The best OCE applicants have a strong foundation in science, with a bachelor’s and/or master’s degree in physics, mathematics, chemistry, biology, engineering, geophysics, oceanography, marine science, or a related field. Applicants must take the GRE. Those whose first language is not English must pass the Test of English as a Foreign Language (TOEFL) with a score of at least 550.

Application for Admission to the Rosenstiel School of Marine and Atmospheric Science (Ph.D. and M.S.)

Getting Started
All applicants should review undergraduate preparation requirements and recommendations for a competitive application (https://graduate.rsmas.miami.edu/admissions/undergraduate-prep/). In addition to satisfactory scores (as judged by the graduate program) on the appropriate tests, the general requirement for admission is a bachelor’s degree from an accredited college or university with a 3.0 GPA average. If you have any questions about these requirements, please contact the Graduate Program Director for the program you are interested in.

When submitting an application, prospective students must indicate the program(s) of interest. The online application will allow you to submit one application to multiple RSMAS graduate programs with no additional application fee.

The online application will ask you to identify up to 5 faculty with whom you would be interested in meeting if you are offered the opportunity to interview. We encourage you to review faculty associated with various research areas and the list of available research assistantships (https://graduate.rsmas.miami.edu/admissions/phd-assistanships/). Please note your application will be considered regardless of your selection. Applicants are welcome to contact faculty via email before and during the application process, but this is not required.

Dates and Deadlines
RSMAS accepts applications year round. For best chances of fall admission into one of our PhD or research based Masters of Science programs, your complete application including all supporting documents must be received in the application period of November 1st - January 10th. However, complete applications received by December 1st will have the highest chance of being invited to our on-site annual recruitment weekend visit in early February.

Application Requirements
Online Application Form and Upload Supporting Documents
Please use the online application which can be found at https://www.applyweb.com/miamigrd/index.html.

- The application will ask you to identify up to 5 faculty with whom you are interested in. See above statement for more details on this.
- Upload PDF of Statement of Purpose identifying your goals and objectives in pursuing a graduate degree. If you have already identified RSMAS faculty you are interested in, please be sure to include this information here as well.
- Upload PDF of unofficial transcripts (for review purposes only). See below statement on transcripts for more details on this.
- Three letters of recommendation from persons well situated to evaluate your qualifications for graduate study. The online application will ask you to enter your recommender’s email addresses for the RSMAS recommendation letter form to be sent to them.
- Non-refundable application fee ($85).

Official Transcripts of All College and Graduate Level Work
US APPLICANTS
While the online application will allow you to upload unofficial transcripts for review purposes, RSMAS must receive official transcripts before an offer of admission can be released. You are strongly encouraged to request the registrar of each institution attended to send transcripts directly to the University of Miami, RSMAS, Graduate Studies Office (address below). For any institution allowing electronic transfer of the official transcript, please use gso@rsmas.miami.edu as the delivery address.

INTERNATIONAL APPLICANTS
Submit the following educational documents to an approved international credentialing evaluation service for evaluation:

- Official original diplomas and certificates in the original language
- Official original transcripts in the original language (names of courses, grades, and hours of instruction) for every year of study.
- NOTE: Documents in a language other than English must be accompanied by professional, certified English translations. Translations supplement, but do not replace the official documents.

Type of Evaluation Required
- The Rosenstiel School requires international applicants to complete a course-by-course evaluation with GPA.
Where to Submit Documents for Evaluation

• Josef Silney & Associates (JS&A), Inc, International Education Consultants, is the preferred evaluation vendor for international applicants to the University of Miami due to their competitive prices and high-quality service. Click here (https://www.jsilny.org/services.aspx/#foreign_anchor) for more information including the Application for Evaluation of Foreign Educational Credentials.

• Please note that international applicants are not required to use the services of JS&A. The international credential evaluation services of any approved vendor may be used. Click here (https://www.naces.org/members/) to view a list of approved vendors.

• Please be sure the vendor sends your evaluation directly to gso@rsmas.miami.edu.

• Evaluation Fee - Applicants are responsible for the evaluation fee.

• Please note that failure to comply with these instructions may cause significant delays in the review and processing of your application, and therefore also significant delays in the processing of your I-20.

