

INSECT BIOLOGY – ENTO 1000/1001 (3-4 credits)

Instructors:

Scott R. Shaw
Professor of Entomology
Office: AG 4016
Lab: AG 4025
Phone: 766-5338
E-mail:
braconid@uwyo.edu
Office Hours: MWF 2:10-3pm

Miranda Bryant
Graduate Assistant
Office: AG 4023
E-mail:
mbryant@uwyo.edu

Class meeting times: 1:10-2pm MWF, lecture room AG 4021; laboratory (ENTO 1001 only) Monday 2:10-4pm, Entomology Teaching Laboratory, room AG 4022. Please bring a notebook to class and TAKE NOTES on each lecture. Good attendance and class participation is essential to doing well in this class. Please review your notes prior to each lecture, and bring any questions to the next class.

Books:

Bugs in the System, Insects and their Impact on Human Affairs, by May R. Berenbaum (lecture). ISBN 0-201-40824-4 (paperback). Reading assignments are listed below by date. Field Guide to the Insects of America North of Mexico. (lab).

“If all mankind were to disappear tomorrow, the world would regenerate back to the rich state of equilibrium that existed 10,000 years ago. If insects were to vanish, the terrestrial environment would collapse into chaos.” E.O. Wilson quoted in Omni Magazine, September 1990

Class schedule

January

M	10	Introduction – class schedule, review of syllabus, grading methods. Importance of insects (pp. xi-xiii, 1-6, 264-270; appreciating insects, 315-340). Lab: INTRODUCTION – Microscope care and use; specimen handling; basic insect form; magnificent magnified wonders.	Shaw / Bryant
W	12	What is an insect and what is not? Insectan vs. non-insectan arthropods (chapter 1, pp. 6-11).	Bryant
F	14	Arthropod body plan; basic insect form – external anatomy (chapter 2, pp. 12-34)	Bryant
M	17	MLK/Equality Day - classes excused – no lab	
W	19	Internal anatomy – digestive and excretory systems (pp. 99-105)	Shaw
F	21	Internal anatomy – circulation and respiration (pp. 259-264)	Shaw

M	24	Internal anatomy – nervous system, senses, and reproduction (pp. 24-34, chapter 3, 38-56) Lab: INSECT ANATOMY – basic mouthparts, mouthpart variations, antennae, eyes, leg segments, leg adaptations.	Shaw
W	26	Hormonal control of molting (pp. 20-24)	Shaw
F	28	Development and metamorphosis (pp. 20-24)	Shaw
M	31	Muscles, wings, and flight (Paleoptera and Neoptera) Lab: WINGS (QUIZ 1) – wing form and venation, paleopteran vs. neopteran wings, direct vs. indirect flight muscles, winglessness (primitive vs. secondary), wing variations (tegmina, elytra, postero-motorism; hemilytra, halteres)	Shaw
February			
W	2	Ancient wingless hexapods (Apterygota) - springtails, diplurans, proturans, bristletails (pp. 352, 361)	Shaw
F	4	Extinct Paleopteran orders – Paleodictyoptera, Protodonata – gigantism (pp. 12-13). Primitive Neopteran orders - Embiodea, and Zoraptera – webspinners and zorapterans	Shaw
M	7	Ephemeroptera – mayflies, aquatic adaptations (pp. 264-270, 354) Lab: COLLEMBOLA, EPHEMEROPTERA, ODONATA, PLECOPTERA (QUIZ 2)	Shaw / Bryant
W	9	Odonata – dragonflies, damselflies, aquatic adaptations (p. 357)	Shaw / Bryant
F	11	Plecoptera – stoneflies, aquatic adaptations (p. 359)	Shaw / Bryant
M	14	Exam 1 (100 points) Lab: DERMAPTERA, ORTHOPTERA, PHASMIDS, DICTYOPTERA (QUIZ 3)	
W	16	Orthoptera – grasshoppers and locusts (pp. 108-118)	Shaw
F	18	Dermaptera, Grylloblattodea, and Phasmatodea – earwigs, icebugs, stick insects (pp. 352-353, 358) Dictyoptera (part) – mantids (pp. 151-156)	Shaw
M	21	Dictyoptera – roaches, termites, eusocial behavior, castes (pp. 255-259, 353, 356) Lab: SOCIAL INSECTS – termites, ants, paper wasps, bees, caste variations (QUIZ 4)	Shaw
W	23	Phthiraptera to Thysanoptera – bark lice, true lice, parasitism, thrips (191-210, 359-360)	Shaw
F	25	Hemiptera diversity – true bugs (p. 354)	Shaw
M	28	Homoptera – cicadas, hoppers, aphids, scales (p. 118-133, 355) Lab: HOMOPTERA, HEMIPTERA (QUIZ 5)	Shaw

