Instructor information
Phone: 985-7475; email: dlunderw@csulb.edu Office: PH2-103
Office Hours: Mondays 1:00 – 2:30 and by appointment or whenever my door is open!

Course information
Lecture is twice weekly: M-W 8:00 - 8:50. Lab is twice weekly: M-W 9:00 - 11:45.
You must attend at least two day-field trips or the overnight field trip. You will be compensated for this
additional time requirement as indicated in the course lecture/lab schedule.
Lab Manual – emailed to you!

Course Objectives
Of the approximately 1.1 million described animal species, insects comprise over 70%, or
approximately 814,000 species. The beetles alone account for over 30% (350,000 species) of the
described animal species. It is estimated that the vast majority of the insects remain unidentified,
especially in the tropics, and that insects probably make up more than 90% of the animal species on
dearth. Insects are found almost everywhere on the planet and they “do” almost everything. Insects
interact with humans on many fronts. Insects are vectors for diseases of humans, domestic animals, and
plants. An estimated 1 million people die from mosquito-borne malaria each year. Crop pest insects
destroy an estimated 30-40% of crop produce valued at $300 billion dollars despite an annual
expenditure of $20 billion on insecticides. However, not all insects affect our economy negatively. The
value of insect-pollinated crops is estimated to be approximately $17 billion dollars annually. Many
insects also serve as predators and biocontrol agents for crop pests and naturally occurring outbreak
species. Finally, insects are, without a doubt, some of the most bizarre and coolest animals on earth;
they range from huge moths to leaf mimicking katydids to the highly organized colonies of ants and bees
to spectacularly colored tropical beetles.

Specifically, our objectives for this semester are:
• To gain an appreciation for species and ecological diversity of insects and their kin (other terrestrial
arthropods).
• To obtain a general understanding of insect museum techniques.
• To be able to use standard keys for identifying insects to family and subfamily.
• To be able to sight ID the most common insect families and orders.
• To understand basic principles of insect population dynamics and how these affect insect diversity in
nature and our attempts at controlling insect populations in forests and fields.

Grading
The breakdown of points is as follows:

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Points</th>
<th>Lab</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team projects in lecture</td>
<td>100</td>
<td>Lab quizzes (2 @ 35 points)</td>
<td>70</td>
</tr>
<tr>
<td>Midterm I</td>
<td>100</td>
<td>Lab Exam I</td>
<td>100</td>
</tr>
<tr>
<td>Midterm II</td>
<td>100</td>
<td>Lab Exam II</td>
<td>200</td>
</tr>
<tr>
<td>Midterm III</td>
<td>100</td>
<td>Insect (and their kin) collection</td>
<td>170</td>
</tr>
<tr>
<td>Term Paper (proposal = 20, draft = 65, final = 75)</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>560</td>
<td>Course Total - 1100 points</td>
<td>540</td>
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I will assign grades with cutoffs at 90% (A), 80% (B), 70% (C), and 60% (D). If the course distribution
warrants, I will lower these cutoffs; I will not raise them.
**Team projects in lecture** - You will be assigned to a team. During every lecture you will complete a graded worksheet as a team. Each worksheet is worth 5 points. You may only earn these points if you come to lecture. If you arrive late to lecture and your team has already answered one or more of the worksheet questions, you will earn points only for the questions you helped answer. **Plan on arriving to class on time.** Very often the first of these projects is assigned during the first five minutes of lecture! The worksheets are worth a total of 100 points (20 lectures). If you attend all lectures, the extra worksheets will be counted as extra credit.

**Lecture Exams** - Three midterms will be given in lecture. The midterms are not cumulative. The final will consist of a term paper that is due when the final exam is scheduled. You must have your term paper topic approved by submitting a graded proposal worth 20 points. The draft of your term paper is worth 65 points and the final paper is worth 75 points. You must follow the guidelines provided for content and format. Failing to do so will result in a point penalty. You are responsible for proper grammar. Please download from the course web site the handout *Common Grammatical Errors*. Each grammatical error will cost one-half point penalty; each grammatical error that appears in the handout *Common Grammatical Errors* will cost you one point. Take this time to polish up your writing skills.

**Lab Quizzes and Exams** - There will be two quizzes in lab approximately one week prior to each of the lab exams. Quizzes will be given at the beginning of the labs; late students will not be given extra time. Be punctual! There will also be two lab exams. Both the quizzes and the exams will follow the format of a standard lab practical where you will be asked to identify specimens and structures and answer questions regarding biology and classification. The first lab exam covers the labs prior to the Coleoptera and is worth 100 points. The final lab exam is comprehensive (covering the entire semester) and is worth 200 points.

