University of California, Santa Barbara
Program Learning Outcomes

B.S. in Aquatic Biology

Students graduating with a B.S. in Aquatic Biology should be able to:

1. Apply the processes and methods of scientific inquiry, including the search and retrieval of scientific information, the formulation of scientific hypotheses, the design and conduct of experiments, and the analysis and interpretation of data.
2. Use the fundamental tools and knowledge of mathematics and the physical sciences needed for studying and understanding biological phenomena.
3. Understand fundamental concepts concerning the properties, structures and functions of biological molecules, metabolic pathways and bioenergetics.
4. Describe the structure and function of cells as the fundamental units of life and as the building blocks of single and multicellular organisms.
5. Explain the processes underlying development, cellular differentiation, and reproduction in complex eukaryotes.
6. Explain the principles of inheritance from molecular mechanisms to population level consequences.
7. Describe the principles and mechanisms of evolution at the molecular, micro and macro levels, and the role of evolution as the central unifying concept in biology.
8. Recognize the scope of biological diversity and the phylogenetic relationships among major groups of organisms.
9. Discuss the interactions between organisms and their environments, and the consequences of these interactions in natural populations, communities, and ecosystems.
10. Describe the diversity of aquatic organisms, their evolutionary history, biogeography, interactions with other organisms, and adaptations to their environments.
11. Synthesize knowledge of physical and chemical processes of aquatic systems and the biology of organisms to ask questions about natural history, ecology and evolutionary relationships.

Laboratory Skills:

12. Implement contemporary biological research techniques to conduct experiments in aquatic systems, and use quantitative and/or statistical approaches to analyze the results and draw appropriate conclusions.