

Course Description:

An introduction to foundational topics within marine biology, including (1) quantitative reasoning for aquatic biologists, (2) marine geography and mapping, (3) life in a fluid environment, (4) microcosms: marine aquarium systems, (5) scientific illustration, (6) electronic resources in marine biology, (7) internships, coops, jobs, and careers in marine biology, and (8) current topics.

Credit: One semester hour college credit.

Prerequisite: Placement in college-level mathematics or permission of instructor.

Required Text: None.

Class Structure

I anticipate seven class meetings: six 2-hour in-class meetings and one 3-hour field trip. Meeting times will be set to avoid conflict with field courses offered during the same session at the CBFS (e.g. evenings, weekends).

The destination of the field trip will be determined by student interest and scheduling availability. Possible destinations include a mariculture facility, a marine research laboratory, a wildlife refuge, a public aquarium, or a marine-focused museum.

Topics to be Covered:

1. Math for Marine Biology

Learn to estimate, compute, and convert distances, volumes and concentrations in metric and US customary units.

2. Marine Geography & Mapping

Master basic marine geography and the relationship between principle ocean currents and the distribution of marine communities.

3. Introduction to Fluid Dynamics

Introduce the impact of fluid dynamics on the physiology and behavior of marine organisms, including friction, drag, inertia, boundary layers, lift, and interpreting Reynold's numbers.

4. Marine Aquariums

Set up and maintain a simple marine aquarium; explain the nitrogen cycle and how it is established, maintained, and tested; explain and interpret the layout of larger marine systems; evaluate the trade-offs of closed and open systems; evaluate the quality of educational marine displays.

5. Scientific Illustration

Introduce the critical criteria used in evaluating scientific illustrations; clarify the distinction between beautiful (artistic) and functional (adequate) illustrations; and demonstrate techniques for creating good scientific illustrations.

## 6. Online Resources

Provide an overview of electronic resources in marine biology including evaluating web page reliability; using primary literature (what kinds of marine journals exist, how to find citations, how to access articles, how to interpret information including authorship, acknowledgements, citations, impact factors, etc.); listservs – what are they and why are they useful.

## 7. Enriching your Education

Introduce methods for advancing a marine career: useful web sites for finding additional field courses, internships, coops, and jobs; etiquette for email, applications, and interviews.

### Sample References:

Levinton, J.S. 2009. *Marine Biology: Function, Biodiversity, Ecology*. New York, NY: Oxford University Press.

Moe, M.A. 1989. *The Marine Aquarium Reference: Systems and Invertebrates*. Plantation, FL: Green Turtle Publications.

Vogel, S. 1994. *Life in Moving Fluids: the Physical Biology of Flow*, 2nd edition. Princeton, NJ: Princeton University Press.

Wood, P. 1994. *Scientific Illustration: A Guide to Biological, Zoological, and Medical Rendering Techniques, Design, Printing, and Display*. New York, NY: John Wiley & Sons.