

Biology 4410:001, MC1, Z01 & 5407:MC1, MC1
Medical and Veterinary Entomology Syllabus-Fall 2020
Lecture M-W-F 11:00-11:50 WSB 107 Lab M 1:00-2:50 WSB 109/Fox 131

Instructor: Dr. Chris M. Ritzi

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Text: Mullen, G.R. and L.A. Durden. 2009. Medical and Veterinary Entomology. 2nd Edition. Academic Press. Boston, MA.

Course Description: This course will study the major insect, mite, and tick vectors of disease to man and associated animals. Students will learn to identify and understand the life cycles, morphology, and behavior of mosquitoes, ticks, mites, lice, fleas, and other disease vectors. Lectures will emphasize the major arthropod-transmitted disease cycles, such as malaria, Lyme disease, West Nile virus, leishmaniasis, and plague. The interaction between the disease-causing pathogen and the arthropod vector will also be covered, including biological and mechanical transmission of pathogens, as well as the mechanical damage that a parasite inflicts on its host. Laboratory studies will emphasize taxonomy and identification, as well as collection techniques.

Student Learning Outcomes

The graduating biology student graduating with a BS in Biology should be able to:

- 1) The student will be able to demonstrate an understanding of basic biological concepts, including but not limited to evolution via natural selection, cell theory, and the role and function of DNA.
- 2) The student will be able to demonstrate utilization of various field techniques toward addressing scientific questions in the specific discipline. These field techniques can include, but are not limited to, plant collection and processing, various animal collection techniques, ecological surveying and sampling, and biodiversity indexing.
- 3) The student will be able to use biological instrumentation to solve biological problems using standard observational strategies.
- 4) The student will develop writing skills by summarizing and critiquing recent relevant biological literature.

Graduate Student Learning Outcomes

The graduating biology student with an MS in Biology should be able to:

- 1) Understanding and implementation of scientific methodology.
- 2) Utilization of field techniques toward addressing scientific questions.
- 3) Be able to utilize statistics toward the analysis of data within the discipline.
- 4) Be able to effectively disseminate scientific findings using both written and oral communication.

Course Learning Objectives:

- 1) Students will identify the basic groups of medical and veterinary important arthropods.
- 2) Students will describe and diagram the life cycles and vector biology of these parasites.
- 3) Students compare various methods of collecting ectoparasites, and learn the appropriate collecting method for the particular situation they face.
- 4) Students will assess the impact of medical and veterinary arthropods in terms of disease transmission.
- 5) Students will study the use and efficacy of forensic entomology.
- 6) Students will demonstrate a proficiency preservation and mounting techniques for preparing specimens for identification.

Grading: Your grade will be assigned based on the percentage of points you get out of a total possible 800 points. (4-100pt exams, 50 pt Arthropod paper, 5-10 pt quizzes, 100 pts Participation and Attendance, 200 pts lab exams (2-100 pt lab practicals)). Graduate students will be graded on an addition 100 point project that will be incorporated into their lab activity, and take home exams separate from the in-class lecture exams.

Tests: There will be a total of 4 exams, each worth 100 points. Lab practicals will be offered as Midterm and final lab exams, as well, also worth 100 points each. If you miss an exam and have a legitimate excuse, contact me within 24 hours of the test and we will arrange a make-up test. If you do not contact me within 24 hours, you will receive a zero on that exam.

Attendance: Students missing 20% of lectures (9 lectures) OR labs (3 labs) may be dropped from the class per the SRSU catalog. Any student dropped for excessive absences will receive an F for the course grade. Please notify your instructor BEFORE missing class for authorized activities, death in the family, or illness. Exams missed for any reason must be made up within one week of the originally scheduled date. **REGARDLESS OF WHY AN ABSENCE OCCURS, YOU MAY BE GIVEN AN F FOR THE COURSE GRADE IF YOU ACCUMULATE SIX ABSENCES.**

If you are feeling ill, have a fever of 100 F, or am exhibiting any symptoms of the current COVID infection, please stay home and self-quarantine until you are either tested and cleared, or have been symptom free for over 10 days. As this class will be offered on-line as well as in person, attendance and participation online is the equivalent of in-class participation. Whether you are connecting to the class during the scheduled class time in zoom or viewing the recordings of class in Blackboard and posting in the discussion forums, activity each week is required.

