

Insect Ecology: ENVS 131, Summer 2018 Syllabus & Information

Course Number and Title:

ENVS 131 – Insect Ecology

Class time and location:

Tuesday/Thursday 9:00-12:30 PM, ISB 221

Instructor:

Monika Egerer, PhD Candidate, Environmental Studies Department

Office: NS2 417, *E-mail:* megerer@ucsc.edu

Office hours: Tuesdays 12:45-2:45 in NS2 417

Required Textbook:

Insect Ecology: Behavior, Populations, and Communities by P.W. Price, R.F. Denno, M.D. Eubanks, D.L. Finke and I. Kaplan

Please let me know if you have any issues obtaining this book.

Course description and objectives:

This course is an advanced course in insect ecology for undergraduate students in Environmental Studies and in related disciplines. In the course we will cover major concepts in ecology as they apply to insects, how ecologists study these components of insect ecology, and how this information can be applied to conservation, agriculture, and public health. We will examine many of the important ecological interactions that center around insects within ecosystems at local to global scales. The course structure will follow biological organization from the individual, to populations, to communities to food webs. The diversity of insects is far too great to cover in five weeks; thus the course will focus on terrestrial insects and the main broad ideas that contribute to insect ecology. The course will include varied activities including lectures, discussions, in-class activities, field trips, and independent study.

The three main learning objectives for this course are:

- 1) Gain an understanding of ecological principles as they pertain to insects
- 2) Gain an appreciation and knowledge of the natural history of insects
- 3) Gain an understanding of scientific inquiry associated with insect ecology

Lectures:

Course lectures will consist of a combination of: 1) oral lectures with PowerPoint slides, 2) small group discussions and activities, 3) guest lectures, and 4) laboratory and field activities. I will do my best to post the lecture slides to canvas resource folders by 8 PM the day before class so that students can bring a copy to class if they choose to do so. Much of the material discussed in class will not be included as text or notes on the slides, and class discussions and activities will contribute a substantial amount to learning objectives. Further, because this is a 5-week course, missing a class means missing a large portion of lectured material (10%!!), as well as discussion and activity material that will be on quizzes and exams. Thus printing and reviewing slides is not a substitute for attending class. It is highly recommended that students take detailed notes in class on lecture materials, and on class discussions/activities in addition to studying the text and lecture presentations.

Course Evaluation / Grading:

There are varied ways for you to earn your grade in this class. Your grade will be based on one exam, one midterm test, four short quizzes, class participation, journaling, and an insect-based research project. The

breakdown by percentage (and points) is listed below. Your overall grade will be calculated on a straight scale (A+, 100–97%; A, 96–93%; A-, 92–90%; B+, 89–87%; B, 86–83%; B-, 82–80%; etc.) based on your earned points total. There will be one extra credit opportunity (see below).

Item	% of grade	Points
Quizzes (4 in class quizzes)	20	100
Midterm test	10	50
Final Exam	20	100
Insect Ecological Journaling (8 entries)	10	50
Insect Ecology Research Projects	20	100
Class Participation - (<i>Including Insect of the Day</i>)	20	100
Total	100	500

Course readings: Readings selected for the lecture are paired to the lecture material. Students should complete the readings before they come to lecture. I also strongly recommend that you revisit the readings after lectures to revisit material you may not have completely understood. Other readings are posted on Canvas in the “Course Readings” folder under Files.

Exams: There will be a short Midterm test and a Final Exam that include multiple choice, short answer, and essay questions on course topics. The Midterm test will be 25 questions (thus longer than a quiz) and will be allotted 50 minutes to complete in class. The Final Exam is cumulative, will consist of 40 questions (mixed multiple choice, short answer, essay), and be allotted the entire last course period to complete.

Quizzes: To guide your study and to gauge lecture comprehension, there will be four short in-class quizzes. The quizzes will be closed book/notes, and students will have 20 minutes to answer 5-10 questions (e.g. multiple choice, matching, or true/false) per quiz. The quizzes will cover all class material (lectures, readings, activities, guest speakers) since the previous quiz (e.g. lectures given on the same day as the quiz are not included). Your lowest quiz score will be dropped, so in other words, 3 of the 4 quizzes count towards your grade. There will be no make-up quizzes (i.e. if you miss one, that score will be your dropped score).

