SCIENCE

An Introduction to Marine Biology

I. THE OCEAN PLANET 40%
   A. An Introduction to Marine Biology
      1. What Is Marine Biology?
      2. The History of Marine Biology and Oceanography
      3. Modern Marine Biology and Oceanography
   B. How Do We Study Marine Life?
      1. The Scientific Method
   C. The Geography and Geology of the Ocean
      1. Ocean Basin Geography
      2. The Formation of the Earth and the Ocean
      3. The Ocean Floor and Plate Tectonics
      4. The Formation of the Basins
      5. Marine Provinces
         a. Continental Margins
         b. The Deep-Sea Floor
      6. Biological Provinces
   D. Water and Seawater
      1. The Chemical and Physical Properties of Water
      2. Seawater
      3. Dissolved Gases in Seawater
   E. Sediments
      1. The Classification of Sediments
      2. The Study and Economic Impact of Sediments
   F. Interactions of the Ocean and the Atmosphere
      1. Atmospheric Circulation
      2. Oceanic Circulation
   G. Waves
      1. Wave Anatomy
      2. Wave Classification
      3. Wave Generation
      4. Tsunamis
   H. Tides
      1. Lunar Tides
      2. Solar Tides
      3. Tidal Patterns
      4. Tidal Patterns and Marine Organisms
      5. Energy from Tides

II. MARINE LIFE 40%
   A. The Origins of Life
   B. Defining Marine Life

C. The Building Blocks of Life
D. Photosynthesis and Chemosynthesis
    1. The Fuel of Life
E. Biogeochemical Cycles
    1. The Carbon Cycle
    2. The Nitrogen Cycle
    3. The Phosphorous Cycle
F. Classifying Marine Life
    1. The Tree of Life
G. The Microbial World
    1. Viruses
    2. Bacteria
    3. Archaea
    4. Unicellular Algae
    5. Protozoans
H. Plankton
    1. Phytoplankton
    2. Zooplankton
I. Seaweeds and Plants
    1. Seaweeds
    2. Flowering Plants
    3. Salt Marsh Plants
    4. Mangroves
J. Invertebrates: Animals without a Backbone
    1. Sponges
    2. Gelatinous Animals
    3. Worms
    4. Molluscs
    5. Arthropods
    6. Echinoderms
    7. Tunicates and Cephalochordates
K. Vertebrates
    1. Jawless Fishes
    2. Cartilaginous Fishes
    3. Bony Fishes
    4. Marine Reptiles
    5. Marine Birds
    6. Marine Mammals

III. MARINE ECOSYSTEMS 10%
A. What Is Marine Ecology?
B. Environmental Factors Limiting Organismal Distribution
C. Ecological Principles
D. Habitats
    1. The Intertidal Zone
    2. Seaweed Communities

3. Estuaries and Salt Marshes
4. Coral Reefs
5. The Open Ocean
6. The Deep-Sea

E. Feeding and Food Webs

IV. HUMANS AND THE OCEAN 10%

A. Resources from the Ocean
1. Living Resources
2. Nonliving Resources

B. Anthropogenic Impacts
1. Marine Pollution
2. Eutrophication
3. Habitat Modification
4. Overfishing
5. Introduced Species
6. Climate Change Impacts on the Oceans

C. Conservation and Protection
1. Marine Protected Areas
2. Habitat Restoration