Lecture courtesy: The general rules of classroom etiquette are below.

- 1) Please do not talk to others in class while the instructor is lecturing. If you have a question, ASK THE INSTRUCTOR! That's what I'm here for.
- 2) No eating, chewing, dipping, etc.

- 3) Please turn cell phones and pagers to silent while in class. They are disruptive to the entire class, and detract from learning.
- 4) For remote connections, please attend class as professionally as one would do in person (ie. Wearing clothes, not being disruptive or disrespectful to your peers, etc.)
- 5) If attending class in person, please wear you mask at all times and maintain social distancing. Failure to do so will result with being asked to leave the class and count as an absence for the day.

Students with disabilities will be provided reasonable accommodations. If you would like to request such accommodations because of physical, mental, or learning disability, please contact the ADA Coordinator for Program Accessibility at 837-8203, FH 112.

TENTATIVE LECTURE OUTLINE

DATE	LECTURE TOPIC	CHAPTER
Aug 24	Introduction	1
Aug 26	Classification of Parasitic Arthropods	2 & 3
Aug 28	Hematophagy and Disease Transmission	3
Aug 31	Epidemiology of Vector-Borne Diseases	3
Sept 2	Epidemiology continued	3
Sept 4	Cockroaches	5
Sept 7	Labor Day – No class	
Sept 9	Beetles	8
Sept 11	Beetles continued	8
Sept 14	Exam I	
Sept 16	Flies (Diptera)	10
Sept 18	Moth Flies and Sand Flies	11
Sept 21	Biting Midges	12
Sept 23	Mosquito Taxonomy and Biology	14
Sept 25	Mosquito Viruses and Diseases	14
Sept 28	Mosquito monitoring and control	14
Sept 30	Horse Flies and Deer Flies	15
Oct 2	Muscid flies	16
Oct 5	Myiasis (Bots, grubs) and Louse Flies	18
Oct 7	Black Flies	13
Oct 9	Tsetse Flies	17
Oct 12	Exam II	
Oct 14	Fleas of Importance	9
Oct 16	Fleas of Importance	9
Oct 19	Fleas and Plague	9
Oct 21	Fleas and Murine Typhus	9
Oct 23	Lice of Importance	6

Oct 26	Louse-borne Typhus	6
Oct 28	Moths and Butterflies	20
Oct 30	True Bugs of Importance	7
Nov 2	True Bugs of Importance	7
Nov 4	Exam III	
Nov 6	Mites	25
Nov 9	Mites Part II	25
Nov 11	Mites Part III	25
Nov 13	Ticks	26
Nov 16	Ticks Part II	26
Nov 18	Ticks Part III	26
Nov 20	Spiders and Kin	23 & 24
Nov 23	Scorpions	22
Nov 25	Thanksgiving Holidays – No Class	
Nov 27	Thanksgiving Holidays – No Class	
Nov 30	Ants, Wasps, and Bees	21
Dec 2	Dead Day (for this class)	
Dec 4 10:15 am	Final exam for MWF 10:00	

Note – This outline is subject to change for reasons of course interest, time constraint, or instructor whim. The exams will be administered on the dates given, unless material relevant for a given exam has not been covered. Under such cases, an exam may be moved a class period or two to aid in the clarity and understanding of the material.

MEDICAL AND VETERINARY ENTOMOLOGY LABORATORY SCHEDULE

DATE	LABORATORY
Aug 24	No Lab – University Faculty meeting
Sept 1	True Bugs and Beetles (Hemiptera & Coleoptera)
Sept 7	Labor Day – No Lab
Sept 14	Lice (Phthiraptera)
Sept 21	Fleas (Siphonoptera)
Sept 28	Flies (Tabanidae & Muscidae)
Oct 5	Flies II (Culicidae, Psychodidae, & Simuliidae)
Oct 12	Flies III (Glossinidae, Muscoidea, & Hippoboscoidea)
Oct 19	Midterm Lab Practical

Oct 26	Mites (Acari)
Nov 2	Ticks (Acari)
Nov 9	Acari continued
Nov 16	Scorpions, Spiders, and kin (Cheliceriformes)
Nov 23	Hymenoptera
Nov 30	Final Lab Practical

We might combine or collapse one or two of these labs to conduct more field and outdoor learning activities. Please be aware that this lab schedule is subject to change based on specimen availability, weather, and class interest.