## Bachelor of Science

# Ocean and Earth Science with a Major in Marine Science Technology (BS)

Victoria Hill, 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 Marine Science Technology complete a course-based research experience including both field work and laboratory analysis. 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 Marine Science Technology

The marine science technology major is designed for students interested in the more practical and technical side of oceanography. Students in this major will gain practical skills in data acquisition and processing, field operations, and instrument design, assembly, operation, and maintenance. Whereas other majors in ocean and earth science emphasize more theoretical aspects of these fields, this major focuses on hands-on skills. Upon graduation, students in this major will be able to work closely with scientists, researchers, and engineers on wide ranging projects in the environmental science and technology fields. For example, these include potential job opportunities associated with Virginia's offshore wind resource development, which involve collecting and analyzing meteorological, oceanographic and environmental data, upgrading port and logistics facilities, and ensuring this development is compatible with other ocean uses.

## Requirements

### Lower-Division General Education

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|---|---|
| Written Communication (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#written) | 6 |
| Oral Communication (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#oral) | 3 |
| Mathematics (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#math) | 3 |
| Language and Culture (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#language) | 0-6 |
| Information Literacy and Research (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#information) | 3 |
| Human Behavior (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior) | 3 |
| Human Creativity (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity) | 3 |
| Interpreting the Past (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret) | 3 |
| Literature (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature) | 3 |
| Philosophy and Ethics (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy) | 3 |
| The Nature of Science (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#nature) | 8 |
| Impact of Technology (https://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 444.

Mathematics: MATH 211 or MATH 205

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

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

Impact of Technology: met in the major by OEAS 220T

### 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.

## Marine Science Technology Major

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|---|---|---|
| **General Education** | | |
| Complete lower-division requirements | | 32-39 |
| Complete upper-division requirements (minimum of 6 credit hours) | | 6 |
| **Marine Science Technology** | | |
| OEAS 111N | Physical Geology | 4 |
| or OEAS 112N | Historical Geology | |
| OEAS 130G | Research Skills and Information Literacy for the Natural Sciences | 3 |
| 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 |
| PHYS 111N | Introductory General Physics | 4 |
| or PHYS 231N | University Physics I | |
| PHYS 112N | Introductory General Physics | 4 |
| or PHYS 232N | University Physics II | |
| BIOL 291 | Ecology | 3-4 |
| or OEAS 320 | Sedimentology and Stratigraphy | |
| OEAS 220T | Introduction to Meteorology | 3 |
| OEAS 306 | Oceanography | 3 |
| OEAS 307 | Research Experience in Oceanography | 3 |
| OEAS 310 | Global Earth Systems | 4 |
| STAT 310 | Introductory Data Analysis | 3 |
| OEAS 406 | Matlab | 1 |

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|---|---|---|
| OEAS 416 | Electronics and Oceanographic Instrumentation | 3 |
| OEAS 444 | Communicating Ocean Science to Informal Audiences (meets Oral Communication) | 3 |
| GEOG 402 | Geographic Information Systems | 3 |
| Upper-Division OEAS Electives* | | 15 |
| BIOL 402 | Scientific Diving Methods for Marine Research | |
| OEAS 303 | Paleontology | |
| OEAS 315 | Minerals and Rocks | |
| OEAS 320 | Sedimentology and Stratigraphy (can be used as an elective only if BIOL 291 is used to satisfy the concentration requirement) | |
| OEAS 344W | Geomorphology | |
| 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 418 | Limnology: Biogeochemistry of Lakes | |
| OEAS 425 | Marine Geology | |
| OEAS 451W | Data Collection and Analysis in Oceanography | |
| OEAS 490 | Paleoceanography | |
| **Total Credit Hours** | | **105-113** |

* For these upper-division courses please pay careful attention to prerequisites that may not necessarily also be required courses in the major. Up to 4 credits of 200-level courses may be used to satisfy this upper-division requirement. Up to six credit hours of electives from departments outside of Ocean and Earth Sciences can be used to satisfy this requirement (see the Chief Departmental Advisor for the list of these approved electives). At least one writing-intensive "W" course must be taken within the major.

