

INSECT BIOLOGY, EBIO 4660/5660
Fall, 2008

WHO ARE WE?

Professor: Deane Bowers

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Office: Ramaley N295

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Office Hours: Tuesdays 9 – 11 or by appointment, Ramaley N295

Teaching Assistant: Natalie Robinson

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Office Hours: To be scheduled in Ramaley N1B76

Course Meets: Muenzinger E417
MWF 12PM-12:50PM

Lab Meets: RAMY N1B76
Mon or Wed, 2 PM- 4:50PM

Textbook: Gullan, P.J. and Cranston. 2005. The Insects: An Outline of Entomology, 3rd edition. Blackwell Publishing. United Kingdom.

McGavin, G.C. 2001. Essential Entomology: An Order-by-Order Introduction. Oxford University Press, New York

Additional readings: RECOMMENDED IDENTIFICATION KEY.

D.J. Borror and R.E. White. 1970. A Field Guide to the Insects. Houghton Mifflin Co., Boston, Massachusetts.

Course Objectives: The goal of this course is to develop your understanding, enthusiasm about, and enjoyment of insect biology. Throughout the semester, we will examine insect morphology, physiology and development in order to develop a context for understanding insect ecology, behavior and evolution. The laboratory will focus on learning insect identification; techniques for collecting, mounting and labeling insects; insect morphology and evolutionary relationships.

Course Requirements and Grading: Attendance is expected at lectures. Students will be responsible for all information presented (e.g., lecture materials, assignments, announcements etc.) regardless of attendance. Laboratory attendance and attendance at all exams is mandatory. If a valid, verifiable excuse for missing an exam is presented, the student will be allowed to take the exam at an assigned time and date. **IF YOU MISS A LECTURE, YOU MUST RELY ON YOUR PEERS TO GET COPIES OF NOTES FOR THE MISSED LECTURES, I DO NOT GIVE OUT COPIES OF MY NOTES OR POWERPOINT PRESENTATIONS.** There will be handouts available at each lecture that will outline the main points of that day's lecture. These will also be posted on WebCT.

Lecture Schedule

Date	Lecture #	Topic	Chapter (pages)	Notes
M Aug 25	1	Introduction to the Course	1 (2- top of 4)	
W Aug 27	2	Insects as Arthropods		
F Aug 29	3	Insect body Plan	7 (178-183) Box 7.1	
M Sep. 1		HOLIDAY (go collecting)		no lab
W Sep. 3	4	Insect Diversity and Conservation	1(4-top of 8)	no lab
F Sep. 5	5	External Anatomy: Insect Cuticle I.	2 (22-top of 28)	
M Sep. 8	6	External Anatomy: Insect Cuticle II.	2 (22-top of 28)	
W Sep. 10	7	Physiology: Circulatory system	3 (61-65)	
F Sep. 12	8	Physiology: Respiration	3 (65-68)	
M Sep. 15	9	Physiology: Digestive System I.	3 (68-81)	
W Sep. 17	10	Physiology: Digestive System II.	3 (68-81)	
F Sep. 19	11	Physiology: Excretion and Water Balance	3 (68-81)	
M Sep. 22	12	Physiology: The Molting Process I.	6 (142-145, 151-156)	
W Sep. 24	13	Physiology: The Molting Process II.	3 (59-61)	
F Sep. 26	14	Locomotion and Flight I	3 (50-58), 8 (208-211)	
M Sep. 29		EXAM 1		
W Oct. 1	15	Locomotion and Flight II	3 (50-58), 8 (208-211)	
F Oct. 3	16	Sensory Systems I. Mechanoreception & Chemoreception	4 (86-100)	
M Oct. 6	17	Sensory Systems II. Photoreception	4 (105-109)	
W Oct. 8	18	Reproduction I. Morphology/Development	3 (81-84)	
F Oct. 10	19	Reproduction II. Behavior	5 (114-140)	
M Oct. 13	20	Coevolution and Mutualisms I.	11.1 (265, 284-288,); 13 (342-344)	lab exam
W Oct. 15	21	Coevolution and Mutualisms II.	11.1 (265, 284-288); 13 (342-344)	lab exam
F Oct. 17	22	Insect-Plant Interactions: I. Phytophagous Insects	11 (264-278)	
M Oct. 20	23	Insect-Plant Interactions: II. Plant Defenses	11.1 (268)	
W Oct. 22	24	Insect-Plant Interactions: III. Herbivore Offenses		
F Oct. 24	25	Insect-Plant Interactions: IV. Pollination	11 (281-285)	
M Oct. 27	26	Insect Defenses I.	14 (356-374)	
W Oct. 29	27	Insect Defenses II.	14 (356-374)	
F Oct. 31	28	Insects as Predators	13 (328-335)	
M Nov. 3		EXAM 2		
W Nov. 5	29	Insects in the Fossil Record (Dena Smith)	8 (203-208)	
F Nov. 7	30	Insects as Parasitoids (Evan Lampert)	13 (335-342)	
M Nov. 10	31	Insects as Parasites		
W Nov. 12	32	Insects as Vectors	15 (377-388)	
F Nov. 14	33	Insect Learning		
M Nov. 17	34	Insect Communication	4 (98-104)	exp write-up due

