GEORGIA STATE UNIVERSITY DEPARTMENT OF BIOLOGY

MASTER OF SCIENCE DEGREE POLICY DOCUMENT

2019-2020

Revised September 2019

I. ADMISSION REQUIREMENTS and PROCEDURES

a. Applicants must have a baccalaureate degree in biology or a related field.
b. Applicants must submit transcripts of their past academic performance, scores on the Graduate Record Examination, (and/or MCAT scores for MBMS concentration,) and three letters of reference.
c. Applicants must indicate their first and second preferences for a concentration. A concentration is optional and can be removed or changed upon admission.
d. Applicants must submit a statement of their academic interests and goals.
e. In addition to meeting the regular admission requirements, international applicants must demonstrate proficiency in English, this can be satisfied by taking either the TOEFL or IELTS tests.

Applications for the M.S. program will be considered for fall and spring semesters. The upcoming deadlines for completion of all application materials and other correspondence concerning admission are as follows:

SEMESTER	DEADLINES
Fall	July 15th (May 15th for MBMS concentration)
Spring	November 15th (September 1st for MBMS concentration)

NOTE: International applications and all required documentation must be sent four weeks prior to the deadlines indicated above.

f. All application materials should be submitted directly to: Graduate Admissions-College of Arts & Sciences <cas.gsu.edu/graduate-studies/admissions/>. There is a $50.00 application fee.
Applications should be completed online and can be found at: https://gradapply.gsu.edu/apply/

II. STUDENT SUPPORT

Teaching assistantships are available on a competitive basis, and individual faculty members may support students working on specific research programs with funds from research grants. Students requiring financial assistance are urged to apply as far in advance as possible. Financial support is not guaranteed.

III. DEGREE REQUIREMENTS

The Master of Science (M.S.) degree in the Department of Biology is offered with a Non-Thesis or Thesis option. Upon acceptance into the M.S. program, all students are enrolled in the Non-Thesis option. Students are admitted to the Thesis option upon approval and successful defense of a Thesis proposal. In addition to the required courses listed below, the department website provides a listing of concentration-specific courses students may select for their concentration.

a. The Non-Thesis option requires:
    i. A minimum of 40 semester credit hours of coursework to be selected from 6000 numbered courses. 8000 numbered courses should only be taken with advise from the course instructor or the student's area advisor. (Note: Biology 6900 and courses numbered 7000-7999 are not applicable to the M.S. degree in Biology.) Coursework must include:
        1. One course in biochemistry of at least 3 hours [normally Chem 6600 (5 hours), 6610 (3 hours) or Chem 6670], although higher-level courses may be selected. A passing grade of C or better is required. This requirement may be waived if the student has successfully passed an equivalent undergraduate course with a B or better. By waiving this requirement, no student is exempt from completing 40 hours for graduation.
        2. Two hours of Seminar Biol8700
        3. Two hours of Topics (Biol8940, 8950, 8960, 8970, 8980) or Concepts (Biol8110, 8310,8510, 8710) are recommended but not required.
        4. Up to 9 hours of Public Health, SNHP, and /or Law courses may be included in the 40 hour coursework requirement. A list of approved courses can be found in Appendix II.
        5. Up to 4 hours of Biol8800 (Research) may be included in the 40-hour coursework requirement.
    ii. The successful completion of a laboratory or literature-based research paper, documented with Biol 8888.