Official GRE Score Report

• An official score of the Graduate Record Examination Test (GRE): http://www.ets.org/gre/revised_general/scores/ must be submitted using institution code 7690 (there is no department code). The University of Miami requires a minimum score of 297 (total of verbal + quantitative) for acceptance into any Graduate School program. The Rosenstiel School does not have a minimum score requirement of its own (other than the UM minimum) for the verbal and quantitative sections, but most admitted applicants score approximately in the 80th percentile or better. In addition, applicants must have a minimum of 3.5 on the analytical writing section.

• It is only recommended, not required, that applicants to the Graduate Program in Marine Biology and Ecology submit the score of the Subject Test in Biology.

Official TOEFL or IELTS Score Report (International Applicants Only)

• International applicants whose native language is not English must submit official results of the Test of English as a foreign language (TOEFL): http://www.ets.org/toefl/ using institution code 2919 or the International English Language Testing System (IELTS) http://www.ielts.org/ using institution code 4862. There is no department code for either score submission.

• An exception to this rule is an international student who will have earned a US degree prior to enrollment at RSMAS.

• A minimum score of 550 (paper-based test), 213 (computer-based test), 80 (iBT), or 6.5 for the IELTS is required for admission.

Additional Supplemental Documents

• Ph.D. Applicants with a Prior Master’s Degree

• Students applying to the Ph.D. program with a prior Master’s degree must include with their application an abstract of the thesis or reprints or manuscripts of scientific work. Applicants can email this to gso@rsmas.miami.edu. (gso@rsmas.miami.edu)

• Financial Documents

• Applicants who have already secured an external fellowship, scholarship, sponsorship or other funding to finance the degree should email financial documents directly to gso@rsmas.miami.edu.

Mailing Address:

Graduate Studies Office SLAB 130
Rosenstiel School of Marine and Atmospheric Science
University of Miami
4600 Rickenbacker Causeway
Miami, Florida 33149
Telephone: 305.421.4155
Facsimile: 305.421.4771
E-mail: gso@rsmas.miami.edu

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Mailing Address:
Graduate Studies Office SLAB 130
Rosenstiel School of Marine and Atmospheric Science
University of Miami
4600 Rickenbacker Causeway
Miami, Florida 33149
Telephone: 305.421.4155
Facsimile: 305.421.4771
E-mail: gso@rsmas.miami.edu

Curriculum Requirements

The applicable requirements will be those in effect during that academic year when the student first registered in the Program, unless stated otherwise in the OCE Handbook or by the OCE Graduate Program Director. Any uncertainties regarding the procedures and requirements should be clarified with the OCE Graduate Program Director and the RSMAS Graduate Studies Office (GSO).

All RSMAS courses are listed on the RSMAS website. Students should consult their advisors and the OCE Graduate Program Director regarding their choices of courses; courses taken by students should be approved by their advisors. Any deviations from the requirements listed below must be approved by the advisor and the OCE Graduate Program Director.

OCE students follow one of four academic tracks: Ocean Dynamics, Air-Sea Interaction and Remote Sensing, Marine Biogeochemistry, or Biophysical Interactions.

Ocean Dynamics Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Core Courses</td>
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<td>6</td>
</tr>
<tr>
<td></td>
<td>Choose 2 courses from the following:</td>
<td></td>
</tr>
<tr>
<td>OCE 603</td>
<td>Physical Oceanography</td>
<td></td>
</tr>
<tr>
<td>OCE 610</td>
<td>Ocean Biogeochemistry</td>
<td></td>
</tr>
<tr>
<td>OCE 701</td>
<td>Mathematical Methods in Marine Physics</td>
<td></td>
</tr>
<tr>
<td>Ocean Dynamics Track</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>OCE 611</td>
<td>Geophysical Fluid Dynamics I</td>
<td></td>
</tr>
<tr>
<td>OCE 711</td>
<td>Geophysical Fluid Dynamics II</td>
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<tr>
<td>Electives</td>
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</tr>
<tr>
<td>Dissertation Research</td>
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<td>33</td>
</tr>
<tr>
<td>OCE 830</td>
<td>Doctoral Dissertation</td>
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<tr>
<td>Required Examinations</td>
<td></td>
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<tr>
<td></td>
<td>Comprehensive Examination</td>
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<tr>
<td></td>
<td>Qualifying Examination</td>
<td></td>
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<tr>
<td>Additional Requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dallas Murphy Writing Workshop or Writing Skills Course (RSM 780)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSM 700</td>
<td>Research Ethics</td>
<td></td>
</tr>
</tbody>
</table>
The remaining course credits can be obtained by taking other graduate courses offered at RSMAS or, with permission of the advisor, at other departments of UM.

