This course will review marine invertebrate diversity via lectures and practicals as well as a short research project. Lectures on the diversity of animals will be followed by practicals looking at prepared materials with both stereo- and compound microscopes. There will be displays of materials from the SIO Benthic and Pelagic Invertebrates Collections and dissections of fresh/living material. The course will be held in room 3300 Hubbs Hall. Lectures will start at 12.30 followed by a short break followed by the lab session in the same room until 6.00.

SIO184 is conjoined with SIO 284; This year there are ~29 undergraduates and ~7 graduates.
A short (~ 7-8 minute) project seminar for the class with a write-up of the project is required at the end of the course (30%). The project will be a review of a current interesting topic or controversies of particular marine invertebrate group. There will be a mid-term (15%) and final exam (30%); lab/drawing books will be marked (20%). For graduate students who participate in the course a more critical, extensive and detailed project write-up is required. 5% will be awarded for participating in a class project generating online content.

**Getting to Hubbs Hall**
From the main campus catch the SIO Shuttle, which leaves every 15 minutes.

http://blink.ucsd.edu/facilities/transportation/shuttles/SIO.html

*Note:* the Shuttle has **limited** capacity so if you all try and get the 12.15 shuttle some of you will miss out! So my advice is to plan on the 11.45 or 12.00 shuttles and go for the 12.15 only as last option. Get off the Shuttle at the IGPP or Vaughn Hall stops and walk to Hubbs Hall; go into either the 4th or 3rd floor east doors; the rest are always locked and make your way to the northeast corner of the 3rd floor where you will find the laboratory 3300. Please try to have eaten your lunch by the time you get to the lab. No food or drink are allowed to be consumed in the lab. There are nice places to eat your lunch around Hubbs and enjoy the view.

**Text:**
None required

**Dissecting kit**
Please buy and bring a dissecting kit by week 2. See examples at the links below.

http://webmedbooks.com/ucsd/content/productdetail.aspx?upc=f6abf8ba-db0b-4439-8962-b0642ba5b0d0/id=1/sid=3359fa83-2c29-4d9a-b8d8-ec4acea32a58/


**Lab policy**
This is a laboratory so you must wear closed-toe shoes. You will be asked to leave if you don’t have them on. There will be dissections and lots of seawater so you may want to wear a lab coat if you have one. No food or drink is to be consumed in the lab.

**Lab Notebook**
There will be a Blackboard site for course content and lectures and labs will be uploaded at least the day before. There is wireless access in HH3300. Printouts of practicals will be provided but not lecture notes. For your practical lab work, bring either a drawing book or a folder with **BLANK (unlined)** pages. It will be collected and marked twice (= 20% of your grade). All drawings must be done with a pencil (soft= HB or softer).

**Class times Tuesdays and Thursdays 12.30 to 6.00**

**Office hour for Greg is Thursday 11-12. Josefin and Brock will announce their available times.**
Syllabus

One hour lecture followed by a ~4.5 hour practical, twice a week. A project on aspects of a species or group will be required for each student to be presented as a 10 minute talk and a 4 page writeup at the end of the course. We will also do an online group project.

Lectures
Week 1
Tuesday Jan 6: Introduction to systematics, phylogenetics and the Animal tree of life (Metazoa)
Thursday Jan 8: Animal tree of life (Metazoa), Choanoflagellates, Porifera and Placozoa

Week 2
Tuesday Jan 13: Cnidaria and Ctenophora
Thursday Jan 15: Acoelomorpha (basal Bilateria), Orthonectida and Dicyemida, Platyzoa (Platyhelminthes)

Week 3
Tuesday Jan 20: Other Platyzoa (Gnathostomulida, Micrognathozoa, Gastotricha, Rotifera incl. Acanthocephala); Chaetognatha and Polyzoa (Bryozoa and Entoprocta)
Thursday 22: Nemertea and Brachiopoda (incl. Phoronida)

Week 4
Tuesday Jan 27 Molluscs I
Thursday Jan 29 Molluscs II

Week 5
Tuesday Feb 3: Mid-Term Exam 12.30 to 1.50; lecture 2.00 to 2.50 Annelida 1
Thursday Feb 5: Annelida 2: more polychaetes and Clitellata

