Requirements for a Graduate Degree (M.S. or Ph.D.) in Oceanography at the University of Maine

Mission Statement

The University of Maine's Oceanography Program creates and communicates integrated understanding of oceanographic processes by weaving fundamentals from basic sciences and mathematics into a fully interdisciplinary, marine context. As leaders in ocean observation and prediction, we focus expertise on the Gulf of Maine and maintain active research programs throughout the world's oceans. Mentorship of students in the Program emphasizes fundamentals, novel composites of disciplines tailored to the students' research, and an adaptive, problem-solving skill set that prepares students for rapid change within both their profession and the oceans themselves.

Admission to the Oceanography Program

A student may be admitted to the Oceanography degree program as a prospective candidate for either the Master's (M.S.) or doctoral (Ph.D.) degree. The M.S. degree prepares a student to enter the workforce or to continue academic studies toward a doctoral degree. The Ph.D. degree prepares a student to undertake independent research in academia, government, or industry.

A student who does not hold a M.S. degree at the time of her entrance to the Oceanography Program will normally be admitted to the M.S. degree program, which provides the student with direct supervision in the beginning of her career. The decision to admit a student who applies directly to the Ph.D. program without a M.S. degree will be made by the Admissions Committee, in consensus with the prospective advisor and the Oceanography graduate program coordinator. A student who holds a M.S. degree may be admitted as a prospective Ph.D. candidate. Alternatively, if either subject specialization or performance on the M.S. is an issue, she may be required by the admissions committee, in consultation with the prospective advisor and the Oceanography graduate program coordinator, to first enter the M.S. program before entering the Ph.D. program; in that case, a decision to admit the student to the Ph.D. program may be made by the Oceanography faculty at the student's first annual review or anytime thereafter.

The requirements for the M.S. and Ph.D. degrees in Oceanography at the University of Maine include the general requirements of the Graduate School, as stated in the Graduate Catalog and current web site, and the specific requirements of the Oceanography Degree Program of the School of Marine Sciences, as instituted by the faculty of the Oceanography Program. General requirements for an Oceanography degree are outlined below; requirements specific to the M.S. or Ph.D. programs are listed in separate sections.

Orientation

Students are required to participate in an orientation program during their first semester, whose purpose is to:

- introduce students to the faculty and other graduate students in the program;
- acquaint students with resources on the Orono campus and at the Darling Center, (the University of Maine's marine research and educational facility);
- communicate the faculty's expectations from, and the responsibilities of, a graduate student — especially where they differ from expectations and responsibilities in undergraduate program;
- communicate the advisor's and advisory committee's responsibilities to the student;
- familiarize students with program requirements and time lines;
- inform students of opportunities for outside funding, internships and oceanographic cruises; and,
- provide a relaxed format in which students can ask questions and allay concerns about the transition to graduate school.

Student Responsibilities

The student carries responsibility for conducting himself as a professional and for taking the responsibility for learning – through courses, readings, research, seminars (students are particularly encouraged to attend the weekly SMS seminars), discussions, etc. Unlike the undergraduate experience of most students, graduate school is open-ended learning. In general, the student who learns more will do better. Grades matter less than achievement of competencies. This change of academic focus can be disorienting, and the student should develop a continuing dialogue with Advisory Committee members and other faculty regarding the emphasis of ongoing learning and research efforts. The goal is to find a set-point for learning rate that optimizes the graduate opportunity, *i.e.,* a balance of challenge and enjoyment. The most important evaluations will come not as grades but in the form of recommendation letters from those advisors that document acquired skills, abilities and knowledge base upon completion of the degree.

The student is responsible for:

- rectifying deficiencies in his background and for meeting all requirements for the degree;
- registering for courses on time (*i.e.,* pre-registering well in advance of the beginning of the semester);
- meeting deadlines and updating forms required by the Graduate School (the Graduate School calendar, released annually, includes dates relative to curriculum and degree granting); and
- assembling an Advisory Committee before the beginning of second semester of the first year. It is the student's responsibility to meet with the Advisory Committee annually.

Advisor and Advisory Committee

A student first will be accepted by an advisor, prior to her formal acceptance to the Oceanography Program. In most cases the advisor will work with the student throughout her/his degree program. The student should discuss research interests with her advisor, and if the research interests are misaligned, the student should pursue a change of advisor as early as possible in her program.

The student and her advisor should assemble an Advisory Committee by her second semester. (As the student focuses her research, committee membership may also need to be refocused.) The Ph.D. student may require more time to assemble an Advisory Committee that includes members from outside SMS. In such a case, the Ph.D. student and her advisor should assemble a more informal Advisory Group of at least three members by her second semester, and should complete the full Advisory Committee before the beginning of her fourth semester.

