



Syllabus – *Insect Ecology*

University of Maryland - College Park

ENTM 612
Spring 2021

Course Overview and Organization

INSECT ECOLOGY is 3-credit, advanced course in population and community ecology, plant-insect interactions, insect biodiversity and biogeography, and applied ecological entomology, with shared emphases on both classical and current advances in ecological & entomological science. Current trends in ecological entomology research will be framed in terms of classical, quantitative, and conceptual theory. We will survey: individual insect adaptations and life history strategies in response to abiotic and biotic drivers; geographic distribution and population dynamics of species; interactions among species, food web dynamics, and emergent structure of diverse communities; and reciprocal interactions with ecosystems. Applications include lessons for/from pest management, biological control, vector control, and biodiversity management in agroecosystems, forestry, urban systems, and other managed systems.

The course will meet synchronously with 75-minute, twice weekly 'lecture' sessions, six (6) of which will be devoted to student-led discussions of the primary literature. The synchronous framework does not require you to be in a specific location to participate; however, you must have access to WiFi and a full-screen computer or tablet for each live session. The online nature of this class will push you to take an active role in the learning process. You will do this by engaging and collaborating with other students and the instructor on a regular basis both, in live sessions, as well as through group work and your writing. Please bear with me as I test new approaches for online pandemic teaching and learning. I will frequently seek your feedback on what is working or not. We are fortunate this year: the Brood X 17-year periodical cicadas will have their 2021 event in our region.

Learning Outcomes

After completing this course, students should be able to:

1. Recognize and provide examples of the important role of natural history within the discipline of insect ecology;
2. Communicate the role insects and kin have played in the historical development and testing of ecological theories;
3. Analyze the quantitative dimensions of insect ecology;
4. Critically assess and objectively critique the primary scientific literature on insect ecology;
5. Integrate basic ecological concepts relating to insects and their relatives with their applications for management and pest control.

Dr. Daniel Gruner (he/him)
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Synchronous Class

Tuesday & Thursday
12:30 p.m. – 1:45 p.m.
Virtually via Zoom

Website

<https://elms.umd.edu/>

Zoom Office Hours

Wed 11-12, Thur 2-3
Or by appointment

Optional Text

Price et al. 2011. *Insect Ecology: Behavior, Populations and Communities*. Cambridge University Press

Prerequisites

- No requirements
- Recommended: undergraduate level ecology, entomology, calculus, statistics

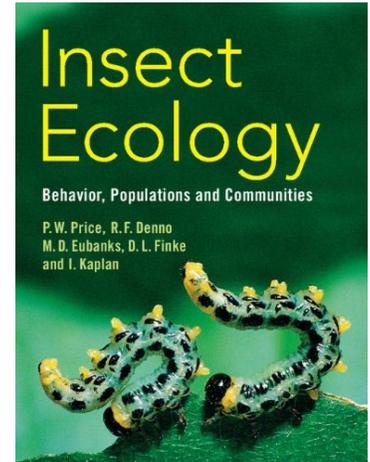
Communication

- ELMS email system
- Zoom office hours
- by appointment

Resources

Course materials, Zoom links, access to media, quizzes, and discussions will be provided on ELMS-Canvas, accessible via elms.umd.edu (<https://umd.instructure.com/courses/1299392>).

The optional text will be useful to you, as the course structure is modeled upon it, with chapter readings indicated in the Course Schedule below: **Price et al. 2011. Insect Ecology: Behavior, Populations and Communities** (Cambridge University Press, ISBN 978-0521542609). Used or rental copies are widely available. Reading lists will be provided for each unit with supplemental readings from the primary literature available on [Endnote Web](#). Any required readings will be posted on ELMS-Canvas well in advance: please have literature readings completed by the indicated dates and prior to the relevant discussion sections.