Insect Ecological Journaling: Inquiry, observation, and reflection are fundamental to learning and are very necessary in ecology. Over the duration of the class, students will keep a journal to document their ecological questions, observations and thoughts related to insect ecology. Students should compose **two entries per week**, each ~300 words, to submit to me every Friday. Students can derive their reflections from experiences within the course, including guest lectures and activities, or from experiences outside of the course, including observations on a hike, critical thoughts on a news/journal article, even ideas for future research experiments! I strongly encourage you to engage with outside course material to show how you are thinking about and applying key concepts outside of class. **All journal entries must directly relate to insect ecology to receive credit.** Journal entries will be due before 11:59 PM every Friday. You may type up or take a photo of a written journal entry to submit to canvas. **The first is due on Friday, August 10.**

Insect Ecology Research Projects: Students will work on investigating a topic of their choice, in pairs or individually. Please see pages 5-6 of syllabus.

Class Participation: Each student in the class should attend class regularly and be an active participant. Actively participating should include asking questions in class, or on field trips, participating in in-class discussions, filling in worksheets during field trips, etc. If you are uncomfortable speaking in class, please try. But there will be other participation opportunities, including in-class paired discussions, to support you in achieving this class requirement. You may also give me written questions at the start or end of class and I will address those questions during that class or another class period. Your points will be assigned based on days

attended (40 pts, 4 pts per class attended, 1 pt per class if arrive late), level and quality of participation (30 pts), as well as your “*Insect of the day*” presentation (30 pts).

Insect of the Day: During most class periods, we will take ~10 minutes at the start of class for two to three students to present their “insect of the day”. **Students will sign up for their insect of the day at the end of the first lecture.** Each presentation should last a *maximum* of 5 minutes (please practice your presentation before class. You will lose points if your presentation is too long). PowerPoint, videos, and worksheets are allowed, but not required. If you plan to use a Google Presentation, PowerPoint or a video, please email the file or link to Monika the night before class, and **arrive to class by at least 8:50 AM** to set up your presentation. If you use class time to set up your presentation, you will lose points. Each presentation should include:

- (a) Introduction to your insect including order, family, scientific and common names
- (b) Information about the geographic range / distribution if known
- (c) Description of the life cycle of the organism
- (d) Information about the diet or feeding mode of the insect
- (e) One interesting piece of information about the ecology of the insect
- (f) Explanation of why you chose this insect

Extra credit option: You can receive 10 points extra credit for ONE *quality* original artwork, poem, music, cuisine, or other artistic endeavor that is related to insect ecology. In order to receive the 10 points, you must: 1) present this to the class on August 28 during class (see syllabus), and 2) give a brief explanation of your item, how it relates to what we’ve learned in class, and why you were inspired to do it. This will be the ***only*** opportunity to earn extra credit in this class.

COURSE POLICIES:

Deadline and Absence Policy:

The dates of the exams and due dates for all assignments are firm. All assignments submitted late will be subjected to a 10% deduction in grade for each calendar day late (including weekends). If extenuating circumstances occur, contact me >48 hours before the due date. In general, the only acceptable reasons for missing a deadline for an assignment or exam are illness and family emergencies.

Please note that the deadline to drop the class is Monday, August 6 and deadline to withdraw from the course is Friday, August 17. Neither Summer Session nor instructors drop students for non-attendance or non-payment. Students must drop themselves. Dropping results in full tuition reversal/refund. Withdraw posts a W for the grade and full tuition is charged (no refund). For all dates and deadlines, including 'change of grade option' (P/NP) and grades due, here is the summer academic calendar:

<https://summer.ucsc.edu/fundamentals/academic-calendar.html>

Email Etiquette

Please allow me 24-48 hours to reply to your email. If I do not reply within 48 hours, you are welcome to send me another email. Emails that do not include an address ("Dear Monika", "Hello", "Hi Monika", etc...) or that are addressed inappropriately ("Hey") and in the format of a text message will be ignored. Please email me if you think you will miss class due to a legitimate excuse. Please do not email me asking what you missed in class. You are welcome to ask clarifying questions after you check in with a classmate.

Office Hours

I welcome you in my office hours by appointment or drop in to discuss questions, comments, concerns and the like. Specifically, I expect you to come to office hours with prepared, thought out questions on your assignments, the course material, classroom issues (see below). Emailing me beforehand about the topic could facilitate a thoughtful response, but it is certainly not required. I very much respect your time and efforts that you put into the class; I expect you to respect my time and energy as well.

