Bachelor of Science

Ocean and Earth Science with a Major in Biological Oceanography (BS)

Richard Hale, Advisor

Students in the Ocean and Earth Science program focus on global systems that control environmental conditions on the planet. They also learn to develop solutions to complex environmental problems by working in interdisciplinary teams. All majors in the department complete courses in the basic sciences and mathematics and core courses in Earth systems science. Students majoring in Biological Oceanography, Chemical Oceanography, Physical Oceanography, and Geology complete a capstone field research experience. In addition, students complete a suite of specialty courses specified in each major. A minimum grade of C or higher in all major and prerequisite courses is required for graduation.

Ocean and Earth Science with a Major in Biological Oceanography

The Biological Oceanography major is designed for students considering graduate work or employment in the pure and applied fields of oceanography. Students in this major are strongly encouraged to minor in biology and select 12 credits from 300/400 level biology courses.

Requirements

Lower-Division General Education

Written Communication (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#written)	6
Oral Communication (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#oral)	3
Mathematics (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#math)	3
Language and Culture (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#language)	0-6
Information Literacy and Research (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#information)	3
Human Behavior (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior)	3
Human Creativity (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity)	3
Interpreting the Past (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret)	3
Literature (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature)	3
Philosophy and Ethics (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy)	3
The Nature of Science (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#nature)	8
Impact of Technology (http://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#impact)	3

Written Communication: grade of C or better required in both courses

Oral Communication: met in the major by OEAS 441

Mathematics: MATH 211.

Information Literacy and Research: met in the major by OEAS 130G

The Nature of Science: CHEM 121N & CHEM 122N, CHEM 123N & CHEM 124N

Upper-Division General Education

- Option A. Approved Disciplinary Minor (a minimum of 12 hours determined by the department), or second degree or second major.
- Option B: Interdisciplinary Minor (specifically 12 hours, 3 of which may be in the major)
- Option C. An approved Certification Program such as teaching licensure
- Option D. Two Upper-Division Courses from outside the College of Sciences and not required by the major (6 hours)

Requirements for Graduation

Requirements for graduation include the following:

- Minimum of 120 credit hours.
- Minimum of 30 credit hours overall and 12 credit hours of upper-level courses in the major program from Old Dominion University.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken toward the major.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken toward a minor.
- Completion of ENGL 110C, ENGL 211C or ENGL 231C, and the writing intensive (W) course in the major with a grade of C or better. The W course must be taken at Old Dominion University.
- Completion of Senior Assessment.

Biological Oceanography Major

General Education		
Complete lower-division requirements		36-42
Complete upper-division requirements (minimum of 6 credit hours)		6
Biological Oceanography		
BIOL 121N & BIOL 122N	General Biology I and General Biology I Lab	4
BIOL 123N & BIOL 124N	General Biology II and General Biology II Lab	4
MATH 212	Calculus II	4
OEAS 111N	Physical Geology	4
OEAS 130G	Research Skills and Information Literacy for the Natural Sciences	3
OEAS 306	Oceanography	3
OEAS 307	Oceanography Laboratory	1
PHYS 231N & PHYS 232N	University Physics I and University Physics II	8
OEAS 310	Global Earth Systems	4
STAT 310	Introductory Data Analysis	3
OEAS 406	Matlab	1
OEAS 440	Biological Oceanography	4
BIOL 292	Evolution	3
BIOL 415W	Marine Ecology	4-5
or OEAS 451W	Data Collection and Analysis in Oceanography	
CHEM 211	Organic Chemistry I Lecture	3
CHEM 212	Organic Chemistry I Laboratory	2
CHEM 213	Organic Chemistry II Lecture	3
CHEM 441	Biochemistry Lecture	3
OEAS 441 & OEAS 442W	Ocean and Earth Sciences Field Study I and Ocean and Earth Sciences Field Study II (satisfies oral and upper-division written communication requirement)	6
Select two of the following electives:		6
OEAS 303	Paleontology	

OEAS 350	Where Rivers Meet the Sea: Ecology and Climate	
OEAS 403W	Aquatic Pollution	
OEAS 405	Physical Oceanography	
OEAS 410	Chemical Oceanography	
OEAS 412	Global Environmental Change	
OEAS 413	Environmental Geochemistry	
OEAS 415	Waves and Tides	
OEAS 416	Electronics and Oceanographic Instrumentation	
OEAS 418	Limnology: Biogeochemistry of Lakes	
OEAS 420	Hydrogeology	
OEAS 425	Marine Geology	
OEAS 444	Communicating Ocean Science to Informal Audiences	
OEAS 452	Microbial Ecology of the Oceans	
OEAS 451W	Data Collection and Analysis in Oceanography (if not taken in lieu of BIOL 415W)	
OEAS 453W	Marine Molecular Ecology	
OEAS 466W	Introduction to Mitigation and Adaptation Studies	
OEAS 467	Sustainability Leadership	
OEAS 490	Paleoceanography	
Total Credit Hours		**115-122**

Elective Credit

Elective credit may be needed to meet the minimum requirement of 120 credit hours.

