

## **IB 468: Insect Classification and Evolution**

### **Instructors:**

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Teaching Assistant: to be determined each semester when the course is offered; typically an entomology graduate student in systematics.

### **Course description:**

Analytical survey of the classification and evolution of the orders and principal families of insects, with practical experience in the identification of insects at these taxonomic levels; field trips required. Lecture and laboratory. 4 undergraduate hours. 4 graduate hours. Offered in alternate (odd) years in the Fall. Prerequisite: IB 401 or consent of instructor.

*Lecture:* MW 9:00 -9:50 am, NHB 4072

*Laboratory:* MW 10 - 11:50 am, NHB 4072

### **Student outcomes:**

#### *Primarily:*

The student should learn the most important features of insect natural history and taxonomy.

The student should learn major diagnostic features for sight recognition of the most common and important insect families (roughly 300).

The student should learn the newest concepts of the phylogenetic relationships and evolutionary history of major insect and arthropod groups.

#### *Secondarily:*

The student should learn insect collecting, sampling and preservation techniques.

### **Lecture Schedule**

#### **UNIT I. The basics of insect biology (class periods 1-6)**

##### *Topics*

The general subject matter, conduct and content of the course, grading.  
Insect anatomy, internal and external, used in classification.

Insect development and classification.  
Insect field natural history.

*Readings*

Textbook chapters 1-14 (most of this should be review).  
Handout material

<i>Class Period(s)</i>	<i>Topics covered</i>
1	Introduction to course
2	The insect body
3	The integument
4	Development
5	Insect natural history/lifestyles
6	Exam on Unit 1

**UNIT 2. Insect phylogeny, evolution and classification (class periods 7-12)**

*Topics*

Insights from comparative morphology into phylogeny and classification.  
Fossil history and early evolution of insects  
Insights from molecular genetics into phylogeny and classification  
Approaches to insect phylogenetics and classification  
Nomenclature

*Readings*

Textbook, chapters 15-16.  
Handouts from the literature.

<i>Class Period(s)</i>	<i>Topics covered</i>
7	Nomenclature & Classification
8	Systematic approaches
9	Fossil history
10	Molecular phylogeny
11	Comparative morphology
12	Exam on Unit 2

(in lab, we will have started a survey of non-insect arthropods and the orders of insects)

### **UNIT 3. Introduction to the orders and common families of insects. (lab periods)**

#### *Topics*

A group-by-group survey of the orders and common families of insects, plus a brief discussion of non-insect arthropods. Each lecture will focus on the basic biology and some diagnostic features of each group, while each lab will focus on diagnostic features and learning to sight-identify the insect groups. In each case, the start of a new order will be accompanied by an updated review of the phylogeny and classification of that order. The pace of coverage in this section is driven mainly by the amount of material to be absorbed in the lab.

#### *Readings*

Textbook, chapters 17-46.

#### **Topics covered in lab \* (unit 3)**

Non-insect arthropods Entognatha, Apterygota, Ephemeroptera, Odonata	18-21
Phasmatodea, Blattodea (Including Isoptera), Mantodea, Orthoptera, Grylloblattodea, Mantophasmatodea	22-25, 29
Dermoptera, Embiidina	26, 28
Plecoptera, Zoraptera, Phthiraptera	27, 31-33
Hemiptera, Thysanoptera	34, 35
Neuroptera, Megaloptera, Raphidioptera	36-38
Coleoptera	39
Strepsiptera, Siphonaptera, Mecoptera, begin Diptera	40,42,44
Diptera	43
Trichoptera	46
Lepidoptera	45
Hymenoptera	41
Collection and Preservation	47

\*See the lab web page for handouts and potential lab practical dates.

## *GRADING SYSTEM*

Lecture exam on Unit I	100 pts.
Lecture exam on Unit II	100 pts.
Laboratory practical quizzes (6 @ 75 pts.) 450 pts.	
Final lecture exam	100 pts.
Insect collection	250 pts.
TOTAL:	1000 pts.

## GRADING SCALE

900-1000	A
800-899	B
700-799	C
600-699	D
below 600	F

Attendance to all lectures and lab sessions is important, not only to enhance learning, but because schedules are liable to change and exams may change dates if necessary.

### **Academic integrity**

According to the Student Code, 'It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions.' Please know that it is the responsibility of an instructor to uphold the academic integrity policy of the University, which can be found here: [http://studentcode.illinois.edu/article1\\_part4\\_1-401.html](http://studentcode.illinois.edu/article1_part4_1-401.html).

### **Disability accommodations**

To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class are asked to see the instructors as soon as possible. In particular, alternatives to the field collecting component will be considered.