# Entomology 335 – Introduction to Insect Identification

## Syllabus

**Fall Semester 2011**

**Instructor:** Chris Oseto  
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**Text:** Arthropod Collection and Identification, 2006.  
**Gibb and Oseto,** Elsevier/Academic Press  
**Text:** Borror and DeLong’s Introduction to the Study of Insects  
7th ed., 2005. Triplehorn and Johnson

<table>
<thead>
<tr>
<th>Week of Monday</th>
<th>Lecture Topics</th>
<th>Readings</th>
<th>Lab Activities</th>
<th>Readings</th>
</tr>
</thead>
</table>
| Aug. 22        | Course introduction | Collection requirements | Purdue Ent. Res. Collection  
Evaluation exam | 7-31 |
|                | Arthropod schemes | Equipment checkout | Labeling |
|                | 100             |          |                |
| Aug. 29        | Quiz 1          | Field trip/Techniques | 32-52 |
|                | Cladistics      |          |                |
|                | Order: Protura  | 169-170 | 157  |
|                | Order: Collembola | 170-174 | 157  |
|                | Order: Diplura  | 174-176 | 158  |
|                | Order: Microcoryphia | 177-179 | 158-9 |
|                | Order: Thysanura | 179-180 | 159  |

No class, September 5 Labor Day - University Holiday

<table>
<thead>
<tr>
<th>Sept. 5</th>
<th>Quiz 2</th>
<th>Field trip/Techniques</th>
<th>53-74</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Order: Ephemeroptera</td>
<td>181-192</td>
<td>159-160</td>
</tr>
<tr>
<td></td>
<td>Order: Odonata</td>
<td>193-208</td>
<td>160-162</td>
</tr>
<tr>
<td></td>
<td>Order: Orthoptera</td>
<td>209-226</td>
<td>162-163</td>
</tr>
<tr>
<td></td>
<td>Order: Phasmatodea</td>
<td>227-229</td>
<td>166</td>
</tr>
<tr>
<td></td>
<td>Order: Gryllloblattodea</td>
<td>230-231</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Order: Mantophasmatodea</td>
<td>232-233</td>
<td></td>
</tr>
</tbody>
</table>
Sept. 12  Examination 1  Field trip/Identification  75-96
Order: Dermaptera  234-238  163-164
Order: Plecoptera  239-246  164-165
Order: Embiidina  247-249  165-166
Order: Zoraptera  250-251

Sept. 19  Quiz 3  Field trip/Identification
Order: Isoptera  252-259  167-9
Order: Mantodea  260-262  170-1
Order: Blattodea  263-267  172

Sept. 26  Quiz 4  Identification
Order: Hemiptera  268-332  173-175
Order: Thysanoptera  333-340  175-176
Order: Psocoptera  341-355  176-179

Oct. 3  Examination 2  Identification
Order: Phthiraptera  356-364  173-175
Order: Coleoptera  365-468  179-181

No class, October 12-13  October Break

Oct. 17  Quiz 5  Identification
Order: Coleoptera  365-468  179-81

Oct. 24  Quiz 6  Identification
Order: Neuroptera  469-480  179-181
Order: Hymenoptera  481-557  182-183

Oct. 31  Examination 3  Identification
Order: Hymenoptera  481-557  182-183
Order: Trichoptera  558-570  183-184

Nov. 7  Quiz 7  Identification
Order: Lepidoptera  571-647  184-185

Nov. 14  Quiz 8  Identification
Order: Lepidoptera  571-647  185-188
Order: Siphonaptera  648-661  192-193

Nov. 21  Quiz 9  Identification
Order: Mecoptera  662-668  189-191
Order: Strepsiptera  669-671  181-182

Nov. 28  Examination 4
Collection due, November 28, 2011 at 5:00 PM
No class, Thanksgiving Break, November 25-27

Dec. 5 Quiz 10 Identification
Order: Diptera 672-744 193-197

Finals week Examination 5

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Note: Every attempt will be made to cover all topics listed in the syllabus, and the instructor reserves the right to make changes to the topics covered.

COURSE OBJECTIVES
Entomology 335 students will become proficient in collecting, preparing, and identifying commonly encountered insects. Students will learn taxonomic characters needed to correctly identify specimens to families and to understand the behavior and ecology of representative members of these families. To meet these objectives, the student will:

1) Collect and prepare, according to procedures outlined in the text, *Arthropod Collection and Identification*, a required number of adult insects, and
2) Correctly identify collected specimens to the required taxonomic category based on sight identification and use of taxonomic keys given in *Borror and DeLong’s Introduction to the Study of Insects*.

COLLECTION REQUIREMENTS
Insect collecting is a critical part of ENTM 335, and collections provide valuable information on habitat, time of activity, behavioral traits, and interactions with plants and animals. For some students, collecting may develop into a life-long avocation.

You may fulfill collection requirements by submitting specimens that you have collected over the past summer or have exchanged with fellow classmates. You may NOT use previously collected specimens such as those used for 4-H projects.

