TEXAS A&M UNIVERSITY

SYLLABUS

Course title and number	Entomology 689 Special Topics in Chemical Ecology
Term and credits	Fall 2019, 3 credits
Meeting times	Lecture: Mondays and Wednesdays 12:40-1:30 PM Laboratory: Tuesdays 2:00-4:50 PM
Location	Minnie Belle Heep Center Rm 205 lecture, Rm 207 lab and 103K ERL Building by appointment

Course Overview: All organisms emit, perceive, and respond to chemical compounds. These compounds play important roles in helping organisms locate food, attract mates, associate with symbionts, deter enemies, and defend against pathogens. The aim of this course is to provide students with an understanding of chemically mediated interactions among plants, animals, and microbes. Students will learn about the functional and evolutionary basis for chemical signals and cues that elicit behavioral responses in organisms as well as methods for analyzing such compounds and behaviors. Students will also learn about potential applications of chemical ecology for controlling pests or preventing disease.

Instructor: Anjel Helms
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Office location: 103D Entomology Research Laboratory Building
Office Hours: By appointment

Prerequisites: Students should have completed at least one semester of chemistry and one semester of ecology at the undergraduate level or higher.

Reading Material: Assigned articles will be provided electronically through eCampus

Learning Objectives: Upon successful completion of this course, students will be able to:
1. Classify types of chemical signals and cues and their ecological roles
2. Describe and apply techniques for analyzing ecologically relevant chemical compounds and organismal responses to such compounds
3. Critically evaluate primary scientific literature and create meaningful discussion topics
4. Develop a testable hypothesis, design appropriate experiments, and draft a research proposal for a project related to chemical ecology

Course Grading Scheme:

Class discussion	50 points
Lecture midterm exam	100 points
Laboratory methods group project	100 points
Lecture final exam	100 points
Research proposal	100 points
Total possible points	450 points

Grading Scale: A (90-100%), B (80-89%), C (70-79%), D (60-69%), F (below 60%)
Grades will be rounded up if the final grade percentage is within 0.5% of the next grade level.

Grading Policies:
If students have an excused absence, make up assignments can be arranged without penalty. Late assignments will be accepted for up to one week following the deadline with an automatic grade reduction of 5% from the earned score for each day past the deadline.

Class Discussion: Students will read assigned material before each discussion session, create discussion topics based on the readings, and actively participate in discussion sessions throughout the course. Each student will submit one discussion question based on the assigned reading electronically through eCampus by 11:59 PM the day before the scheduled discussion session. A good question will be one that demonstrates knowledge of the assigned material, an understanding of the limitations of our knowledge, and one that stimulates class discussion, and will receive 5 points. A student who does not submit a question and has not been excused from the class for that day will receive 0 points.

Lecture Exams: Students will complete 2 lecture exams (midterm and final) for this course. The exams will consist of short and long essays based on the lecture material and in-class discussion of primary literature. These will be take-home, open-book exams to be completed in 1 week. The exam questions will be electronically distributed to students, then students will turn in their answers within a single Microsoft Word document via eCampus by the specific exam deadlines.

Group Project: During the laboratory portion of the course students will work as a team to complete a group project. Students will work together and with the instructor to learn about an analytical or behavioral method commonly used in chemical ecology research. They may be asked to assist the instructor in presenting a demonstration of this method for their peers and will ultimately film a tutorial video of their demonstration to be shared online as a teaching resource.

Research Proposal: Students will write a research proposal to address a question of their choice (to be pre-approved by the instructor) related to chemical ecology. The proposals will be graded on whether there is a testable hypothesis, whether the proposed experiments address the hypothesis, and whether sufficient background information has been provided to justify the research (max 4 pages).

