

**CAL POLY HUMBOLDT**  
**University Senate**

**Resolution to Recommend New Bachelors of Science in Marine Biology**

11-21/22-ICC - February 8, 2022 - First Reading

**RESOLVED:** That the University Senate of Humboldt State University recommends to the Provost that the new Bachelors of Science in Marine Biology detailed in proposal [21-1446](#) be approved.

**RATIONALE:** The proposed Bachelors of Science in Marine Biology elevates the current Marine Biology concentration within Biology to a stand alone BS program. Through this program, students will develop knowledge and skills on the diversity of marine life, its evolutionary history, the importance to our planet, and how it is impacted by human activities. The Department of Biology and the ICC believe this major will provide students with knowledge and skills for future careers and endeavors in Marine Biology and associated positions (e.g. aquarium manager, museum curator, science librarian, laboratory technician, environmental consultant, microbiologist, biotechnology research technician, etc.) as well as graduate programs in Marine Biology. The ICC discussed feedback from the Oceanography and Fisheries departments about the framework of the proposed program being that of a Biology program with marine emphasis as opposed to a Marine Science framework. As the feedback was centered on differing viewpoints for the structure of the program, the ICC considered the history of support for establishing the Biology centered Marine degree, the plans in the works for the development of the future MS with the Marine Sciences framework, and the College Dean's support of this proposed program, and supports the Marine Biology Program as proposed. There are no new courses being proposed to support this program. This program is being proposed as part of the transition to a Polytechnic University.

**Bachelors of Science in Marine Biology Program Learning Outcomes**

1. Students will be able to identify and classify marine microbes, algae, invertebrates, fishes, birds and mammals, in the context of a phylogenetic framework;
2. Students will be able to describe how marine life functions at the gene, genome, cell, tissue, organ and organ-system level. They will be able to describe the development, reproduction, and behavior of different forms of marine life and use ecological and evolutionary principles to explain how these organisms perform their functions in an environmental context;

3. Students will be able to relate the physical features of the marine environment to the structure of marine populations, communities, and ecosystems and explain how they are affected by human activities;
4. Students will be able to explain how descent with modification has shaped all biological processes and why biological evolution offers the only logical scientific explanation for the simultaneous unity and diversity of life on earth;
5. Students will be able to apply the scientific method to questions in marine biology by formulating testable hypotheses, gathering data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses; and
6. Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists.

## **Bachelors of Science in Marine Biology Curriculum**

### **BS Marine Biology 119-128 units total**

#### **Prerequisite (0 – 6 units)**

Students may demonstrate calculus readiness by achieving an appropriate score on a department administered placement test, by successful completion of a course in precalculus, or by completing one of the following prerequisite course pathways, or their equivalent:

MATH 102 (4) Algebra and Elementary Functions, OR  
 MATH 101 (3) College Algebra AND MATH 101T (3) Trigonometry

#### **Lower Division (46 units)**

BIOL 105	(4) Principles of Biology
BIOL 255	(3) Marine Biology
BOT 105	(4) General Botany
CHEM 109	(5) General Chemistry I
CHEM 110	(5) General Chemistry II
CHEM 228	(4) Brief Organic Chemistry
MATH 105	(3) Calculus for the Biological Sciences & Natural Resources
OCN 109	(3) General Oceanography
OCN 109L	(1) General Oceanography
OCN 260	(1) Sampling Techniques and Field Studies

PHYX 106	(4) College Physics: Mechanics & Heat
PHYX 118	(1) College Physics: Biological Applications
STAT 109	(4) Introductory Biostatistics
ZOOL 110	(4) Introductory Zoology

**Upper Division (35-39 units)**

BIOL 307	(4) Evolution
BIOL 330	(4) Principles of Ecology
BIOL 340	(4) Genetics
BOT 356	(4) Phycology
FISH 310	(4) Ichthyology
ZOOL 314	(5) Invertebrate Zoology
BIOL 430	(3) Intertidal Ecology, or
OCN 310	(4) Biological Oceanography

Complete one of the following (3-4 units):

BIOL 350	(3) Cell Biology, or
BOT 310	(4) Gen. Plant Physiology, or
ZOOL 310	(4) Animal Physiology, or
FISH 311	(3) Fish Physiology

Complete at least one advanced marine biology elective from the following list, or from any optional course NOT taken above (3-4 units).

BIOL 418	(3) Marine Microbiology
BOT 553	(3) Marine Macrophyte Ecology
FISH 335	(3) US and World Fisheries
FISH 358	(4) Fisheries Data Analysis
FISH 375	(3) Mariculture
FISH 435	(4) Ecology of Marine Fishes
FISH 471	(3) Fish Diseases
FISH 474	(4) Conservation Genetics of Fish and Wildlife
FISH 478 or 578	(3) Fisheries Oceanography
FISH 558	(4) Fish Population Dynamics
OCN 301	(3) Marine Ecosystems - Human Impact
OCN 320	(4) Physical Oceanography
OCN 330	(4) Chemical Oceanography

OCN 340	(4) Geological Oceanography
OCN 410	(3) Zooplankton Ecology
OCN 420	(3) Oceans and Climate
STAT 333	(4) Linear Regression Models / ANOVA
STAT 404	(4) Multivariate Statistics
STAT 410	(4) Modern Statistical Modeling
ZOOL 530	(3) Benthic Ecology
ZOOL 552	(3) Advanced Invertebrate Zoology
ZOOL 556	(4) Marine Mammals

Complete one of the following (1-3 units):

BIOL 490	(1-2) Senior Thesis
BIOL 498	(2) Marine Biology Capstone Research
BIOL 499	(1-2) Directed Study
REC 471	(3) Scientific Diving