Syllabus

Insect Ecology Syllabus, Spring 2017, pp. 1-3

An explanation of the philosophy and requirements of a 3 credit course in insect ecology (*ENT 470/670*)

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Abstract. In this course you will learn about the fundamental concepts of ecology as they relate to insects. We will emphasize how these ecological principles help inform other aspects of applied and basic research with insects. To do this we will use the current entomological and ecological literature and we will draw on examples from a broad range of natural and managed systems.

Key words: communities, ecology, entomology, graduate instruction, insect ecology, organisms, populations, undergraduate instruction.

INTRODUCTION

Humans affect their environment while also being an important part of it (Cain et al. 2014). If we are to effectively manage and support this global environment, we must study and understand "ecology, the scientific study of how organisms affect-and are affected by-other organisms and their environment" (Cain et al. 2014).

Insects have a number of features that make them remarkable, including how they react to the environment and other organisms (Price et al. 2011). Moreover, there are important relationships between insects, the roles they play with the natural environment, and human use of that environment (Price et al. 2011). Therefore studying the ecology of insects plays a fundamental role in understanding the basic structure of natural systems while helping to solve practical problems posed by insects (Price et al. 2011).

In studying insect ecology in this course, we will have the following course objectives. 1) You will be able to identify and fundamental concepts and ideas in insect ecology. 2) You will be able to apply those ideas to basic and applied research. 3) You will be able to connect those ideas to the research that helps generate and test them. In addition, we will address the larger goals of: locating and critically evaluating information from the peer-reviewed insect ecology literature; improving your ability to effectively communicate information.

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MATERIALS AND METHODS

Method of instruction

To learn about insect ecology and meet the stated course objectives, the class will meet from 0930-1045 Tuesdays and Thursdays in 272 Hultz Hall. Additional office hours are available from 1045-1200 Tuesdays and Thursdays and by appointment.

The class will follow the format of a "flipped classroom". This means there will be little to no classic lecturing during class. Content delivery will be primarily through independent readings (textbook and journal articles) outside the classroom. In the classroom there will be a good deal of structured discussions and activities all designed to enhance understanding and the application of knowledge. Before most classes there will be either a short quiz or a "pre-class assignment" related to that day's reading. These will help check understanding and prepare for discussion.

The proposed class schedule is available in Box 1 and assessment is decided by the following factors and combined in the results to assign grades.

Absences from class

You can miss three classes without losing points from your participation grade (see Grading). If you do miss class, you are still responsible for turning in any homework due that day (e.g. pre-class assignments). Any absences in excess of this must be discussed and agreed upon with the instructor.

Homework

There will be several types of homework that will tie in to other aspects of the class.
Article summary assignment – to practice critical reading and evaluation skills of scientific literature.
Pre-class assignments & quizzes – to focus or check out of class readings and prepare for discussions.
Reflections – to help summarize learning from activities and make connection to class ideas and materials.

Exams

Instead of standard exams, we will be using take-home essays. Each essay will emphasize your understanding of the material read discussed in the most recent unit while applying those ideas to research questions. There will be 5 essay exams, one for each of the 5 units we cover. You must take and complete 4 of the 5 exams. If you take all five exams I will throw out the lowest score you received (thus it can only benefit your final grade to take all exams).

Graduate student grant writing exercise

Graduate students will write an additional paper in the format of a research grant. The purpose is to give practice in writing papers (grants) while developing researchable ideas in insect ecology. Each student will think of a researchable idea and justify their choice. These justifications must include how the idea addresses a fundamental question in insect ecology (theory) and its application. Students will proposed topics and need my approval of their topic before they can proceed.

Graduate students will also be expected to lead additional discussions during the semester.

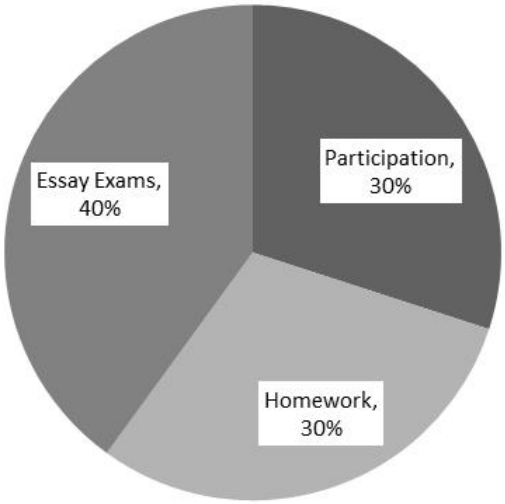
Late work

Any assignment turned in after the due date/time will be marked down 10%. For every week the assignment is late, another 10% will be marked off. All assignments must be turned in by the time/date of the final of they will receive no points.

RESULTS

The relative weight of class participation, homework, essay exams, and the grant project (for graduate students) is given for undergraduates (Fig. 1A) and graduate students (Fig. 1B). Final grades are given based on achieving the following proportion of points overall: A ≥ 90%; B = 80% - 89.9%; C = 70% - 79.9%; D = 60% - 69.9%; F < 60%.