The advisor will normally serve as chair of the Advisory Committee. The Advisory Committee acts as a resource and provides advice to the student in developing the Program of Study and the thesis/dissertation research, provides oversight of the student's academic and research progress, participates in the formal annual review of the student's progress, participates in evaluation of whether a Ph.D. student is qualified to advance to candidacy, evaluates the thesis/dissertation, and administers the final M.S. or Ph.D. oral examination.

Program of Study

The student, in consultation with his Advisory Committee, should develop a Program of Study as early as possible. The Program of Study is an outline of all academic work to be undertaken by the student, including all courses to be taken while the student is enrolled in the degree program. The Program of Study also identifies the topic of the thesis or dissertation research and includes a preliminary written proposal of the work to be undertaken. (The M.S. student will have the opportunity to expand on the thesis proposal; please see below, No. 9 under "M.S. Requirements". The Ph.D. student also will have the opportunity to expand on the dissertation proposal prior to the Oral Dissertation Examination; please see below, No. 11 under "Ph.D. Requirements"). The form (available on the current Graduate School web site) must be approved and signed by the student's Advisory Committee and the Graduate Program Coordinator, and submitted to the Graduate School before the end of the student's second semester.

The Program of Study is the student's required curriculum. Changes may be made only if a "Request for Change in Program" is approved, signed by the student's Advisory Committee and the Graduate Program Coordinator and submitted to the Graduate School.

Core Courses

Core Oceanography Program courses should be completed with a grade of "B-" or better by the end of the second semester of full-time study, and must be completed by the end of the fourth semester:

SMS 501 Biological Oceanography SMS 520 Chemical Oceanography
SMS 541 Physical Oceanography SMS 560 Marine Geology
SMS 691 Seminar (the seminar should be taken during the student's first year)

The requirement for one or more of the core courses may be waived – if an equivalent course was taken elsewhere with a grade of "B-" or better, and if signed approval is given by the student's advisor, the instructor of the course whose requirement is to be waived, and the Oceanography Graduate Coordinator. Because the student is responsible for integrating the material provided in the core courses, he/she may wish to consider auditing courses for which the requirement has been waived.

A student who lacks the necessary background for any core course is expected to take the initiative to make up the deficiency. Core-course faculty can assist students in determining if they have adequate background and can provide guidance if more background is needed.

Elective and Advanced Courses

Elective courses should be selected to contribute to the background and ability of the student to qualify as a competent investigator and scholar in his research area as well as in related disciplines. Courses at the 400 level and higher qualify for graduate credit. Specific requirements for each degree are given below, under appropriate sections for M.S. and Ph.D.

Oceanic Research Cruise

For an oceanography student, first-hand experience at sea is essential training. All Oceanography degree students are required to participate in a minimum of one oceanic research cruise of at least 5 (continuous) days in duration. Specifics regarding this requirement must be approved by the student's advisor and the Oceanography Graduate Coordinator. A student may have this requirement waived under special circumstances or by demonstrating previous oceanic cruise experience; the waiver must be signed by the advisor and the Graduate Program coordinator and placed in the student's file.

Graduate Student Symposium

All full-time Oceanography Program students are expected to present research results and future research plans at the annual SMS Graduate Student Symposium, usually held at the end of Spring Semester. Students should alternate oral and poster presentations from year to year, to practice in both communications media. Part-time students are expected to present every second year, but should attend every year. If a student cannot attend the Symposium, due to field sampling or another commitment, he will prepare a poster to be presented *in absentia.* If a student completes <u>all</u> degree requirements in the semester in which the Symposium occurs, he will be excused from presenting at the Symposium, <u>unless</u> the student intends to pursue an additional degree in the School of Marine Sciences.

Annual Review

A review of the progress of all Oceanography Students will be conducted annually by the entire Oceanography Program faculty to provide students with feedback and specific recommendations for improvement. The review will consider grades for courses taken as well as progress of the student toward accomplishing thesis or dissertation research. The review comprises three steps: 1) student self-assessment, 2) Advisory Committee assessment, and 3) Oceanography faculty assessment.

A "Milestones" form (AKA "Tracking" form) will help the student, advisor, and Advisory Committee monitor progress and completion of requirements. The student and Advisory Committee are responsible before each annual review to update timelines for the student's milestones, including completion of the degree. This step is particularly crucial for part-time students.

