

Entomology 450 Lecture – Syllabus 2015

Course Number:	Entomology 450*
Course Name:	Basic and Applied Insect Ecology
Credits:	3
Format:	Lecture, Tuesdays and Thursdays, 11a – 12:15p
Location:	147 Russell Labs
Offering:	Every other fall semester
Instructor:	Dr. Claudio Gratton, cgratton@wisc.edu 3111 Wisconsin Energy Institute Office hours by appointment

***Companion course:** Entomology 451- Basic and Applied Insect Ecology
Laboratory/Discussion, 1 cr., Wednesdays 1:20 – 4:20p, 147
Russell; enrollment is required for Entomology graduate
students.

Course Description:

Basic and Applied Insect Ecology is an advanced course in population and community ecology, plant-insect interactions, insect biodiversity and biogeography, and applied ecology. The course will weave basic ecological theory and principles with their application to entomological problems such as conservation, biological control, agriculture, and insect-vectored diseases of plants and humans. We will use the current entomological and ecological scientific literature and draw on examples from a broad range of natural and managed ecosystems. As the semester progresses, the scope of the lectures and literature will broaden from individual insect responses to the environment and pair-wise species interactions (e.g., a predator and its prey) to the entire community of organisms and their physical environment. Lectures are designed to emphasize the theoretical principles and historical background underlying the various topics with a link to potential applications in agriculture, conservation, pest management, and/or invasion biology. This is an advanced course and graduate students will be evaluated on a slightly different scale and have additional assignments.

Student learning objectives:

Upon completion of the course, you will have demonstrated:

1. Comprehension of ecological concepts/principles at the physiological, population, community and ecosystem levels.
2. Understanding of the mechanisms mediating interactions of insects with their biotic and abiotic environments.
3. Proficiency in the application of ecological theory to the understanding of novel insect systems and their applied implications
4. Understanding of the importance of insects as selective, stabilizing and potentially destructive components of ecosystems.
5. Ability to view and understand applied entomological problems through the lens of basic ecological theory

6. Ability to understand and communicate the significance of specific research studies published in the primary literature

Required Textbook:

Price, P. W., R. F. Denno, M. D. Eubanks, D. L. Finke, and I. Kaplan. 2011. **Insect Ecology: Behavior, Populations and Communities**. Cambridge University Press. 829 pp. ISBN: 9780521542609

Additional readings to complement the lectures will be provided either online or from materials deposited on the Learn@UW web site. I will assume you know how to utilize electronic journal resources and academic databases such as ISI Web of Science. If not, we can have a quick tutorial outside of class. Required and optional readings for each week will be announced in advance on the class web site.

Course Web site:

We will be using the Learn@UW system to to post information regarding lectures, readings, discussions, etc. You need to login using your netID credentials. Weekly reading quizzes will be administered on Learn@UW.

Course Requirements and Grading:

Your final grade will be based on the following:

<u>Components</u>		<u>Total Pts</u>
Weekly reading quizzes	13 x 10	130
Two take-home exams	2 x 150	300
Literature summaries	3 or 4* x 20	60 or 80*
Term paper		200 or 300*
<u>Participation and Attendance</u>	<u>15 x 4</u>	<u>60</u>
Total		750 or 870*

* Graduate students will be required to do one additional write-up and the term paper will be of a different format and count more.

Weekly reading quizzes (~ 17%). This course will rely heavily on external readings for basic background information. There are several excellent textbooks will be used to put things into a broader context and will serve to give many examples of particular topics. We will use class time to dive into more detail in the materials, sacrificing breadth (which you will get in the readings) for depth (which will come from our discussions and lectures). In order to make the class sessions more valuable, it is important that you stay on top of the readings as best as possible. There will be

weekly quizzes on the general “Tuesday readings” prior to each week’s Tuesday lecture. The quizzes will be administered through the Learn@UW site and must be completed before midnight Monday night.

Examinations ($\approx 40\%$). There will be two take-home “midterm” examinations during the semester, 150 points each, covering materials from previous unit(s). These will primarily essay questions aimed at exploring your ability to synthesize and apply concepts you have learned over the prior modules. Missing a submission deadline will result in a 15 point deduction for each day it is late. Questions for the take-home exam will be posted by Friday 8 am the week prior to when they are due, and submission of your materials should occur no later than 11:59 pm Thursday of the next week (i.e., you have about 1 week to work on it).

Primary literature summaries ($\approx 8\%$). The course will rely heavily on the primary literature to help you understand how insect ecology is studied, how hypotheses are tested and how conclusions are drawn from experiments and natural patterns. The ability to read and interpret this literature is critical in developing your skills as a scientist and insect ecologist. At regular intervals during the semester, you will identify one paper from the scientific literature that you will summarize and interpret. A rubric will be provided to help guide your short summaries, which will be no longer than 500 words (appx. 2 pages). There will be three summaries due (4 for graduate students), each earn you up to 20 points. Late submissions (after midnight on the day they are due), will incur a 5 point penalty. Deadlines will be posted on the Learn@UW site and will occur by 11:59 pm on Thursday of that week. Submissions will be made via the Learn@UW site as well.