## Elective Credit

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

## Ocean and Earth Sciences Survey

The Ocean and Earth Sciences Survey will be sent to students via email during their graduating semester approximately one month prior to graduation. Students must complete the survey in the time frame (typically two weeks) provided in the email. Students must have applied for graduation in order to receive the survey.

# 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:

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|---|---|---|
| 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 (C or better required) | 3 |
| OEAS 111N<br>or OEAS 112N | Physical Geology<br>or Historical Geology | 4 |
| BIOL 121N and BIOL 122N | | 4 |
| Literature | | 3 |
| Elective or Language & Culture I (May be waived; See requirement details) | | 3 |
| | **Credit Hours** | **17** |
| **Spring** | | |
| BIOL 123N and BIOL 124N | | 4 |
| ENGL 211C<br>or ENGL 231C | Writing, Rhetoric, and Research (C or better required)<br>or Writing, Rhetoric, and Research: Special Topics | 3 |
| MATH 211<br>or MATH 205 | Calculus I<br>or Calculus for Life Sciences | 3-4 |
| Elective or Language & Culture II (May be waived; See requirement details) | | 3 |
| | **Credit Hours** | **13-14** |
| **Sophomore** | | |
| **Fall** | | |
| CHEM 121N and CHEM 122N | | 4 |
| BIOL 291<br>or OEAS 320 | Ecology<br>or Sedimentology and Stratigraphy | 3 |
| PHYS 111N<br>or PHYS 231N | Introductory General Physics<br>or University Physics I | 4 |
| OEAS 130G (Meets Information Literacy and Research) | | 3 |
| Interpreting the Past | | 3 |
| | **Credit Hours** | **17** |
| **Spring** | | |
| CHEM 123N AND CHEM 124N | | 4 |
| PHYS 112N<br>or PHYS 232N | Introductory General Physics<br>or University Physics II | 4 |
| OEAS 220T | Introduction to Meteorology (Meets Impact of Technology) | 3 |
| Philosophy and Ethics | | 3 |
| | **Credit Hours** | **14** |
| **Junior** | | |
| **Fall** | | |
| OEAS 306 | Oceanography | 3 |
| OEAS 307 | Research Experience in Oceanography | 3 |
| Human Behavior | | 3 |
| Upper-Division OEAS Elective | | 3 |

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|---|---|---|
| Elective | | 3 |
| | **Credit Hours** | **15** |
| **Spring** | | |
| OEAS 310 | Global Earth Systems | 4 |
| OEAS 406 | Matlab | 1 |
| STAT 310 | Introductory Data Analysis | 3 |
| Upper-Division OEAS Elective | | 3 |
| Human Creativity | | 3 |
| | **Credit Hours** | **14** |
| **Senior** | | |
| **Fall** | | |
| Upper-Division OEAS Elective | | 3 |
| GEOG 402 | Geographic Information Systems | 3 |
| Upper-Division General Education Course (Option D) | | 3 |
| Upper-Division OEAS Elective | | 3 |
| Elective | | 3 |
| | **Credit Hours** | **15** |
| **Spring** | | |
| OEAS 416 | Electronics and Oceanographic Instrumentation | 3 |
| Upper-Division OEAS Elective | | 3 |
| Upper-Division General Education Course (Option D) | | 3 |
| OEAS 444 | Communicating Ocean Science to Informal Audiences | 3 |
| Elective | | 3 |
| | **Credit Hours** | **15** |
| | **Total Credit Hours** | **120-121** |

# BA or BS to MBA (Master of Business Administration) Dual Dominion Program

The Dual Dominion 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 (https://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) Dual Dominion Program

The Dual Dominion 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 Dual Dominion 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 (https://catalog.odu.edu/graduate/business/public-service/). For additional information, please contact the School of Public Service in the Strome College of Business.