

Course Information

Course Number: **ENTO 423**

Course Title: **Medical Entomology**

Section: **In-person sections (with recorded lectures posted to Canvas)**

Time: **Lecture: Monday and Wednesday 3:00 to 3:50 pm**

Five Lab Sections: M (4-6:50pm), T (3:55-6:45pm), W (4-6:50pm), R (3:55-6:45pm), F (9:10-12pm)

Location: **Lecture: HPCT 101/Canvas/Zoom**

Laboratory: HPCT 108/Canvas/Zoom

Credit Hours: **3 hours**

Instructor Details

Instructor: **Gabriel Hamer**

Office: **515**

Phone: **979-862-4067**

E-Mail: **ghamer@tamu.edu**

Office Hours: **By appointment (Zoom or in person)**

Course Description

This course will examine the biology and adaptations of parasitic arthropods that have direct and indirect impacts on human health. We will identify the arthropods of medical importance and the agents of disease that they transmit. We will cover morphological and biological adaptations that influence vectorial capacity and hinder vector control. We will also explore the different landscape and ecological factors that regulate vector populations and the control measures that can be taken to reduce populations, limit contact with humans, and reduce vector-borne diseases. The lab will familiarize students with the morphological features that are used to identify adults and immature stages of parasitic arthropods of medical importance and explore the internal anatomy of ticks and mosquitoes. They will also explore some molecular techniques that are used to determine the infectious status of arthropod vectors.

Course Prerequisites

Junior or Senior classification or permission of instructor.

Course Learning Outcomes

At the end of this course, you should be able to:

- *Categorize medically important arthropods;*
- *Distinguish how biological and physiological adaptations facilitate the relationship of vectors and particular pathogens;*
- *Establish the diseases that are caused by specific disease agents and the vectors that transmit them;*
- *Develop educational outreach material to prevent and eradicate a vector-borne disease from a specific geographical area.*

At the end of the lab, you should be able to:

- *Determine the ID of medically important arthropods using dichotomous keys and defined morphological features;*
- *Compare the internal anatomy of medically important vectors;*

- Contrast the physiological functions of different organs and evaluate their role in pathogen transmission.

Textbook and/or Resource Materials

Optional: *Medical and Veterinary Entomology, 3rd Edition, 2019, Gary R. Mullen and Lance A. Durden. Free through TAMU Library: <https://library.tamu.edu/>*
 Required: *Lab Course Packet – Available at MSC Bookstore.*

Grading Policy

Lecture exams (4)	40 points
Vector Management Project	30 points
<u>Participation</u>	<u>10 points</u>
Total of	80 points
Lab Quizzes	10 points
<u>Lab practical exams</u>	<u>40 points</u>
Total of	130 points
<u>Honor students Lab project</u>	<u>20 points</u>
Total for Honor students	150 points

Final Grade: A=100%-90%; B= 89.9%-80%; C= 79.9%-70%; D= 69.9%-60%; F= less than 60%.

Lecture exams (40 points) –The material will be tested 4 times during the semester (See lecture schedule). These exams will not be cumulative and will cover only material since the prior exam. Exams will include a combination of multiple choice, true or false, and short answer questions. This exam will only be available in person during our scheduled lecture period. If you are absent and have a university-excused absence (e.g. positive for COVID), we will allow you to make-up the exam at a later date. If you are registered with Disability Resources to receive accommodations during exams (e.g. longer time and reduced distraction environment), please email the instructor to schedule.

Integrated Vector Management Project (30 points) – You will develop an educational campaign in response to a specific arthropod-borne disease outbreak. In assigned groups you will present details about an emerging problem relevant to public health in Texas and develop a poster presentation which will be delivered at the end of the semester. More details can be found in IVM project assignment on Canvas.

Participation (10 points) – Participation points will be earned through discussions and polls in class or on Canvas.

Lab quizzes (10 points) – During lab students will receive a quiz in which they will have to identify specimens or respond to specific questions related to the arthropod group that they are working with or the technique that they are using.

Lab practical exams (40 points) – Lab exams will be cumulative and can cover all the different arthropod orders and anatomical features covered so far during the semester. The exam will consist of stations with a specific arthropod or organ on display. Each student will rotate through the stations and will have 3 minutes to identify the specimen. The lab course packet will be allowed for use during the lab practical exams.