1. Student Self-Assessment
   In preparation for the annual faculty review, and during the two months prior to the review, each student will prepare:
   a. a one-page summary of progress made during the previous year, with supporting figures and tables as necessary,
   b. a one-page statement of work to be undertaken in the coming year, and
   c. a self assessment of strengths and goals for improvement, including how the student plans to achieve the latter and what resources she may need to do so. If the student requires financial assistance (*e.g.,* for a course outside the university or to attend a meeting), the student should include a budget and be prepared to discuss the resources required.

2. Committee Meeting:
   Before the annual faculty review, the student will meet with her committee to:
   a. present the written material (#1, above) to the committee,
   b. discuss progress and future plans, and
   c. receive oral and written feedback from the committee. The advisor is responsible for the written assessment.

3. Faculty Assessment
   Both sets of written material (# 1a, b, c and #2c, above) and grades will be made available to all faculty at the annual review. The review by the entire faculty is intended to make assessments fair and uniform, establishing consistent standards for knowledge, skills and abilities across the Oceanography Program. Following the meeting of the faculty, no later than one month after the Graduate Student Symposium, each student will receive a written evaluation, prepared by the Oceanography Program Coordinator, that summarizes the faculty assessment.

Should the faculty find the progress of the student to be "unsatisfactory," they may recommend corrective action. Should the faculty find the progress of the student as "continuing to be unsatisfactory," they may recommend that the student be dismissed from the Oceanography Program. Such action must be approved by a majority of the

Oceanography Graduate Faculty, with concurrence by the Oceanography Program Coordinator and the Director of the School of Marine Sciences.

Part-time students

During his first year, a part-time student is expected to participate in orientation and to enroll in the seminar class, SMS691. The part-time student should attend the Graduate Student Symposium every year and plan to present every second year. The part-time student should assemble an Advisory Committee before the beginning of his third semester and file his Program of Study before the end of his third semester, although it is expected that his research proposal will become more fully developed after he completes the core courses. Part-time students are also expected to participate fully in the Annual Review and in an oceanographic cruise. Although the part-time student will require more flexibility than a full-time student in meeting requirements, establishing a clear time line is critical to ensure that the part-time student conforms to the time limits established by the Graduate School for completion of degree (please see details below for each degree).

M.S. Degree Requirements

In the following description, requirements are labeled according to whether they originate from the Graduate School (**GS**; for full details of those requirements see the Graduate Catalog or current Graduate School web site) or the Oceanography Degree Program (**ODP**).

1. Credit Requirements (**GS**): A minimum of 30 semester hours, including thesis credits, is required. At least six thesis credits, but no more than 15, will be applied toward the degree. A minimum of 15 credit hours of 500- and 600-level coursework is required, including the core Oceanography courses. Only courses at the 400 level and above can be used for graduate credit. The student, in consultation with his committee, will select courses most appropriate for his career goals.

2. Grades and Credits (**GS**): In general, only a grade of "B-" or better is acceptable for coursework on a student's program of study, including core Oceanography courses. A grade of "C" may carry graduate credit, if so recommended by the student's Advisory Committee and approved by the Graduate School; however, no more than 6 credits of "C" grade on a student's Program of Study can apply toward the GS credit requirement. Audited and Pass-Fail courses are normally not accepted for graduate degree credit.

3. Transfer Credit (**GS**): A maximum of six credits may be transferred from another graduate degree-granting institution, subject to approval by the student's Advisory Committee. In addition, a total of six credit hours may be transferred from appropriate coursework taken at the University of Maine before matriculation into a graduate degree program.

4. Full-time Registration (**GS**) is defined as six or more course credits per semester.

5. Residence Requirement (**GS**): At least 50 % of the coursework to be applied toward the degree must be taken through the University of Maine.

6. Time Limit (**GS**): All work toward the degree should be completed in two to three years (but MUST be completed within six years) of first registering for work toward the M.S. degree. The student may petition for an extension by filing an "Exception to Regulation" that must be approved by the advisor, the Graduate Coordinator, and the Graduate School.

7. Advisory Committee (**GS**): The Advisory Committee for the M.S. degree comprises a minimum of three members of the Graduate Faculty. The graduate student, in conjunction with his advisor, is responsible for establishing the student's Advisory Committee. If a member of the committee is from outside the University of Maine, the proposed committee member must first be recommended for appointment to the Graduate Faculty by the Graduate Program Coordinator and appointed by the Director of the Graduate School. **ODP**-specific Requirements: At least two of the three members must

be from the Oceanography Graduate Faculty. The Advisory Committee should be formed before the beginning of the student's second semester.

