, a prediction graph, a schedule, and a literature cited section. The proposal should be ~2 pages (11-pt Arial font, 1" margins, double-spaced). Citation format must follow the journal *Ecology*.

The progress benchmark will be determined based on a first draft of your research project paper, focusing on literature review in the Introduction, completed Methods section, organized data book, and data entered into a spreadsheet.

The final paper must be submitted by the deadline as an electronic file (.doc) along with all data files and data book; failure to submit data files and book will result in no credit for the paper. The formal research paper should be 15-20 pages (11-pt Arial font, 1" margins, double-spaced) and formatted to the journal *Ecology*.

Optional: The Pittsburgh Botanic Garden is a developing project with opportunities for student involvement. On 25 June (Saturday), we will drive to the Garden to participate in invasive plant management (removal). Details will be discussed in class.

Schedule: <subject to change with announcements in class, by email, or posted to Sakai>

Day		Date	Morning (8:00-11:30am)	Afternoon (1:00-3:00pm)
1	Mon	6 June	Introduction, History, Theory, LEM (SWA)	Introduction to AFS, plants, garlic mustard (GM) transects
2	Tue	7 June	AFS – GM project	Invasive plant characteristics (SWA)
3	Wed	8 June	AFS – GM project	Invaded system characteristics (SWA)
4	Thur	9 June	AFS – GM project	Effects of invasive plant species on community dynamics (SWA)
5	Fri	10 June	AFS – GM project	Sampling methods (SWA)
6	Mon	13 June	AFS – GM project	Invasive plant species in Pennsylvania (SWA)
7	Tue	14 June	AFS – GM project	Formulate questions and design research project (SWA)
8	Wed	15 June	AFS – GM project	Peer review and discussion of proposals (SWA)
9	Thur	16 June	AFS – GM project	No class – complete proposal by 3pm to Sakai Dropbox
10	Fri	17 June	AFS – GM project	Proposal discussion with Dr. Kilgore (SWA)
11	Mon	20 June	AFS – research project	Effects of invasive plant species on ecosystem processes (SWA)
12	Tue	21 June	AFS – research project	Invasive plant species management (SWA)
13	Wed	22 June	AFS – research project	No class – lit review for research project
14	Thur	23 June	AFS – research project	No class – lit review for research project
15	Fri	24 June	AFS – research project	No class – lit review for research project
<i>opt</i>	<i>Sat</i>	<i>25 June</i>	<i>Pittsburgh Botanic Garden – Invasive plant removal</i>	
16	Mon	27 June	AFS – research project	Benchmark meeting (SWA)
17	Tue	28 June	AFS – research project	No class – lit review for research project
18	Wed	29 June	Data analysis and writing – research project	
19	Thur	30 June	Data analysis and writing – research project	
20	Fri	1 July	No class – Final paper and data files due by 3pm to Sakai Dropbox (databook to Dr. Kilgore)	

(SWA) – Meet in Swanson 101; all other meetings begin in Dieter-Porter 311.

Course Grade:

Assessments	%
Completion of all assigned readings and participation in discussions	10
Presentations of primary literature article	15
Participation in class project	15
Research Project	
Proposal	10
Progress benchmark	10
Paper (with data files and databook)	40
Total	100

Final grades will be based on your cumulative percentage points earned: A, 93-100%; A-, 90-92%; B+, 87-89%; B, 83-86%; B-, 80-82%; C+, 77-79%; C, 73-76%; C-, 70-72%; D+, 67-69%; D, 63-66%; D-, 60-62%; F, <60%. Grades are based on individual performance and not on the class 'average.'

Student Responsibilities:

Official method of contact: Email sent to your "jay.washjeff.edu" email account is the official method of communication for all courses and administrative purposes at W&J. Checking your W&J email account on a regular basis is your responsibility. We will also set up a phone tree for emergency purposes.

Preparation: You must be prepared for all sessions related to this course. All assignments and readings assigned for a particular session should be completed prior to the session unless otherwise instructed.

Attendance: You are required to attend all lectures, discussions, work sessions, and field trips, with exceptions made only in cases of illness ('written doctor's excuse' required), death in the family (requires notification by the Office of Student Life), or other extreme emergencies (requires notification by Office of Student Life). Notify Dr. Kilgore of an excused absence as early as possible, preferably prior to your absence. Notification is your responsibility, and you are responsible for all course material covered during your absence.