Accommodations for Students with Disabilities:

The Disability Resources Center reduces barriers to inclusion and full participation for students with disabilities by providing support to individually determine reasonable academic accommodations. If you have questions or concerns about exam accommodations, or any other disability-related matter, please contact the DRC office, located in Hahn 125 or at 831-459-2089 or drc@ucsc.edu.

Classroom Etiquette and Student Wellness:

There will be plenty of interaction in the class with each other and the instructor, and please feel free to raise your hand for questions at any time and participate in discussion. Please do not hold private conversations during class. Please make an effort to arrive on time, and turn off cell phones and other electronic devices. Holding private conversations, using electronic devices, and arriving late distract other students and the instructor. Students who repeatedly do not uphold this policy will receive reduced class participation points.

I am committed to promoting a diverse, just, open, and caring community. Course discussions and lectures will strive to support these principles as well as avoid everyday verbal and nonverbal microaggressions that include axes of difference related to citizenship, identity, race, class, gender, background knowledge, criminality, and/or sexual preference. If you are concerned about any of these issues, please raise your concern in class or with me (in office hours, over email, or after lecture) so that it may be effectively addressed, hopefully ameliorated, and provide a foundation upon which we commit to further engage in our learning experience.

We all face many pressures as members of the UCSC community, as colleagues in the Environmental Studies Dept., and as fellow human beings. Please remember that we are all members of the same campus community, that the instructor is here to help you to the best of your ability, and that there are many useful campus services that are here to help everyone along the way, including academic advising in Environmental Studies (<http://envs.ucsc.edu/>), the Student Health Center <http://healthcenter.ucsc.edu/>, and Campus counseling and psychological services <http://caps.ucsc.edu/>.

Academic Integrity:

Academic integrity is the cornerstone of a university education. Academic dishonesty includes but is not limited to cheating, fabrication, plagiarism, or facilitating academic dishonesty or as further specified in campus regulations. Academic dishonesty diminishes the university as an institution and all members of the university community. It tarnishes the value of a UCSC degree. All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. All members of the community are expected to report observed instances of cheating, plagiarism, and other forms of academic dishonesty in order to ensure that the integrity of scholarship is valued and preserved at UCSC. In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript.

In the context of this course, I expect all written assignments turned in for this class to be written individually and should be original works for this class. Cheating, making up numbers or observations, etc. all violate the most fundamental ethical code in science. When scientists report false information, they influence the thinking of many other people, thereby compromising our collective understanding of nature and undermining the work of others. In this class you will be treated like scientists and are expected to follow the ethical code of honesty and integrity in your own science. Students will receive zero points for any assignment where academic dishonesty is suspected, and all academic integrity violations will be prosecuted. Accordingly, students are expected to understand and adhere to the UCSC policies on academic integrity and plagiarism:

Academic integrity: http://www.ucsc.edu/academics/academic_integrity/undergraduate_students/
Plagiarism: <http://library.ucsc.edu/science/instruction/CitingSources.pdf>

Title IX:

UCSC cherishes free and open exchange of ideas and enlargement of knowledge. To maintain freedom and openness requires objectivity, mutual trust, and confidence; it requires the absence of coercion, intimidation, or exploitation. The principal responsibility for maintaining these conditions must rest upon members of the UCSC community who exercise most authority and leadership: faculty, managers, and supervisors.

UCSC has therefore instituted a number of measures designed to protect its community from sex discrimination, sexual harassment, sexual violence, and other related prohibited conduct. [Information about the Title IX Office](#), the [online reporting link](#), applicable campus [resources](#), reporting responsibilities, the [UC Policy on Sexual Violence and Sexual Harassment](#) and the UC Santa Cruz Procedures for Reporting and Responding to Reports of Sexual Violence and Sexual Harassment can be found at titleix.ucsc.edu.

The Title IX/Sexual Harassment Office is located at 105 Kerr Hall. In addition to the [online reporting option](#), you can contact the Title IX Office by calling 831-459-2462.