W	Nov. 19	35	Insect Sociality	12 (300-326)	exp write-up due
F	Nov. 21	36	Diapause and Migration	6 (158-164)	
M – F, Nov. 24-28		Thanksgiving break!! Enjoy!!			
M	Dec. 1	37	Insects and Climate change (Cesar Nufio)		collection due
W	Dec. 3	38	Insects and Humans I		collection due
F	Dec. 5	39	Insects and Humans II		
M	Dec. 8	40	Pest Management & BioControl I	16 (396-423)	lab exam
W	Dec. 10	41	Pest Management & BioControl II	16 (396-423)	lab exam
F	Dec. 12	42	Catch up		

FINAL EXAM Wednesday, December 17, 1:30 PM – 4 PM

Grades will be based on the following: The lecture portion of the course is worth 3/4 of your grade. You will have 2 midterms and a final, and a set of 3 scientific papers that you will be expected to read and review.

The midterms and final will be a combination of defining terms and providing examples, and both short and long essay questions, in which you will be expected not only to know the answers to the questions posed, but also to communicate that knowledge in a clear and concise fashion (i.e., writing skills will be an important part of the course). Each midterm exam will cover only the portion of the course since the previous exam. The final will mostly focus on the material following the last exam but about 25% of the questions will focus on prior materials. The exams will focus on lecture materials, but some questions will be taken from the assigned readings.

LECTURE part of course--Grading

Undergraduates

- Midterm I (25%)
- Midterm II (25%)
- Final (35%)
- Writing assignments (15%)

Graduate Students

Graduate students: Will be required to write an additional 10 page review on an insect related topic of your choice. During the course, I will ask for your topic. Be sure I approve your topic before you begin.

- Midterm I (20%)
- Midterm II (20%)
- Final (25%)
- Writing assignments (15%)
- Final paper (20%)

LAB part of course--Grading

- Lab Exam I (25%)
- Lab Exam II (25%)
- Collection (35%)
- Experiment write-up (15%)

Information on specific assignments for lecture (lab information covered in lab):

Extra Readings: Throughout the course I will assign papers to supplement the materials that we cover in the lectures; most of the time these papers will be reviews on a particular topic.

However, unless otherwise told, you will not have to write reviews on these papers but expect to see questions about the papers on the exams.

Lecture writing assignments: Throughout the course, I'll assign 3 journal articles and students will be expected to read the articles and write a 2-3 page review on the paper. Students will have a full week to turn in their review. If I assign a paper on a Monday, its review will be due the following Monday. For every day it is late, I will reduce the total points one can get from the paper by 20%.

ADDITIONAL IMPORTANT INFORMATION**Disabilities**

If you qualify for accommodations because of a disability, please submit a letter to me from Disability Services within 2 weeks of the start of the semester so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. Contact: 303-492-8671, Willard 322, or www.Colorado.EDU/disabilityservices

Religious observance

Campus policy regarding religious observances requires that faculty make every effort to fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. Because one of your exam grades can be dropped, this should not be a problem if there is an exam conflict. If there is a problem, see me immediately.

See policy details at http://www.colorado.edu/policies/fac_relig.html

Classroom Behavior

Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at

<http://www.colorado.edu/policies/classbehavior.html> and at
http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

Honor Code

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council

(honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Additional information on the Honor Code can be found at

<http://www.colorado.edu/policies/honor.html> and at
<http://www.colorado.edu/academics/honorcode/>

Laboratory Schedule
Insect Biology Laboratory Schedule
Fall, 2008

Date	Week	Topic
Aug. 25, 27	1	Intro and overview, collecting techniques, keys, distribute equipment, intro to non-insect arthropods
Sep. 1, 3	2	No Labs (Monday holiday) Go collecting!!
Sep. 8, 10	3	Field trip or Museum
Sep. 15, 17	4	Field trip or Museum
Sep. 22, 24	5	Visit the entomology collection in the Museum, General intro to the insect orders, phylogeny.
Sep. 29, Oct. 1	6	External anatomy
Oct. 6, 8	7	Internal anatomy
Oct. 13, 15	8	Lab Practical 1
Oct. 20, 22	9	Review of key characteristics and identification of Apterygote insect orders, "Paleopteran" orders, Orthopteroids, Plecoptera
Oct. 27, 29	10	Set up for experiment, work on collection if time
Nov. 3, 5	11	Experiment, Review of characteristics and identification of "Hemipteroid" orders (Psocoptera, Phthiraptera, Heteroptera, "Homoptera" and Thysanoptera)
Nov. 10, 12	12	Finish Experiment
Nov. 17, 19	13	Review of characteristics and identification of Coleoptera, Neuropteroids (Neuroptera, Megaloptera, Raphidioptera), and Strepsiptera EXPERIMENT WRITE-UP DUE
Nov. 24, 26	14	THANKSGIVING—ENJOY
Dec. 1, 3	15	Review of characteristics and identification of Diptera, Mecoptera, and Siphonaptera, Lepidoptera, Trichoptera, and Hymenoptera COLLECTION DUE
Dec. 8, 10	16	Lab Practical 2