Remote Classroom Tech

Zoom: We will use Zoom to connect for each synchronous meeting. Prior to class, you need to authenticate by logging into <https://umd.zoom.us/> (or with your Zoom account at your own university) or by clicking on the Zoom session through the course ELMS page. By authenticating you can join the session without the need to admit you manually. We will start class promptly. Zoom tips:

- Many of us probably will be Zooming from home, which means that there will be interruptions from housemates, kids, parents, pets, leaf blowers, etc. Let's just do our best to avoid getting distracted or distracting others.
- Please keep your video on as much as possible - it really helps me feel more like we are in a classroom and that you exist. It helps me get a sense for how well we are communicating, and it helps others get to know you as well. I understand you may need to turn off your video on occasion, but if this is a problem for you please contact me so that we can find a solution.
- You are welcome to use virtual backgrounds, but please avoid anything too distracting.
- Mute and unmute yourself as necessary. If you are not speaking, please stay muted.
- Please get familiar with the "Participants" window, especially with the "non-verbal feedback" functions. You can raise your hand, signal responses to questions (yes/no, faster/slower, like/dislike) and more.
- Also, please get familiar with the "Chat" window. You can use it to message me or the whole group.
- You should feel free to take a quick break or get a snack when you need to; we will also have regular breaks.
- If I am disconnected, I will attempt to reconnect and resume class. If I am not able to reconnect, please check Canvas for information. If you are disconnected and unable to reconnect, please contact me by email with your situation.

Turning Point ('clickers'): We cannot use physical clicking devices, of course. However, I plan to use Turning Point software to engage with live polling remotely (see more under 'Lectures' below). You will need to register using your UMD email address. Registration is free of charge. In class each day, you can participate either through the Turning Point app (apple or android) on a phone or tablet, or access via the web: tppoll.com. Join the following session ID to join each day: **'entm612'**

Panopto: Zoom sessions can be recorded only if all students consent, and breakout rooms cannot be recorded. An alternative is to record powerpoint presentations with Panopto capture. Whether the Zoom session or just the slides are captured, you will find these at 'Panopto Recordings' on the ELMS site. I will provide outlines and supplemental materials in advance of each lecture, which I encourage you to use for your note-taking, however I will not provide the raw powerpoint files. I encourage you to actively take notes in your own words on the main ideas we cover in class; you can review, rewrite or add to your notes by reviewing Panopto sessions later.

Course Components

I. Exams: There will be two [2], primarily essay-based, open notes/book exams (100 pts each). The midterm will cover units 1 & 2, and the final exam will cover units 3 & 4 (see schedule below). The final exam will not be explicitly cumulative, although knowledge of foundational topics is expected. Exams will be available prior to the due date, which cannot be re-scheduled without advance consent for campus-approved absences (i.e., religious observances, mandatory military obligation; illness of the student or illness of an immediate family member; participation in university activities at the request of university authorities; or other compelling circumstances beyond the student's control). Exams will integrate content and ideas from lecture, assigned readings, and discussion papers. For lectures, PDF handouts, outlines, presentation summaries, and supplementary resources will be posted on the class ELMS site ("Canvas") no later than the evening prior to lecture, and the Panopto capture of Zoom sessions will be rendered and posted same day.

II. Review Paper: Students will prepare a concise review paper on a current topic in insect ecology (150 pts total). Students will choose a topic and prepare a high-quality draft for internal peer review by two of their colleagues. Each student will prepare two anonymous reviews, and each student will then revise their own paper according to reviews received. The final, revised paper will be submitted along with a cover letter describing the changes made (or not made) in response to the reviews. Late drafts or peer reviews will impact your peers, and thus all assignments will be penalized 5% of point total for each business day they are late.

