OCB 2003L: Introduction to Marine Biology Laboratory
Syllabus – Fall 2018

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Office Hours: Thursday 10:00-11:00 am, also by appointment

Course Description:
This course is an overview of marine organisms and concepts, with some focus on local South Florida ecosystems. There is a weekly quiz on the previous and current weeks' labs, one required field trip, and possibly one optional field trip. You will work in groups to get hands-on experience that will enhance your learning and develop your practical knowledge and skills. At the end of the semester, you will give a 5-10 minute presentation in class on a marine environmental issue of your choice. There will be 2 other assignments to prepare for the presentation.

Schedule:

DATE	WEEK #	TOPIC	SKILLS
8/23	1	Lab 1: Introductions & Scientific Method	Conceptual diagrams
8/30	**2**	**NO LAB**	**NO LAB**
9/6	3	Lab 2: Seawater Chemistry & Oceanography	Using chem. analytical tools
9/13	4	Lab 3: Dissecting Microscope, Microorganisms	Microscopes/Dichotomous key
9/20	5	Lab 4: Aquatic Vegetation	Chromatography/ Spectrophotometry
9/27	6	Lab 5: Mangrove ID/ Field Techniques ***Field Trip at BBC***	Observational & field techniques
10/4	**7**	**Midterm**	n/a
10/18	8 (Presentation Topic Due)	Lab 6: Lower Invertebrates	Dissections/Taxonomic classification
10/25	9	Lab 7: Molluscs, Arthropods & Echinoderms	Dissections/Anatomical Drawings/Taxonomic classification
11/1	10 (Presentation outline due)	Lab 8: Vertebrates: Bony & Cartilaginous Fish	Dissections/Anatomical Drawings
11/3	10	***Fieldtrip on SATURDAY***	Snorkeling, Real-time identification

11/8	11	Lab 9: Vertebrates: Birds & Mammals	Observational techniques/Taxonomic classification
11/15	**12**	**FINAL**	N/A
11/22	**13**	**THANKSGIVING BREAK- NO CLASS**	**NO CLASS**
11/29	14	Presentations	Oral & visual communication

Course Requirements:

- Must be available for one Saturday field trip to snorkel in Key Largo or Biscayne Bay.
- Personal Protective Equipment (PPE): Lab coat, goggles, long pants or long skirt, closed-toe shoes. You will not be allowed into the lab to take the quiz, exam, or participate without ALL your PPE.
- Print your own Lab Handout each week.
- Optional textbook: Laboratory and Field Investigations in Marine Life, ISBN:978-1-4496-0501-8
- Cooperative learning

Grading: 500 total points possible

12% Lab Participation & Notes (9 labs + 1 field trip)- 60 points
28% Weekly Quizzes (7 total)- 140 points
20% Practical Midterm- 100 pts
20% Practical Final- 100 pts
20% Presentation (5% Topic, 5% Outline & References, 10% In-lab Presentation)- 100 pts

Grade scale:

100 **<** A **≥** 92,
92 **<** A - **≥** 88,
88 **<** B+ **≥** 86,
86 **<** B **≥** 82,
82 **<** B - **≥** 79,
79 **<** C+ **≥** 76,
76 **<** C **≥** 72,
72 **<** C - **≥** 69,
69 **<** D **≥** 60,
60 **<** F

- There is no curve, extra credit, make-up labs, or make-up exams.
- Lowest quiz score is dropped.

Presentation Assignments:

Topic: A few (3-5) sentences on the marine environmental issue/event or organism you have chosen, including why this is an important or interesting topic. Must be printed out and turned in at the beginning of class (see schedule for due date).

Outline: Must include trustworthy references. Must include the topic, progression of ideas in your presentation, and general information about your topic. See example below. Must be printed out and turned in at the beginning of class (see schedule for due date).

Presentation: 5-10 minutes long. Must have a .ppt presentation emailed by beginning of class.

Example format if you are presenting on an issue/event: (Must be more expansive than example below)

Issue/Event: Sea Level Rise in South Florida

Problem/Cause: Global temperature rise, polar ice caps melting, coastal erosion

Importance: Greatly impacts economy and population of south florida, businesses, housing, etc

Solutions/Possible solutions: global scale: countrywide emissions control
local scale: beach restoration, giant seawall construction project

Implications/Repercussions: Loss of florida landmass, unsuitable living conditions, loss of tourism, loss of manufacturing, barriers to transportation, etc.

Example format if you are presenting on an organism:

Organism name: *Manta birostris* (Giant Oceanic Manta Ray)

Habitat & Distribution: Widespread distribution in tropical and temperate waters worldwide. Northern hemisphere: north as southern california and new jersey. South as peru and south africa.

Ecology: Ocean traveling species, spends majority of life far from land. Travels with currents, spends time near offshore oceanic islands. They are filter feeders and consume large quantities of zooplankton in the form of shrimp, krill, and planktonic crabs. An individual manta may eat about 13% of its body weight each week. Feeds on zooplankton and has few natural predators due to its size, including tiger sharks and hammerhead sharks.

Behavior: swims steadily in a straight line, while further inshore it usually basks or swims idly around. Mantas may travel alone or in groups of up to 50 and sometimes associate with other fish species, as well as sea birds and mammals. When foraging, it usually swims slowly around its prey, herding the planktonic creatures into a tight group before speeding through the bunched-up organisms with its mouth open wide. While feeding, the cephalic fins are spread to channel the prey into its mouth and the small particles are sifted from the water by the tissue between the gill arches. As many as 50 individual fish may gather at a single, plankton-rich feeding site.

The giant oceanic manta ray sometimes visits a cleaning station on a coral reef, where it adopts a near-stationary position for several minutes while cleaner fish consume bits of loose skin and external parasites. Such visits occur most frequently at high tide. It does not rest on the seabed

as do many flat fish, as it needs to swim continuously to channel water over its gills for respiration.

Reproduction: Males become sexually mature when their disc width is about 4 m (13 ft), while females need to be about 5 m (16 ft) wide to breed. When a female is becoming receptive, one or several males may swim along behind her in a "train". During copulation, one of these males grips the female's pectoral fin with his teeth and they continue to swim with their ventral surfaces in contact. He inserts his claspers into her cloaca and these form a tube through which the sperm is pumped. The pair remains coupled together for several minutes before going their own ways.

Predation: Because of its large size and velocity in case of danger (24 km/h escape speed) the oceanic manta ray therefore has very few natural predators which could be fatal to it. Only big sharks as for example the tiger shark (Galeocerdo cuvier), the great hammerhead shark (Sphyrna mokarran) or the bullshark (Carcharhinus leucas), and also the False killer whale (Pseudora crassidens) and the killer whale (Orchinus orca) are entitled to try to eat a piece of its wings before it disappears.

Environmental Influence: The oceanic manta ray is considered to be vulnerable by the IUCN’s Red List of Endangered Species because its population has decreased drastically over the last twenty years due to overfishing. Whatever the type of fishing (artisanal, targeted or bycatch), the impact on a population which has a low fecundity rate, a long gestation period with mainly a single pup at a time, and a late sexual maturity can only be seriously detrimental to a species that cannot compensate for the losses over several decades. In recent years, fishing for manta rays has been significantly boosted by the price of their gill rakers on the traditional Chinese Medicine market, where fabricated medicinal virtues have been assigned to them without proven scientific basis and a clever marketing strategy has generated significant demand

Please note the syllabus is subject to change