In the event of an unexcused absence, you will receive '0' points for the session, field trip, or other event missed. Excused absences will be managed on an individual basis.

There will be no 'make-up' sessions scheduled for any absence. More than one missed session may result in either an incomplete (excused absences) or a failing grade (unexcused absence) for the course. The Office of Academic Affairs will be notified of any unexcused absences.

Plagiarism and academic honesty: You are expected to follow W&J's policies/guidelines concerning plagiarism and academic honesty. You are responsible for reading and understanding the information in the College Academic Honesty Policy found in the Academic Regulations wiki linked from Sakai. You will be required to sign an Academic Honesty Agreement; please see me if you have any questions or concerns.

Cases of 'plagiarism' are sometimes due to not knowing how to correctly cite, paraphrase, or describe someone else's work. If you are unsure how to correctly reference the work of others,

don't hesitate to ask! Whether intentional or unintentional, plagiarism and other acts of academic dishonesty will result in a failing grade for the assignment/exam or a failing grade for the course. Examples of how to cite and reference the intellectual property of others will be presented throughout the course.

Electronic devices: All cell phones, music players, and PDA's must be turned off during all course sessions. Ringing cell phones will result in a warning and then a 1% reduction in your course grade for each subsequent occurrence. Answering a call during an active class session will result in your being asked to leave and you will receive a '0' for any work missed during your absence. If you are expecting an important phone call related to a family emergency or job offer, please see me before the session begins for the day.

Complete, detach, and submit to Dr. Kilgore

Medical information (confidential)

Full name:

PH number:

Emergency contact names: _____

Emergency contact numbers: _____

Do you have any health conditions or other considerations that may affect your or others' abilities to actively learn in the classroom, laboratory, or outdoors? If yes, how are these conditions managed?

Revised schedule (24 June 2011): <subject to change with announcements in class, by email, or posted to Sakai>

Day		Date	Morning (8:00-11:30am)	Afternoon (1:00-3:00pm)
1	Mon	6 June	Introduction, History, Theory, LEM (SWA)	Introduction to AFS, plants, garlic mustard (GM) transects
2	Tue	7 June	AFS – GM project	Invasive plant characteristics (SWA)
3	Wed	8 June	AFS – GM project	Invaded system characteristics (SWA)
4	Thur	9 June	AFS – GM project	Effects of invasive plant species on community dynamics (SWA)
5	Fri	10 June	AFS – GM project	Sampling methods (SWA)
6	Mon	13 June	AFS – GM project	Invasive plant species in Pennsylvania (SWA)
7	Tue	14 June	AFS – GM project	Formulate questions and design research project (SWA)
8	Wed	15 June	EDDMapS project	Peer review and discussion of proposals (SWA)
9	Thur	16 June	AFS – research project	No class – complete proposal by 3pm to Sakai Dropbox
10	Fri	17 June	AFS – research project	Proposal discussion with Dr. Kilgore (SWA)
11	Mon	20 June	AFS – research project	Effects of invasive plant species on ecosystem processes (SWA)
12	Tue	21 June	AFS – research project	No class – lit review for research project
13	Wed	22 June	AFS – research project	Statistics meetings (311 D-P)
14	Thur	23 June	No class – lit review for research project	Invasive plant species management (SWA); email papers to group
15	Fri	24 June	Peer review day	Discuss 1 st drafts (SWA)
opt	Sat	25 June	<i>Pittsburgh Botanic Garden – Invasive plant removal</i>	
	Sun	26 June	Email benchmark papers to Dr. Kilgore by midnight	
16	Mon	27 June	Benchmark meetings (311 D-P)	
17	Tue	28 June	No class – research project paper	<i>Cardamine impatiens</i> (CARDIMPA) project discussion (SWA)
18	Wed	29 June	AFS – CARDIMPA	No class – research project paper
19	Thur	30 June	AFS – EDDMapS	No class – research project paper
20	Fri	1 July	No class – Final paper and data files due by 3pm to Sakai Dropbox (databook to Dr. Kilgore)	

(SWA) – Meet in Swanson 101; all other meetings begin in Dieter-Porter 311.