1A. Undergraduate students



1B. Graduate students

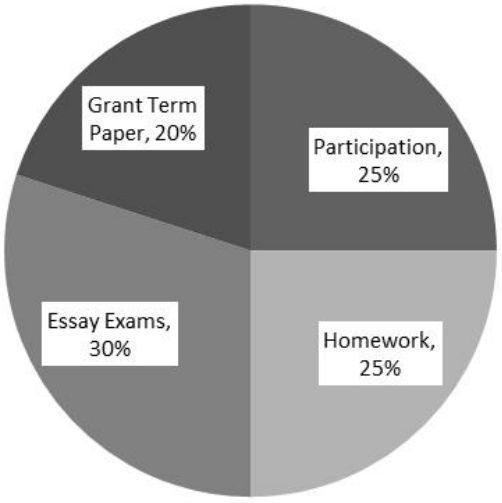


Fig. 1. Relative contribution of data sets in determining the final grades for A) undergraduate students and B) graduate students.

Box 1. **Class schedule:** Below is a tentative list of the topics that we are going to cover this semester. I reserve the right to modify this list as best serves the needs of the class.

Introduction
1/10 Syllabus and introduction
1/12 Scientific process and peer-reviewed articles

UNIT ONE: Insects as Organisms

1/17 & 1/19 Individual response to abiotic conditions
1/24 & 1/26 Behavioral ecology
1/31 & 2/2 **No class**
2/7 & 2/9 Acquiring resources

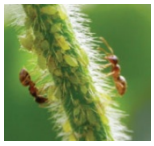
UNIT TWO: Insect Populations

2/14 & 2/16 Using resources
2/21 & 2/23 Population structure
2/28 & 3/2 Population dynamics

UNIT THREE: Trophic Interactions

3/7 & 3/9 Herbivory
3/14 & 3/16 **No class – Spring break**
3/21 & 3/23 Predation
3/28 & 3/30 Parasites and parasitoids

UNIT FOUR: More Species Interactions



4/3 & 4/6 Competition and lateral interactions
4/11 & 4/13 Mutualisms
4/18 & 4/20 Multispecies interactions

UNIT FIVE: Insects in Communities and Ecosystems
4/25 & 4/27 Community structure & dynamics
5/2 & 5/4 Species diversity

DISCUSSION

*Academic Honesty***:** All students taking any course in the College of Agriculture, Food Systems, and Natural Resources are under the Honor System (http://www.ag.ndsu.edu/academics/honor-system-1). The Honor System is a system that is governed by the students and operates on the premise that most students are honest and work best when their honesty, and the honesty of others, is not in question. It functions to prevent cheating as well as penalize those who are dishonest. It is the responsibility of the students to report any violations of the honor pledge to the instructor, honor commission or the Dean of the College of Agriculture, Food Systems, and Natural Resources.

The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.

Students with special requirements: Any students with disabilities or other special needs, who need special accommodations in this course are invited to share these concerns or requests with the instructor as soon as possible. The instructor may ask for verification and that, plus other assistance, can be requested from Disability Services in Wallman Wellness Center 170 (231-8463). http://www.ndsu.edu/disabilityservices/.

Veterans and military personnel: Veterans or military personnel with special circumstances or who are activated are encouraged to notify the instructor as early as possible.

Plagiarism. Plagiarism is a very serious issue in the classroom and scientific research. To put it bluntly, scientists throw away careers by plagiarizing. It is ultimately your responsibility to understand what plagiarism is and to avoid it. However, *if you are ever confused or unsure about whether something constitutes plagiarism **ASK!***

If I believe plagiarism has occurred on an assignment you will have a chance to meet about it, but if I believe the plagiarism was deliberate or extensive you will receive no points for the assignment and a Student Academic Misconduct Tracking Form will be filed as per NDSU policy 335. Excessive instances of plagiarism and/or multiple offenses will receive additional harsher punishments up to and including moving to have the student expelled.

Important dates

January 16	Martin Luther King Jr. Holiday (no class, offices closed)
January 19	Last day to add classes via Campus Connection
January 19	Last day for no-record drop of classes @ 100% refund
January 19	Last day to withdraw to 0 credits @ 100% refund
January 24	Financial Aid applied to Student Accounts
January 30	Last day to submit request to audit, pass/fail
February 3	Undergraduate Spring graduation application due
February 10	Graduate Student Spring Intent to Graduate forms due

February 20	Presidents' Day Holiday (no classes, offices closed)
March 3	Grades of Incomplete convert to F
March 13-17	Spring Break (no classes)
March 20	Advising begins for Summer/Fall semesters
March 24	Last day to withdraw to 0 credits
March 27	Summer/Fall registration begins
April 7	Last day to drop classes with record (W)
April 7	Last day to withdraw to 0 credits
April 14	Holiday (no classes, offices closed)
April 17	Holiday (no classes)
April 18	Spring commencement participation deadline
May 1-5	Dead Week
May 8-12	Final Examinations
May 13	Commencement
May 18	Spring grade access begins online

Acknowledgments

I thank JA White, I Kaplan and others for advice. More importantly, I thank you, the student for taking this course, giving your best effort, and helping you and your fellow students get as much as possible out of this experience.

Literature Cited

Cain, M. L., W. D. Bowman, and S. D. Hacker. 2014. Ecology, Third Edition. Sinaur Associates, Incorporated, Sunderland, MA. ISBN-13: 978-0-87893-908-4.
Companion website: http://www.sinauer.com/ecology/

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, Cambridge. ISBN: 978-0-521-54260-9.