School of Marine Science and Policy

Policy Statement Sc/1/14
(Replaces Policy Statement Sc/1/13)
Graduate Program

1. Administration

a) The School of Marine Science and Policy (SMSP) offers the following degrees and concentrations administered within the four graduate-level programs of Marine Biosciences, Marine Policy, Oceanography, and Physical Ocean Science and Engineering:

i. Master of Marine Policy

ii. Master of Science in Marine Studies with a concentration in Marine Biosciences

iii. Master of Science in Marine Studies with a concentration in Oceanography

iv. Master of Science in Marine Studies with a concentration in Physical Ocean Science and Engineering

v. Doctor of Philosophy in Marine Studies with a concentration in Marine Biosciences

vi. Doctor of Philosophy in Marine Studies with a concentration in Marine Policy

vii. Doctor of Philosophy in Marine Studies with a concentration in Physical Ocean Science and Engineering

viii. Doctor of Philosophy in Oceanography

b) The Director of the School is responsible for the graduate-degree programs in the School of Marine Science and Policy (SMSP). The various curricula are housed in the four Academic Programs that comprise the SMSP (see Policy Statement Sa/2/09). Each Program is administered by an Associate Director. Coordination and oversight of graduate education resides in the Directors Council of the School (see Policy Statement Sa/3/09).

c) All core and joint faculty members of the SMSP are eligible to teach graduate courses and to serve as principal advisors or as advisory committee members. Core faculty members are those individuals who have primary appointment in the SMSP. These include both tenure-track and research faculty (see SMSP Policy Statement Sf/5/09). Joint faculty members have primary appointment in another unit of the University and secondary appointment in the SMSP (see College of Earth, Ocean, and Environment Policy Statement F/2/09).

d) Individuals other than School faculty may be permitted to teach specific graduate courses during specific terms if both the course and instructor are approved by the appropriate Associate Director and the Director.

2. Assessment

The Mission Statement for the SMSP is *to advance knowledge and education critical to the understanding, stewardship, and conservation of estuarine, coastal, and ocean environments*. The curricula of the academic programs in the SMSP are multidisciplinary and encompass the fields of Marine Biosciences, Marine Policy, Oceanography, and Physical Ocean Science and Engineering. Students are encouraged to explore areas outside of their own specialties.

The faculty of the SMSP has defined seven learning goals consistent with this Mission Statement. Students will:

1. Identify or define a research question
2. Understand and synthesize literature material
3. Design and execute a research study or experiment
4. Critically evaluate and interpret the outcome
5. Write for peer review publications
6. Present in professional and public forums
7. Perform in collaborative workgroups

The specific learning goals stated above are linked to courses administered by the four academic programs in the SMSP, and achievement of these goals is assessed through multiple methods including:

- Exams
- Term Project(s) / Paper(s)
- Laboratory Report(s)
- Oral Presentation(s)
- Problem Based Learning
- Problem Sets
- Case Studies

3. Admission

a) Admission to the graduate programs of the School is based on GRE scores, grade point averages, letters of recommendation, and other appropriate information.

b) Prospective students apply online through the University Office of Professional and Graduate Education. Subsequent evaluation of the applications for Master of Science (MS), Master of Marine Policy (MMP), and Doctor of Philosophy (PhD) is conducted by the respective Associate Directors in consultation with relevant faculty members. The Associate Director forwards a recommendation for admission to the Director, who makes final decisions concerning admission.

c) International students are required to take the Test of English as a Foreign Language (TOEFL), to be considered for admission. A minimum score of 95 must be achieved by applicants taking the TOEFL IBT exam. No exceptions will be made to this minimum. The IELTS may not be taken in lieu of the TOEFL exam.

d) Before qualified applicants are admitted to the School, a specific faculty member must be identified as the primary advisor for the admitted applicant. The Director appoints the faculty advisor *pro tem*; at the initiative of faculty or applicant, the advisor may be changed. When an appropriate advisor cannot be identified, the relevant Associate Director acts as the point of contact for the applicant regarding academic issues.

