

# Entomology 305

## Evolution of Insect Structure

### Basic Course Information

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**305 Lecture** MW 11:30 to 12:20 (103 Heep Center)  
**305 Lab** M 1:50 to 4:40 (210 Heep Center; section 501)  
M 5:00 to 7:50 (210 Heep Center; section 502)

**Instructor** Dr. John D. Oswald, Professor & Curator, Department of Entomology  
**Office** 216A Heep Center (inside Heep 216, the main Insect Collection room)  
**Contacts** [j-oswald@tamu.edu](mailto:j-oswald@tamu.edu); 979-862-3507 (office phone); 979-845-6305 (fax)  
**Office Hours** None specifically scheduled, feel free to drop in and see me just about anytime—but please not in the hour immediately before lecture.

**Lab TA** Ana DalMolin  
**Office** 310 Heep Center (if not there, also check 311)  
**Contacts** [adalmolin@tamu.edu](mailto:adalmolin@tamu.edu); 979-845-3699 (phone)  
**Office Hours** R 9:00 to 10:30 (310 Heep Center)

**Textbook** (optional, but very strongly recommended) Triplehorn, C. A.; Johnson, N. F. 2004. *An Introduction to the Study of Insects*. 7th Edition. Thomson Brooks/Cole, Belmont, CA. (this textbook will be required for Ento 301, so you should consider purchasing it now if you will later be taking 301; many of the labs reference this textbook)

**Lab Manual** (required) The course lab manual is produced by CopyCorner as a Printed Course Pack, and can be purchased from Texas Aggieland Bookstore (on Texas Ave.) or Barnes & Noble at Texas A&M University (in the MSC). See <http://copycorner.com/info-for-professors/> for contact information to enquire about availability. This manual is required for every lab, ***including the first lab on the first day of classes***, so please make plans to purchase it before the first day of classes. The cost will be \$10.15 + tax.

**Web Site** <https://insects.tamu.edu/students/undergrad/ento305/index.html>; Login information: *username*: ento305; *password*: morphology

**Notes** The official course website will provides access to the syllabus, the PowerPoint files used in lecture and lab, and a variety of other course-related materials. Lecture notes will not be provided—you are expected to take your own notes in lecture and lab.

**Facebook Group** TAMU ENTO 305 – You can use this Facebook Group to communicate with other students in the class. The group will be overseen primary by the Lab TA. To join the group, search for the group by name and request to join.

**Prerequisites** Ento 201 or equivalent knowledge. The background information that you should know prior to taking this course is outlined on the course website under “Prerequisites”, where you can also find references to the pages in the textbook that you should read if that information is not already familiar to you.

**Corequisites** None

## Course Objectives

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Evolution of Insect Structure is designed to provide an introduction to basic insect anatomy, functional morphology, and the terminology associated with those fields—with a focus on the external skeletal structures of adult insects. In addition, we will discuss a variety of topics related to the evolution of the insect form, and important variations on selected aspects of that form (for example, variation in mouthparts and wings). Lectures will introduce and discuss these topics and the terminology associated with them. Laboratories will emphasize the exploration of insect anatomy and functional morphology using physical insect specimens, while reinforcing the development of a vocabulary of terms useful for communicating about the “parts” of insects.

### After completing this class you should ...

- ... be sufficiently knowledgeable about the basic anatomy of insects that you can explain it to and discuss it with other entomologists, non-entomological scientists, fellow students, first graders, and the general public.
- ... have developed an extensive new vocabulary of terms related to insect anatomy and morphology that will allow you to read the descriptive scientific literature of entomology with considerable understanding.
- ... be familiar enough with the fundamental morphology of insects, and its terminology, that you can readily use keys for identifying insects to the family level (this will be especially helpful for those of you who will be moving on to Entomology 301 in the spring...).
- ... have developed an appreciation for both the basic body form of insects (how all different insects are similar), and some of the ways that that body form has been altered in specialized ways in different groups of insects.
- ... be able to explain how many of the morphological differences that are seen among the major groups of insects can be viewed as adaptations of those insect groups to different biological conditions.
- ... understand that there are often multiple “solutions” to many of the general “problems” that face biological organisms (like the needs to move, grasp, feed, swim, breath, etc.), including (but not restricted to) insects, and that these different “solutions” are often prominently reflected in the morphologies of the different lineages of insects.
- ... be able to make predictions about the biological functions of structures based on observations of anatomical form.

### Grading Point System

	points	points	%	%
Lecture	450		67	
Exams (3 @ 100 points each)		300		45
Lecture Final (comprehensive)		150		23
Lab	225		33	
Quizzes (10 @ 5 points each)		50		7
Exams (1 @ 75 points each)		75		11
Lab Final (comprehensive)		100		15
	675 =	675	100 =	100

## **Letter Grades\***

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A (90-100%); B (80-<90%); C (70-<80%); D (60-<70%); F (<60%)

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\* Students meeting these percentiles are guaranteed the indicated grade. However, I reserve the right to lower the percentiles required to achieve each grade.