Course Topics, Calendar of Activities, Major Assignments

	Lecture	**Lab**	**Assignments due**
Week 1 8/26/19	1. Course overview and introduction to chemical ecology	Introduction and Lab Safety	Lab Safety agreement/ Assign groups and topics for lab projects
	2. Chemical communication		Discussion question 1 (due 9/01/19 11:59 PM)
Week 2 9/02/19	3. Insect communication Discussion 1	Insect extracts and introduction to GCMS: Dr. Pierre-André Eyer	Discussion question 2 (due 9/03/19 11:59 PM)
	4. Social insect communication Discussion 2		
Week 3 9/09/19	5. Plant defense	Leaf extracts and intro to HPLC	Discussion question 3 (due 9/10/19 11:59 PM)

	6. Plant detection of herbivores and pathogens: Dr. Loren Rivera-Vega Discussion 3		
Week 4 9/16/19	7. Plant-herbivore defense coevolution	Interpreting GCMS and HPLC data	Discussion question 4 (due 9/17/19 11:59 PM)
	8. Animal defense Discussion 4		
Week 5 9/23/19	9. Plant volatiles	Collection and analysis of plant leaf volatiles	Discussion question 5 (due 9/24/19 11:59 PM)
	10. Multitrophic interactions Discussion 5		
Week 6 9/30/19	11. Microbes in plant-herbivore interactions	Olfactory-based choice tests	Discussion question 6 (due 10/1/19 11:59 PM)
	12. Plant-plant communication Discussion 6		Midterm take-home exam assigned 10/2/19
Week 7 10/07/19	13. Work on exam	Work on lab projects	Midterm exam (due 10/9/19 11:59 PM)
	14. Work on exam		
Week 8 10/14/19	15. Belowground interactions	Belowground olfactory-based choice tests	Approved proposal topic (due 10/14/19 11:59 PM) Discussion question 7 (due 10/15/19 11:59 PM)
	16. Pollination Discussion 7		
Week 9 10/21/19	17. Mimicry, deceit, and eavesdropping	Work on lab project	Bonus topic week due 10/29/19 11:59 PM
	18. Gall insects: Dr. John Tooker		
Week 10 10/28/19	19. Aquatic chemical ecology	Work on lab project	Discussion question 8 (due 10/29/19 11:59 PM)
	20. Disease vectors of plants Discussion 8		Proposal outline (due 10/30/19 11:59 PM)
Week 11 11/04/19	21. Disease vectors of vertebrate animals: Dr. Adela Oliva Chavez	Work on lab project	Discussion question 9 (due 11/05/19 11:59 PM)
	22. Microbe chemical ecology Discussion 9		
Week 12 11/11/19	23. Vertebrate chemical ecology	Work on lab project	Discussion question 10 (due 11/05/19 11:59 PM)
	24. Influence of abiotic factors on chemically mediated interactions Discussion 10		Proposal (due 11/15/19 11:59 PM)
Week 13 11/18/19	No Class, Entomological Society of America Meeting	No lab	
	No Class, Entomological Society of America Meeting		Lab project (due 11/23/19 11:59 PM)
Week 14 11/25/19	Watch project videos		Final take-home exam assigned 11/25/19

11/27/19	Thanksgiving Holiday	No lab	
Week 15 12/02/19	Redefined day no class	No lab	
12/04/19	Course evaluation and discussion		Final exam (due 12/06/19 11:59 PM)

Other Pertinent Course Information

Class Attendance: Regular attendance in lectures and labs is required in this course. The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for an absence. Rules for excused and unexcused absences are described in Student Rule 7, found at http://student-rules.tamu.edu/rule07. Failure to notify and/or document properly may result in an unexcused absence. Falsification of documentation is a violation of the Honor Code.

Safety in Teaching Laboratories: The Department of Entomology is committed to the safety of all students and employees participating in teaching laboratories. To ensure that a safe environment is maintained in our teaching laboratories, it is expected that all students will adhere to general safety guidelines and emergency procedures, as well as course-specific and activity specific safety instructions provided by faculty and teaching assistants. Laboratory safety and emergency procedures will be reviewed during the first class period and you will be asked to sign your acknowledgement of these instructions before attending further classes in this course.

Americans with Disabilities Act (ADA): The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Academic Integrity: As students of Texas A&M University, you are expected to abide by the Aggie Honor Code, which states “An Aggie does not lie, cheat, or steal or tolerate those who do.” Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. Honor Council Rules and Procedures can be found at http://www.tamu.edu/aggiehonor/.