

**SIO 131 Parasitology DRAFT**  
Spring 2018

**Course Instructor:**

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**Teaching Assistant:**

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**Course structure:** Two sessions/week on M & W, 12:30pm – 6:00pm in Hubbs Hall 3300. We will start off each session with a 1-1.5 h lecture, followed by a 4-4.5 h laboratory.

**Course Description:** An ecological approach to parasitology. Students will gain the intellectual and practical foundation required to undertake parasitological research. **Lectures** will cover ecological/evolutionary concepts and the biology (e.g., morphology, life cycles, and physiology) of various parasitic taxa. In **laboratories**, students will learn how to (1) survey hosts for parasites, (2) collect, study, & identify parasites, and (3) collect and analyze parasitological data. Students will also **develop scholarship and critical-thinking skills** by delving into the scientific literature and giving a short presentation at the end of the course.

We will dissect live hosts and examine live parasites in the labs. We emphasize marine hosts and parasites, but include some terrestrial parasites. We emphasize metazoan parasites, but include some eukaryotic single-celled parasites. The concepts and skills learned will apply broadly to other types of parasite-host systems.

**Laptop:** Students are required to bring a laptop to the lab. We will use them in almost every lab.

**Textbook (required—bring ideally to 1<sup>st</sup> lab, 2<sup>nd</sup> at latest!):** Goater, Goater, & Esch (2014) Parasitism: the diversity and ecology of animal parasites (2<sup>nd</sup> ed.). Cambridge University Press. *This book includes many of the concepts covered in lecture, but will also serve as a reference for the laboratory.*

**Textbook (recommended):** Roberts, Janovy, & Nadler (2013) Foundations of Parasitology (9<sup>th</sup> edition). McGraw Hill. *This book provides much more in depth and extensive details on the biology of classical parasite groups. It can serve to fill in a lot of detail missing in Goater et al. (2014).*

**Textbook (recommended):** Loker & Hofkin (2015) Parasitology: a conceptual approach. Garland Science. *This book does the most thorough job of covering concepts in parasitology, but does not provide much information on basic biology (which we need in the laboratory).*

**Lab notebook:** Get and bring a bound “drawing” book or a ring-bound folder with unlined pages. All drawings must be done with a soft-leaded pencil (HB or softer). Your lab book will be collected and graded

**Dissecting kit:** We are providing each student with a “dissecting” kit (checked out for quarter)!

**Lab policy:** You must wear closed-toe shoes (even I will, darn it). You will be asked to leave if you don't have them on. No food or drink is to be consumed in the lab. I advise eating lunch beforehand.

**Getting to Hubbs Hall:** From the main campus catch the SIO Shuttle, which leaves every 15 minutes (<https://transportation.ucsd.edu/shuttles/sio.html#Fall,-Winter-and-Spring-Academi>). The shuttle has limited capacity, so if you all try and get the 12:15 shuttle, some of you will miss out! I strongly advise you to take the 11:45 or 12:00 shuttle; go for 12:15 as last option. Come early and eat lunch around Hubbs Hall—there are nice places on the ground or south-side balconies! 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; make your way to the northeast corner of the 3rd floor, where you will find the laboratory 3300.

**TritonEd web site:** I will likely post things on the course page on TritonEd.

**Grading:**

Midterm Exam	15%
Final Exam	25%
Practical	20%
Project/presentation	20%
Lab book	20%

