Invertebrate Zoology (BI451/551, 8 credits)
Tuesdays and Thursdays (8:30 am - 5:30 pm)
Earlier than 8:30 am on many morning field trips

Spring Quarter 2015 (ver 3-30-2015)
Instructors: Richard Emlet (remlet@uoregon.edu)
Maya Watts (mwolf1@uoregon.edu)
TA: Jenna Valley (jvalley@uoregon.edu)

Class Schedule
Week 1
3/31  17:00/ +0.92 ft.
   08:30  Field Trip – Charleston Marina docks
   10:00  Introduction to class
RE   10:30  Lecture: Phylum Porifera (Chapter 4, pgs. 77-88)
   13:15  Set up scopes
   14:00  Lab: Porifera

4/2   06:11/ +1.09 ft.
MW  08:30  Lecture: Phylum Cnidaria Intro. and Anthozoa (Chapter 6, pgs. 117-126)
   11:00  Lab: Anthozoan diversity
   13:15  continue laboratory Anthozoa
RE   16:00  Lecture: Class Hydrozoa (Chapter 6, pgs. 109-115)

Week 2
4/7   08:54/ +0.19 ft. (sunrise 6:48am)
   07:00  Field trip – Southside Sunset Bay (Phyllospadix for Staurozoa and urchins)
   10:30  Lab: Hydrozoan diversity
RE   13:15  Lecture: Classes Scyphozoa, Cubozoa & Staurozoa
          + Jellies video (Chapter 6, pgs.102-108, 116)
   15:00  Lab: Scyphozoans

4/9   10:20/ +0.2 ft.
MW  08:00  Lecture: Ctenophora (Chapter 7)
   09:00  Field trip – South Cove (Notoplana, Tubulanus, Tetrastemma)
MW   13:15  Lecture: Phylum Platyhelminthes (Turbellarians) (Ch. 8, pgs. 147-155)
       14:30  Lab: Platyhelminthes Lab (Turbellarians)
Turn in Lab Notebooks
Week 3
4/14 15:27/ +0.2 ft.
MW 08:30 Lecture: Platyhelminthes (Parasitic Classes)  
(Ch. 8, pgs. 156-168) + (NPR Radiolab “Parasite” Podcast)
RE 11:00 Lecture: Nemertea (Chapter 11)
13:15 Lab: Nemertea
15:00 Field trip: Portside Mudflat

4/16 17:12/ +0.21 ft.
08:30 Midterm Exam I (through Platyhelminthes)
MW 11:00 Lecture: Phylum Annelida I – intro (Chapter 13)
MW 13:15 Lecture: Annelida II (Chapter 13)
14:30 Lab: Annelida Dissection

Week 4
4/21 09:01/ -1.28 ft. (sunsrie 6:25am)
07:00 Field trip to Lighthouse Beach & Lighthouse Island  (chitons and gastropods)
MW 11:00 Lecture: Annelida III (Chapter 13)
13:15 Lab: Annelida Diversity

4/23 10:39/ -0.44 ft.
RE 08:00 Lecture: “Phylum” Sipunculida (Chapter 13, pgs. 314-318)
09:15 Field trip to Domehouse Mudflat (for bivalves next week)
13:15 Laboratory – Sipunculids – peanut worms
RE 15:30 Lecture: Phylum Mollusca Intro + Class Polyplacophora  
(Chapter 12, pgs. 215-222, 265-271)

Week 5
4/28 15:23/ 1.4 ft.
08:30 Lab: Chiton Diversity
JV 10:00 Lecture: Mollusca, Class Gastropoda (Chapter 12, pgs.224-236)
13:15 Lab: Gastropod Diversity

4/30 04:50/ 1.66 ft.
08:00 Boat trip (possibly move BT to 4/28?)
MW 13:30 Lecture: Mollusca, Class Bivalvia + Class Scaphopoda (Chapter 12, pgs. 237-255)
14:30 Lab: Bivalve Diversity, Behavior and Dissection

Week 6
5/5 07:57/ -0.57 ft. (sunsrie 6:05am)
06:30 Field trip to Charlie’s Grotto
MW 11:00 Lecture: Mollusca, Class Cephalopoda (Chapter 12, pgs. 255-264)
13:15 Lab: Squid Dissection and Video
5/7 09:16/ -0.69 ft.
07:30  Field trip to TBA (+ TA crab pots out)
MW 11:00 Lecture: Phylum Arthropoda + Chelicerata (Chapter 14, pgs. 341-358)
RE 13:15 Lecture: Arthropoda, Crustacea I (Class: Branchiopoda) (Ch. 14, pgs. 379-380)
14:30 Lab: Crustacea I, Branchiopoda (Artemia, Cladocera)