Each ORDER collected and properly presented will earn 1 point each. You may use adults ONLY. A maximum of 25 points (25 orders) may be earned.

Each FAMILY correctly identified and prepared will earn two (2) points for a maximum of 140 points.

Required Techniques.
In addition to the standard pinning of insect specimens, specific preparation and mounting techniques are required to study certain groups of insects. You will prepare specimens using the following techniques.
**Pointed Specimens** (5 points). Any small ADULT insect can be placed on a paper point. Specimens must represent 5 different ORDERS. Each correctly pointed specimen is worth 1 point each. You may use pointed specimens to fulfill the order collection requirement.

**Whole Microscope Mounts** (20 points). You will submit a maximum of 10 whole microscope mounts of adult insects representing 10 different families. The prepared whole mounts must be properly cleared, stained, and sealed. All specimens must be correctly oriented on the microscope slide and properly labeled. Each correctly prepared microscope whole mount is worth 2 points each, and you can earn 2 points for the correct family identification.

**Lepidoptera Whole Wing Mounts** (10 points). You will prepare five whole wing mounts (both mesothoracic and metathoracic wings) of 5 different lepidopteran families. Each correctly prepared whole mount is worth 2 points. (See pages 154 – 160 in the lecture manual for details).

**ALL COLLECTIONS ARE DUE IN SMITH 122, NOVEMBER 28, 2011 AT 5:00 PM.**

No late collections will be accepted.

**Tests and Grading**

**Quizzes.** At the start of each class on Mondays, there will be a quiz covering the previous week’s lecture, laboratory, and reading materials. These quizzes may be a combination of definitions, matching, true/false, multiple guess, short essay, etc. and may include identification of orders and families.

Quizzes are not comprehensive and are worth 10 points each. Some quizzes may be given in class or given as a take home quiz. Your lowest two quizzes will be dropped. Because two quizzes are dropped, you will not be permitted to take any missed quiz.

**Hour Examinations.** Examinations will cover lecture and laboratory materials and will focus on taxonomic characters, biologies, and any other information presented in handouts and required readings in both texts. Your ability to identify specimens to orders and families will also be tested. Examinations are comprehensive. Any missed examination because of illness, as verified by a note from PUSH or death in the immediate family with “family” identified by university policy, must be taken within one week after the original test date.

**Grading**

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<thead>
<tr>
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<th>Points</th>
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<tbody>
<tr>
<td>Quizzes</td>
<td>80</td>
</tr>
<tr>
<td>Hour Exams</td>
<td>500</td>
</tr>
<tr>
<td>Collection</td>
<td>200</td>
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<tr>
<td>Total</td>
<td>780</td>
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Grades in Entomology 335 will be distributed as follows:

- **A** = 780 to 702
- **B** = 701 to 624
- **C** = 623 to 546
- **D** = 545 to 468
- **F** = 467 to 000

Important dates to remember

- September 12: Examination 1
- October 3: Examination 2
- October 31: Examination 3
- November 28: Examination 4 and collection due
- Finals week: Examination 5
- Every Monday: Quizzes (On some Mondays we will not have a quiz because of exams. Check the syllabus.)

**SUGGESTED TEXTS**

**Peterson Field Guide Series:**

- *Insects* (Borror and White)
  
  If you were to purchase a basic insect identification book, this would be the one. Although the text offers a limited number of keys for large orders, and the line illustrations and key characters for the families make this a useful text for the beginning student of insect identification. Some of the order names in this text reflect the old taxonomy.

- *Beetles* (White)
  
  Because Coleoptera is the largest order of insects, there is a need for an easy to use identification text for this group. This text lacks basic keys, which means that you will have to match the unknown beetle with the illustration in the book. A general key is found on the insides of the front and back covers.

- *Western Butterflies* (Opler and Wright)
  
  For both texts, the value lies in the color illustrations. Most Lepidoptera can be identified to the family level based on size, wing shape, color patterns, etc. These texts offer distribution maps, which help to narrow the search for families.

- *Eastern Butterflies* (Opler and Malikul)

- *How to Know the Insects* (Bland and Jaques)

  This book has been recently revised with additional illustrations but taxonomic names continue to reflect older taxonomy. The text offers the standard couplets to identify insects.
National Audubon Society Field Guide Series
The Audubon books cover insects and spiders with a large number of color illustrations. Unfortunately, the text is separated from the illustrations, and no taxonomic keys are given so identification is by sight.

Eyewitness Handbook Series: Butterflies and Moths
This beautifully illustrated text covers insects worldwide, and the lack of taxonomic keys limits the usefulness of this text.

Dorling Kinsersley Handbook: Insects, Spiders and Other Terrestrial Arthropods
This identification guide lacks taxonomic keys but the numerous illustrations and labeled figures make this an easy to use guide. The coverage is world-wide so the more common insects in Indiana may not be found in this book.