All M.S. and Ph.D. students are required to take the comprehensive examination. For full-time students, the comprehensive examination should be taken before the end of their first full year of graduate studies at RSMAS. This examination will be arranged by a Comprehensive Examination Committee comprised of the OCE Graduate Program Director and the instructors (or their assignees) of the required courses taken by the students.

The purpose of this examination is to evaluate students’ understanding of materials in the required courses, and their ability to integrate and apply these materials. The outcome of the comprehensive examination determines whether students are permitted to proceed to the M.S. or Ph.D. program.

The comprehensive examination consists of oral and written components.

- The written component, which lasts no longer than 8 hours, consists of a combination of open- and closed-book questions on the material covered in up to four of the required courses taken by each student (to be selected by the student and the OCE Graduate Program Director if the student’s academic track has more than four required courses).
- The oral component, which lasts no longer than 2 hours for each student, may include questions related to all the courses taken by the student.
- Students and advisors will receive feedback from the comprehensive exam committee on the strengths and weaknesses of the student, and possible recommendations on how to address those.

The outcome of the exam, which is determined by the Comprehensive Examination Committee, is based on the student’s performance on this examination, together with consideration of the student’s first year academic record. Possible exam outcomes are:

- **Ph.D-Pass**: Students with this result may pursue a Ph.D. after completing the M.S. degree, subject to approval by their M.S. Committee.
- **MS-Pass**: Students with this result are required to defend a M.S. thesis and get approval from their M.S. committee before pursuing a Ph.D.
- **Fail**: Students with this result will have an opportunity to re-take the exam once.
- A grade of **PhD-Pass** is required for Ph.D. students.
- Ph.D. students earning a grade of **MS-Pass** may pursue a Ph.D. after completing the M.S. degree, subject to approval by their M.S. Committee.

Ph.D. students are expected to take the qualifying examination and dissertation proposal defense by the end of their third full year in the program. If a student needs to take the qualifying examination after that time, they will need to provide a written explanation to, and get approval from, the OCE Graduate Program Director.

The qualifying examination consists of a written and an oral component.

- While the exact format is left to the discretion of the Ph.D. Committee, a typical written qualifying examination consists of take-home questions from all Committee members, which need to be completed within three days. The questions are usually related to the research described in the dissertation proposal.
- A typical oral qualifying examination consists of an hour of questions based on the written questions and other related questions, and a second hour in which the student presents their dissertation proposal. It is recommended that the presentation emphasizes future work rather than a review of previous results, which are in the written dissertation proposal.

**Expectations of the Qualifying Examination:**

a. **Written Examination**: The student’s written answers should be judged by Ph.D. Committee members to demonstrate that the student has adequately addressed each question.

b. **Oral Examination**: The student should demonstrate the ability to express themselves clearly while providing satisfactory responses to questions raised by the Ph.D. Committee, a typical written examination questions, and any other questions asked by Committee members.

c. **Dissertation Proposal**: The dissertation proposal should be written by the student in clear English. The Proposal should demonstrate the student’s capability to produce and present research of a quality that, when completed, is suitable for submission to a peer-reviewed journal. Emphasis should be placed on the proposed research: the questions and hypotheses to be tested, the data and methodology used to test the hypotheses, and some anticipated results (which may or may not be realized). A student is encouraged to discuss the Proposal with their advisor before submitting it to all Ph.D. Committee members.

**Possible Outcomes of the Qualifying Examination:**

- **Pass**: Meets all expectations.
- **Fail**: Unsatisfactory written dissertation proposal or unsatisfactory oral proposal defense.

In some cases, the Ph.D. Committee may require revisions to a proposal or question/answer, or a retake of the oral part of the qualifying examination. Normally there is no need to retake the entire qualifying examination or have an additional full Ph.D. Committee meeting in such cases.

Regular attendance of the COMPASS seminar series (combined OCE, MPO, ATM seminar series) is expected; each student is required to attend at least 10 seminar sessions per semester.