Undergraduate students - Term paper ($\approx 27\%$). You will write a concise review paper (about 5 pages) on a current topic in insect ecology. I will give you the choice of 3 topics, and you will rank them in order of preference - I will try to assign your highest priority – but no guarantees (all topics have to be evenly balanced across the class). The project will be divided into several components to keep you on task and to ensure a high quality product. First, you will prepare a high quality draft for internal peer review by two of your colleagues (who will not be assigned the same topic as you). As part of your obligations, you will prepare one review of the drafts from your classmates for each of the two topics not chosen. You will then have the opportunity to revise your paper based on the reviews from your colleagues. The final, revised paper will be submitted along with a cover letter describing the changes made (or not made) in response to the reviews. Each component of the project (initial draft, peer reviewing of colleagues’ papers, response to reviews and final

draft) will have points associated with it contributing to the total 200 points. More details on this project will be given later in the class.

Graduate Students – Grant proposal (34%). In short, you will be asked to put together a mini-grant proposal for an applied entomology panel at the USDA (or similar granting agency). There will be a proposal “pitch” in the form of a Letter of Intent (LOI) early in the semester to make sure you are on the right track and to get feedback. Then you will have to put together a grant proposal in the format typical of a normal USDA proposal. More information on the details of this will be outlined later in the course.

The final term papers for the graduate and undergraduate students will be due on the last day of class (Dec. 15) by 11:59 pm.

I expect everyone to be familiar with and abide by the University’s Policies on appropriate academic conduct and ethical behavior on assignments. Plagiarism will not be tolerated.

Attendance and Participation (≈ 8%)

Students are expected to attend all lectures. You may miss **one** class during the semester without penalty; thereafter, I will subtract 5 points per absence from your attendance grade if they are unexcused. Excused absences require communicating with me in advance (if possible) of missing class and explaining the circumstances of the absence. Valid excuses include medical absences, UW-approved religious observances (<http://www.secfac.wisc.edu/governance/ReligiousObservancesMemo.htm>). Other reasons will be considered after a meeting in person but are not guaranteed.

If you miss 5 or more lectures without an approved and valid justification, you will receive an **F grade** (fail) in the class. If you miss a class, you are responsible for the material covered or announcements made that day. Participation points reflect your engagement in class.

Students who may need special accommodations for lab/field activities, exams, etc. will need to speak with me by the end of the second week of class, Sept. 10, 2015, to make certain that these accommodations can be met. Requests made after this date may not be accommodated.

Grading

I will assign letter grades with the following straight scale based on the total points earned: Graduate students have different total points available and are graded on a stricter scale:

Graduate students (out of 870 points)

≥ 744	A $\geq 93\%$
743 – 712	AB $\geq 89\%$
711 – 656	B $\geq 82\%$
655 – 632	BC $\geq 79\%$
631 – 576	C $\geq 72\%$
575 – 496	D $\geq 62\%$
≤ 495	F $\leq 59\%$ of total points – are you kidding me?!

Undergraduate students (out of 750 points)

≥ 699	A $\geq 92\%$
698 – 676	AB $\geq 89\%$
675 – 623	B $\geq 82\%$
622 – 600	BC $\geq 79\%$
599 – 547	C $\geq 72\%$
546 – 471	D $\geq 62\%$
≤ 470	F $\leq 59\%$ of total points

Course Topics

The calendar of topics, lectures, midterms, etc. is attached, but can be changed at my discretion.

Basic and Applied Insect Ecology Lecture

Entomology 450, Fall 2015 – Gratton

Module	Week	Tuesday	Topic	Notes	Thursday	Topic	Notes	Assignments due
Auto-ecology	1	--		--	3-Sep	Intro to class - Insects Rule!		
	2	8-Sep	Climate-environment relationships		10-Sep	Global change and conservation	<i>Sean Schoville</i>	
	3	15-Sep	Nutritional Ecology / Stoichiometry		17-Sep	Behavioral Ecology		Reading summary 1
Popula-tions - I Plant-Insect	4	22-Sep	Plant defense theory	<i>Rick Lindroth</i>	24-Sep	HPR, GMOs	<i>Russ Groves</i>	
	5	29-Sep	Plant defense - Insect offense		1-Oct	Aquatic Insect Ecology	<i>Bobbi Peckarsky</i>	Midterm 1
	6	6-Oct	Specialists, Generalists, Coevolution		8-Oct	Weed biocontrol		Reading summary 2
Popula-tions - II Pred-Prey / Parasite-Host	7	13-Oct	Population dynamics, Predator-prey		15-Oct	Biological Control		
	8	20-Oct	Parasite-host interactions		22-Oct	Biological Control	<i>Tania Kim</i>	
	9	27-Oct	Mosquitoes emergent diseases	<i>Susan Paskewitz</i>	29-Oct	Forest pest outbreaks and Global Change	<i>Ken Raffa</i>	Reading summary 3
Commu-nity Interac-tions	10	3-Nov	Coexistence/ niche theory		5-Nov	Invasive species		

Module	Week	Tuesday	Topic	Notes	Thursday	Topic	Notes	Assignments due
	11	10-Nov	Pollination	<i>Christelle Guedot</i>	12-Nov	Mutualisms		Midterm 2
	12	17-Nov	No Class	ESA meetings	19-Nov	Food webs / multispecies interactions		Assign Final paper
	13	24-Nov	Non-trophic interactions		26-Nov	No Class	Thanks-giving	Reading summary 4 (grads only)
Ecosys-tems	14	1-Dec	Landscape Ecology		3-Dec	Agroecosystems IPM	<i>Dave Hogg</i>	
	15	8-Dec	Diversity and Ecosystem functioning		10-Dec	Metacommunity and conservation	<i>John Orrock</i>	
	16	15-Dec	Ecosystem services		--		--	Term paper due