**Insect (and their kin) Collection** - All students are required to submit a collection. **Please carefully read the chapter in the Laboratory Manual that pertains to the collection.** The collection is graded based on identification and curation of specimens (150 points) and overall presentation (20 points). Your collection will be submitted in three parts, each of 25 specimens, for a total of 75 specimens.

Each specimen is worth 2.0 points; correct identification is worth 1.5 points and proper mounting, preservation, and labeling is worth 0.5 point. All specimens must be identified to a unique taxon. Do not submit specimens identified below the subfamily. We will follow the classification scheme presented in the text that is loaned to you for use in lab (Triplehorn and Johnson (2005)). If you use resources for identification that are not present in lab, you MUST provide a reference sheet with your collection that clearly identifies where you found your information.

Preparing your collection will require a substantial number of hours. Do not procrastinate. Plan on collecting more than 75 specimens. When you first begin, you will be unfamiliar with most of the taxa you encounter and many of your specimens will belong to the same taxon. Furthermore, pinning and making labels is extremely time consuming. Budget your time accordingly.

You may submit no more than ten specimens that you did not collect. These may include purchased specimens from an insect fair, an online source, or BioQuip. Be careful labelling purchased specimens as many collectors use slightly different classification schemes than the one in Triplehorn and Johnson (2005). You may also trade specimens with your colleagues in the class. If you were present on the same field trip as a colleague, you may trade specimens from that field trip freely. If you were NOT present on the field trip, any specimen obtained from a colleague will count as one of the ten specimens that you did not catch.

All specimens submitted must have been collected within six months of the beginning of the enrolled semester. If you are repeating the course, you may NOT resubmit specimens from a previous semester.

I encourage everyone to work together on all aspects of the collection. Spending time in the field and lab with other biologists should be fun and you will accomplish more working together than you could separately. Identification of specimens can be tedious, but if you work together, it will be easier, you will learn more in a short amount of time, and this time will be more enjoyable than if you work in isolation.
Lab Policies and Rules

Breaking any of these rules will result in a penalty of 10 points per infraction!

1. Do not write on the museum boxes or drawers. These items have been loaned to you; they are not your personal property.
2. Do not put tape on the museum boxes or drawers. These items have been loaned to you; they are not your personal property.
3. Specimens must be submitted in clean vials that are devoid of tape and text.
4. Submit specimens in the smallest vials possible.
5. For each pinned specimen, multiple labels must be separated on the pin by at least two millimeters.
6. Do not “store” specimens from the teaching collection in your lab drawer or museum drawer. The teaching collection does not belong to you. If I find my specimens in your possession outside of class, I will report this to Student Judicial Affairs.
7. Do not leave Petri dishes or vials in the sink. Clean all glassware before leaving the lab.

Make-up Exams and Late Assignments
All make-up exams will be ORAL EXAMS. A make-up exam can be scheduled if you have made arrangements with the instructor at least 24 hours in advance of the test date. Exceptions to this rule are only possible via extreme circumstances, e.g. death in the family, serious illness, etc. All excuses must be documented and documentation is required to schedule your make-up exam. Make up assignments are available for University-defined excused absences.

Late submission of any component of the course (parts of the collection or the term paper) will result in a penalty of 5 points-per-15 minutes late up to 20 points per day. The weekend counts as two days. If you have trouble making deadlines, plan on turning things in early.

Cheating and Plagiarism
Please read the sections on cheating and plagiarism in the schedule of courses. Such behaviors are VERY serious offenses that can lead to a failing grade and/or expulsion from the University. I WILL forward ANY student to Judicial Affairs for such behaviors. The most common form of plagiarism is when a student copies text word for word from a book, web site, or another student and submits this text as his or her own work. Please do not do this. Furthermore, submitting specimens within your collection that you did not collect and labeling them as your own is also academic misconduct and will result in a referral to Judicial Affairs. If you have ANY questions about this, ask me first.

Lecture outlines, past exams, study questions
Lecture outlines are available to download as pdf files from the course web site (http://www.csulb.edu/~dlunderw/entomology/). NOTE: These are ONLY outlines. You must participate during lecture and take notes if you want to excel in this class. Past exams, study questions, and the Powerpoint presentations that I use in lecture are also available on the course web site. If you need help moving around on the Internet, come by my office and I'll show you enough so that you can find the course web site and download stuff on your own. Don't be shy!