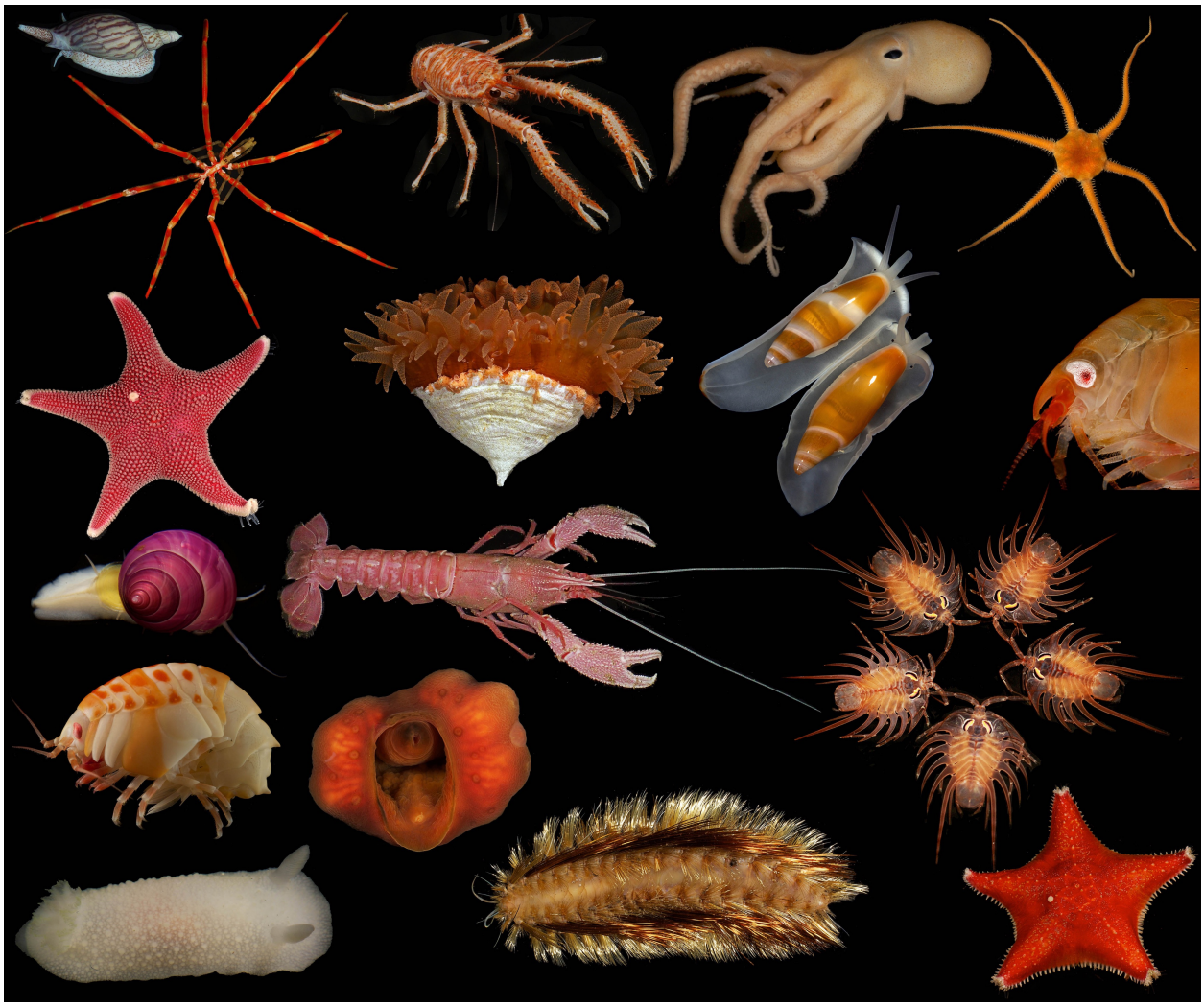
SIO184 Marine Invertebrates, 6 Units

Class times: Monday and Wednesday 0900-1430
Where: 3300 Hubbs Hall
Greg Rouse (grouse@ucsd.edu); 858-534 7973
TA: Dakota Betz ddbetz@ucsd.edu



This course will review marine invertebrate diversity via lectures (Greg) and practicals (Greg with TA Dakota) 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 Invertebrate Collections and dissections of fresh/living material. The course will be held in room 3300 Hubbs Hall. Lectures will start at 0900 followed by a short break followed by the lab session in the same room until 14.20. In 2024, SIO184 has ~30 undergraduates and ~6 graduates.

