

# Entomology (BIOO 462)

*Spring 2020*

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<http://hs.umt.edu/dbs/labs/emlen/>

<http://hs.umt.edu/dbs/labs/woods/>

**Office hours:** by appointments.

This is a four-credit class introducing students to the biology of insects. Lectures will cover the mechanics of being an insect (how insects are put together and how they function), they will cover the diversity of insects, including how to tell the major groups of insects apart, and they will cover the development, ecology, natural history and behavior of insects. We will end with several lectures addressing the impacts of insects (both good and bad) on human populations, and we will begin to explore methods of controlling insect outbreaks.

## Learning outcomes:

1. Be able to identify the major external features of insects.
2. Be able to describe the internal structures and physiology of insects.
3. Be able to describe major classes of insect behaviors.
4. Be able to describe insect development and the major different kinds of insect life cycles.
5. Be able to identify unknown insects to the family level.
6. Be able to explain the evolutionary history of insects.
7. Be able to explain the roles, positive and negative, that insects play in human societies.

Lectures will be complemented with labs that provide students with a hands-on introduction to the external and internal anatomy of insects, as well as how to use taxonomic keys to the major insect families.

For the oral presentation, students will draw the name of an insect from a hat, and prepare a brief talk on their assigned insect. Student presentations will take place during a mini-symposium at the end of the semester. Grading of talks will focus on content, organization, and presentation clarity. Further details regarding the oral presentation will be provided as the date approaches.

- The lecture exams will cover material covered in the lectures, including slides and lecture notes (and including the supplementary reading/ journal articles provided on Moodle).
- Lecture notes will be provided on Moodle in an incomplete form—you should bring an electronic or paper version to lectures and fill in the rest of the information. We will not provide ‘keys’ to the lecture notes.

- There are two exams in lecture, a mid-term and a final. The final is not comprehensive. Multiple choice, fill-in-the-blank, matching, and short answer/essay is the format of both exams.
- The two lab practicals will differ significantly—the first is closed book and covers basic anatomy (typical lab practical exam). The second is open book (Borrer only) and covers keying insects. Further details regarding the lab practicals will be provided during the lab period.

## Course Grading

Midterm Exam (lecture).....	20%
Final Exam (lecture).....	20%
Oral Presentation (lecture).....	10%
Lab-Practical 1 (external anatomy and taxonomy).....	15%
Lab-Practical 2 (taxonomy).....	15%
Lab participation/discussion.....	5%
Insect Collection.....	10%
In-class work sheets.....	5%

## Students with disabilities

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students \(DSS\)](#). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lommasson 154. We are happy to work with you and DSS to provide appropriate accommodations for your learning and testing. Students with disabilities and/or students who have had to miss class due to documented illness or participation in University-sanctioned activities may request to listen to these via iTunes.

## Lecture Schedule and Recommended Readings

<u>Date</u>	<u>Lecture</u>	<u>Reading (G &amp; C)</u>		
Jan	13	Introduction & Course Info (Both)		
	15	Significance/Diversity of Insects (JB)	Chapter 1	
	17	External anatomy I: Integument (RB)		
	<b>20</b>	<b>No class (Martin Luther King Jr. Day)</b>		
	22	External anatomy II: The Head (RB)	Chapter 2.3	
	24	External anatomy III: The Thorax (RB)	Chapter 2.4	
	27	External anatomy IV: The Abdomen (RB)	Chapter 2.5	
	29	Internal Anat.& Physiol. I: Nervous, Endocrine, and Muscle Systems (RB)	Chapter 3.1 – 3.3	
	31	Internal Anat. & Physiol. II: Alimentary and Circulatory Systems (RB)	Chapter 3.4, 3.6	
	Feb	3	Internal Anat. & Physiol. III: Tracheal System & Gas exchange (RB)	Chapter 3.5 & Harrison, Woods, Roberts Chapter 6
		5	Sensory Mechanisms: Tactile, Sound, Chemo (RB)	Chapter 4.4
				Chapter 3.4-7
		7	Sensory Mechanisms: Vision (RB)	
		10	Exam 1 review (RB)	
<b>12</b>		<b><u>EXAM 1</u></b>		
14		Locomotion I: Crawling, Swimming (RB)	Chapter 3.1.3	
<b>17</b>		<b>No class (Presidents' Day)</b>		
19		Locomotion II: Flight (RB)	Chapter 3.1.4	
21		Post-embryonic Development (RB)	Chapter 6	
24		Arthropod Evolution (RB)	Chapter 8	
26		Arthropod Evolution II (RB)		
28		Living in Harsh Conditions (JB)		
March		2	Insects, temperature, and climate (JB)	Chapter 17.3 & Harrison, Woods, Roberts Chapter 3
	4	Soil Insects (RB)	Chapter 9.1	
	6	Aquatic Insects (JB)	Chapter 10	
	9	Insect extended phenotypes (RB)		
	11	Insects & Plants I: Herbivory (RB)	Chapter 11	
	13	Insects & Plants II: Herbivory contd. (RB)		

March 16 – 20 **SPRING BREAK**

	23	Insects & Plants III: Pollination (RB)	
	25	Insects & Other Diets (RB)	
	27	Eusocial Insects (JB)	
	30	Eusocial insects, cont. (JB)	
April	1	Insects & Medicine (RB)	Chapter 15
	3	Insects as Crop Pests (RB)	Chapter 16
	6	Sexual dimorphism in insects (RB)	
	8	Limits to insect sizes (RB)	
	10	TBD Romain and Jackson's research?	
	13	<b>Student Presentations</b>	
	15	<b>Student Presentations</b>	
	17	<b>Student Presentations</b>	
	20	<b>Student Presentations</b>	
	22	Insects & Human History (RB)	
	24	Final Lecture: Insect Conservation/Biodiversity (JB)	
	27	TBD Insect mating systems?	
	29	Final Exam Review/ Course feedback	
May	1	TBD	

**Final exam:**