**Schedule:**

We ek	Lec- ture	Date	Major concept	Taxa	Lab (in addition to the below, labs will sometimes have demonstration material)
1	1	Mon 02 Apr 18	Course logistics; definitions of parasite; trophic strategies	Trematoda 1	(1) Intro to lab; lab notebooks (drawing & note-taking); sample data; (2) horn snails & trematode parthenitae/cercariae, (3) use of a key.
	2	Wed 04 Apr 18	Parasite increased trophic transmission	Trematoda 2	(1) Data management, sample collection, photo-documentation; (2) Examine & survey 2nd intermediate host jackknife clams for trematode metacercariae; (3) metacercaria excystation, anatomy.
2	3	Mon 09 Apr 18	Direct/indirect transmission; complex life cycles	Trematoda 3	(1) Analyze metacercaria abundance in jackknife clams; (2) Begin biannual horn-snail trematode survey; (3) Observe infection of jackknife clam feet by trematode cercariae
	4	Wed 11 Apr 18	Parasite population/ community structure	Turbellaria; Monogenea	(1) Cont. horn-snail trematode survey; (2) Observe infection of jackknife clam feet by trematode cercariae; (3) Data entry.
3	5	Mon 16 Apr 18	Host/site specificity	Cestoda 1	(1) Analyze horn-snail trematode data; (2) Process ghost shrimp for metacestodes, metacercariae, larval nematodes (collect for later); (3) Examine live oncospheres in beetles.
	6	Wed 18 Apr 18	Pathology & disease; ecological currencies	Cestoda 2; Acanthocephala	(1) Survey sand crabs for cystacanths, metacercariae, larval nematodes (all counts & body sizes); (2) Save nematodes for later; (3) Examine live cystacanths and adults from mullet; (4) Enter sand-crab data.
4	7	Mon 23 Apr 18	Host resistance	Nematoda 1	(1) Analyze sand-crab parasite data (examine parasite biomass vs numbers); (2) Survey <i>Tarphyota geniculata</i> rove beetle for <i>Proparasitylenchus</i> nematode castrator (confirm it is a castrator); (3) Examine <i>Proparasitylenchus</i> ; (4) Enter and analyze <i>Tarphyota</i> data.
	8	Wed 25 Apr 18	Coevolution	Nematoda 2; Nematomorpha	(1) Survey and examine topsmelt fish for adult <i>Spirocamallanus</i> nematodes (+monogeneans, metacercariae); (2) Enter and analyze <i>Spirocamallanus</i> abundance data.
5		Mon 30 Apr 18	<b>Midterm</b>		(1) Examine and key out previously collected nematodes (from topsmelt; sand crabs, ghost shrimp).
	9	Wed 02 May 18	Parasites & sexual reproduction	Amphipoda; Isopoda; Barnacles	(1) Survey <i>Chthamalus</i> and <i>Semibalanus</i> barnacles for pseudocastrator <i>Hemioniscus</i> isopods; (2) Examine <i>Hemioniscus</i> ; (3) Process <i>Hemigrapsus</i> shore crabs for

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					castrator <i>Portunion</i> isopods. (4) Enter data on barnacle and crab parasitism.
6	10	Mon 07 May 18	Co-speciation/ phylogenetic tracking	Insecta	(1) Analyze hemioniscid & entoniscid data; (2) FIELD beach collection of kelp fly pupae; (3) Survey kelp fly pupae for <i>Aleocara</i> parasitoid rove beetle; (4) Examine <i>Aleocara</i> ; (5) Enter parasitoid data.
	11	Wed 09 May 18	Vector transmission	Copepoda; Brachiura;	(1) Analyze parasitoid data; (2) Process yellowfin croakers fish for copepods (+adult tremas, adult/larva nemes, etc.); (3) Examine copepods, (4) fix adult trematodes for later staining/mounting;
7	12	Mon 14 May 18	Parasites vs. parasites	Myxozoa; Microsporidea	(1) Stain/mount/examine previously collected adult trematodes; (2) Survey arrow gobies for microsporan and myxozoan in kidney; (3) Examine microsporans and myxozoans
	13	Wed 16 May 18	Parasites & invasions	Amebozoa; Dinoflagellata; Trypano- somatida	(1) Process kelp flies for trypanosomes; (2) Geimsa stain trypanosomes; (3) Parasitic <i>Amoebophrya</i> in free-living <i>Karlodinium</i> dinoflagellates; (4) Survey <i>Paradinium</i> dinoflagellate of <i>Oithona</i> copepod.
8	14	Mon 21 May 18	Parasites & climate change	Apicomplexa- Coccidia, Haemosporida; Ciliata	(1) Count and measure size of stained trypanosomes; (2) Enter and analyze data of trypanosome load; (3) Survey & examine <i>Trichodina</i> ciliates from turban snails.
	15	Wed 23 May 18	Origination of/adaptations to parasitism	Apicomplexa- Gregarinasina	(1) Identify and process polychaetes for eugregarines; (2) Examine eugregarines; (3) Enter and analyze data.
9		Mon 28 May 18	<b>Memorial Day</b>		
	16	Wed 30 May 18	Parasite diversity	Other parasites 1	(1) Discovery session: survey new host species (TBD)
10	17	Mon 04 Jun 18	Parasites in ecosystems	Other parasites 2	<b>Lab practical</b>
		Wed 06 Jun 18	<b>Project presentations</b>		
		9-15 Jun 18	<b>Final</b>		