Limit your final paper to **about 3000 words** [5-6 pages, 12 point font, 1-inch margins, single-line spacing]. References and optional figures or tables are not counted in the rough wordcount limit. First drafts should be double-spaced, line-numbered, and may exceed this word limit (>10-12 pages). Use primary literature and in-text citations to support your arguments, formatted consistently according to the bibliographic style of any relevant entomological or ecological journal. The paper must use at least twelve [12] citations to primary peer-reviewed published literature, at least six [6] of which should be dated 2015 or later (more citations welcome). Papers will be assessed for their incorporation of reviewer comments, their clarity, strength of the argument and narrative, scientific content, use of key concepts covered in class, and use of relevant literature. Peer reviews will be assessed for their critical insight according to a rubric that will accompany the assignment. Try to leverage this assignment as advance work on your thesis, for example the introduction or a chapter devoted to synthesis. Although it is not required, you are invited to include data collection and analysis if you so choose – please let me know so that I can facilitate or help.

III. Discussion: There will be six (6) student-led discussion sessions in which we will synthesize historical and current primary literature (50 points total). Participation is essential. For each session, up to five [5*6 = 30] points will be awarded for attendance and participation. I will not nickel & dime your participation, judge the "quality" of your questions, or score you higher for more frequent or higher volume input. For full credit, I simply expect you to prepare, engage, and interact. Two to three students will lead and stimulate each discussion – all students will participate in leading one discussion and can earn up to twenty [20] points for

their preparation, summary, and questions for discussion. Discussion leaders will work with Dr. Gruner to select topical papers of broad significance, typically using one or more seminal classic along with more recent advance(s). At least five days prior to discussion, leaders will prepare a capsule summary and discussion questions to be posted on the Discussion Forum on the course space on [ELMS-Canvas](#). These summaries should be phrased in your own words, and they should include penetrating comments and questions to motivate the discussion. **Attendance for discussions is required, and no late discussion summaries will be accepted** without advance approval for excused absences.

Grades and Grading

Your final plus/minus letter grade will be based on the accumulation of numeric scores based upon this breakdown.

Midterm Exam	100
Final Exam	100
Term Paper (Literature Review)	150
o First Draft (10)	
o Peer Review (15 x 2 = 30)	
o Cover Letter: Response to Reviews (10)	
o Final Draft (100)	
Literature Discussions	50
o Participation (6 x 5 = 30)	
o Leadership (20)	

TOTAL = 400 points

There will be no curve on final grades, although for numerically borderline cases I will round up to the nearest whole number. No curve also implies that I expect primarily A's and B's for graduate-level work. We will use the following [grading percentile scale](#):

A+	100-98%	B+	89-87%	C+	79-77%	D+	69-67%		
A	97-93%	B	86-83%	C	76-73%	D	66-63%	F	<60%
A-	92-90%	B-	82-80%	C-	72-70%	D-	62-60%		

Campus Policies

Please visit the [Graduate School's list of campus-wide academic policies](#) and follow up if you have questions. It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include the following topics:

- Academic integrity
- Attendance and excused absences
- Accessibility and accommodations
- Grades and appeals
- Student and instructor conduct
- Copyright and intellectual property

Course-Specific Policies

Academic Integrity. At all times, students must adhere to the **UMD Code of Academic Integrity** and the student-generated **Honor Pledge**. We begin in a state of mutual respect and trust, but do follow University policy regarding academic dishonesty, which includes plagiarism, cheating, fabrication, and facilitating academic dishonesty. A significant percentage of plagiarism cases are unintentional, therefore it is the responsibility of students to understand plagiarism and take steps to avoid it. Passages will be selected from term papers and discussion questions throughout the term and run through plagiarism detection software, and you are invited to do this before submission of your work. Violations of the academic integrity policy can result in a failing grade for the class with an indication of academic dishonesty noted on the transcript. **Academic dishonesty will not be tolerated.**

Remote/Online Participation. I expect your regular attendance in our synchronous class time. Please alert me in advance if you must be excused from class on a given day - an excused absence is an absence for which the student has the right to receive - and the instructor has the responsibility to provide - academic accommodation. While I understand circumstances may arise when you will need to turn off your video, generally I expect you to keep your video on while in our zoom session. Seeing each other's faces is helpful for building a learning community and to get to know your classmates. If you are not speaking, mute yourself to limit distracting noises. Please refrain from multi-tasking for unrelated activities.