In the same seminar series, each Ph.D. student is expected to give at least one 15-minute presentation each year after passing the comprehensive examination and at least one 45-minute presentation before defending the Ph.D.
Ph.D. students are expected to be a Teaching Assistant (TA) for two courses while pursuing their degree. The mandatory TA program will include training of new TAs, evaluation of their performance, and recognition of excellence. The goal is to make the experience as valuable as possible for the TA, the faculty, and the students taking our courses. A training session and two teaching opportunities are offered as courses in educational training (RSM 771, RSM 772, RSM 773). Students will be registered accordingly. Specific requirements for TAs are outlined in the RSMAS Student Handbook.

### Air-Sea Interaction and Remote Sensing Track

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<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td></td>
<td><strong>Core Courses</strong></td>
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</tr>
<tr>
<td>OCE 603</td>
<td>Physical Oceanography</td>
<td></td>
</tr>
<tr>
<td>OCE 610</td>
<td>Ocean Biogeochemistry</td>
<td></td>
</tr>
<tr>
<td>OCE 701</td>
<td>Mathematical Methods in Marine Physics</td>
<td></td>
</tr>
<tr>
<td>OCE 675</td>
<td>Fluid Mechanics</td>
<td>6</td>
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<tr>
<td>OCE 676</td>
<td>Wave Propagation in the Ocean Environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Electives</strong></td>
<td>15</td>
</tr>
<tr>
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<td>Educational Training Program (TA)</td>
<td>6</td>
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<tr>
<td>RSM 771</td>
<td>Educational Training 1</td>
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The remaining course credits can be obtained by taking other graduate courses offered at RSMAS or, with permission of the advisor, at other departments of UM.
• All M.S. and Ph.D. students are required to take the comprehensive examination. For full-time students, the comprehensive examination should be taken before the end of their first full year of graduate studies at RSMAS. This examination will be arranged by a Comprehensive Examination Committee comprised of the OCE Graduate Program Director and the instructors (or their assignees) of the required courses taken by the students.

• The purpose of this examination is to evaluate students’ understanding of materials in the required courses, and their ability to integrate and apply these materials. The outcome of the comprehensive examination determines whether students are permitted to proceed to the M.S. or Ph.D. program.

• The comprehensive examination consists of oral and written components.
  - The written component, which lasts no longer than 8 hours, consists of a combination of open- and closed-book questions on the material covered in up to four of the required courses taken by each student (to be selected by the student and the OCE Graduate Program Director if the student’s academic track has more than four required courses).
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• Students and advisors will receive feedback from the comprehensive exam committee on the strengths and weaknesses of the student, and possible recommendations on how to address those.

• The outcome of the exam, which is determined by the Comprehensive Examination Committee, is based on the student’s performance on this examination, together with consideration of the student’s first year academic record. Possible exam outcomes are:
  - PhD-Pass: Students with this result may bypass the M.S. degree and start working toward earning a Ph.D. If the student chooses to, they may complete a M.S. degree before pursuing a Ph.D.
  - MS-Pass: Students with this result are required to defend a M.S. thesis and get approval from their M.S. committee before pursuing a Ph.D.
  - Fail: Students with this result will have an opportunity to re-take the exam once.

A grade of PhD-Pass is required for Ph.D. students.
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  c. Dissertation Proposal: The dissertation proposal should be written by the student in clear English. The Proposal should demonstrate the student’s capability to produce and present research of a quality that, when completed, is suitable for submission to a peer-reviewed journal. Emphasis should be placed on the proposed research: the questions and hypotheses to be tested, the data and methodology used to test the hypotheses, and some anticipated results (which may or may not be realized). A student is encouraged to discuss the Proposal with their advisor before submitting it to all Ph.D. Committee members.

