

Entomology 305 - Evolution of Insect Structure

Instructor: Dr. Bob Wharton
Office: Room 117 Biological Control Bldg
Lab: Room 119 Biological Control Bldg (I'm usually in the lab)
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Lecture: AGLS 113, Monday and Wednesday, 11:30-12:20

Laboratory: Heep Center room 210, Monday 1:50-4:40 pm

Course Goals and Rationale

1) To acquire knowledge about general structure and form including the development of a vocabulary of terms useful for basic communication in all fields of entomology: communication both among fellow entomologists and scientists from related disciplines but also with the informed public. Think of it as a new language. Acquisition of this knowledge will be tested by quizzes in the lab and exam questions that ask students to define terms.

2) To develop a sufficient understanding of some of the major issues in the evolution of insect form, concentrating on external, skeletal structures. This goal introduces the concept of competing hypotheses, how evidence is assembled, and some of the criteria for accepting one hypothesis over another. Very often, there are no right or wrong answers. I will have my bias on each issue, and I will often state it. But I am more interested in your ability to formulate your own opinions and to write coherently about them. This understanding will be assessed with essay exams that measure ability to synthesize, analyze, and assess controversy.

3) To learn how morphological structures have changed in different groups as a result of adaptation to different biological needs (functional morphology). Successful completion of this course should enable students to predict function based on form. This ability will also be assessed through short essay questions and extra credit opportunities.

Prerequisites: Ento 201 or equivalent knowledge. The information I expect you to have acquired prior to taking this course is available on the website, where references are given to the relevant pages of your textbook.

Resources:

Text: Borrer and DeLong's Introduction to the Study of Insects, 7th edition, by Triplehorn and Johnson.

Lab Manual: The lab manual must be purchased from a copy center off campus; you will need it for the first lab and each subsequent lab.

Supplemental material: Additional readings, including all those referenced in the outline on the webpage, will be available through the Evans Library ereserve system. Go to <http://library-reserves.tamu.edu> and follow instructions from there. I also have copies in my office and you can examine the real thing there.

Class Web Page: <http://insects.tamu.edu/students/undergrad/ento305>. The web page contains information on prerequisites, a general outline for the course, references for supplemental reading for each topic covered in the lecture, examples of exam questions, some helpful hints for passing this course, and copies of most of the figures used in the powerpoint presentations. Lecture notes will not be made available.

Extra Credit: See Lab Syllabus.

Class Schedule: Fall, 2011

Class Day	Topic
Monday, 29 August	Course procedures and objectives. History of insect morphology. Importance of an evolutionary approach.
Monday, 29 August	Lab 1. General external anatomy.
Wednesday, 31 August	Evolutionary concepts and terms of location and direction.
Monday, 5 September	Structure and function of the insect integument.
Monday, 5 September	Lab 2. The insect head (quiz day)
Wednesday, 7 September	Evolution of the insect head.
Monday, 12 September	The cranium.
Monday, 12 September	Lab 3. Insect mouthparts (quiz day)
Wednesday, 14 September	Mouthparts.
Monday, 19 September	Mouthparts.
Monday, 19 September	Lab 4. Insect mouthparts (quiz day)
Wednesday, 21 September	Mouthparts.
Monday, 26 September	Antennae; QUIZ IN LECTURE
Monday, 26 September	Lab 5. Insect thorax – the tergum (quiz day)

Wednesday, 28 September	Primary and Secondary Segmentation, Insect Thorax
Monday, 3 October	Thorax – the tergum and pleuron
Monday, 3 October	Lab 6. Insect thorax – the pleuron and sternum (quiz day)
Wednesday, 5 October	Thorax – the pleuron (continued) and sternum
Monday, 10 October	Legs; Review
Monday, 10 October	First Lab Exam
Wednesday, 12 October	First Lecture Exam (through lecture of Oct. 6)
Monday, 17 October	Musculature; Wings
Monday, 17 October	Lab 7. Musculature
Wednesday, 19 October	more wings
Monday, 24 October	Wings (continued)
Monday, 24 October	Lab 8. Insect thorax – Legs and wings (quiz day)
Wednesday, 26 October	Wings (conclusion)
Monday, 31 October	Wings and wing venation
Monday, 31 October	Lab 9. Insect Thorax – Wing venation (quiz day)
Wednesday, 2 November	The insect abdomen
Monday, 7 November	Abdomen – female genitalia
Monday, 7 November	Lab 10. Insect Abdomen (quiz day)
Wednesday, 9 November	Abdomen – male genitalia
Monday, 14 November	Review (ESA Meeting); classification of arthropods
Monday, 14 November	Lab 11. Abdominal appendages and genitalia (quiz day)
Wednesday, 16 November	Second Lecture Exam (ESA Meeting).
Monday, 21 November	Relationships of and among arthropods.
Monday, 21 November	LAB 12. The arthropods.
Wednesday, 23 November	Burgess Shale.
Monday, 28 November	Non-Insect Arthropods.
Monday, 28 November	Final Lab Exam.

