**Department of Ocean, Earth and Atmospheric Sciences**

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http://www.odu.edu/oaes

H. Rodger Harvey, Chair  
Peter N. Sedwick, Graduate Program Director

**Mission**

The Department of Ocean, Earth and Atmospheric 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 in Ocean and Earth Sciences
- Doctor of Philosophy in Oceanography

The Master of Science degree has both thesis and non-thesis options. Areas of emphasis are biological, chemical, and physical oceanography and geological sciences. Interdisciplinary studies are encouraged and often an integral part of the student experience. The curriculum is designed to prepare graduates for professional practice in their area of interest. Official transcripts, 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 February 1 for full consideration. Scores on the GRE verbal, analytical, and quantitative sections are required.

The department receives considerable support from the Commonwealth and local philanthropic sources, as well as from private industry and federal agencies. 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 the nation as a leader in developing new approaches to the solution of marine science problems. 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 marine 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, Earth and Atmospheric Sciences is housed in three buildings. The Oceanography/Physical Sciences Building contains state-of-the-art teaching laboratories, computer facilities, and research laboratories for geological sciences and physical and chemical oceanography. The Center for Coastal Physical Oceanography is located in ODU’s Innovative Research Park and houses all of the department’s physical oceanography laboratories. The Center for Quantitative Fisheries Ecology is housed close to campus. The department maintains a 55-foot research vessel, the R/V Fay Slover, primarily for estuarine and coastal studies. In addition to the Slover, the department has a number of small boats, suitable for near shore investigations.

**Graduate Certificate in Spatial Analysis of Coastal Environments**

The certificate in spatial analysis of coastal environments provides an interdisciplinary program for students wishing to pursue careers in coastal management or research, remote sensing, or geographic information systems (GIS) applications. Rendered upon completion of the requirements, the certificate is an academic affidavit comprised of courses in geography and ocean, earth, and atmospheric sciences and is administered by the two departments. Students must take courses in the areas listed below and complete them with a cumulative GPA of 3.00 or higher and no grade below a C (2.00). The certificate is available to postgraduate professionals who meet the requirements. Students with comparable professional experience may be able to show competence in selected courses through examination.

Students seeking graduate certification are required to complete the 500-level courses.

**I. Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 504</td>
<td>Digital Techniques for Remote Sensing</td>
</tr>
<tr>
<td>BIOL 519</td>
<td>Wetland Plants</td>
</tr>
<tr>
<td>BIOL 550</td>
<td>Principles of Plant Ecology</td>
</tr>
<tr>
<td>OEAS 511</td>
<td>Structural Geology</td>
</tr>
<tr>
<td>OEAS 526</td>
<td>Concepts in Oceanography for Teachers</td>
</tr>
</tbody>
</table>

**II. Interpretive Analysis Courses (Select two from the following)**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>GEOG 502</td>
<td>Geographic Information Systems</td>
</tr>
<tr>
<td>GEOG 522</td>
<td>Coastal Geography</td>
</tr>
<tr>
<td>GEOG 590</td>
<td>Applied Cartography/GIS</td>
</tr>
<tr>
<td>OEAS 595</td>
<td>Special Topics</td>
</tr>
<tr>
<td>GEOG 595</td>
<td>Topics in Geography</td>
</tr>
</tbody>
</table>

**III. Capstone Seminar**

<table>
<thead>
<tr>
<th>Course</th>
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</tr>
</thead>
<tbody>
<tr>
<td>GEOG 519</td>
<td>Spatial Analysis of Coastal Environments</td>
</tr>
<tr>
<td>OEAS 519</td>
<td>Spatial Analysis of Coastal Environments</td>
</tr>
</tbody>
</table>

Total Hours: 15

**Master of Science - Ocean and Earth Sciences**

Peter N. Sedwick, Graduate Program Director

**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 one semester of calculus is 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 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.

**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 interinstitutional 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 program consists of:

<table>
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<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>OEAS 604</td>
<td>Introduction to Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>OEAS 610</td>
<td>Advanced Chemical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>OEAS 620</td>
<td>Advanced Geological Sciences</td>
<td>3</td>
</tr>
<tr>
<td>OEAS 640</td>
<td>Advanced Biological Oceanography</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

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 18 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 must consult the graduate program director regarding the preparation of the M.S. thesis, scheduling a thesis defense, and the final submission of the thesis.

### Time Requirement and Field Work
Each student is required to have at least ten days of shipboard experience, fieldwork, or a combination of the two. Scheduled class field trips may not be counted toward this requirement.

