

Course Information

Course Number:	ENTO 689
Course Title:	Special Topics in Chemical Ecology
Time:	Lecture: Mondays and Wednesdays 12:40 pm – 1:30 pm Lab: Tuesdays 12:00 pm – 2:00 pm
Location:	Lecture: 205 Heep Building Lab: ERL Building
Credit Hours:	3 credits

Instructor Details

Instructor:	Anjel Helms
Office:	103D Entomology Research Laboratory (ERL) Building
E-Mail:	amhelms@tamu.edu
Office Hours:	By appointment

Course Description

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.

Course Prerequisites

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

Course Learning Outcomes

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

Textbook and/or Resource Materials

There is no required textbook for this course. Reading assignments will be provided electronically through Canvas.

Grading Policy

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.

Course Grading Scheme:

<i>Lecture midterm exam</i>	<i>100 points</i>
<i>Lecture final exam</i>	<i>100 points</i>
<i>Class discussion</i>	<i>50 points</i>
<i>Group project</i>	<i>100 points</i>
<i>Research proposal</i>	<i>100 points</i>
<i>Total possible points</i>	<i>450 points</i>

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 through Canvas by 11:59 PM the day before the scheduled discussion session. A good question, that will receive 5 points, is one that demonstrates knowledge of the assigned material, an understanding of the limitations of our knowledge, and one that stimulates class discussion. 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 discussions of primary literature. These will be take-home, open-book exams to be completed within 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 Canvas 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).

Late Work Policy

All assignments must be submitted by their established deadlines. Make up assignments can be arranged without penalty if students have an official University-sanctioned excused absence (See Student Rule 7.). Students will not be allowed to make up in-class activities if they do not have an excused absence. If students miss a laboratory activity, for an excused absence, they are responsible for coordinating with their instructor or group to obtain any collected data or assignment information. 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.

Course Schedule

Course Topics, Calendar of Activities, Major Assignments

	Lecture Monday/Wednesday	Lab Thursday	Assignments due
Week 1			
8/30/21	1. Course overview and introduction to chemical ecology		
8/31/21		1. Introduction/lab safety and prepare for lab activity: Guest Lecture from Taylor Reams	Lab safety agreement/ select groups and topics for projects
9/1/21	2. Chemical communication		
Week 2			
9/6/21	3. Insect communication		
9/7/21		2. Insect CHC extracts and introduction to GCMS: Guest Lecture from Taylor Reams	Discussion question 1 (due 9/7/21 11:59 PM)
9/8/21	4. Social insect communication		Discussion 1 during lecture
Week 3			
9/13/21	5. Plant defense		
9/14/21		3. Leaf extracts and GCMS	Discussion question 2 (due 9/14/21 11:59 PM)
9/15/21	6. Plant volatiles		Discussion 2 during lecture

	Lecture Monday/Wednesday	Lab Thursday	Assignments due
Week 4			
9/20/21	7. Plant detection of herbivores and pathogens		
9/21/21		4. Herbivore elicitors and Plant volatile collections	Discussion question 3 (due 9/21/21 11:59 PM)
9/22/21	8. Plant-herbivore defense coevolution		Discussion 3 during lecture
Week 5			
9/27/21	9. Multitrophic interactions		
9/28/21		5. Olfactory-based choice tests	Discussion question 4 (due 9/29/21 11:59 PM)
9/29/21	10. Plant-plant communication		Discussion 4 during lecture Midterm Exam assigned 10/1/21
Week 6			
10/4/21	Midterm Exam		
10/5/21		No Lab	
10/6/21	Midterm Exam		Midterm Exam (due 10/8/21 11:59 PM)
Week 7			
10/11/21	11. Microbes in plant-herbivore interactions		
10/12/21		6. Leaf extracts and HPLC	Discussion question 5 (due 10/12/21 11:59 PM)
10/13/21	12. Animal defense		Discussion 5 during lecture
Week 8			
10/18/21	13. Belowground interactions		Midterm grades due Approved proposal topic (due 10/18/21 11:59 PM)
10/19/21		Work on project	Discussion question 6 (due 10/19/21 11:59 PM)
10/20/21	14. Pollination		Discussion 6 during lecture
Week 9			
10/25/21	15. Mimicry, deceit, and eavesdropping		
10/26/21		Work on project	Discussion question 7 (due 10/26/21 11:59 PM)
10/27/21	16. Gall insects		Discussion 7 during lecture
Week 10			
11/1/21	No class: ESA meeting		