4. Policies for Matriculated Students

a) Requirements for the various degrees offered by SMSP are described below:

Master of Marine Policy (MMP) (30 credits minimum)

Must take the following three credit course in the area of **Law and Institutions**:

- MAST660 (3 credits) International and National Ocean Policies

Must take the following three credit course in the area of **Decision Analytics**:

- MAST663 (3 credits) Decision Tools for Policy Analysis or other Quantitative Methods Course

Must take one of the following three credit courses in the area of **Economics**:

- MAST675 (3 credits) Natural Resource Economics
- MAST676 (3 credits) Environmental Economics

Must take MAST873 (1 credit) Marine Policy Seminar three times

Science Elective: Must take one course (3 credits) Typically a course from one of the other three program areas in SMSP satisfies the science requirement but it may also be taken from outside SMSP if approved. Science elective must be approved by advisor and Associate Director of Marine Policy.

Must take four or more courses (12 credits) as Policy/Science/Economics/Law (PSEL) Electives: Courses must be approved by the advisor and the Associate Director of Marine Policy. Courses form a coherent course of study across or focusing in the areas of policy, science, economics, or law.

Analytical Paper MAST865: 3 credits

Ph.D. in Marine Studies with a concentration in Marine Policy (must complete the 42 credits of required coursework at minimum)

Must take the following three credit course in the area of **Law and Institutions**:

- MAST660 (3 credits) International and National Ocean Policies

Must take the following three credit course in the area of **Decision Analytics**:

- MAST663 (3 credits) Decision Tools for Policy Analysis

Must take one of the following three credit courses in the area of **Economics**:

- MAST675 (3 credits) Natural Resource Economics
- MAST676 (3 credits) Environmental Economics

Must take MAST873 (1 credit) Marine Policy Seminar three times

Must take one three-credit course in Research Design (Quantitative or Qualitative) and must take one three-credit course in Advanced Research Methods. Courses should be in statistics, survey research, and/or case study methods approved by the faculty advisor and the Associate Director of Marine Policy.

Must take one course (3 credits) as Science Elective:
Typically a course from one of the other three program areas in SMSP satisfies the science requirement but it may also be taken from outside SMSP. Science elective must be approved by advisor and Associate Director of Marine Policy.

Must take four or more courses (12 credits) as Policy/Science/Economics/Law (PSEL) Electives: Courses must be approved by the advisor and the Associate Director of Marine Policy. Courses form a coherent course of study across or focusing in the areas of policy, science, economics, or law.

Dissertation: 9 credits

M.S. in Marine Studies with a concentration in Marine Biosciences (30 credits minimum)

All students in the master's program are required to complete 30 graduate credits. A course outside of the Marine Biosciences Program and the student's area of concentration is also required. All students must write a thesis. Students may bypass the master's degree and work directly toward the PhD upon petition. Written and oral qualifying examinations are required before students are admitted to candidacy for the PhD degree.

Required Courses:

- MAST623 (3 credits) Physiology of Marine Organisms
- MAST634 (3 credits) Marine Molecular and Evolutionary Biology
- MAST821 (1 credit) Marine Biosciences Seminar or equivalent must be taken at least one semester during each year of residence

Must take one three credit course outside of the program. This may be one of the specially designed introductory courses or a more advanced course. Introductory courses include MAST602 (Physical Oceanography), MAST637 (Geological Oceanography), MAST646 (Chemical Oceanography), and MAST660(National and International Ocean Policies)

Thesis: 6 credits

Additional graduate-level coursework as determined by the student’s advisory committee.

Students will work with their advisors to determine what additional coursework must be completed and how many research credits must be taken to account for the remaining credit hours for a minimum total of 30 prior to graduation.

Ph.D. in Marine Studies with a concentration in Marine Biosciences (must complete the 28 credits of required coursework)

Required Courses:

- MAST623 (3 credits) Physiology of Marine Organisms
- MAST669 (3 credits) Statistics for Marine Sciences
- MAST634 (3 credits) Marine Molecular and Evolutionary Biology
- MAST821 (1 credit) Marine Biosciences Seminar or equivalent must be taken at least one semester during each year of residence

Must take one three credit course outside of the program. This may be one of the specially designed introductory courses or a more advanced course. Introductory courses include MAST602 (Physical Oceanography), MAST637 (Geological Oceanography), MAST646 (Chemical Oceanography), and MAST660 (National and International Ocean Policies)

Dissertation: 9 credits

Additional graduate-level coursework as determined by the student's advisory committee.