Course Schedule*:

Date	Day	Topic	Lecturer	Readings **	Assignment due dates
July 31	T	Introduction to course syllabus Introduction to Insects: Diversity, Distributions, and Ecological Roles <i>Guest lecture – Justin Luong</i>	Monika Egerer & Justin Luong	Ch. 1, Ch. 14 “The Silence of the Bugs”; “Why Ecology Needs Natural History”	
Aug. 2	TH	Behavior, Foraging and Communication	Monika Egerer	Ch. 2	Quiz #1
Aug. 7	T	Insect Interactions and Roles I: Herbivory and plant defenses <i>Guest lecture - Andy Kulikowski</i> <i>Herbivory activity with UC Reserves</i>	Monika Egerer & Andy Kulikowski, Alex Jones	Ch. 4: 4.1-4.4	Project proposal due 8/6 (due before 9:00 AM) <i>In-class lab worksheet</i>
Aug. 9	TH	Insect Interactions and Roles II: Mutualisms and pollination <i>Visit to UCSC Natural History Museum</i>	Monika Egerer & Alex Krohn	Ch. 6.1-6.6; 6.9-10 Ch. 3.1-3.3, 3.5	Quiz #2 <i>In-class lab worksheet</i>
Aug. 14	T	Insect Interactions and Roles III: Predation and parasitism <i>Visit to Thimann Greenhouse</i>	Monika Egerer & Jim Velzy	Ch. 7, 8	<i>In-class lab worksheet</i>
Aug. 16	TH	Midterm short test <i>Guest lecture: Azucena Lucatero Research in Insect Ecology</i>	Azucena Lucatero	Quistberg et al. 2016	
Aug. 21	T	Populations, Communities and Food Webs I <i>Guest lecture – Kate Ennis</i>	Monika Egerer & Kate Ennis	Ch. 9-11 Vandermeer et al. 2010	Final paper rough draft due (turn in on Canvas before 8 AM) Quiz #3
Aug. 23	TH	Populations, Communities and Food Webs II Urban Insect Ecology <i>Guest lecture – John Armstrong</i>	Monika Egerer & John Armstrong	Ch. 12-13	
Aug. 28	T	Insects, Humans and Global Change Final project presentations and extra-credit potluck	Monika Egerer	Ch. 15: 15.2-15.3 FAO Edible insects (p. xiii-xvi and 1-2) “Meet the Makech” “Distribution Systems and Ants”	Complete, revised final paper due on Canvas before 8 AM Quiz #4
Aug. 30	TH	Course Exam	Monika Egerer		

* Schedule is subject to change. Please pay special attention to announcements and emails for updates.

** Readings selected are minimum requirements to prepare you for lecture. But I highly recommend that you read further into the chapters given your time!

Insect Ecology Research Projects

Overview:

Each student will participate in an individual or group research project (2 students) on a topic relevant to insect ecology that the students select. Projects will involve three parts: (1) a thorough literature review (1.5 pg), (2) research gaps section (1 pg), and (3) proposed methods to investigate a research question in the topic (1 pg).

In sum, this is similar to the format of a research proposal: in the paper, you are proposing methods for investigating a research topic, but you are not asked to begin an investigation. The research is in you doing the literature review. Students will work individually/together to understand their topic, write a paper, and give an in-class presentation. Papers should be approximately 3.5 pages single spaced (or 6 double spaced), and presentations should be 15 minutes. Potential project ideas are listed here but I very much welcome other ideas. Students should figure out what will be the most interesting question(s) to explore. As you develop project ideas or methods, I am available to talk with you during my office hours, and will welcome questions over email.

Potential projects and project selection:

- ***Native vs. exotic*** - Do related plants (with different origins) support different insect communities?
- ***Urban vs. rural*** – Do urban or rural areas support different insect communities?
- ***Insects and climate change*** – What are the main effects of climate change on insect populations?
- ***Bee’s knees*** – What are the local and regional habitat requirements of native bee populations in a particular biome?
- ***Enemies of enemies: Ladybug zombies and hyperparasitoids*** – What are the insect natural enemies of predators and parasites within natural enemy guilds, and what don’t we know about these interactions?
- ***Lessons learned from insect removal experiments*** – What have ecologists learned about insect roles and interactions through insect removal experiments? Provide 3 examples/case studies in your review.
- ***Are insects the next ‘green’ protein source*** - Search the data out there; is this enviro-friendly or not?
- ***Insects for humanity*** – What are 3 important ways in which insect functional groups contribute to human well-being?
- **Resources for finding topics:** e.g <https://entomologytoday.org/>, <https://www.the-scientist.com/tag/insects>, https://www.sciencedaily.com/news/plants_animals/insects_and_butterflies/

Grading:

Grading for the projects will include the following items (100 points total):

Item	Due Date	Points
Project proposal	Aug 6	10
Final Paper Rough Draft	Aug 21	30
Final Paper	Aug 28	30
Presentation	Aug 28	20
Presentation peer evaluation	Aug 28	10

All documents are due to canvas before class (before 8 AM) on the due date. Only one copy of each document need be uploaded, and groups can determine which student will be responsible for uploading the document(s). Comments will be returned to students electronically via email to the students within 48 hours. It is expected that all students will contribute to all aspects of the project. Each project component will be graded on content, completeness, and attention to detail, grammar, spelling, organization, and correct naming of the files. Grades will be assigned individually to each student and will be based on quality of the written assignments and the presentation, as well as the peer evaluations.