11/2/21		No lab: ESA meeting	
11/3/21	No class: ESA meeting		Proposal outline (due 11/3/21 11:59 PM)

	Lecture Monday/Wednesday	Lab Thursday	Assignments due
Week 11			
11/8/21	17. Aquatic chemical ecology		
11/9/21		Work on project	Discussion question 8 (due 11/9/21 11:59 PM)
11/10/21	18. Plant pathogens		Discussion 8 during lecture
Week 12			
11/15/21	19. Animal pathogens		Proposal (due 11/15/21 11:59 PM)
11/16/21		Work on project	Discussion question 9 (due 11/16/21 11:59 PM)
11/17/21	10. Microbe chemical ecology		Discussion 9 during lecture
Week 13			
11/22/21	22. Vertebrate chemical ecology		
11/23/21		Work on project	
11/24/21	No Class: Reading Day		
Week 14			
11/29/21	24. Abiotic factors and chemically mediated interactions		
11/30/21		Work on project	Discussion question 10 (due 11/30/21 11:59 PM)
12/1/21	Watch project videos		Discussion 10 and Project videos due in lecture
Week 15			
12/6/21	No Class: Redefined Day		Final exam assigned
12/7/21		No Lab: Redefined Day	
12/8/21	Last Day of classes: Course evaluations		
Week 16			
12/13/21	Final Exam		Final exam (due 12/13/21 11:59 PM)

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 lab period.

University Policies

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, a person who is subjected to the alleged conduct will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-

care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.

COVID-19 Temporary Addendum Campus Safety Measures

To promote public safety and protect students, faculty, and staff during the coronavirus pandemic, Texas A&M University has adopted policies and practices for the Spring 2021 academic term to limit virus transmission. Students must observe the following practices while participating in face-to-face courses and course-related activities (office hours, help sessions, transitioning to and between classes, study spaces, academic services, etc.):

- Self-monitoring—Students should follow CDC recommendations for self-monitoring. **Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely if that option is available, and should not participate in face-to-face instruction.**
- Face Coverings—[Face coverings](#) (cloth face covering, surgical mask, etc.) must be properly worn in all non-private spaces including classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource and support offices, and outdoor spaces where 6 feet of physical distancing is difficult to reliably maintain. Description of face coverings and additional guidance are provided in the [Face Covering policy](#) and [Frequently Asked Questions \(FAQ\)](#) available on the [Provost website](#).
- Physical Distancing—Physical distancing must be maintained between students, instructors, and others in course and course-related activities.
- Classroom Ingress/Egress—Students must follow marked pathways for entering and exiting classrooms and other teaching spaces. Leave classrooms promptly after course activities have concluded. Do not congregate in hallways and maintain 6-foot physical distancing when waiting to enter classrooms and other instructional spaces.
- To attend a face-to-face class, students must properly wear an approved face covering. If a student refuses to wear a face covering, the instructor should ask the student to leave and join the class remotely. If the student does not leave the class, the faculty member should report that student to the [Student Conduct office](#) for sanctions. Additionally, the faculty member may choose to teach that day's class remotely for all students, or dismiss the class in the case of a traditional face to face lecture.

Personal Illness and Quarantine

Students required to quarantine must participate in courses and course-related activities remotely, if that option is available, and **must not attend face-to-face course activities**. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities.

Students experiencing personal injury or illness that is too severe for the student to attend class qualify for an excused absence (See [Student Rule 7, Section 7.2.2.](#)) To receive an excused absence, students must comply with the documentation and notification guidelines outlined in Student Rule 7.