Aquatic Entomology Z477/577 – Winter 2015 (4 credit hours)
Prerequisite: C- or better in BI211, 212, and 213.
Instructor: Dr. Dave Lytle (4012 Cordley Hall, lytleda@oregonstate.edu)
Teaching Assistant: Haley Ohms (haley.ohms@oregonstate.edu)
Lecture: T&Th, 9:00-9:50 – Cordley 3121
AM Lab: 10:00-11:50; PM Lab: 1:00-2:50 – both are T&Th in Cordley 2089

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Lab</th>
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<tbody>
<tr>
<td>Jan</td>
<td>6 Introduction – phylogeny &amp; evolution</td>
<td>Introduction to the Orders</td>
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<td></td>
<td>8 Biology of Odonata &amp; Plecoptera</td>
<td>Odonata</td>
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<td>10 <em>Planned: Saturday fieldtrip to Soap Creek, 8:30 to 1pm</em></td>
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<td></td>
<td>13 Respiration in aquatic environments</td>
<td>Plecoptera</td>
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<td>15 Physiology in aquatic environments</td>
<td>Plecoptera (con’t)</td>
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<td>17 <em>Planned: Saturday fieldtrip to Alsea Falls, 8:30 to 3pm</em></td>
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<td></td>
<td>20 Life cycles I</td>
<td>Ephemeroptera</td>
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<td>22 Life cycles II</td>
<td>Hemiptera &amp; Minor Orders</td>
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<td>24 <em>Planned: Saturday fieldtrip to Kings Valley, 8:30 to 2pm</em></td>
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<td>27 Genetics of populations (Dr. Deb Finn)</td>
<td>Study for quiz &amp; work on collections</td>
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<td>29 Dispersal (Emily Hartfield Kirk)</td>
<td>LAB QUIZ #1</td>
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<td>Feb</td>
<td>3 Biology of Trichoptera &amp; Coleoptera</td>
<td>Trichoptera</td>
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<td>5 LECTURE EXAM #1</td>
<td>Coleoptera</td>
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<td>10 Feeding ecology I (Haley Ohms)</td>
<td>Work on collections</td>
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<td>12 Feeding ecology II (Haley Ohms)</td>
<td>1/2 COLLECTION DUE</td>
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<td>17 Biology of Diptera</td>
<td>Diptera</td>
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<td>19 Drought &amp; seasonal habitats (Dr. Tiffany Schriever)</td>
<td>Work on collections</td>
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<td>24 Mating systems I</td>
<td>Study for quiz &amp; work on collections</td>
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<td></td>
<td>26 Mating systems II</td>
<td>Study for quiz &amp; work on collections</td>
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<tr>
<td>Mar</td>
<td>3 Flooding and disturbance</td>
<td>LAB QUIZ #2</td>
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<td>5 LECTURE EXAM #2</td>
<td>Work on collections</td>
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<td></td>
<td>10 Biomonitoring</td>
<td>Work on collections/ collection label audit</td>
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<td></td>
<td>12 Conservation</td>
<td>COLLECTIONS DUE</td>
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<tr>
<td>Mar</td>
<td>xx Taxonomy clinic (during final exam time) – Cordley 2089</td>
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LEARNING GOALS & OUTCOMES

This course is a thorough treatment of the taxonomy, evolution, ecology, and conservation of aquatic insects. The labs and about 1/3 of the lectures cover the specifics of aquatic insect taxonomy, and the other 2/3 of the lectures cover the ecology and behavior of aquatic insects. This course will be useful for students interested in fisheries biology, water quality monitoring, aquatic conservation, or fly fishing. It will be very hands-on: most of your time will be spent in the field collecting your own insects and using microscopes and taxonomic keys to identify them.

Z477/577 outcomes. By the end of this course students should be able to:
- collect and process aquatic insect samples from stream and pond habitats
- identify aquatic insect specimens from the Pacific Northwest using taxonomic keys
- describe the basic diversity and evolution of the major aquatic insect groups
- articulate the basic ecology and evolution of aquatic insects
- explain the connections between aquatic insects and water quality

Students will also collect, identify, and curate specimens for an aquatic insect collection (details below).

Z477-specific outcomes. Emphasis on using basic taxonomic keys in the textbook to identify specimens to family. Collection graded on a 100 point scale.

Z577-specific outcomes. Emphasis on using specialized taxonomic literature, in addition to basic taxonomic keys, to identify specimens to genus and species. Collection graded on a 120 point scale.

TEXTBOOK

OTHER READINGS will be assigned and distributed as PDF files or copies.