b. The Thesis option requires:
    i. A minimum of 40 semester credit hours of coursework to be selected from 6000 numbered courses. 8000 numbered courses should only be taken with advise from the course instructor or the student's area advisor. (Note: Biology 6900 and courses numbered 7000-7999 are not applicable to the M.S. degree in Biology.) Coursework must include:
        1. One course in biochemistry of at least 3 hours [normally Chern 6600 (5 hours), 6610 (3 hours) or Chern 6670], although higher-level courses may be selected. A passing grade of C or better is required. This requirement may be waived if the student has successfully passed an equivalent undergraduate course with a B or better. By waiving this requirement, no student is exempt from completing 40 hours for graduation.
        2. Two hours of Seminar Biol8700
        3. Two hours of Topics (Biol8940, 8950, 8960, 8970, 8980) or Concepts (Biol8110, 8310,8510, 8710) are recommended but not required.
        4. Up to 9 hours of Public Health, SNHP, and /or Law courses may be included in the 40 hour coursework requirement. A list of approved courses can be found in Appendix II.
        5. Up to 4 hours of Biol8800 (Research) may be included in the 40-hour coursework requirement.
        6. A minimum of 14 hours of Biol 8999 (Thesis Research)
    ii. A successfully defended Thesis proposal.
    iii. A Thesis defense and publication.
    iv. A final oral presentation directed primarily to defense of the Thesis.

IV. ACADEMIC PERFORMANCE

Students are required to maintain a minimum overall grade point average of 3.0 to remain in good standing. If a student's grade point average falls below 3.0, the student will be placed on academic probation. The student must regain a 3.0 average within the next 18 credit hours of coursework to remain in the program. Research performance also

plays a significant role in the evaluation of a student's progress. Two negative evaluations in research courses (Biol 8800 or 8999) as indicated by a grade of U (Unsatisfactory) will be grounds for dismissal from the program.

V. ADVISEMENT

Students should obtain advisement from the MS Graduate Director or a member of the MS Area Advisory Committee.

VI. NON-THESIS RESEARCH PAPER REQUIREMENTS (NON-THESIS OPTION ONLY)

All students electing to pursue the Non-Thesis option for the M.S. degree are required to successfully complete a Non-Thesis paper. Students are required to select a mentor under whose direction the Non-Thesis paper will be prepared. All Biology faculty are eligible to serve as M. S. Non-Thesis mentors upon approval by the MS Graduate Director. During preparation of the research paper, the student is required to enroll in Biol8888 (Non-Thesis Masters Research).

A committee consisting of the student's mentor plus one other faculty member chosen in consultation with the mentor will evaluate the research paper. Students must file a M. S. Non-Thesis Committee Selection form with the Graduate Coordinator's Office for approval by the M. S. Graduate Director. The student's mentor is expected to review, make editorial and organizational suggestions of the first draft. The edited version will then be distributed to the mentor and the other reader of the committee for evaluation and grade assignment. Students must follow the Deadline Schedule posted for each semester. All papers must be go through a plagiarism check. Contact the Graduate Coordinator's Office for access. The paper along with the Final Non-Thesis Project Approval form, with signatures, must be submitted to the Graduate Coordinator's Office on or before the due date required by the department. The assigned grade will be the grade the student receives for Biol 8888 (a passing grade of C or better is required).

Non-Thesis Research Paper Options (Choose one of the following).

a. Laboratory-based Research - The purpose is to provide students with the opportunity to do laboratory research and incorporate the results into a written document. A research project will be conducted under the mentor's supervision. Students may enroll in Biol 8800 (Research) to receive credit for their laboratory experience (up to four credit hours). Following the completion of Biol 8800 students will need to enroll in Biol 8888 (Non-Thesis Masters Research). The Non-Thesis research report will be evaluated on clarity of expression as well as scientific content. The report should be a minimum of 20 double-spaced pages (excluding appendix and references) and should include the following information:
    i. Introduction - literature-based background to the research project
    ii. Specific Aims of the research project
    iii. Methodology used in the research project
    iv. Results of the research project
    v. Discussion of the research project including the significance and limitations of the results discussed. If significant results are not obtained during the course of the research, suggestions should be made for alterations in the experimental design that would improve the chances of success
    vi. References, should follow conventions used by a scientific journal and must include titles for the articles.
    vii. Appendix: tables and figures with legends, these can also be incorporated into the text.
b. Literature-based Research Paper - The paper will consist of a critical analysis of a topic from the current scientific literature selected in conjunction with the mentor. Preparation of the paper is done under the supervision of the student's faculty mentor and should involve regular meetings with the mentor. Students are required to enroll in Biol 8888 (Non-Thesis Research). The analysis will be evaluated on clarity of expression as well as scientific content. The paper must be at least 20 double- spaced, typewritten pages (excluding references, tables and figures).
    i. Introduction: a brief overview of background information designed to be understood by a first-year graduate student in the student's area of specialization.
    ii. Current Research Question: a clear presentation of the research topic or questions under consideration and a summary of results on the subject reported in the recent literature
    iii. Significance and limitations of the research.
    iv. Discussion of future directions which the research may take.

