This course will review marine invertebrate diversity via lectures (all by Greg) and practicals (led by Greg with TA's) as well as a literature review 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.

In 2017, SIO184 has ~33 undergraduates and ~3 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 (10% talk, 20% writeup = 30%). The project will be a review of a current interesting topic or controversies of particular marine invertebrate group. There will be a midterm (15%) and final exam (30%); lab/drawing books will be marked (20%). 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 (the south balconies on the 2 to 4th floors) and enjoy the view.

**Text:**
The recommended (not obligatory) text is *Invertebrates* 3rd Edition. Brusca, Moore and Shuster. 2016. Sinauer


**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-ec4ace3a3a58/


**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 TritonEd 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).

An example drawing book is this

Class times Mondays and Wednesday 12.30 to 6.00
Office hour for Greg is Monday 11-12. Nicole and Sonya will announce their times.

**Syllabus**

~Lecture (1230) followed by a ~4.5 hour practical, twice a week. A project on aspects of a species or group will be required; to be presented as a 7-8 minute talk and a 4-5 page writeup at the end of the course. We will also do an online group project.

**Lectures**

**Week 1**

**Monday Jan 9:** Introduction to systematics, phylogenetics and the Animal tree of life (Metazoa)

**Wednesday Jan 11:** Animal tree of life (Metazoa), Choanoflagellates, Porifera and Placozoa

**Week 2**

**Monday Jan 16:** Martin Luther King Jr. Day

**Wednesday Jan 18:** Cnidaria and Ctenophora

**Week 3**

**Monday Jan 23:** Other Platyzoa (Gnathostomulida, Micrognathozoa, Gastotricha, Rotifera)

**Wednesday 25:** Chaetognatha and Polyzoa (Bryozoa and Entoprocta)

**Week 4**

**Monday Jan 30** Nemertea and Brachiopoda (incl. Phoronida)

**Wednesday Feb 1** Molluscs II

**Week 5**

**Monday Feb 6:** Molluscs II

**Wednesday Feb 8:** Mid-Term Exam 12.30 to 1.50; lecture 2.00 to 2.50 Annelida 1

**Week 6**

**Monday Feb 13:** Annelida 2: more polychaetes and Clitellata

**Wednesday Feb 15:** Ecdysozoa 1 (Priapulida, Kinorhyncha, Pycnogonida, Tardigrada)

**Week 7**

**Monday Feb 20:** Ecdysozoa 2 (Chelicerata, Crustacea 1)

**Wednesday Feb 22:** Ecdysozoa 3 (Crustacea 2)

**Week 8**

**Monday Feb 27:** Echinodermata

**Wednesday March 1:** Hemichordata, Urochordata, Cephalochordata

**Week 9**

**Monday March 6:** Pelagic marine invertebrates

**Wednesday March 8:** No lecture: Low tide excursion to Dike Rock to observe; followed by sorting and identifying in the lab. **Low tide at 3.44: -0.6 foot.**

**Week 10**

**Monday March 13:** Deep sea invertebrate diversity

**Wednesday March 15:** No lecture, presentations
Practicals

Week 1
Monday Jan 9: Introduction to phylogenetics, taxonomy tree building and reading evolutionary trees
Wednesday Jan 11: Tours of the Experimental Aquarium; Benthic Invertebrate and Pelagic Invertebrate Collections.

Week 2
Monday Jan 16: Martin Luther King Jr. Day

Week 3
Wednesday Jan 25: Acoela, Mesozoa, Platyzoa I. Octopus kidney for dicyemids; Whole mount Planaria, TS Planaria. Live flatworms. Horned snail and trematodes, Clonorchis slide and lifecycle

Week 4
Wednesday Feb 1: Kryptrochozoa = Nemertea and Brachiopoda (incl. Phoronida). Dissect and draw live brachiopod (Terebratalia) and phorons. Live Nemertea. Sections of Nemertea

Week 5
Monday Feb 6: Molluscs I Chiton radula preparation, bivalve gill TS; bivalve dissection, bivalve diversity. Displays of Aplacophora, Polyplacophora, Scaphopoda and Bivalvia
Wednesday Feb 8: After Midterm 2.50 onwards Molluscs II Squid dissection; Gastropod radula. Displays of Gastropoda and Cephalopoda diversity

Week 6
Wednesday Feb 15: Annelida II + Project planning. Clitellate earthworm sections; Leech whole mount, observe and draw marine leech.

Week 7
Wednesday Feb 22: Crustacea I. Barnacle dissection. Barnacle nauplei; Ostracoda, Maxillipoda
**Week 8**

**Monday Feb 27: Crustacea II.** Crab dissection. Crab zoea, crab megalopa. Various Malacostraca to examine.

**Wednesday March 1: Echinodermata.** Sea urchin fertilization and dissection. Draw sand dollar. Tube feet slide, TS seastar arm. Displays of Asteroidea, Ophiuroidea, Crinoidea, Holothuroidea, Echinoidea.

**Week 9**

**Monday March 6: Hemichordata, Urochordata, Cephalochordata**

**Wednesday March 8: Low tide excursion** to Dike Rock: Low tide excursion to Dike Rock to collect; followed by SIO pier collect plankton, sort and identify sorting and identifying in the lab. **Low tide at 12:53 PM -0.8.**

**Week 10**

**Monday March 13: Revision Laboratory and/or Start Project presentations. Hand in lab book.**

**Wednesday March 15: Project presentations**

**Writeup for Projects are due 5 pm Friday March 17**

**Final Exam: (To be confirmed) MARCH 21: 11.30-2.30 at Hubbs Hall 3300**