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<td>Marine Biogeochemistry Track</td>
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</table>
### Ph.D. in Ocean Sciences

<table>
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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>OCE 612</td>
<td>Marine Organic Geochemistry</td>
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<tr>
<td>OCE 622</td>
<td>Marine Microbial Dynamics</td>
</tr>
<tr>
<td>MBE 704</td>
<td>Biological Oceanography</td>
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<tr>
<td>OCE 705</td>
<td>Chemical Oceanography</td>
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**Electives**

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>OCE 830</td>
<td>Doctoral Dissertation</td>
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</tbody>
</table>

**Required Examinations**

- Comprehensive Examination
- Qualifying Examination

**Additional Requirements**

- Dallas Murphy Writing Workshop or Writing Skills Course (RSM 780)
- RSM 700 Research Ethics
- OCE Seminar
- Educational Training Program (TA)
- RSM 771 Educational Training 1
- RSM 772 Educational Training 2
- RSM 773 Educational Training 3

**Total Credit Hours**

60

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1. Minimum of 27 course credits and 12 dissertation credits.
   - Minimum of 9 course credits should be taken from 700-level courses.
   - Required courses are normally taken during the student’s first full year of study (beginning in the fall semester). The Comprehensive Examination will focus on the required courses.

2. The remaining course credits can be obtained by taking other graduate courses offered at RSMAS or, with permission of the advisor, at other departments of UM.

3. All M.S. and Ph.D. students are required to take the comprehensive examination. For full-time students, the comprehensive examination should be taken before the end of their first full year of graduate studies at RSMAS. This examination will be arranged by a Comprehensive Examination Committee comprised of the OCE Graduate Program Director and the instructors (or their assignees) of the required courses taken by the students.
   - The purpose of this examination is to evaluate students’ understanding of materials in the required courses, and their ability to integrate and apply these materials. The outcome of the comprehensive examination determines whether students are permitted to proceed to the M.S. or Ph.D. program.
   - The comprehensive examination consists of oral and written components.
     - The written component, which lasts no longer than 8 hours, consists of a combination of open- and closed-book questions on the material covered in up to four of the required courses taken by each student (to be selected by the student and the OCE Graduate Program Director if the student’s academic track has more than four required courses).
     - The oral component, which lasts no longer than 2 hours for each student, may include questions related to all the courses taken by the student.
   - Students and advisors will receive feedback from the comprehensive exam committee on the strengths and weaknesses of the student, and possible recommendations on how to address those.
   - The outcome of the exam, which is determined by the Comprehensive Examination Committee, is based on the student’s performance on this examination, together with consideration of the student’s first year academic record. Possible exam outcomes are:
     - **PhD-Pass**: Students with this result may bypass the M.S. degree and start working toward earning a Ph.D. If the student chooses to, they may complete a M.S. degree before pursuing a Ph.D.
     - **MS-Pass**: Students with this result are required to defend a M.S. thesis and get approval from their M.S. committee before pursuing a Ph.D.
     - **Fail**: Students with this result will have an opportunity to re-take the exam once.
   - A grade of **PhD-Pass** is required for Ph.D. students.
   - Ph.D. students earning a grade of **MS-Pass** may pursue a Ph.D. after completing the M.S. degree, subject to approval by their M.S. Committee.
Ph.D. students are expected to take the qualifying examination and dissertation proposal defense by the end of their third full year in the program. If a student needs to take the qualifying examination after that time, they will need to provide a written explanation to, and get approval from, the OCE Graduate Program Director.

The qualifying examination consists of a written and an oral component.

- While the exact format is left to the discretion of the Ph.D. Committee, a typical written qualifying examination consists of take-home questions from all Committee members, which need to be completed within three days. The questions are usually related to the research described in the dissertation proposal.
- A typical oral qualifying examination consists of an hour of questions based on the written questions and other related questions, and a second hour in which the student presents their dissertation proposal. It is recommended that the presentation emphasizes future work rather than a review of previous results, which are in the written dissertation proposal.

**Expectations of the Qualifying Examination:**
- **Written Examination:** The student’s written answers should be judged by Ph.D. Committee members to demonstrate that the student has adequately addressed each question.
- **Oral Examination:** The student should demonstrate the ability to express themselves clearly while providing satisfactory responses to questions raised by the Ph.D. Committee that relate to the written examination questions, and any other questions asked by Committee members.
- **Dissertation Proposal:** The dissertation proposal should be written by the student in clear English. The Proposal should demonstrate the student’s capability to produce and present research of a quality that, when completed, is suitable for submission to a peer-reviewed journal. Emphasis should be placed on the proposed research: the questions and hypotheses to be tested, the data and methodology used to test the hypotheses, and some anticipated results (which may or may not be realized). A student is encouraged to discuss the Proposal with their advisor before submitting it to all Ph.D. Committee members.