Week 7
5/12 13:49/ 0.39 ft.
08:30 Midterm II
MW 11:00 Lecture: Arthropoda, Crustacea II - Intro. Malacostracans + Decapods (Chapter 14, pgs. 373-379)
13:15 Lab: Crab Dissection

5/14 15:47/ 0.86 ft
MW 08:30 Lecture: Arthropoda, Crustacea III – Peracarida (Chapter 14)
10:00 Lab: Malacostracan diversity (or just decapods diversity if we can’t squeeze in peracarids).
RE 13:15 Lecture: Arthropoda IV: (Classes Copepoda, Ostracoda, Cirripedia) (TA plankton tow for pm lab) (Chapter 14, pgs. 373, 381-391)
14:30 Laboratory: Cirripedia + crustaceans in plankton
Lab Notebooks due (II)

Week 8
5/19 07:57/ -1.72 ft. (sunrise 5:49am)
06:30 Field trip to Squaw Island
RE 11:00 Lecture: Phylum Echinodermata Intro. (Chapter 20)
RE 13:15 Lecture: Echinodermata, Classes: Stelleroidea and Ophiuroidea (Chapter 20, pgs. 503-509)
14:30 Laboratory: Asteroid and Ophiuroid Diversity

5/21 09:25/ -1.09 ft.
07:30 Field trip to North Cove (bryozoans + hemichordates)
RE 11:00 Lecture: Echinodermata, Classes Echinoidea & Holothuroidea (Chapter 20, pgs. 509-521)
13:15 Lab: Echinoidea and Holothuroidea Diversity, Holothurian Dissection

Week 9
5/26 13:27/ 1.45 ft.
MW 08:30 Lecture: “Lophophorates” Intro. and Bryozoa (Chapter 19, 480-489)
10:00 Laboratory: Bryozoa
RE 13:15 Lecture: Phyla Phoronida and Brachiopoda (Chapter 19, 474-480)
14:00 Lab: Phoronida (1 or 2 species)
15:30 STUDENT TALKS I (6)
5/28  15:09/2.06 ft.
RE  08:30  Lecture: Phylum Chordata, Subphylum Tunicata (= Urochordata) (Chapter 23)
     10:00  Lab: Ascidian diversity
RE  13:15  Lecture: Chordata, Subphylum Cephalochordata (Chapter 23, pgs. 548-551)
     15:30  STUDENT TALKS II (6)

Week 10
6/2  06:59/ -0.92 ft. (05:39 PDT  Sunrise)
   06:00  Field trip to North Cove at Cape Arago
RE  10:00  Lecture: Phylum Hemichordata (Chapter 21)
       11:00  Lab: Hemichordate (draw one 😊)
MW  13:15  Lecture: Phylum Nematoda (Chapter 16)
       14:30  Lab – Nematoda
       15:30  STUDENT TALKS III (6)

6/4  8:18/ -1.31 ft.
   06:30 Field trip to Middle Cove.
       13:00 Midterm III
       16:00 Lab cleanup
       Notebooks due

Week 11 (Finals Week)
6/9  12:09/ 0.13 ft.
    no class, no final
Syllabus for INVERTEBRATE ZOOLOGY (BI 451/551, 8 credits), Spring 2015

COURSE GOALS/LEARNING OUTCOMES

Student will:
1) Learn to use marine invertebrates as models to understand general biological processes
2) Develop an understanding of the unifying features across organisms while appreciating the unique morphological, physiological and ecological diversity of organisms.
3) Learn to evaluate relationships between structure and function by examining how organisms accomplish activities such as locomotion, feeding, growth, respiration, excretion and reproduction.
4) Develop working knowledge of Oregonian and northeastern Pacific marine invertebrates accessible in their local habitats and environments.


You will have access to the lab 24/7. We will be in the lab Tuesdays and Thursdays and likely on other occasions as well. You are welcome to drop by our offices/labs (Richard in Tyler lab and Maya in library beside Barb) if you have questions. If we are unavailable at that time, we can make an appointment to meet you. We will have field trips to local habitats, often starting early in the morning depending on the tides.