8. Thesis Requirement (**GS**): A thesis is required of all M.S. degrees unless a non-thesis option is specifically given. **ODP**-specific Requirement: The Oceanography Degree Program does not presently offer a non-thesis degree, so all M.S. degrees in Oceanography require a thesis.

9. Thesis Proposal, **ODP**-specific Requirement: In addition to the preliminary thesis topic identified in the Program of Study, a more developed thesis proposal should be submitted to the Advisory Committee before the student's second annual review. A copy of the final version of the proposal will be included in the student's file.

10. Final Examination (**GS**): A final examination for the M.S. degree is required of a student in a thesis program. The examination is the responsibility of the student's Advisory Committee, and it bears sole responsibility for evaluating the student's performance. Other members of the faculty may attend and participate in the questioning. **ODP**-specific Requirement: This examination will be given orally. The examination will begin with a public seminar, followed by questions from the audience, after which all members of the public will withdraw. Further questions pertaining to the student's thesis will then be asked by the Advisory Committee and interested faculty members. The examination will be scored as either a Pass or Fail. In the event of a Fail, the examination may be re-taken at a time to be determined by the student's Advisory Committee but within six months of the initial exam.

11. Application for Graduation (**GS**): A candidate for a M.S. degree must submit an "Application for Degree" to the Office of Student Records according to an established set of dates. The student is responsible for checking with the Graduate School to verify all deadlines.

Ph.D. Requirements

In the following description, requirements are labeled according to whether they originate from the Graduate School (**GS**; for full details of those requirements see the Graduate Catalog or current web site) or the Oceanography Degree Program (**ODP**).

1. Credit Requirements (**GS**): A minimum of 12 hours (exclusive of dissertation credits) of 500- and 600-level coursework is required. Only courses at 400 level and above can be used for graduate credit. After admission to candidacy (please see No. 12, below), a doctoral student must register for a minimum of six credits of dissertation research (SMS 699). **ODP**-specific Requirement: In addition to fulfilling the requirements for the Oceanography core courses (13 credits), a student in the Ph.D. program must take at least six additional credits of coursework at the 500 level, or higher, in Oceanography.

2. Grades and Credits (**GS**): In general, only a grade of "B-" or better is acceptable for coursework on a student's program of study, including the core Oceanography courses. A grade of "C" may carry graduate credit, if so recommended by the student's Advisory Committee and approved by the Graduate School; however, no more than six credits of "C" grade on a student's Program of Study can apply toward the GS credit requirement. Audited and Pass-Fail courses are normally not accepted for graduate degree credit.

3. Transfer Credit (**GS**): A maximum of 30 credits beyond the bachelor's degree may be transferred from another graduate degree-granting institution, subject to approval by the student's advisory committee. In addition, a total of six credit hours may be transferred from appropriate coursework taken at University of Maine before matriculation in a graduate degree program. In no case may the number of credit hours transferred into a graduate degree program exceed 50 % of the student's entire coursework for the degree.

4. Residency Requirement (**GS**): The minimum residence requirement for the Ph.D. is met by registering for courses or dissertation research through the University of Maine for four semesters beyond the baccalaureate degree or two semesters beyond the M.S. degree.

5. Full-time Registration (**GS**) is defined as six or more course credits per semester. After admission to candidacy (see No. 12, below), one dissertation credit per semester may be considered full time.

6. Time Limit (**GS**): All work for a doctoral degree must be completed within eight years; completion within four to six years is highly recommended. **N.B.:** this requirement has two parts: 1) a student must be admitted to candidacy within four years of her first registration within the Ph.D. degree; and 2) the dissertation must be completed within four years of admission to candidacy. The student may petition for an extension by filing an "Exception to Regulation" form that must be approved by the advisor, the Graduate Coordinator, and the Graduate School.

7. Advisory Committee (**GS**): The Advisory Committee for the Ph.D. student comprises a minimum of five members of the Graduate Faculty. It is recommended that one member of the Advisory Committee be from the Graduate Faculty of a department other than that of the student's degree program. The graduate student, in conjunction with her advisor, is responsible for establishing the student's Advisory Committee. If a member of the committee is from outside the University of Maine, the proposed committee member must first be recommended for appointment to the Graduate Faculty by the Graduate Program Coordinator and appointed by the Director of the Graduate School. **ODP**-specific Requirement: At least three of the five members must be Oceanography Program Graduate Faculty. The Advisory Committee should be assembled before the beginning of her second semester of registration within the Ph.D. degree program.