FIELDTRIPS AND COLLECTING
We are planning three Saturday fieldtrips during the month of January to collect insects in nearby streams, marshes, and ponds. Dates and destinations TBA. Additionally, students can sign out aquatic D-nets and waders for day or weekend collecting trips. We encourage you to go on collecting trips as often as possible, as having lots of collected material makes it much easier to put together a good insect collection. Please discuss with us if you cannot attend any of the Saturday field trips.

GRADING
Lab quiz #1 10%
Lab quiz #2 10%
Lecture exam #1 20%
Lecture exam #2 20%
Collection and notebook 40%
Insect Collection and Curation

Collecting/laboratory supplies you will need to obtain (OSU bookstore or elsewhere):
- Write in the Rain (or equivalent) bound field notebook
- Two watchmaker forceps, #4385 or equivalent
- Pigma Micron 01 pen or a sharp pencil for making labels
- Vials for collecting (small glass or plastic jars that seal tightly)
- Box for storing your specimens and equipment in the lab (shoeboxes work fine)

Supplies we will give to you:
- 72 one-dram shell vials for identified specimens
- 70% ethanol for sample preservation
- Pipettes for collecting mayflies and small larvae
- Transportation to/from fieldtrip sites (university vans)

Equipment you can borrow on a short-term basis (for a weekend, except on fieldtrip weekends):
- D-nets and waders
- Pans for sorting samples

Labels. Each vial should contain a collection label (info on when/where/who collected the specimen) and a determination label (name of the specimen and who identified it). These should be printed using our label making spreadsheet (available on Blackboard). Labels should fit into the vial without being bent or folded or touching the stopper. Collection label: state, county, town, specific water body, date, and name of collector. Determination label: order, family, and genus/species.

Collection list. Included with your collection should be a list of all specimens in your collection. Your collection list should follow the taxonomic order of the master list we provide you with (this is a list of all possible Pacific NW taxa, based on Merritt & Cummins), and it should include the taxonomic codes from the master list (i.e., “E7.1”). You will label the end of each vial with this code as well (use an alcohol-proof Pigma pen and the round stickers we provide). Your final collection list MUST be generated using the Excel template we provide on Blackboard – we use these to compile long-term data about the sites we visit every year.

Field notebook. The field notebook needs to be bound, so that pages are not removable – this is standard scientific practice. It should include details of the collection locality, flow conditions, date and time, weather, types of habitat sampled. Keep a complete notebook, in that it contains information about all collecting that produced specimens for your collection.
Insect Collection Grading

Collections will be graded as follows:
2 pts. for each correct, unique family
2 pts. for each correct, unique genus
1 pt. for each correct, unique species
-1 pt. for any incorrect specimens

477 students: graded on a 100 point scale.
577 students: graded on a 120 point scale.

“Unique” means that no duplicates are allowed – you only get points for each family once, although you can get points for each new genus in that same family. An exception to this occurs for taxa that require different keys for larvae vs. adults, in which case we treat the adult and juvenile forms as if they were unique taxa (examples – Coleoptera larvae and adults will be graded as if they were separate orders, but not so for Hemiptera larvae and adults). Collection quality (label accuracy, specimen condition, organization) also accounts for a small portion of the overall grade.

Specimens. Any North American (north of Mexico) specimens are permissible but they should have been collected this calendar year. Every specimen in the vial will be checked for accuracy. If an incorrect specimen is present in the vial along with correctly-determined specimens, that vial will be marked as wrong. You can include up to 5 traded specimens (collected by someone else but determined by you); however, the collection label must indicate the actual collector.

Midterm collection grading. We require that at least half of your collection be turned in for grading at mid-semester. Specimens that are incorrect at midterm should be correctly ID’d and turned in with final collection.

Final collection. The complete final collection that you will submit for grading includes:
1. The specimens - in good condition, correctly labeled (both collection information and identification), and preserved in clean 70% ethanol. For the final collection, you must use laser printed labels generated from our label maker Excel template.
2. Your field notebook – including information about all sites you collected from.
3. A printed copy of your collection list (generated using our collection list Excel template).
4. A digital copy of your collection list, emailed to us.

Final exam. There is no graded final exam – instead, we consider your collection to be the primary goal of this course. We will use the final exam time for a taxonomy clinic to correct mistakes made in your collection, but there is no grade associated with this.

Statement Regarding Students with Disabilities
Oregon State University is committed to student success; however, we do not require students to use accommodations nor will we provide them unless they are requested by the student. The student, as a legal adult, is responsible to request appropriate accommodations. The student must take the lead in applying to Disability Access Services (DAS) and submit requests for accommodations each term through DAS Online. OSU students apply to DAS and request accommodations at our http://ds.oregonstate.edu/gettingstarted.

EXPECTATIONS FOR STUDENT CONDUCT:
http://oregonstate.edu/studentconduct/offenses