Honors Program in Ocean and Earth Science

Students admitted by the faculty to the Ocean and Earth science honors program engage in supervised individual study in areas of their interest. Honors students must complete all courses required by the department with a minimum grade point average of 3.50 and a total of at least three credits in one of the following courses:

OEAS 487	Honors Research in Ocean and Earth Sciences	1-3
OEAS 497	Special Problems and Research	1-3

Degree Program Guide

The Degree Program Guide is a suggested curriculum to complete this degree program in four years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

Course	Title	Credit Hours
Freshman		
Fall		
ENGL 110C	English Composition	3
BIOL 121N and BIOL 122N		4
OEAS 111N	Physical Geology	4
Literature		3
Language & Culture I (May be waived; See requirement details)		3
	Credit Hours	**17**
Spring		
BIOL 123N and BIOL 124N		4
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research or Writing, Rhetoric, and Research: Special Topics	3
MATH 211	Calculus I	4
Elective or Language & Culture II (May be waived; See requirement details)		2-3
	Credit Hours	**13-14**
Sophomore		
Fall		
CHEM 121N and CHEM 122N		4
PHYS 231N	University Physics I	4
MATH 212	Calculus II	4
OEAS 130G (Meets Information Literacy and Research)		3
	Credit Hours	**15**
Spring		
CHEM 123N AND CHEM 124N		4
PHYS 232N	University Physics II	4
Impact of Technology		3
Interpreting the Past		3
	Credit Hours	**14**
Junior		
Fall		
CHEM 211 and CHEM 212		5
BIOL 292	Evolution	3
Human Creativity		3
Philosophy and Ethics		3
	Credit Hours	**14**
Spring		
CHEM 213	Organic Chemistry II Lecture	3
OEAS 306	Oceanography	3
OEAS 307	Oceanography Laboratory	1
OEAS 310	Global Earth Systems	4
OEAS 406	Matlab	1
STAT 310	Introductory Data Analysis	3
	Credit Hours	**15**
Senior		
Fall		
CHEM 441	Biochemistry Lecture	3
OEAS 440	Biological Oceanography	4
OEAS 441	Ocean and Earth Sciences Field Study I (Meets Oral Communication)	3
OEAS elective		3
Upper-Division General Education Course (Option D)		3
	Credit Hours	**16**
Spring		
OEAS 442W	Ocean and Earth Sciences Field Study II	3
BIOL 415W or OEAS 451W		4-5
OEAS Elective		3
Upper-Division General Education Course (Option D)		3

Human Behavior	3
Credit Hours	**16-17**
Total Credit Hours	**120-122**

BA or BS to MBA (Master of Business Administration) Linked Program

The linked BA/MBA or BS/MBA program is an early entry to the MBA program of study. The early-entry program is designed for well qualified non-business undergraduate ODU students to start their MBA program prior to completing their undergraduate degree. Well qualified non-business undergraduate students may take MBA-level courses as early as three semesters prior to graduation and count up to 12 graduate credits toward their undergraduate degree. Students participating in the early-entry program must earn a minimum of 150 credit hours (120 discrete credit hours for the undergraduate degree and 30 discrete credit hours for the graduate degree). Early-entry program students should carefully consider their undergraduate degree program requirements when planning their course of study. Students in the early-entry program work in close consultation with the MBA Program Office and should refer to information in the Strome College of Business section in the graduate catalog (http://catalog.odu.edu/graduate/stromecollegeofbusiness/) to develop an individualized plan of study based on the required coursework.

BA or BS to MPA (Master of Public Administration) Linked Program

The linked BA/MPA or BS/MPA program provides qualified Old Dominion University undergraduate students with the opportunity to earn a master's degree in public administration while taking credits in the MPA program as an undergraduate student. The program is designed for highly motivated students with the desire to immediately continue their education after the bachelor's degree. The program is especially relevant to individuals seeking to work (or currently working) in the public or non-profit sectors, but is suitable for students from any undergraduate major. Graduate courses may be taken during the fall and spring semester of the student's senior undergraduate year. Up to 12 graduate credits can count toward both the undergraduate and graduate degree and can meet upper-level General Education requirements. After receiving the undergraduate degree, a student will continue with the MPA program, taking MPA courses until completing the required 39 credit hours. Students in the linked program must earn a minimum of 150 credit hours (120 discrete credit hours for the undergraduate degree and 30 discrete credit hours for the graduate degree).

Requirements for admission to the graduate program can be found in the School of Public Service section of the Graduate Catalog (http://catalog.odu.edu/graduate/business/public-service/). For additional information, please contact the School of Public Service in the Strome College of Business.