The ***project proposal*** should be a ≤500 word description of your project. The proposal should include (a) project team nickname (e.g. “DungBeetles”), (b) team member names, (c) a background statement and a

rationale for conducting the project, (d) a statement of the research question, (e) information about the methods that will be used – e.g. key words you will use for your literature review, (f) timeline for completing the project, and (g) responsibilities of each team member if in a group. You are free to include 1-2 figures or tables if that will help frame your idea. When uploading to canvas, please upload a Word doc (not a PDF) and name the file “*ProjectTeamNickname-Proposal*”.

The ***final paper rough draft*** should include everything that you plan to include in the final paper, but in rough draft form. Figures, tables, and maps are welcome, but there should be no more than 5 maps, figures, or tables per paper. The draft should be no more than 3.5 pages single-spaced, or 6-pages double-spaced, with Times New Roman font size 12, and 1” margins all around. Figures, maps, and tables should be placed at the end of the document, after the literature cited, and each should have a 1-2 sentence legend. Figures, maps, tables, and the literature cited do not count in the page total. When uploading to Canvas, please include all team member names at the top, upload a Word doc (not a PDF) and name the file “*ProjectTeamNickname-RoughDraft*”.

---- The paper should have the following sections: (a) Abstract (<200 word summary of the paper), (b) Introduction (an outline of the topic of the paper and the specific details to be discussed), (c) several organized sections that contain information relevant to the details of the question or topic, (d) research gaps section that addresses areas of research need, (e) proposed research question and methods proposal, and (d) Literature Cited (the bibliography). Each project paper should cite at least 20 papers from the scientific literature. Please follow the formatting guidelines for the journal *Environmental Entomology* (on Canvas resources) for in-text citations and the literature cited section.

Grading of the rough draft will be based on the following: 10 pts for content (e.g. Does the paper contain an introduction and research question? Was sufficient literature reviewed? Are the results summarized and/or appropriately analyzed? Is there a discussion of the main findings?), 5 pts for completeness of the draft (e.g. Are all aspects of the paper included? Are there citations and references included?), 5 pts for the level of detail (Is it clear that the student(s) have thoughtfully discussed the results and understand the cited literature?), 5 pts for grammar and spelling, and 5 pts for overall organization for a total of 30 points.

The ***final paper*** should be completed exactly as the draft of the final paper, but should incorporate any changes or suggestions that I provided on the draft. When uploading to Canvas, please include all team member names, upload a Word doc (not a PDF), and name the file “*ProjectTeamNickname-Final*”. Grading of the final paper will be based on the following: 10 pts for content (e.g. Does the paper contain an introduction and research question? Was sufficient literature reviewed? Are the results summarized and/or appropriately analyzed? Is there a discussion of the main findings?), 5 pts for the level of detail (Is it clear that the student(s) have discussed the results and understand the cited literature?), 5 pts for grammar and spelling, 5 pts for overall organization, and 5 pts for revisions (e.g. Did the student(s) take the editorial and content suggestions from the draft and incorporate these into the final paper?) for a total of 30 points.

The ***evaluations*** will involve (a) candid assessments of your contribution to the work, (b) the contributions of the other student in your group pair, and (c) peer evaluations from your presentation to be completed in class. Each student will submit an evaluation of him or herself (≤100 words) as well as a separate evaluation for another team member (≤100 words for each other team member). These are private evaluations and will not be shared with other students. **Please upload this to your Canvas Drop Box.** Please upload a Word doc (not a PDF) and name the file “*YourLastName-ProjectTeamNickname-Evaluation*”.

The ***in-class presentations*** will be 15 min. presentations followed by 2-3 min. of questions. Each student in the group should be a part of the presentation. Please practice presentations so that you know how long they are. Presentations may involve PowerPoint or other visuals as students see fit. Students will submit peer evaluations on each presentation, where presentations will be evaluated on a 1 to 5 scale of proficiency in presentation skills: organization, accuracy, relevance, message, language, equity, delivery, technology, use of time, questions and presence. These evaluations scores will be incorporated into the evaluation grade.