March

- W 2** Holometabola –neuropteroids – dobsonflies, lacewings (p. 357); **Shaw**
- F 4** Terrestrial Coleoptera – beetles – hyperdiversity (pp. 143-146, 240-255, 351) **Shaw**
- M 7** Coleoptera 2 – Aquatic beetles, aquatic adaptations **Swanson**
Lab: NEUROPTERA, COLEOPTERA, BIOMONITORING (QUIZ 6)
- W 9** Introduction to Diptera – Nematocera - primitive flies, aquatic flies (pp. 219-237, 353) **Bryant**
- F 11** **OPEN SESSION** – (pp. 274-284)
- Spring Break: March 14-18 (no classes)**
- M 21** Diptera 2 – Brachyceran flies (pp. 247-252) **Shaw**
Lab: DIPTERA, SIPHONAPTERA, MECOPTERA (QUIZ 7)
- W 23** Mecoptera, Siphonaptera – scorpionflies, fleas (pp. 210-219, 360); Strepsiptera – twisted-wing parasites **Shaw**
- F 25** Trichoptera – caddisflies – the underwater architects (pp. 361) **Shaw**
- M 28** **Exam 2 (100 points)**
Lab: RESPIRATORY ADAPTATIONS, TRICHOPTERA, LEPIDOPTERA – moths and butterflies (QUIZ 8)
- W 30** Lepidoptera – moths, butterflies – silk (pp. 133-143, 333-340, 356) **Shaw**
- ## April
- F 1** Hymenoptera 1 – sawflies, parasitoid wasps, modes of parasitism (pp. 156-157; galls, 127-133)
- M 4** Hymenoptera 2 – nest-provisioning wasps, social wasps (paper wasps, hornets) **Shaw / Bryant**
Lab: HYMENOPTERA (QUIZ 9)
- W 6** Insect societies: ants and bees (pp. 72-96) **Bryant**
- F 8** Origins of social behavior – sociobiology (chapter 4, pp. 59-72) **Shaw / Bryant**
- M 11** Sexual behavior (part 1) (chapter 3, pp. 38-56) **Shaw**
Lab: SEXUAL DIMORPHISMS, MEGALOPTERA, STREPSIPTERA, MECOPTERA (QUIZ 10)
- W 13** Sexual behavior (part 2) (chapter 9, pp. 274-312) **Shaw**
- F 15** Plant-insect interactions, coevolution (chapter 5, pp. 99-133; pollination, 81-90) **Shaw**
- M 18** Entomophagy, aposematism, crypsis, and mimicry (chapter 6, pp. 159-186) **Shaw**
Lab: APOSEMATISM, CRYPSIS, AND MIMICRY; INSECT GALLERY (QUIZ 11)
- W 20** Integrated pest management (IPM) (part 1) **Shaw**

- (pp. 157-159, 165-176, 191-237, 274-295)
- F 22 Easter Break – no classes** (pp. 296-300)
- M 25** Integrated pest management (part 2), biological control **Shaw**
Lab: (QUIZ 12) REVIEW FOR FINAL EXAM
- W 27** Diversity patterns, and species richness – how many **Shaw**
species of insects? (pp. 351-361)
- F 29** Tropical insect diversity, the biodiversity crisis, **Shaw**
extinction, insect conservation– (pp. 344-347)
- May**
- W 4 1:15-3:15 Final Exam (100 points)**

Grading: The lecture grade is based on three exams – two hourly exams and the final exam – each worth 100 points. **Lecture total = 300 points.**

The lab grade is based on weekly quizzes, in-lab assignments, homework, attendance and participation. Note: it is important to attend lab on time. Quizzes are given on the scheduled dates – there are no “make-up” quizzes (or tests). **Lab total = 100 points.**