Honor students:

Honor Lab project (20 points) – Design a research project that involves the collection, identification, and reporting of arthropods relevant to veterinary entomology. This assignment requires you work in small groups to design and implement a survey of veterinary important arthropods. More details can be found in the assignment documents.

Course Schedule

Week	Date	Subject	Assignment	Assessment
1	8/30	Syllabus and course introduction		
	9/1	Arthropods and human health	Chapter 1 Introduction	
2	9/6	Principles of Arthropod-borne disease epidemiology	Chapter 4 Epidemiology of Vectorborne Diseases	
	9/8	Direct effects of arthropods	Chapter 3 Arthropod toxins and venom	
3	9/13	Vector- Host interactions (host quality, immunity, and other host factors that affect the vector)		
	9/15	Exam 1		Exam 1
4	9/20	Morphological and Biological Adaptations of Parasitic Arthropods	Chapter 2 Morphological Adaptations	IVM Project Preference Due
	9/22	Ticks biology	Chapter 27 Ticks	
5	9/27	Tick taxonomy		
	9/29	Tick-borne diseases 1		
6	10/4	Tick-borne diseases 2	Chapter 11 Diptera	
	10/6	Exam 2		Exam 2
7	10/11	Mites and mite-borne diseases	Chapter 26 Mites	
	10/13	Mosquito biology	Chapter 15 Mosquitoes	
8	10/18	Mosquitoes taxonomy		
	10/20	Mosquito-borne diseases: viruses		
9	10/25	Mosquito borne diseases: Parasites		
	10/27	Exam 3		Exam 3
10	11/1	Myiasis	Chapter 19 Myiasis	
	11/3	Fleas and Flea-borne diseases	Chapter 10 Fleas	
11	11/8	Lice and Louse-borne diseases	Chapter 7 Lice	



	11/10	Kissing bugs (Hemiptera) and Chagas disease	Chapter 8 True Bugs	
12	11/15	Sandfly, biting midges, black flies, and associated diseases	Chapter 14 Black Flies Chapter 12 Sand Flies Chapter 15 Biting Midges	
	11/17	No Class		Draft IVM Poster Due
13	11/22	Vector Monitoring and Integrated Vector Management		
	11/24	Reading Day – No Class		
14	11/29	Exam 4		Exam 4
	12/1	Poster Presentation		Final IVM Posters IVM Group Grades Due
15	12/6	Redefined day – attend Friday classes		
	12/8	Poster Presentation		Final IVM Posters IVM Group Grades Due

Laboratory Schedule

Week	Topic	Assessment
1	Lab introduction: how to handle specimens, lab equipment, etc.	Group assignment
2	Arthropods external anatomy	Lab quiz 1
3	Arthropods internal anatomy	Lab quiz 2
4	Lab exam 1	LAB EXAM 1
5	Identification of mites	Lab quiz 3
6	Identification of ticks	Lab quiz 4
7	Lab exam 2	LAB EXAM 2
8	Identification adults' mosquitoes	Lab quiz 5
9	Identification of mosquito larvae	Lab quiz 6
10	Mosquito anatomy	Lab quiz 7
11	Lab exam 3	LAB EXAM 3
12	Identification of adult flies	Lab quiz 8
13	Identification of maggots	Lab quiz 9
14	Identification of Hemiptera, lice, and fleas	Lab quiz 10
15	Lab exam 4	LAB EXAM 4

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](#).)

Under health or other circumstances that are deemed appropriate by the instructor, makeup or late work will be accepted as a full grade or partial grade after discussion between the student and the instructor.

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.

Except for 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, you 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 proper 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](https://www.suicidepreventionlifeline.org).

Statement on COVID-19

To help protect Aggieland and stop the spread of COVID-19, Texas A&M University urges students to be vaccinated and to wear masks in classrooms and all other academic facilities on campus, including labs. Doing so exemplifies the Aggie Core Values of respect, leadership, integrity, and selfless service by putting community concerns above individual preferences. COVID-19 vaccines and masking — regardless of vaccination status — have been shown to be safe and effective at reducing spread to others, infection, hospitalization, and death.