

# OCEANOGRAPHY

## Bachelor of Science degree with a major in Oceanography

### Minor in Oceanography

#### Department Chair

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### The Program

Students completing this program will have demonstrated:

- utilization of scientific concepts from biology, chemistry, geology, physics, and mathematics to understand fundamental oceanographic processes and functions
- the ability to employ appropriate sampling, laboratory, and computer techniques to collect, measure, and interpret oceanographic information
- integration of conceptual and technical understanding to address complex interdisciplinary problems in oceanography
- utilization of reading, writing, and oral skills to effectively communicate oceanographic information.

Humboldt's students have the advantage of living in an ideal natural environment for marine studies, close to both the ocean and a number of estuaries and lagoons. Humboldt State University has a fully equipped marine laboratory in the nearby town of Trinidad and a research vessel docked in Humboldt Bay, allowing students to supplement classroom learning through laboratory and seagoing experiences and field trips.

Flexible coursework and experiences allow students a variety of choices while still providing an education of considerable breadth, an understanding of fundamental concepts unique to oceanography, and an appreciation of how concepts from allied fields interrelate. The intent is to develop an interdisciplinary train of thought essential for understanding the marine environment.

Participants also study in depth a science related to oceanography, such as geology, chemistry, physics, or biology. This program allows a student to:

- prepare as an ocean scientist to collect, process, and aid in interpreting scientific data collected on oceanographic cruises and other field work conducted by federal, state, educational, or private institutions and agencies;

- prepare for graduate study in oceanography or a related science by acquiring a broad, sound science background;
- secure a broad science background and sound fundamental education (for those with an interest in the major who do not intend to use it as a career).

Humboldt's program prepares ocean scientists who collect, process, and interpret scientific data. Graduates excel in these careers: oceanographer, research assistant, marine biologist, marine products salesperson, aquatic biologist, marine geophysicist, hydrologist, water pollution technician, environmental specialist, scientific officer, hydrographic surveyor, earth scientist, aquatic chemist.

### Preparation

Students should have a good background in biology, chemistry, physics, and mathematics. Competence with computers and a language other than English is recommended.

### REQUIREMENTS FOR THE MAJOR

*For a description of degree requirements to be fulfilled in addition to those listed below for the major, please see "The Bachelor's Degree" section of the catalog, pp. 66-80. The Upper Division Area B General Education requirement is met by the coursework within the major.*

#### Core Courses

##### Lower Division Core

BIOL 105	(4) Principles of Biology
CHEM 109	(5) General Chemistry I
CHEM 110	(5) General Chemistry II
GEOL 109	(4) General Geology
OCN 109	(3) General Oceanography &
OCN 109L	(1) General Oceanography Laboratory
OCN 260	(1) Sampling Techniques & Field Studies

##### Upper Division Core

OCN 310	(4) Biological Oceanography
OCN 320	(4) Physical Oceanography
OCN 330	(4) Chemical Oceanography
OCN 340	(4) Geological Oceanography
OCN 370	(2) Library Research & Report Writing
OCN 420	(3) Oceans & Climate
OCN 485	(1) Undergraduate Seminar
OCN 495	(3) Field Cruise I
OCN 496	(2) Field Cruise II

*And one of the following two groups:*

#### Group 1:

MATH 109	(4) Calculus I
MATH 110	(4) Calculus II
MATH 210	(4) Calculus III
PHYX 109	(4) General Physics I
PHYX 110	(4) General Physics II

Plus an 11-unit package of approved electives, tailored individually to the student's educational goals.

#### Group 2:

MATH 105	(3) Calculus for the Biological Sciences & Natural Resources
MATH 205	(3) Multivariate Calculus for the Biological Sciences & NR
PHYX 106	(4) College Physics: Mechanics & Heat
PHYX 107	(4) College Physics: Electromagnetism & Modern Physics

STAT 108	(4) Elementary Statistics, <b>or</b>
STAT 109	(4) Introductory Biostatistics

Plus a 13-unit package of approved electives, tailored individually to the student's educational goals.

Besides satisfying the major requirement, the elective package commonly leads to completion of a minor in a related field of study.

### REQUIREMENTS FOR THE MINOR

OCN 109	(3) General Oceanography &
OCN 109L	(1) General Oceanography Laboratory
OCN 260	(1) Sampling Techniques & Field Studies

*Two of the following:*

OCN 310	(4) Biological Oceanography
OCN 320	(4) Physical Oceanography
OCN 330	(4) Chemical Oceanography
OCN 340	(4) Geological Oceanography

*One additional course from the 300-level classes listed above or a course below:*

OCN 301	(3) Marine Ecosystems — Human Impact
OCN 304	(3) Resources of the Sea
OCN 410	(3) Zooplankton Ecology
OCN 420	(3) Oceans & Climate
OCN 495	(3) Field Cruise I
BIOL 430	(3) Intertidal Ecology
CHEM 370	(3) Earth System Chemistry
FISH 310	(4) Ichthyology
FISH 335	(3) US & World Fisheries
GEOL 460	(3) Solid Earth Geophysics