Students will work with their advisors to determine what additional coursework must be completed and how many research credits must be taken to complete the degree.

M.S. in Marine Studies with a concentration in Oceanography (30 credits minimum)

All students in the master's program are required to complete 30 graduate credits. A course outside of the Oceanography program and the student's area of concentration is also required. All students must write a thesis. Students may bypass the master's degree and work directly toward the PhD upon petition. Requirements for the PhD degree are similar to those for the master's degree, but are more intensive. Written and oral qualifying examinations are required before students are admitted to candidacy for the PhD degree.

Required Courses: [1]

- MAST602 (3 credits) Physical Oceanography or equivalent
- MAST627 (3 credits) Biological Oceanography or equivalent
- MAST637 (3 credits) Geological Oceanography or equivalent
- MAST646 (3 credits) Chemical Oceanography or equivalent

[1] Equivalency previously taken or alternative courses is to be determined by current instructor and approved by the Associate Director of the program. A higher level course may be substituted for these courses on approval of the advisor and committee.

MAST853 (1 credit) Oceanography Seminar or equivalent must be taken at least one semester during each year of residence[2]

One three credit course in Marine Policy or one three credit course outside of the student's declared sub-discipline of interest (not including courses taken to meet the program core course requirement) as approved by the faculty advisor and the Associate Director must be completed

Thesis: 6 credits

Additional courses may be required by the student's advisory committee

Students will work with their advisors to determine what additional coursework must be completed and how many research credits must be taken to account for the remaining credit hours for a minimum total of 30 prior to graduation.

Ph.D. in Oceanography (must complete the 34 credits of required coursework)

Required Courses: [1]

- MAST602 (3 credits) Physical Oceanography or equivalent
- MAST627 (3 credits) Biological Oceanography or equivalent
- MAST637 (3 credits) Geological Oceanography or equivalent
- MAST646 (3 credits) Chemical Oceanography or equivalent

MAST853 (1 credit) Oceanography Seminar or equivalent must be taken at least one semester during each year of residence[2]

At least six credits of 800-level courses other than courses used to meet the seminar and core required courses must be taken

One three credit course in Marine Policy or one three credit course outside of the student's declared sub-discipline of interest (not including courses taken to meet the program core course requirement) as approved by the faculty advisor and the Associate Director must be completed

Dissertation: 9 credits

Additional courses may be required by the student's advisory committee

Students will work with their advisors to determine what additional coursework must be completed and how many research credits must be taken to complete the degree.

[2] An alternative seminar may be substituted for MAST853 in request of the student and with permission of advisor and the Associate Director of the program.

M.S. in Marine Studies with a concentration in Physical Ocean Science and Engineering (30 credits minimum)

All students in the master's program are required to complete a minimum of 30 graduate credits. A course outside of the POSE program and the student's area of concentration is required. All students must write a thesis. Students may bypass the master's degree and work directly toward the PhD upon petition. Requirements for the PhD degree are similar to those for the master's degree, but are more intensive. Written and oral qualifying examinations are required before students are admitted to candidacy for the PhD degree.

Required Courses:

- MEEG690 (3 credits) Intermediate Engineering Mathematics
- MAST693 (3 credits) Waves in the Marine Environment or
- MAST655 (3 credits) Geophysical Fluid Dynamics
- MAST691 or CIEG639 (4 credits) Fluid Dynamics in Marine Systems
- MAST811 (3 credits) Oceanographic Time Series Analysis

One three credit course outside of the Physical Ocean Science and Engineering program. This may include one of the specially designed introductory courses or a more advanced course. Students may not test out of these classes. Introductory courses outside of this program include MAST627 (Biological Oceanography) or MAST660 (International and National Ocean Policies), NOTE: MAST 602 Physical oceanography courses will not meet this requirement.