## **Exams**

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- Regular lecture exams will emphasize previously untested material – that is, although they are not intended to be fully comprehensive, they may contain some elements from previously tested material; lab exams will be at least partially comprehensive.
- Finals will be comprehensive.
- Exams given in each part of the course (lecture and lab) will emphasize materials covered that part of the course, but some lab material may also be covered in lecture exams and vice versa (there is quite a bit of natural overlap).
- Make-up exams will be possible only under very exceptional circumstances.
- Lecture and lab exams will cover, almost exclusively, information actually covered in lectures and labs, so attend all lectures and labs.
- Sample lecture exams will be posted on the course web site. Use these to see the kinds of questions that will be on the exams. Typical questions will be: fill-in-the-blank, short answer, essay, essay correction, labeling and diagramming.
- Most lab quizzes (ca. 5 questions each) and exams will focus on testing knowledge of morphological structures, functions, and terminology. Quizzes will require recognition structures from images; exams will require recognition from physical specimens. Quizzes will be given at the beginning of lab (with ca. 5-10 minutes to complete) and generally test material from the previous one or two labs. All quizzes and exams will be closed book and closed note.

## **Rules of Conduct for Exams and Quizzes**

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- 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, etc.) 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 Policy**

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- I expect all students to attend all lectures and labs, and to complete all assignments. Attendance does matter in this course, especially when it comes to assessing final grades for borderline cases.
- I may call roll until I learn the names of the students in the class.
- There is no assigned seating.
- Student rules governing class attendance and university excused absences can be found on the Texas A&M University web site at <http://student-rules.tamu.edu/rule07>. The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for absence. **Make-up exams in Entomology 305 lecture and lab will only be given for university excused absences, or other CLEARLY EXCEPTIONAL circumstances.** If you think your circumstances are clearly exceptional, please discuss them with me.

## **Class Etiquette**

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- 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 that 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.
- Please put away all cell phones, pagers and other electronic communications devices during class.
- Use of laptops, tablet computers, and similar devices in class should be limited to accomplishing tasks that are directly class-related (for example, taking notes in lecture, or working on lab assignments).

## **Americans with Disabilities Act (ADA) Policy**

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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 you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 118B of the Cain Hall or call 845-1637.

## **Academic Integrity**

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“An Aggie does not lie, cheat, or steal or tolerate those who do.” For more on the Aggie Honor Code, link to: <http://www.tamu.edu/aggiehonor>.

## **Copyright**

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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 problems, in-class materials, review sheets and additional problem sets. Because these materials are copyrighted, you do not have the right to copy them unless I expressly grant permission.

## **Plagiarism**

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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 have the permission of that person. Plagiarism is one of the worst academic sins because plagiarists destroy the trust among colleagues that is needed to safely communicate research. If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules (<http://student-rules.tamu.edu/>).

## **Laboratory Safety**

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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 you will be asked to sign your acknowledgement of these instructions before attending further classes in this course.

*The above procedures are subject to change in the event of extenuating circumstances.*

# Entomology 305

## Evolution of Insect Structure

### Lecture Schedule\*

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#### August

week	day	lec	topic
1	26 M	1	Introduction; history of insect morphology
1	28 W	2	Evolutionary concepts and terms of location and direction

#### September

2	2 M	3	The insect integument
2	4 W	4	Evolution of the insect head
3	9 M	5	The insect cranium
3	11 W	6	Mouthparts (I)
4	16 M	7	Mouthparts (II)
4	18 W	8	Antennae
5	23 M		<b>Lecture Exam I</b>
5	25 W	9	Thorax (I)
6	30 M	10	Thorax (II)

#### October

6	2 W	11	Thorax (III)
7	7 M	12	Legs ( <b>Lab Exam I</b> )
7	9 W	13	Musculature
8	14 M	14	Wings (I)
8	16 W	15	Wings (II)
9	21 M	16	Wings (III)
9	23 W	17	Wings (IV)
10	28 M		<b>Lecture Exam II</b>
10	30 W	18	Abdomen (I)

#### November

11	4 M	19	Abdomen (II)
11	6 W	20	Abdomen (III)
12	11 M	21	Alimentary canal
12	13 W	22	Molting; development; immatures
13	18 M	23	Burgess Shale
13	20 W		<b>Lecture Exam III</b>
14	25 M	24	Non-Insect Arthropods ( <b>Lab Final</b> )
14	27 W	25	Classification and relationships of arthropods

#### December

15	2 M	--	<b>No Lecture</b> ; Redefined Day (=Friday)—so no lecture
15	4 W	--	<b>No Lecture</b> ; Redefined Day (=Thursday)—so no lecture
16	11 W	--	<b>Final Lecture Exam (10:30-12:30 Heep 103)</b>

\* Changes to this schedule may be required during the semester.

**Entomology 305**  
**Evolution of Insect Structure**

**Laboratory Schedule\***

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**August**

26 M Lab 1 General external anatomy

**September**

2 M Lab 2 Insect head; **Quiz 1**

9 M Lab 3 Insect mouthparts (I); **Quiz 2**

16 M Lab 4 Insect mouthparts (II); **Quiz 3**

23 M Lab 5 Insect thorax (I: tergum); **Quiz 4**

30 M Lab 6 Insect thorax (II: pleuron and sternum); **Quiz 5**

**October**

7 M **Lab Exam I** (covering Labs 1-6)

14 M Lab 7 Insect musculature

21 M Lab 8 Insect thorax (I: legs and wings); **Quiz 6**

28 M Lab 9 Insect thorax (II: wing venation); **Quiz 7**

**November**

4 M Lab 10 Insect abdomen (I: general); **Quiz 8**

11 M Lab 11 Insect abdomen (II: appendages and terminalia); **Quiz 9**

18 M Lab 12 Non-insect arthropods; **Quiz 10**

25 M **Final Lab Exam** (comprehensive; approx. 1/3 on labs 1-6, approx.. 2/3 on labs 10-13)

**December**

2 M **No Lab**; Redefined Day (=Friday)—so no lab

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\* Minor changes to this schedule may be required during the semester.