Names/Pronouns and Self Identifications. The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering inclusive and equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.) in your ELMS profile and/or your Zoom profile. The pronouns someone indicates are not necessarily indicative of their gender identity. Visit trans.umd.edu to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do our best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

Communication with Instructor. Email: If you need to reach out to me, please email using the ELMS-Canvas inbox (preferred) or by standard email, while identifying yourself and the course in which you are enrolled. Please do not email questions that are easily found in the syllabus or on ELMS-Canvas (i.e. When is this assignment due? How much is it worth? etc.) but please DO reach out about personal, academic, and intellectual concerns/questions. I will do my best to respond to emails within 24 hours during the week (Monday-Friday).

I will send important announcements via ELMS-Canvas messaging. Please enable your email & announcement notifications (including changes in assignments and/or due dates) in ELMS-Canvas so you do not miss any messages. You are responsible for checking your email and ELMS-Canvas inbox with regular frequency.

Communication with peers. With a diversity of perspectives and experience, we may disagree with one another. As such, it is important that we conduct ourselves in a professional manner and that we work together to foster and preserve a virtual classroom environment in which we can respectfully discuss controversial

questions. I will make every attempt to create an atmosphere in which each student feels comfortable voicing their argument without fear of being personally attacked, mocked, demeaned, or devalued.

Any behavior (including harassment, sexual harassment, and racially and/or culturally derogatory language) that endangers this atmosphere will not be tolerated. Please alert me immediately if you feel threatened, dismissed, or silenced at any point during our semester together and/or if your engagement in discussion has been in some way hindered by the learning environment.

Resources & Accommodations

Accessibility and Disability Services. The University of Maryland is committed to creating and maintaining a welcoming and inclusive educational, working, and living environment for people of all abilities. The University of Maryland is also committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to discrimination. The **Accessibility & Disability Service (ADS)** provides reasonable accommodations to qualified individuals to provide equal access to services, programs and activities. ADS cannot assist retroactively, so it is generally best to request accommodations several weeks before the semester begins or as soon as a disability becomes known. Any student who needs accommodations should contact me as soon as possible so that I have sufficient time to make arrangements.

For assistance in obtaining an accommodation, contact Accessibility and Disability Service at 301-314-7682, or email them at **adsfrontdesk@umd.edu**. Information about **sharing your accommodations with instructors, note taking assistance** and more is available from the **Counseling Center**.

Student Resources and Services. Taking personal responsibility for your own learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come talk to me so that I can help you find the right approach to success in this course, and I encourage you to visit **UMD's Student Academic Support Services website** to learn more about the wide range of campus resources available to you.

In particular, everyone can use some help sharpen their communication skills (and improving their grade) by visiting **UMD's Writing Center** and schedule an appointment with the campus Writing Center.

You should also know there are a wide range of resources to support you with whatever you might need (**UMD's Student Resources and Services website** may help). If it would be helpful to have someone to talk to, visit **UMD's Counseling Center** or **one of the many other mental health resources on campus**.

Basic Needs Security. If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live, please visit **UMD's Division of Student Affairs website** for information about resources the campus offers you and let me know if I can help in any way.

Netiquette Policy. Netiquette is the social code of online classes. Students share a responsibility for the course's learning environment. Creating a cohesive online learning community requires learners to support and assist each other. To craft an open and interactive online learning environment, communication has to be conducted in a professional and courteous manner at all times, guided by common sense, collegiality and basic rules of etiquette.