**Possible Outcomes of the Qualifying Examination:**
- **Pass:** Meets all expectations.
- **Fail:** Unsatisfactory written dissertation proposal or unsatisfactory oral proposal defense.

In some cases, the Ph.D. Committee may require revisions to a proposal or question/answer, or a retake of the oral part of the qualifying examination. Normally there is no need to retake the entire qualifying examination or have an additional full Ph.D. Committee meeting in such cases.

Regular attendance of the COMPASS seminar series (combined OCE, MPO, ATM seminar series) is expected; each student is required to attend at least 10 seminar sessions per semester.

In the same seminar series, each Ph.D. student is expected to give at least one 15-minute presentation each year after passing the comprehensive examination and at least one 45-minute presentation before defending the Ph.D.

Ph.D. students are expected to be a Teaching Assistant (TA) for two courses while pursuing their degree.
- The mandatory TA program will include training of new TAs, evaluation of their performance, and recognition of excellence. The goal is to make the experience as valuable as possible for the TA, the faculty, and the students taking our courses.
- A training session and two teaching opportunities are offered as courses in educational training (RSM 771, RSM 772, RSM 773). Students will be registered accordingly.
- Specific requirements for TAs are outlined in the RSMAS Student Handbook.

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**Biophysical Interactions Track**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>OCE 701</td>
<td>Mathematical Methods in Marine Physics</td>
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<tr>
<td>OCE 603</td>
<td>Physical Oceanography</td>
<td>3</td>
</tr>
<tr>
<td>or OCE 610</td>
<td>Ocean Biogeochemistry</td>
<td>3</td>
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<tr>
<td>OCE 736</td>
<td>Modeling of Physical-Biological Interactions</td>
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| Electives | 18 |

<table>
<thead>
<tr>
<th>Dissertation Research</th>
<th>33</th>
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<tr>
<td>OCE 830</td>
<td>Doctoral Dissertation</td>
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<table>
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<th>Required Examinations</th>
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<tr>
<td>Comprehensive Examination</td>
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<td>Qualifying Examination</td>
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<th>Additional Requirements</th>
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<tr>
<td>Dallas Murphy Writing Workshop or Writing Skills Course (RSM 780)</td>
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<td>RSM 700</td>
<td>Research Ethics</td>
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<td>OCE Seminar</td>
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<td>Educational Training Program (TA)</td>
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<tr>
<td>RSM 771</td>
<td>Educational Training 1</td>
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<td>RSM 772</td>
<td>Educational Training 2</td>
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Ph.D. in Ocean Sciences

<table>
<thead>
<tr>
<th>RSM 773</th>
<th>Educational Training 3</th>
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<tbody>
<tr>
<td>Total Credit Hours</td>
<td>60</td>
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</tbody>
</table>

1. Minimum of 27 course credits and 12 dissertation credits.
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### Mission

The Department of Ocean Sciences (OCE) seeks to advance knowledge and understanding of physical, chemical and biological processes in the oceans. We train graduate students and young scientists to be leaders in ocean-science-related fields. With distinct strengths in ocean dynamics, air-sea interactions and remote sensing, ocean biogeochemical cycles, biophysical interactions and coastal processes, we strive to achieve excellence in research and education. We seek to promote, among the public and policy makers, responsible science-based stewardship of the oceans. Our program commits to inspire graduates to continued scholarship, service, and innovation in an environment that is inclusive and diverse.

### Goals

To train graduate students and young scientists to be leaders in ocean-science-related fields.

### Student Learning Outcomes

- **Proof of Fundamental Knowledge**: Students will demonstrate a broad understanding of fundamentals of ocean science and an awareness of how scientific research in their topical areas relate to current societal issues.

- **Capability to Explain and Defend Own Work**: Students will demonstrate a comprehensive understanding of their field of work and the ability to explain their work and defend their results in oral and written communication in a way adequate for a continuing academic career and for employment as a highly qualified research scientist or equivalent professional level scientist.

- **Capability to Give Short Presentations**: Students will demonstrate the ability to explain their work and defend their key results in a short oral presentation in a competitive environment similar to a session at a scientific conference or a professional project meeting.