Wednesday, 30 November Molting; development; immatures.

Monday, 5 December Redefined day (= Friday)---therefore no class.

Wednesday, 7 December Optional: Discussion and Review (Reading Day, no formal class).

Final Examination: Monday, December 12, 10:30-12:30 pm

Please Note:

All exams (lecture and lab) will be comprehensive, that is, they will contain material covered on previous exams. Brief quizzes will be given at the beginning of the indicated lab periods.

Course Grading

Lecture Quiz	30 points
Lecture Exam 1	100 points
Lecture Exam 2	100 points
Final Lecture Exam	150 points
Lab Quizzes	45 points
Lab Exam 1	75 points
<u>Final Lab Exam</u>	<u>100 points</u>
Total	600 points

The grading scale is as follows:

540 and above = A

480-539 = B

420-479 = C

360-419 = D

below 360 = F

Rules of conduct for and during exams and quizzes:

- There will be no excused trips to the bathroom or other excursions from the classroom during an exam.
- If one must leave the room during an exam, that student's exam must be terminated and submitted to the instructor. Exceptions to this rule will be made on a case-by-case determination at the discretion of the instructor in charge.
- Examinations missed during an absence will be made up at the discretion of the instructor and only if the absence meets the guidelines of an official absence. In general *make up examinations*

are discouraged.

- All materials (books, papers, backpacks, **electronic devices**) are to be placed below the desk or in the front of the room and remain on the floor until the test has been terminated for all students.
- Talking or looking at others while taking the test will be considered cheating and grounds for invoking academic dishonesty.
- No food or drinks will be permitted during an examination.

Attendance and class etiquette:

Lecture attendance: Texas A&M University expects all students to attend class and to complete all assignments. Attendance does matter in this course, especially when it comes to assessing final grades for borderline cases. Points will be deducted for repeated, unexcused absences. For official rules on attendance, please visit the student rules website (see <http://student-rules.tamu.edu/rule07>).

Exams and quizzes: you will be required to take all quizzes and exams the days they are scheduled. Only the following absences are considered excused by Texas A&M University:

- Participation in an activity appearing on the university authorized activity list (see <http://studentactivities.tamu.edu/online/sponsauth/>).
- Death or major illness in a student's immediate family. Immediate family may include: mother, father, sister, brother, grandparents, spouse, child, spouse's child, spouse's parents, spouse's grandparents, stepmother, step-father, step-sister, step-brother, step-grandparents, grandchild, step-grandchild, legal guardian, and others as deemed appropriate by faculty member or student's academic dean.
- Illness of a dependent family member.
- Participation in legal proceedings or administrative procedures that require a student's presence.
- Religious holy day (see <http://student-rules.tamu.edu/append4>).
- Illness that is too severe or contagious for the student to attend class (to be determined by Health Center or off-campus physician). I require a note from the health care provider in such cases.
- Required participation in military duties.
- Mandatory admission interviews for professional or graduate school, which cannot be rescheduled.

Excused absences: Rules concerning excused absences may be found at <http://student-rules.tamu.edu/rule07>. In particular, except for absences due to religious obligations, the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g., accident, or emergency) the student must provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class. If the absence is excused, the instructor must either provide the student with an opportunity to make up any quiz, exam or other graded activities or provide a satisfactory alternative to be completed within 30 calendar days from the last day of the absence.

Class etiquette:

- Students are expected to be in their seats and prepared for lecture at the time scheduled for the start of class. Personal conversations should cease at this time.
- If a student must be late, please enter quietly and be seated as close to the door as possible.
- If you have reason to be late consistently, please discuss the reasons with the instructor and obtain approval.
- If a student is absent, the student remains responsible for all lecture or laboratory subjects discussed and materials provided during the period(s) of absence.
- No cell phones or pagers in use or active.

Laboratory Safety

The Department of Entomology is committed to the safety of all students and employees participating in teaching laboratories. To ensure that a safe environment is maintained in our teaching laboratories, it is expected that all students will adhere to general safety guidelines and emergency procedures, as well as course-specific and activity-specific safety instructions provided by faculty and teaching assistants. Laboratory safety and emergency procedures will be reviewed during the first class period and on a regular basis thereafter.

Americans With Disabilities Act

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If a student believes he or she has a disability requiring an accommodation, he or she should contact the Department of Disabilities services, Cain Hall, Room B118 (979-845-1637) so that such accommodation can be made.

Copyright, Honor Code, and Plagiarism

The handouts used in this course are copyrighted. By “handouts” I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab manual, in-class materials, review sheets and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

The Honor Code: “An aggie does not lie, cheat, or steal or tolerate those who do.” Honor Council Rules and Procedures can be found at <http://www.tamu.edu/aggiehonor>

As commonly defined, plagiarism consists of passing off as one’s own the ideas, words, writings etc. which belong to another person. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst

academic sins, for the plagiarists destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the latest issue of the *Texas A&M University Student Rules*, under the section “Scholastic Dishonesty”.