MAST882 (1 credit) Physical Ocean Science and Engineering Seminar or equivalent must be taken each spring semester during every year of residence.

Thesis: 6 credits

Additional courses may be required by the student's advisory committee

Students will work with their advisors to determine what additional coursework must be completed and how many research credits must be taken to account for the remaining credit hours for a minimum total of 30 prior to graduation.

Ph.D. in Marine Studies with a concentration in Physical Ocean Science and Engineering

- MEEG690 (3 credits) Intermediate Engineering Mathematics
- MAST693 (3 credits) Waves in the Marine Environment
- MAST691 or CIEG639 (4 credits) Ocean Fluid Dynamics
- MAST655 (3 credits) Geophysical Fluid Dynamics
- MAST811 (3 credits) Oceanographic Data Analysis

One three credit course outside of the Physical Ocean Science and Engineering program. This may include one of the specially designed introductory courses or a more advanced course. Students may not test out of these classes. Introductory courses outside of this program include MAST627 (Biological Oceanography) or MAST660 (International and National Ocean Policies), NOTE: MAST 602 Physical oceanography courses will not meet this requirement.

One three credit appropriate modeling course to be determined by the student in consultation with his/her advisor or advisory committee.

MAST882 (1 credit) Physical Ocean Science and Engineering Seminar or equivalent must be taken each spring semester during every year of residence.

Dissertation: 9 credits

Additional courses may be required by the student's advisory committee

Students will work with their advisors to determine what additional coursework must be completed and how many research credits must be taken to complete the degree.

b) All degrees except the Master of Marine Policy require a thesis or dissertation describing original work completed by the student.

c) Graduate work must be completed within the time limits imposed by the University and the SMSP. The SMSP provides guidance for students with regard to the timeframe in achieving individual academic milestones as listed below:

Milestones for M.S. and M.M.P.	**Time Limit**
Approved Advisory Committee	Two semesters
Approved Thesis Proposal	Two semesters
Complete Required Courses & Credits	Before graduation
Six Credits MS Thesis or Three Credits MMP Analytical Paper	Before graduation
Defend Thesis or Analytical Paper	Six semesters
Graduate	Six semesters
Milestones for Ph.D. with M.S.	**Time Limit**
Approved Advisory Committee	Three semesters
Approved Dissertation Proposal	Before fifth semester
Pass Qualifying Exam (both written and oral)	Before fifth semester
Complete Required Courses and Credits	Before graduation
Nine Credits Ph.D. Dissertation	Before graduation
Defend Dissertation	Eight semesters
Graduate	Eight semesters

Milestones for Ph.D. without M.S. (For students admitted directly into a Ph.D. program)	**Time Limit**
Approved Advisory Committee	Three semesters
Approved Dissertation Proposal	Before fifth semester
Pass Qualifying Exam (both written and oral)	Before fifth semester
Complete Required Courses and Credits	Before graduation
Nine Credits Ph.D. Dissertation	Before graduation
Defend Dissertation	Ten semesters
Graduate	Ten semesters
Milestones for Ph.D. with M.S. Bypass (students admitted to a M.S. program who are bypassing the M.S. degree)	**Time Limit**
Approved M.S. Advisory Committee	Two semesters
Approved M.S. Thesis Proposal	Two semesters
Approved Bypass Petition	Three semesters
Approved Ph.D. Advisory Committee	Three semesters
Approval of Ph.D. Dissertation Proposal	Before fifth semester
Pass Qualifying Exam(both written and oral)	Before fifth semester
Complete Required Courses and Credits	Before graduation
Nine Credits Ph.D. Dissertation	Before graduation
Defend Dissertation	Ten semesters
Graduate	Ten semesters

d) All students matriculated into the SMSP will have their milestone achievements tracked in the SMSP Graduate Student Database. Each year during the faculty performance review with the SMSP Director, the milestone achievement and academic progress of each SMSP student advisee will be discussed and appropriate notes about progress will be updated into the student's file. Students who are significantly overdue on their milestone achievements and have been notified must submit (jointly with their advisor) a justification of why they are out of compliance and a detailed plan and timeline for completion of the remaining milestones. In the case of University time limits extensions, all requests must be approved by the SMSP Director and then the University Office of Graduate and Professional Education.

