

## Master of Science

# Ocean and Earth Sciences (MS)

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## Mission

The Department of Ocean and Earth Sciences acquires and disseminates knowledge of the earth system, including the relationships among the biological, chemical, geological, and physical components of our planet. It is critical that we understand both natural and human-induced processes that change this system so we are prepared to meet present and future challenges to our society. With curiosity, creativity, scholarship, and respect as cornerstones of our philosophy, we strive to increase scientific knowledge and literacy through excellence in research, education, and service to the Commonwealth of Virginia and society in general.

## General Description of Graduate Degrees

Two graduate programs are offered:

- Master of Science, Ocean and Earth Sciences
- Doctor of Philosophy, Oceanography

The Master of Science degree has both thesis and non-thesis options. The Ph.D. degree follows the traditional path of original research in the field of oceanography. For both degree paths, areas of emphasis are biological, chemical, geological, and physical oceanography, and the earth and geological sciences. Interdisciplinary studies are emphasized and an integral part of the student experience. The curricula are designed to prepare graduates for professional practice in their area of interest. Official transcripts, 3 letters of recommendation, TOEFL scores (international students), and a statement of goals and interest for graduate study should all be submitted to the Office of Admissions by January 1 for full consideration.

The department receives support from the Commonwealth and local philanthropic sources, as well as from private industry, and considerable support from federal agencies such as the National Science Foundation. Establishment of the Virginia Graduate Marine Science consortium by the General Assembly in 1979 demonstrated the Commonwealth's determination to achieve excellence in marine science. The purpose of the consortium is to advance marine science instruction, research, training, and advisory services and to enhance Virginia's position in seeking funding to carry out these activities. Charter members of the consortium are Old Dominion University, the University of Virginia, Virginia Polytechnic Institute and State University, and the College of William and Mary. The Samuel L. and Fay M. Slover endowment to Old Dominion University in 1986 significantly accelerated the program of oceanographic studies. In 1991, a Center for Coastal Physical Oceanography (CCPO) was established at Old Dominion University by the Commonwealth of Virginia. The center is a Designated Center for Excellence.

The Department of Ocean and Earth Sciences is housed in two buildings. The Oceanography/Physical Sciences Building contains state-of-the-art teaching laboratories, computer facilities, and research laboratories for geological sciences and biological, chemical and geological oceanography. The Center for Coastal Physical Oceanography is located in ODU's Innovation Research Park and contains most of the department's physical oceanography laboratories. The Department maintains a 55-foot research vessel, R/V Fay Slover, primarily for estuarine and coastal studies. In addition to R/V Slover, the Department has a number of small boats suitable for near-shore investigations.

## Admission

Applicants who have obtained a bachelor's degree in a science (e.g., biology, chemistry, geology, physics), mathematics, or engineering, with a minimum 3.00 grade point average in their major and a 2.80 overall grade point average, are eligible for regular admission to the program. At least two semesters of calculus are also required. Ocean and earth sciences is an interdisciplinary endeavor and it is expected that applicants have science courses outside their major.

For students wishing to study geological/earth sciences, an undergraduate major in geology is required for regular admission. Students wishing to study physical oceanography should have majored in physics, mathematics, engineering, computer science, meteorology or a related physical sciences. Such applicants must have completed 36 hours in one of these fields and completed mathematics through partial differential equations.

An applicant who does not meet all requirements for admission as a regular graduate student may be admitted as a provisional graduate student. Students lacking adequate preparation for the program may make up deficiencies by taking appropriate undergraduate courses.

## Curriculum Requirements

The student shall meet all university requirements for graduate degrees outlined in the Requirements for Graduate Degree section in this catalog, including at least 30 hours of graduate study. A maximum of 12 hours of credit may be transferred into a graduate degree program from non-degree status at Old Dominion University or from another accredited institution, except in the case of an approved inter-institutional program. All students are expected to demonstrate competency in oral communication and proficiency in writing.

## Course Distribution

A minimum of 13 hours of basic course work in the four sub-disciplines of oceanography is required of all M.S. students. This core program consists of:

### Required Core Courses

|          |                                       |   |
|----------|---------------------------------------|---|
| OEAS 604 | Introduction to Physical Oceanography | 3 |
| OEAS 610 | Advanced Chemical Oceanography        | 3 |
| OEAS 620 | Advanced Geological Sciences          | 3 |
| OEAS 640 | Advanced Biological Oceanography      | 4 |

### Electives

|                                                             |    |
|-------------------------------------------------------------|----|
| Courses to be approved by the student's guidance committee. | 17 |
|-------------------------------------------------------------|----|

|                           |           |
|---------------------------|-----------|
| <b>Total Credit Hours</b> | <b>30</b> |
|---------------------------|-----------|

Students must achieve a grade of B or better in each of the four core courses. Students may repeat any individual core course only once; if a student fails to earn a grade of B or better on repeating a core course, then the student will be dismissed from the program.

The remaining 17 credits are chosen from a list of graduate courses approved by the student's guidance committee. At least 60 percent of all courses must be at the 600 level or above. For the non-thesis option, up to three hours of research may be used to meet course requirements. For the thesis option, up to six hours of research may be used to meet the course requirements.

## Non-Thesis Option

A student in the non-thesis program must pass a written comprehensive examination testing breadth of knowledge in oceanography. The examination is given twice yearly, normally in October and March. The examination grades are fail, pass, or pass with distinction. A student who has failed the examination may retake it only once.

## Thesis Option

Before a student embarks on thesis research, a thesis advisory committee must be formed. Further information on university guidelines for forming this committee can be found in the Requirements for Graduate Degrees section of this catalog. The student must also submit a thesis proposal which outlines the research to be undertaken and identifies the resources required for completion of the research. Guidelines for the preparation of

the thesis proposal are available from the graduate program director. Any student whose thesis research requires departmental funding must obtain prior approval from the department chair and graduate program director. No funds will be given without this approval. The thesis proposal requires the approval of the graduate program director and the student's thesis advisory committee.

As part of the thesis requirement, the student is required to present a public defense of the research. The public defense and approval of the thesis by the student's Thesis Committee satisfy the comprehensive examination requirement. Students in the thesis program should consult the graduate program director regarding the preparation of the M.S. thesis, scheduling a thesis defense, and the final submission of the thesis.

## **Additional Requirements**

### **Ship Time Requirement and/or Field Work**

MS graduate students must participate in field activities for a total of 5 days.

### **Request to Graduate**

The student should complete an Application for Graduation form through the Registrar's Office. The deadline for submitting this application is listed in the class schedule each semester and usually falls near the end of the semester preceding the one during which graduation is anticipated. It is the student's responsibility to meet these deadlines and submit the necessary paperwork for graduation.

### **Removal of Incompletes**

At least one month prior to graduation, all incomplete grades should be cleared. An Academic Record Change form is used for this purpose, and the instructor of the course and the department chair need to sign this form.