A short (~ 10 minute) project seminar for the class with a write-up of the project is required (10% talk, 20% writeup= 30% of total grade). A separate guide for this is available. 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 (15%). Attendance is required and will be noted for all classes (5%) along with a

weekly short quiz (5%). Missing more than a class without a doctor's certificate or equivalent means you lose 5%.

Getting to Hubbs Hall

From the main campus catch the SIO Shuttle, which leaves every 15 minutes:
https://transportation.ucsd.edu/campus/shuttles/sio.html

Note: the Shuttle has **limited** capacity so please plan accordingly to be at the lecture on time at 0900. Get off the Shuttle closest to Hubbs Hall and go into the 4th floor east door (the rest are always locked) and make your way to the northeast corner of the 3rd floor where you will find the laboratory 3300. No food or drink are allowed to be consumed in the lab. There are nice places to take a break from the lab section eat a quick lunch around Hubbs (the south balconies on the 2nd to 4th floors) and enjoy the view.

Text:

The recommended (not obligatory at all) text is *The Invertebrate Tree of Life*, Gonzalo Giribet and Gregory Edgecombe (Your can get it **MUCH** cheaper on Amazon or other sellers)
https://press.princeton.edu/books/hardcover/9780691170251/the-invertebrate-tree-of-life

Dissecting kit

Will be provided. **If you want your own this is a good basic option:**
https://www.amazon.com/DR-Instruments-61936PCT-Precision-Dissection/dp/B00TAA0P6A/ref=lp_7656075011_1_6?s=industrial&ie=UTF8&qid=1553623941&sr=1-6

Lab policy

This is a laboratory class 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 Canvas site for course content and lectures and labs will be uploaded at least the day before. Lectures are **not** being recorded. 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) good quality** pages, **8 1/2 by 11 inches** (see link below for example). It will be collected and marked twice (7.5% each time= 15% of your total grade). All drawings must be done with a pencil (soft= HB or softer).

An example drawing book is this:
https://www.amazon.com/Pentalic-Sketch-Hardbound-2-Inch-11-Inch/dp/B0025TV24C/ref=sr_1_4?ie=UTF8&qid=1482185848&sr=8-4&keywords=sketch+book

Office hours (please email to book):
Greg, Wed.10-11 (HH2170) (email for Zoom link)
Dakota

Academic Integrity is expected. Cheating will not be tolerated.
https://academicintegrity.ucsd.edu/forms/form-pledge.html

Syllabus

~Lecture (1.30) 50 minutes followed by a ~4 hour practical, twice a week.

Lectures

Week 1

Tuesday January 9: Introduction to systematics, phylogenetics and the Animal tree of life (Metazoa)

Thursday January 11: Choanoflagellates, Porifera, Ctenophora and Placozoa

Week 2

Tuesday January 16: Cnidaria

Thursday January 18: Xenacoelomorpha, Rouphozoa (Gastotricha, Platyhelminthes), Mesozoa

Week 3

Tuesday January 23: Protostomes/Deuterostomes, Chaetognatha and Gnathifera (Gnathostomulida, Micrognathozoa, Rotifera)

Thursday January 25: Nemertea, Lophophorata (Brachiopoda, Phoronida, Bryozoa & Entoprocta)

Week 4

Tuesday January 30: Molluscs I

Thursday February 1: Molluscs II

Week 5

Tuesday February 6: Annelida 1

Thursday February 8: Mid-Term 9-1020

Week 6

Tuesday February 13: Annelida II: more polychaetes and Clitellata

Thursday February 15: Ecdysozoa I (Priapulida, Kinorhyncha, Pycnogonida, Tardigrada)

Week 7

Tuesday February 20: Ecdysozoa II (Onychophora, Myriapoda, Chelicerata)

Thursday February 22: Ecdysozoa III (Crustacea)

Week 8

Tuesday February 27: Echinodermata I

Thursday February 29: Echinodermata II, Hemichordata

Week 9

Tuesday March 5: Urochordata, Cephalochordata

Thursday March 7: Pelagic marine invertebrates

Week 10

Tuesday March 12: Deep sea invertebrate diversity, sampling and imagery

Thursday March 14: No lecture Projects presentations

Practicals

Week 1

Tuesday January 9: Introduction to phylogenetics, taxonomy tree building and reading evolutionary trees.