e) A Ph.D. committee must consist of at least four members, but not more than six. At least one member of the committee must be a core faculty member of the SMSP and at least half of the committee members (but no less than three) must be either core or joint faculty in the School. As per University regulations, at least one member of the committee must be external to the School, and students are "encouraged to seek the external member from outside the University in order to broaden the perspectives of the committee."

f) An MS or MMP committee must consist of at least three members, but no more than four. At least one member of the committee must be a core faculty member of the School and at least half of the committee members must be core or joint faculty in the SMSP.

g) Only core or joint appointees may serve as committee chairs, except in the case of an emeritus professor who has, prior to retirement, been the advisor of a student when that student's committee was formed.

h) A dissertation proposal is required to obtain admission to candidacy for the Ph.D. Satisfactory completion of dissertation proposal is at the discretion of the advisor in consultation with the student's advisory committee. The dissertation proposal may be included as part of the written qualifying exam (below) at the discretion of the advisor in consultation with the student's advisory committee.

i) A qualifying examination is required to obtain admission to candidacy for the Ph.D. In order to take the examination, each student must be in good academic standing and have approval of the advisory committee. A research proposal is ordinarily required before a student takes the qualifying examination.

j) The qualifying examination must include both oral and written parts.

i. The examination is prepared and administered by the advisor in consultation with the student's advisory committee

ii. At least 60 days prior to the examination, the advisor must inform the student of the areas to be examined and the format of the written and oral parts of the examination. If the student is not notified with at least 60 days notice, the student has the option to petition the School Director for a postponement of the qualifying examination.

iii. The student must be informed of success or failure of the written portion of the qualifying examination within two weeks of completion and if the written component is not successfully satisfied the oral may not be administered. Once the written component is satisfied, the oral component may be administered. The student must be informed of success or failure of the oral portion of the qualifying exam within two weeks of completion.

iv. A student who fails either part of the qualifying examination is entitled to only one re-examination, which must be taken within six months of the first examination.

v. A student who fails either part of the second qualifying examination may be considered for reclassification as a Master's student only after advisory committee consultation with the School Director. If a student is reclassified in this situation, the Master's thesis must follow the same rigor outlined in 6.b. of this policy statement. In some cases, if recommended by the committee and the School Director, the student may be terminated from the program.

k) The defense of the dissertation, thesis, and analytical paper focuses on the scope of the research and its contribution to the field.

vi. The student's advisory committee serves as the examining board.

vii. The defense is oral and open to the academic community of the University and to interested

members of the public; the defense must be announced at least two weeks in advance.

viii. The defense begins with a presentation of the work by the candidate, followed by an open period of questions from the audience.

ix. After a short break, the members of the examining board address questions to the candidate.

x. At the close of questioning, the examining board retires for deliberation and decision.

xi. Upon reaching a decision, the board communicates that decision to the candidate and to the Director of the School.

xii. Dissertations, theses, and analytical papers must be submitted to the Office of Graduate and Professional Education according to the deadline schedule published by that office.

j) The dissertation proposal and the qualifying examination are to be completed before the fifth semester, however because of workload it is advised that either the proposal or the qualifying exam be completed during the third semester.

5. Change in Student Status

a) A student may change advisor in consultation with the assigned advisor and the potential advisor. The relevant Associate Director and the Academic Coordinator of the SMSP must be informed of the change.

b) Students who have formed a Master of Science (MS) or Master of Marine Policy (MMP) advisory committee and who have completed a thesis proposal may petition for admission to a PhD program within three semesters of matriculation in the School. This is known as the *bypass option.* Petitioning students must submit evidence of high performance to the M.S. or MMP advisory committee. Ordinarily this evidence includes excellent grades in graduate courses, promising research results, and sound plans for dissertation research. The following steps are necessary for approval of a bypass petition:

i. Chair of MS or MMP advisory committee sends a letter of support of behalf of committee to relevant Associate Director.

