

## Oceanography AS Major - Active

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Department: Earth Sciences

Approval: April 2018

Effective Semester: Fall 2019

The oceanography major is designed to clearly demonstrate the breadth of expertise required by Oceanographers and to prepare students for the advanced courses and projects that lie ahead should they transfer to a bachelor's major in oceanography at a four-year college.

The ocean plays a central role in physical, biological, chemical, and geological processes on earth. As such, a degree in oceanography requires an understanding of the interactions between the biosphere, hydrosphere, lithosphere, and atmosphere.

Oceanography courses are recommended for anyone interested in better understanding and living with the natural water bodies around us, in understanding global climate system, and in making informed decisions on matters pertaining to interactions between natural Earth processes and society.

Oceanography, an interdisciplinary science, requires expertise in chemistry, physics, biology, geology, mathematics, computer science, and critical thinking. It requires skill in problem solving, analysis, scientific inquiry, and communication. Students completing the Associate in Science in Oceanography will be prepared for upper division studies in oceanography and for transfer to an oceanography program at a four-year college. To accomplish this goal, majors will complete transferable lower-division courses in oceanography, biology, math, chemistry, and physics.

Oceanography majors will be able to take most or all of their lower division courses at CCSF before they transfer but should see a counselor to confirm their program of study. Additional courses might be required to transfer to particular institutions. The Oceanography major is suitable for students planning to transfer into programs in marine science, oceanographic and atmospheric sciences, oceanography, earth sciences, and environmental sciences. Note: because of the diversity within this discipline, students will narrow their focus once they get to their transfer institution (to biological oceanography, geological oceanography, physical oceanography, or chemical oceanography). We cannot provide coverage for all these areas of focus in this one major and don't intend to. Please seek advice to determine if there are additional courses you should take for your particular major.

Through the core units of the oceanography major, students will gain the scientific knowledge necessary to investigate problems and ideas presented in upper division oceanography courses. The laboratory work will train students to use current laboratory technologies, equipment and techniques to engage in the research process using scientific methods and to investigate research questions safely.

### Learning Outcomes

Upon completion of this program, students will be able to:

- Make accurate field observations at outcrops, distinguishing those from interpretations, especially as relates to oceanographic phenomena.
- Apply the methods of scientific inquiry to investigate oceanographic phenomena.
- Synthesize ideas from physics, chemistry, biology, and geology to solve complex ocean-related problems

- Analyze and discuss scientific topics with rigor, including a skeptical evaluation of evidence.
- Evaluate the impacts of society on the ocean ecosystem.

Assuming students start this AS with transfer-level math and English eligibility, the minimum time for completion is 4 semesters. Completion time will vary based on student preparation and number of units completed per semester.

### ***Courses Required for the Major in Oceanography AS***

<b>Course</b>	<b>Units</b>
<b>Core courses:</b>	
O CAN 1 - Oceanography	3.00
O CAN 1L - Oceanography Lab	2.00
CHEM 101A - General College Chemistry	6.00
MATH 110A - Calculus I	5.00
MATH 110B - Calculus II	5.00
PHYC 4A - Classical Mechanics for Scientists and Engineers	3.00
PHYC 4AL - Mechanics Laboratory for Scientists and Engineers	1.00
PHYC 4B - Electromagnetism for Scientists and Engineers	3.00
PHYC 4BL - Electromagnetism Laboratory for Scientists and Engineers	1.00
Total:	29.00
<b>Choose one of the following courses:</b>	
CHEM 101B - General College Chemistry	5.00
MATH 110C - Calculus III	5.00
Total:	5.00
<b>Choose one of the following course combinations:</b>	
GEOL 10 - Physical Geology	3.00
and	
GEOL 10L - Physical Geology Lab	2.00
BIO 100A - General Biology	5.00
and	
BIO 100B - General Biology	5.00
NOTE: Students who want to major in biological oceanography should take the BIO 100A + B option instead of geology.	
Total:	5.00 - 10.00
<b>Recommended additional activities:</b>	
Enroll in the Earth Sciences Club	
Become part of the Earth Sciences Mentoring Program (see Department website for details).	
Enroll in both the geology and biology classes as many transfer programs will require both.	
Enroll in Math 110C	
Enroll in a computer class, such as GEOG 110	
<b>Total:</b>	<b>39.00 - 44.00</b>

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