Tips for Success in an Online Course

1. **Participate.** Discussions and group work are a critical part of the course. You can learn a great deal by discussing ideas, articulating your thoughts, and developing critical thinking skills.
2. **Manage your time.** Make time for your online learning and participation in discussions each week. Give yourself plenty of time to complete assignments including extra time to handle any technology related problems.
3. **Login regularly.** Log in to ELMS-Canvas several times a week to view announcements, discussion posts, and replies. You may need to log in multiple times a day when group submissions are due.
4. **Do not fall behind.** This class moves at a quick pace and each week builds on the previous. It will be hard to keep up with the course content if you fall behind in the pre-work or post-work.
5. **Use ELMS-Canvas notification settings.** ELMS-Canvas can ensure you receive timely notifications in your email or via text. Be sure to enable announcements to be sent instantly or daily.
6. **Ask for help if needed.** If you need help with ELMS-Canvas or other technology, IT Support. If you are struggling with a course concept, or anything else impinging on your abilities to learn the material, reach out to me, and your classmates, for support.

Course Evaluation. Please submit a course evaluation through CourseEvalUM in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to CourseEvalUM is confidential. Campus will notify you when CourseEvalUM is open for you to complete your evaluations for fall semester courses. Please go directly to the [Course Eval UM website](#) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing through [Testudo](#), the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

Copyright Notice. Course materials are copyrighted and may not be reproduced for anything other than personal use without written permission.

Note: The mental health and well-being of our colleagues is our collective responsibility. I pledge to be flexible and empathetic with each of you as we work together to learn the fascinating topic of Insect Ecology. I ask for your patience, and your constructive feedback, as we adapt to the online-only format of the course this semester.

Course Schedule (“Chapters” refers to optional text, Price et al. 2011)

Lect#	Date	Topic	Chapters
1	26-Jan	Introduction: Ecological Importance of Insects & Kin	1
UNIT 1: Plant—Herbivore Interactions			
2	28-Jan	Plants as Heterogeneous Resources for Herbivores	4.1-4.2
3	2-Feb	Pattern and Theory of Plant Defense	4.3-4.4
4	4-Feb	Herbivore Adaptations, Behavior and Distributions	4.5
	9-Feb	Discussion #1	
5	11-Feb	Herbivore Diet Breadth Evolution & Co-Evolution	4.6, 8.8
UNIT 2: Predator—Prey Interactions			
6	16-Feb	Predator Behavior and Insect Defense	2.7, 7.1-7.2, 7.7-7.8, 8.11
7	18-Feb	Multitrophic Interactions: Plant Mediation of Predation	4.6, 7.7, 13.2
	23-Feb	Discussion #2	
8	25-Feb	Predation: Functional & Numerical Responses	7.3-7.4
9	2-Mar	Population Growth & Dynamics	7.5, 9.1-9.2
10	4-Mar	Predator-Prey Population Regulation ** Term Paper Assigned	11.1-11.5
11	9-Mar	Stability, Persistence of Predator-Prey Interactions & Biological Control	7.6, 7.appl
	11-Mar	MIDTERM EXAMINATION DUE (no class)	
	16-Mar	Spring Break	
	18-Mar	Spring Break	
UNIT 3: Evolution of Life Histories & Insect Societies			
	23-Mar	Discussion #3	
12	25-Mar	Life History Evolutionary Theory	10
13	30-Mar	Mating Systems, Parental Investment & Sexual Selection	2.8
14	1-Apr	Structure and Evolution of Insect Societies	3
	6-Apr	Discussion #4 ** First Draft Term Paper Due	
UNIT 4: Communities, Ecosystems, and Macroecology			
15	8-Apr	Competition, Coexistence, Resource Partitioning & the Niche	5, 12.2
16	13-Apr	Positive Interactions: Mutualisms & Pollination	6
17	15-Apr	Parasites, Pathogens & Insects as Vectors ** Term Paper Peer Reviews Due	8
18	20-Apr	Food Webs and Trophic Cascades	12.4, 12.7, 13.3
	22-Apr	Discussion #5	
19	27-Apr	Insect Community Structure & Development	12
20	29-Apr	Biogeography & Macro Patterns of Diversity ** Final Term Paper Due	14
21	4-May	Insect Diversity, Nutrient Cycling & Ecosystem Function	7.6, 15.3
22	6-May	Invasive Species, Conservation & Global Change	15
	11-May	Discussion #6	
	16-May	FINAL EXAMINATION DUE	