Course Requirements and Evaluations:
Your final grade will be determined by a combination of three midterm exams, your laboratory notebook, and a presentation on a phylum or class of invertebrates that Richard and Maya are unable to cover this term (see attached list of potential phyla/classes and further discussion below). Material covered on midterms will include lectures, lab materials, and assigned readings (see above schedule). Attendance on all field trips, in all laboratory sessions, and all lectures and student talks is required.

Notebooks – 30% (10% each time hand in)
Midterms – 60% (3 midterms at 20% each)
Student presentation – 10%

You need to have:

1) textbook (specifics above)
2) A lecture notebook
3) A separate lab notebook – loose leaf notebook with unlined paper in 3-ring binder.
4) Rite-n-Rain notebook for field notes (in office)
5) Dissecting tools – forceps, scissors, scalpel, disposable blades, probe, plastic ruler
6) Memory stick
7) Full raingear and rubber boots
Lab Notebook

We will not have a formal lab manual that guides you through each lab but will typically have a lab handout to give some guidance (e.g. helpful diagrams for dissections, recommendations for organisms to look at). You will be drawing a diversity of organisms for most taxonomic groups, combined with notes on any exercises we do in lab. You don’t have to draw everything you see in lab but drawing thorough examples of different groups for each phylum is important.

Your lab notebook should include:

1. Drawings, descriptions, and notes on observations of animals you examine in lab
2. Accurate labeling of anatomy of live and dissected animals
3. Classification for each animal (starting with Phylum and working down to Genus and species)
4. Some indication of size scale for each drawing (field of view and magnification)
5. Notes on lab exercises
6. Field information for the organisms you describe (e.g. habitat, ecological associations etc.)

Jenna Valley’s (former invert zoo student) lab notebook is on display in the back of the lab as an A+ sort of notebook. But note, artistic ability is not graded, just thoroughness!

The notebook will be graded on:

1. Number of animals drawn (a representative number for each taxonomic group available in lab)
2. Description of organism/correct anatomical labeling
3. Classification and scale for each specimen drawn
4. Observations (e.g. ecology, habitat collected from, lifecycle, if pertinent)
5. Detailed notes on all fellow student talks

Student Interest Talk

Invertebrates represent 97% of all animal species on the planet. In this course we will focus on local marine invertebrates. Luckily for us, there is an amazing diversity in local habitats. Even so, there are many phyla and large classes of invertebrates that we will not be able to cover given time constraints. With that said, many of the taxonomic groups are awesome, unique, and exciting and we would like to know which of these interests you. With that in mind, we are asking you to find a phylum, class or other group we are not covering this term (see attached list of possibilities or run another group by us) and give an 8 min. (ca. 5 slide maximum) presentation on the group. We will have a sign-up sheet in the lab so each person will cover a different group of inverts.
These talks should include:

1. Taxonomic placement (brief mention so we know possible relationship to other groups)
2. Important morphological characteristics
3. Important systems (e.g. digestive, reproductive etc.)
4. Whatever 3 to 4 things you find most interesting about the group of inverts (e.g. lifecycle, feeding, locomotion, ecology, symbiotic relationships, whatever).

Your talk will be evaluated based on the average scores of your peers, combined with instructor scores.
Potential Taxa for Student Presentations

I. Phylum Placozoa
II. The Mesozoans
III. Phylum Rotifera
IV. Phylum Acanthocephala
V. Phylum Gnathostomulida
VI. Phylum Micrognathozoa
VII. Phylum Mollusca, Class Aplacophora
VIII. Phylum Mollusca, Class Monoplacophora
IX. Phylum Arthropoda – any small groups we don’t get to cover (e.g. marine insects, stomatopods, krill)
X. Phylum Tardigrada
XI. Phylum Onychophora
XII. Phylum Nematomorpha
XIII. Phylum Priapulida
XIV. Phylum Kinorhyncha
XV. Phylum Loricifera
XVI. Phylum Gastrotricha
XVII. Phylum Chaetognatha
XVIII. Phylum Cycliphora
XIX. Phylum Chordata, Subphylum Urochordata, Class Larvacea

A fossil group of rank similar to above, but not currently living – e.g. there are many classes of extinct echinoderms, a number classes/orders of extinct mollusks, etc.)