Week 6
Tuesday Feb 10: Ecdysozoa 1 (Priapulida, Loricifera, Kinorhyncha, Pycnogonida, Tardigrada)
Thursday Feb 12: Ecdysozoa 2 (Chelicerata, Crustacea 1)

Week 7
Tuesday Feb 17: Ecdysozoa 3 (Crustacea 2)
Thursday Feb 19: No lecture: Low tide excursion to Dike Rock to observe; followed by sorting and identifying in the lab. Low tide at 1.40: -0.35 foot.

Week 8
Tuesday Feb 24: Echinodermata
Thursday Feb 26: Hemichordata, Urochordata, Cephalochordata

Week 9
Tuesday March 3: Guest lecture
Thursday March 5: Pelagic marine invertebrates

Week 10
Tuesday March 10: Deep sea invertebrate diversity
Thursday March 12: No lecture, presentations
Practicals

**Week 1**

**Tuesday Jan 6:** Introduction to phylogenetics, taxonomy tree building and reading evolutionary trees  
**Thursday Jan 8:** Tours of the Experimental Aquarium; Benthic Invertebrate and Pelagic Invertebrate Collections.

**Week 2**

**Tuesday Jan 13:** Porifera. Slides = *Grantia, Spongilla, Gemmules,* (live *Spongilla*?); various live sponges. Spicule preparation and drawings.  

**Week 3**

**Tuesday Jan 20:** Acoela, Mesozoa, Platyzoa I. Octopus kidney for dicyemids; Whole mount Planaria, TS Planaria. Live flatworms. Horned snail and trematodes, *Clonorchis* slide and lifecycle.  
**Thursday Jan 22:** Platyzoa 2 (Rotifera incl. Acanthocephala) and Polyzoa (Bryozoa and Entoprocta), Chaetognatha. Live Rotifera, Slide of Acanthocephala, Various live Bryozoa. Draw polyps.

**Week 4**

**Tuesday Jan 27:** Kryptrochozoa = Nemertea and Brachiopoda (incl. Phoronida). Dissect and draw live brachiopod (*Terebratalia*) and phoronids. Live Nemertea. Sections of Nemertea  
**Thursday Jan 29:** Molluscs I Chiton radula preparation, bivalve gill TS; bivalve dissection, bivalve diversity. Displays of Aplacophora, Polyplacophora, Scaphopoda and Bivalvia

**Week 5**

**Tuesday Feb 3:** After Midterm 2.50 onwards Molluscs II Squid dissection; Gastropod radula. Displays of Gastropoda and Cephalopoda diversity  
**Thursday Feb 5:** Annelida I. Display of many different polychaetes. TS polychaete drawing and Parapodia preparation. Filter feeding (serpulids and or sabellariids). Draw various anteriors. Hand in lab book.

**Week 6**

**Tuesday Feb 10:** Annelida II + Project planning. Clitellate earthworm sections; Leech whole mount, observe and draw marine leech.  
**Thursday Feb 12:** Kinorhyncha, Pycnogonida, Tardigrada, Chelicerata (*Limulus*) Pycnogonid drawing and live observation. Tardigrade drawing and live observation

**Week 7**

**Tuesday Feb 17:** Crustacea I. Barnacle dissection. Barnacle nauplii; Ostracoda, Maxillipoda  
**Thursday Feb 19:** Low tide excursion to Dike Rock: Low tide excursion to Dike Rock to collect; followed by sorting and identifying in the lab. **Low tide at 3.30:** -1.22 ft.
Week 8


Week 9

Tuesday March 3: Hemichordata, Urochordata, Cephalochordata

Thursday March 5: Plankton Lab; collect off the SIO pier, sort and identify

Week 10

Tuesday March 10: Revision Laboratory and/or Start Project presentations. Hand in lab book.

Thursday March 12: Project presentations

Writeup for Projects are due 5 pm Friday March 13

Final Exam: (To be confirmed) MARCH 17: 11.30-2.30 at Hubbs Hall 3300