Bachelor of Science

Ocean and Earth Science with a Major in Chemical 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 Chemical Oceanography

The Chemical 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 chemistry and select the following courses: CHEM 211-CHEM 213, CHEM 212-CHEM 214, CHEM 321 and CHEM 322.

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.

Chemical Oceanography Major

General Education		
Complete lower-division requirements		36-42
Complete upper-division requirements (minimum of 6 credit hours)		6
Chemical 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
OEAS 111N	Physical Geology	4
OEAS 130G	Research Skills and Information Literacy for the Natural Sciences	3
CHEM 211 & CHEM 213	Organic Chemistry I Lecture and Organic Chemistry II Lecture	6
MATH 212	Calculus II	4
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 410	Chemical Oceanography	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 one of the following:		2-4
CHEM 322	Analytical Chemistry Laboratory	
CHEM 332W	Experimental Physical Chemistry I	
CHEM 334W	Experimental Physical Chemistry II	
CHEM 352	Inorganic Chemistry Laboratory	
CHEM 422	Instrumental Analysis Laboratory	
CHEM 442W	Biochemistry Laboratory	
CHEM 452	Advanced Inorganic Chemistry Laboratory	

Select three of the following:		9
CHEM 321	Analytical Chemistry Lecture	
CHEM 331	Physical Chemistry Lecture I	
CHEM 333	Physical Chemistry Lecture II	
CHEM 351	Inorganic Chemistry	
CHEM 415	Intermediate Organic Chemistry	
CHEM 421	Instrumental Analysis Lecture	
CHEM 441	Biochemistry Lecture	
CHEM 443	Intermediate Biochemistry	
CHEM 449	Environmental Chemistry	
CHEM 451	Advanced Inorganic Chemistry	
Select two of the following:		6-7
OEAS 350	Where Rivers Meet the Sea: Ecology and Climate	
OEAS 403W	Aquatic Pollution	
OEAS 405	Physical Oceanography	
OEAS 412	Global Environmental Change	
OEAS 413	Environmental Geochemistry	
OEAS 415	Waves and Tides	
OEAS 418	Limnology: Biogeochemistry of Lakes	
OEAS 425	Marine Geology	
OEAS 430	Introduction to Geophysics	
OEAS 434	Geodynamics	
OEAS 435	Introduction to Ocean Modeling and Prediction	
OEAS 440	Biological Oceanography	
OEAS 444	Communicating Ocean Science to Informal Audiences	
OEAS 451W	Data Collection and Analysis in Oceanography	
OEAS 452	Microbial Ecology of the Oceans	
OEAS 453W	Marine Molecular Ecology	
OEAS 467	Sustainability Leadership	
OEAS 490	Paleoceanography	
Total Credit Hours		**113-122**

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
MATH 211	Calculus I	4
OEAS 111N	Physical Geology	4
CHEM 121N & CHEM 122N		4
Language & Culture I (May be waived; See requirement details)		3
	Credit Hours	**18**
Spring		
CHEM 123N and CHEM 124N		4
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research or Writing, Rhetoric, and Research: Special Topics	3
MATH 212	Calculus II	4
OEAS 130G	Research Skills and Information Literacy for the Natural Sciences (meets Information Literacy and Research)	3
Language & Culture II (May be waived; See requirement details)		3
	Credit Hours	**17**
Sophomore		
Fall		
BIOL 121N and BIOL 122N		4
PHYS 231N	University Physics I	4
CHEM 211	Organic Chemistry I Lecture	3
Human Creativity		3
Human Behavior		3
	Credit Hours	**17**
Spring		
BIOL 123N & BIOL 124N		4
CHEM 213	Organic Chemistry II Lecture	3
OEAS 406	Matlab	1
PHYS 232N	University Physics II	4
Impact of Technology		3
	Credit Hours	**15**
Junior		
Fall		
Upper-Division Chemistry elective		3
Upper-Division Chemistry elective		3
Interpreting the Past		3
Literature		3
Philosophy and Ethics		3
	Credit Hours	**15**
Spring		
OEAS 306	Oceanography	3
OEAS 307	Oceanography Laboratory	1
OEAS 310	Global Earth Systems	4
STAT 310	Introductory Data Analysis	3
Upper-Division Chemistry elective (lab)		2
	Credit Hours	**13**

Senior		
Fall		
OEAS 441	Ocean and Earth Sciences Field Study I (Meets Oral Communication)	3
Upper-Division Chemistry elective		3
OEAS 400-level Elective		3
Upper-Division General Education Course (Option D)		3
	Credit Hours	**12**
Spring		
OEAS 442W	Ocean and Earth Sciences Field Study II	3
OEAS 410	Chemical Oceanography	3
OEAS 400-level Elective		4
Upper-Division General Education Course (Option D)		3
	Credit Hours	**13**
	Total Credit Hours	**120**

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.