8. Examinations to Determine Admission to Candidacy (**GS**): Comprehensive examinations may be written, oral, or both, and will be administered by the student's academic unit and passed to the satisfaction of the Advisory Committee. These examinations may not be taken until the student has completed at least 1.5 years beyond the bachelor's degree, but must be successfully passed within four years of entry into the doctoral program. **ODP**-specific Requirements: Doctoral students must pass two exams in order to advance to candidacy for the doctoral degree – a Written Comprehensive Examination and an Oral Dissertation Examination. The purpose of the written test is to examine the student's ability to synthesize her oceanographic coursework and readings of the literature. The purpose of the oral exam is to document the student's ability to formulate both a suite of testable hypotheses and a plan of research that together are likely to lead to publishable findings.

9. Written Comprehensive Examination (**ODP**-specific Requirements): Normally this exam will be taken before the end of the third semester of study as a Ph.D. student. The written exam will consist of three, 3-hour sessions. A first day of two, 3-hour sessions will pose broadly integrative oceanographic questions, and a second day of one, 3-hour session will focus on the student's particular area of specialization, which may or may not be a traditional sub-discipline of oceanography. Faculty who teach the core Oceanography courses will design and evaluate this exam, with input from the entire Oceanography faculty. Within one month of the exam, the student will be passed; failed with an opportunity to retake the test once more (either in its entirety or in part, depending on the student's performance); or, failed and asked to withdraw.

10. Oral Dissertation Examination (**ODP**-specific Requirements): Normally this exam will be taken before the end of the fourth semester of study as a Ph.D. student, but within a year of successful passing of the Written Comprehensive Examination. The oral exam will focus on the student's dissertation proposal (please see No. 11, below), which must be submitted to the student's Advisory Committee a minimum of two weeks prior to the oral exam. At the oral exam, the student will present her proposal to the public (30 minutes), followed by a period of public questioning (< 30 minutes). The Advisory Committee, joined by other Oceanography faculty members, will provide a more intensive oral exam on the order of two hours duration on the material contained in the

dissertation proposal plus any fundamental science (oceanographic or otherwise) related to the proposed work. This exam will focus on the student's mastery of the field necessary to perform the research, as well as thinking skills (e.g., ability to critique, quantify, and generate hypotheses) necessary for successful pursuit of research. The Advisory Committee must agree unanimously to a conclusion of pass, fail with an opportunity to retake the test once more, or fail and withdraw from the Program. The Advisory Committee may recommend additional coursework or other means of acquiring skills as a result of this examination.

11. Dissertation Proposal (**ODP**-specific Requirements): In addition to the preliminary dissertation proposal, filed at the time of submission of the Program of Study, a fully-developed dissertation proposal approximately 10 text pages long must be submitted to the Advisory Committee at least two weeks before the Oral Dissertation Examination (please see No. 10, above). A copy of the final version of the proposal will be included in the student's file.

12. Admission to Candidacy (**GS**): Admission to candidacy signifies that the student has successfully fulfilled all degree requirements except for completing the dissertation, the final oral examination, and a few courses, if appropriate. A student in a Ph.D. program will be admitted to candidacy when the Graduate School is informed that the student has successfully passed the Written Comprehensive Examination and the Oral Dissertation Examination and has met any other departmental requirements. After admission to candidacy (please see No. 1, above), a doctoral student must register for a minimum of six credits of dissertation research (SMS 699).

13. Dissertation (**GS**): The doctoral dissertation must demonstrate the candidate's mastery of the area of research and must embody the results of an original investigation in the principal field of study. Other requirements, including manner of submission and style are obtainable from the Graduate School.

14. Final Examination (**GS**): After the dissertation has been accepted by the candidate's Advisory Committee, the candidate will appear for a final oral examination by an examining committee of no fewer than five members (*i.e.,* the student's Advisory Committee); if substitutions are necessary, additional members may be appointed to the student's Advisory Committee by the Graduate School. Other members of the faculty may attend and participate in the questioning, but only members of the committee may evaluate the student's performance. The original dissertation must be presented to the Graduate School within its required time limits, available on the Graduate School's web site. **ODP**-specific Requirements: The examination will be given orally and will continue as long as necessary. The examination will begin with a public seminar, followed by questions from the audience, after which all members of the public will withdraw and additional questions will be asked by the student's Advisory Committee and interested faculty members. The questioning may range beyond the topic of the student's dissertation to general aspects of the oceanographic sciences. This examination is scored as either a Pass or Fail. In the event of a Fail, the examination may be retaken once at a time to be determined by the student's Advisory Committee.

15. Application for Graduation (**GS**): A candidate for a degree must submit an "Application for Degree" to the Office of Student Records according to an established set of dates. The student is responsible verifying all Graduate School deadlines.