### 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.

### Doctor of Philosophy - Oceanography

#### Admission
The doctoral degree in oceanography is granted to students who have:

1. mastered definite fields of knowledge, become familiar with research in these specific fields, and developed an informed understanding of opportunities for further advances;
2. demonstrated the capacity to do original, independent, scholarly work in their specific fields; and
3. shown the ability to integrate the field of specialization with the larger domains of knowledge and understanding.

All students are expected to demonstrate competency in oral communication and proficiency in writing.

All students in the oceanography Ph.D. program are responsible for reading and understanding the regulations and policies set forth throughout this catalog regarding requirements for the Ph.D. degree. The essential credit requirements for the Ph.D. are as follows. The student shall complete 48 credit hours beyond the master’s degree or 78 credit hours for students admitted to the program with a bachelor’s degree. Up to 24 credits can be granted for dissertation.

### Requirements

#### Major Advisor and Guidance Committee
A major advisor must be identified to the graduate program director (GPD), at least provisionally, prior to admission to the program. After receiving admission to the program and enrollment, students should consult with the GPD and their major advisor for guidance on initial course work. Before the completion of nine semester hours (i.e. before the end of the student’s first semester), the student will form a guidance committee in consultation with the major advisor. Please see the graduate program director and the Requirements for Graduate Degrees section of this catalog for further information on forming a guidance committee.

#### Plan of Study—Curriculum Plan
Sometime in the first year of study, the student shall prepare a plan of study with the aid and approval of the guidance committee. Students should see the graduate program director and refer to the Requirements for Graduate Degrees section of this catalog for further information on preparing a plan of study.

### Course Work Requirements
Students who do not have an M.S. degree in oceanography normally complete the following within the first year:

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<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td><strong>13</strong></td>
</tr>
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</table>

Waiving the requirement to take any of the core courses requires the approval of the GPD. Students must achieve a grade of B or better in each of these 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.

In consultation with the advisor and guidance committee, students will plan a complete program of course work designed to meet their objectives (see the section above). Depending on the entry status of the student, the following credit hours are also required:
Admission to candidacy is a formal step that occurs after the student has:

1. completed all formal course work.
2. filed a dissertation prospectus approved by the student’s dissertation committee; and,
3. completed all formal course work.

The student must be admitted to candidacy at least 12 months before the time the degree is expected to be received, but usually not before the completion of one-and-a-half years of graduate work.

**Dissertation Preparation**

General regulations and procedures governing the submission of a doctoral dissertation are given in the Guide for Preparation of Theses and Dissertations (obtained at https://www.odu.edu/content/dam/odu/offices/graduate-studies/thesis-dissertation/docs/thesis_dissertation_guide.pdf (http://sci.odu.edu/sci/about/information/thesis/index.shtml)). Students should read this guide carefully before beginning to write their dissertation. Writing the dissertation as chapters that can be submitted for publication is encouraged.

Please note that the thesis and dissertation guide in place at the start of the semester will remain in force for the entire semester, and any changes made to the guide over the academic year (and the dates of these changes) will be listed on the cover page of the guide. Changes to the previous guide will also be noted on the cover page of the guide, or in a separate document that can be downloaded from the same site as the complete guide. For more information on dissertation preparation and approval in the College of Sciences, contact your graduate program director.

**Dissertation Defense**

The format of a dissertation defense is determined by the dissertation committee with the approval of the GPD. The defense is chaired by the director of the dissertation committee. The chair will act as moderator, ruling on questions of procedure and protocol that may arise during the defense. Students should see the graduate program director or refer to the Requirements for Graduate Degrees section in this catalog for further information on the format of the dissertation defense.

Satisfactory performance on this examination (oral dissertation defense) and adherence to all regulations outlined above complete the requirements for the Ph.D. degree. All requirements for the doctoral degree must be completed within eight calendar years from the date of initial registration in the program.

**Dissertation Acceptance and Submission**

Once the dissertation committee has approved the dissertation, the student and major advisor must review the entire dissertation to ensure that it adheres to the format described in the Guide for Preparation of Theses and Dissertations before submitting the dissertation to the GPD for final review. Ten days should be allowed for GPD review. Once the GPD has approved the dissertation, the student submits the dissertation to the associate dean in the College of Sciences for approval. All approvals must be completed by the day before commencement. However, the associate dean generally requires that all dissertations be submitted prior to this deadline. Students should consult with the GPD for further details.

**Request to Graduate**

The student should obtain a copy of the form Application for Graduation from the Registrar’s Office and complete this application. The deadline for submitting this application is listed on the Registrar’s Office website at www.odu.edu/registrar 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.