ii. Associate Director forwards approved letter to the Assistant Dean for Graduate Services and the Director of the SMSP.

iii. Director of SMSP approves bypass.

iv. The student submits completed “Change of Classification” form to Assistant Dean for Graduate Services which must be signed and forwarded to the Office of Graduate and Professional Education

v. Student continues as a PhD student

c) Students who want to continue for a PhD after completing an MS or MMP must submit a letter of intent to the relevant Associate Director.

i. The letter should outline dissertation research plans and specify an advisor and funding source.

ii. The Associate Director reviews the applicant's credentials and consults with faculty members as required.

iii. The Associate Director forwards a recommendation concerning admission to the Director of the SMSP.

vi. The Director acts on this recommendation

vii. If approved, the student submits a completed "Change of Classification" form to Assistant Dean for Graduate Services which must be signed and forwarded to the Office of Graduate and Professional Education

6. Competency of SMSP graduates

a) A recipient of a PhD from the University of Delaware must have the analytical skills and intellectual scholarship to perform research with independent creativity. This criterion is demonstrated by the submission of a **written dissertation** of original research. Furthermore, it is expected as part of the Ph.D. that the thesis, or portions thereof, be published in one or more articles in an internationally recognized and refereed journal or equivalent medium. Going through this process will demonstrate the student's ability to communicate their results to the larger community and, as a result, gain wider recognition of their work.

b) A **written thesis** is required for the MS, and an **analytical paper** is required for the MMP. The depth and breadth of these documents are more limited than a dissertation and reflect a more focused and restricted exposure to research and analysis, yet must still demonstrate analytical skills and intellectual scholarship to perform research. Students are expected to produce work worthy of publication in a refereed journal and are encouraged in consultation with their advisor to submit their work for publication.

7. Changes in Requirements

a) Any change in academic requirements requires approval of the Directors Council of the SMSP.

b) The Council has the authority to determine when a vote of the entire faculty of the SMSP is necessary to effect a change in requirements.

c) Notice of the proposed change must be sent to the Office of Graduate and Professional Education to be approved by the Graduate Committee and the Graduate Faculty Senate Committee.

Legislative History

- Draft given by Associate Dean of College of Marine Studies (CMS) to Program Directors for review and comment - December 1981.
- Draft C/1/82 circulated for faculty comment - 10 February 1982.
- Promulgated by Dean of CMS - 3 March 1982.
- CMS Executive Committee reviewed and recommended retention after modification - 25 February 1985.
- Dean of CMS promulgated - 1 December 1985.
- Revised by Academic Council of CMS annually and sent to Office of Graduate Studies for approval.
- A decision was made that the revised Graduate Program Policy Statement would be placed in the CMS Student Advisement Manual with a note to that effect in this policy manual - 1 May 1992.
- Some sections of the CMS Student Advisement Manual (now Current Student information) were moved back to this section. Revised and approved by Academic Council of CMS - 27 July 2004.
- Approved by Faculty of CMS – 7 February 2005.
- Promulgated by Interim Dean of CMS – 7 February 2005.
- Discussed and approved by Academic Council of CMS- 30 May 2006.
- Revised by Interim Director of SMSP—1 September 2009
- Discussed and approved by Directors Council of School of Marine Science and Policy—10 May 2010
- Approved by Dean of College of Earth, Ocean, and Environment—31 May 2010
- Promulgated by Interim Director of SMSP—31 May 2010
- Revised at the request of the Office of Graduate and Professional Education by the Assistant Dean for Graduate Services—1 January 2012
- Discussed and approved by Directors Council of School of Marine Science and Policy—26 Jan 2012
- Promulgated by the Dean of College of Earth, Ocean, and Environment—2 Feb 2012
- Revised by the Director of the SMSP – 20 Dec 2012
- Discussed and approved by the Directors Council of the School of Marine Science and Policy – 20 Dec 2012
- Approved by the Dean of the College of Earth, Ocean, and Environment – 11 Jan 2013
- Promulgated by the Director of the SMSP – 11 Jan 2013
- Revised by the Director of the SMSP 31 July 2015