

**MARINE SCIENCE 102  
THE LIVING OCEAN**

**BULLETIN INFORMATION**

MSCI 102 - The Living Ocean (4 credit hours)

**Course Description:**

Origin, evolution, and diversity of marine life, biological production, trophic dynamics, nutrient cycles, marine resources, and environmental concerns. Three lecture and three laboratory hours per week. Scheduled field trips required.

Prerequisites: science, engineering, or education major or consent of instructor

**SAMPLE COURSE OVERVIEW**

This class integrates basic biological concepts with an introduction to the fundamentals of Biological Oceanography.

**ITEMIZED LEARNING OUTCOMES**

**Upon successful completion of Marine Science 102, students will be able to:**

1. Discuss theories about early life forms and processes in the ocean
2. Explain and apply scientific methods and terminology, including hypothesis formulation and testing, experimental design, and the method of multiple working hypotheses
3. Describe the processes of photosynthesis, primary production, and consumption
4. Describe the major taxonomic groups of producers and consumers in the ocean
5. Construct representative marine food webs for varying regions of the ocean understanding how marine organisms are identified (technology), evaluated (science) and the impacts on society when the food webs are disrupted
6. Describe trophic levels based on data presented, formulation of hypotheses, and discussion of findings
7. Demonstrate understanding of the concepts of the Biological Pump and the Microbial Loop
8. Identify major environmental concerns and the ocean's role in global climate change

**SAMPLE REQUIRED TEXTS/SUGGESTED READINGS/MATERIALS**

1. Sverdrup, K.A. and E.V. Armbrust. An Introduction to the World's Oceans. McGraw Hill, 10<sup>th</sup> edition. (Older editions are fine).
2. Hardee, M.L. and C.R. Benitez-Nelson. THE LIVING OCEAN Lab Manual, 3<sup>rd</sup> edition.

**SAMPLE ASSIGNMENTS AND/OR EXAM**

1. Two hour tests
2. Final exam

3. Lab quizzes and reports
4. Homework Assignments

### **SAMPLE COURSE OUTLINE WITH TIMELINE OF TOPICS, READINGS/ASSIGNMENTS, EXAMS/PROJECTS**

- Week 1:       Origins; Marine Biological Terminology  
              Basic cell biology  
              *No lab this week*
- Week 2:       Marine Viruses, Archaea, Bacteria  
              *No lab this week*
- Week 3:       Phytoplankton  
              Light and Pigments  
              *Lab 1: The Plankton*
- Week 4:       Photosynthesis: Light Reactions  
              Primary Production  
              *Lab 2: Determination of Chlorophyll a in seawater*
- Week 5:       Physical & Biological Factors, Processes I (Temperature, nutrients, membrane transport)  
              Physical & Biological Factors, Processes II (Salinity, dissolved gases, pressure)  
              *Lab 3: Statistical Methods for Experimental Analyses*
- Week 6:       Zooplankton  
              Test 1  
              *Lab 4: Primary Production*
- Week 7:       Marine Animals I (Invertebrates)  
              Marine Animals II (Invertebrates)  
              *Lab 5: The "Nuts and Bolts" of Taxonomy*
- Week 8:       Marine Animals III  
              *Lab 6: Survey of Marine Organisms I*
- Week 9:       Marine Animals IV (Sharks)  
              Marine Animals V (Fish, Mammals)  
              *Lab 7: Survey of Marine Organisms II*
- Week 10:      Marine Communities I (Food webs)  
              Test 2  
              *Lab 8: Food Webs and Trophic Levels*

- Week 11: FIELD TRIP DAYS (no classes or labs this week)
- Week 12: Marine Communities II (Benthic communities)  
Environmental Concerns I  
*Lab 9: Coastal Ecosystems and Species Diversity*
- Week 13: Environmental Concerns II  
Environmental Concerns III  
*Lab 10: Adaptations of Marine Organisms*
- Week 14: Review for Final Exam  
*Lab 11: Deep Ocean Ecosystems*

**FINAL EXAM according to University Exam schedule**