Thursday January 11: Porifera and Ctenophora. Drawing and microscopes introduction. Slides = *Grantia, Spongilla*, Gemmules, Various live sponges. Spongilla, Spicule preparation and drawings.

Week 2

Tuesday January 16: Cnidaria. Live: cup corals, corals, anemones, sea pansy, hydroids. Live *Aurelia* for life cycle. Sections of anemone (*Metridium*), Slides of *Obelia* polyps and medusa, *Physalia*. **Hydra**; Firing nematocysts exercise.

Thursday January 18: Rouphozoa (Platyhelminthes+ Gastotricha)
Whole mount Planaria, TS Planaria. **Live Planaria.** Horned snail and trematodes, *Clonorchis* slide and lifecycle. **Gastrotricha (*Lepidermella*)**

Week 3

Tuesday January 23: Gnathifera (Rotifera incl. Acanthocephala and Chaetognatha), and **Lophophorata I** (Bryozoa and Entoprocta). **Live Rotifers (Mixed *Monostyla* and *Philodina*) and *Brachionus*,** Slides of Acanthocephala, Various live Bryozoa. Draw polyps. Chaetognatha live if possible.

Thursday January 25: Lophophorata II (Brachiopoda and Phoronida) **Nemertea.** Dissect and draw live brachiopod (*Terebratalia*). Live Nemertea. Sections of Nemertea and Phoronida

Week 4

Tuesday January 30: Molluscs I Chiton radula preparation, bivalve gill TS; bivalve dissection, bivalve diversity. Displays of Aplacophora, Polyplacophora, Scaphopoda and Bivalvia

Thursday February 1: Molluscs II Squid; radula. Gastropoda & Cephalopoda diversity

Week 5

Tuesday February 6: Annelida I. Display of many different polychaetes. TS polychaete drawing. Filter feeding (*Chaetopterus*). Draw various anteriors.

Thursday February 8: Annelida II. Parapodia preparation. Filter feeding (serpulids and or sabellariids). Clitellate earthworm sections; Leech whole mount, observe and draw live ***Dero* and *Aeolosoma*. Tidy up and hand in lab book.**

Week 6

Tuesday February 13: Nematoda, Pycnogonida, Tardigrada, Chelicerata (*Limulus*). **Nematodes (*C. elegans*, *Cephalobus*)**, pycnogonids, **tardigrade** drawing and live observation.

Thursday February 15: Crustacea I. Ostracoda, , ***Daphnia*, *Artemia*,** Barnacle dissection. Barnacle nauplei;

Week 7

Tuesday February 21: Crustacea II. Copepoda, Amphipoda, Isopoda (**Pill bugs)**, Leptostraca drawings

Thursday February 23 Crustacea III. Crab dissection. Crab zoea, crab megalopa. Various Malacostraca to examine.

Week 8

Tuesday February 28: Echinodermata. Sea urchin fertilization and dissection. Draw sand dollar. Tube feet slide, TS seastar arm. Displays of Asteroidea, Ophiuroidea, Crinoidea, Holothuroidea, Echinoidea.

Thursday March 2: Hemichordata, Urochordata, Cephalochordata

Dissect solitary ascidian and draw. Draw ascidian ‘tadpole’. Live Amphioxus, Displays of specimens.

Week 9

Tuesday March 5: Biodiversity knowledge and reinforcement. Sort, identify and draw 5 planktonic organisms. Revision Laboratory.

Thursday March 7: Biodiversity knowledge and reinforcement. Tour Benthic Invertebrate and Pelagic Invertebrate Collections; Sort, identify and draw a 5 intertidal benthic organisms. **Hand in lab book.**

Week 10

Tuesday March 12: Project Presentations

Thursday March 14: Project Presentations

Writeup for Projects are due 11:59 pm, Saturday March 16.

Final Exam: ????? at Hubbs Hall 3300