v. References, should follow conventions used by a scientific journal and must include titles for the articles.
vi. Appendix: tables and figures with legends, these can also be incorporated into the text.

VII. THESIS REQUIREMENTS (THESIS-OPTION ONLY)

a. Thesis Proposal
   i. Thesis Committee Selection: A Thesis committee consisting of at least three members (one of whom is the student's faculty advisor) should be selected before or immediately after a Thesis topic has been selected by the student and advisor. At least half of the committee must be members or associate members of the Research Faculty in Biology. The student, in consultation with the advisor, will nominate other committee members. Students must file an Appointment of M.S. Thesis Committee form with the Graduate Coordinator's Office for approval by the MS Graduate Director. The student's committee should play an important role in the synthesis and development of a research topic. The committee nominees should be selected carefully so that maximum assistance can be obtained with the research.
   ii. Proposal Format: The Thesis proposal will be 3-4 pages (double-spaced, type-written) in length and will consist of:
      1. Cover Page (not included in page limit)
      2. An Abstract
      3. An Introductory section providing the rationale, justification for the proposed experiments and concluding with the hypothesis being tested.
      4. The Specific Aims and Experimental Design
      5. A brief description of the Materials and Methods
      6. List of References (not included in page limit)

      The purpose of the proposal is to provide a clear formulation of the specific aims in relation to a well-defined hypothesis. It may be necessary to go through multiple iterations of the proposal with both the advisor and Thesis committee before it is approved. All proposals should go through a plagiarism check. Contact the Graduate Coordinator's Office for access. The advisor and Thesis committee members indicate their approval by signing the M.S. Thesis Proposal Cover Page form, which is then submitted to the Graduate Coordinator's Office by the student.

   iii. Oral Defense of Thesis Proposal: Following approval of the Thesis proposal by the committee, the student will orally defend the Thesis proposal at a meeting with the Thesis Committee. The oral defense will consist of a brief presentation of the Thesis proposal followed by questioning on the proposal as well as the background information relevant to the proposal. Following successful defense of the Thesis proposal, the committee will submit a "Thesis Proposal Approval Form" signed by a majority of the Thesis Committee to the Graduate Coordinator's Office. If the defense is unsuccessful, the committee will determine a proper course of action.
   iv. Acceptance into Thesis-Option: Once an approved Thesis Proposal and Thesis Proposal Defense Form are on file in the Graduate Coordinator's Office, the student is considered to be accepted into the Thesis Option M.S. Program and is permitted to register for Biol 8999 (Thesis Research).

b. Thesis Preparation and Defense
   i. Commencement of Thesis:
   Once the student's Thesis research is nearing completion (as judged by the faculty advisor in consultation with the Thesis Committee), the student will commence preparation of the Thesis.
   ii. Completion of Thesis:
   A copy of the Thesis as approved by the faculty advisor must be submitted to Thesis Committee members at least four weeks prior to the proposed defense date.
   iii. Request for Defense:
   After the Thesis Committee agrees that the Thesis is ready for defense, a draft of the Thesis along with a one-page abstract, and a request for scheduling of the defense will be submitted to the Graduate Coordinator's Office. This must be done at least two weeks before the requested date for the Thesis defense.

iv. Scheduling of Defense:
Upon submission of the request for scheduling of the defense, the student will schedule a defense date in consultation with his/her committee members and will recommend a GSU faculty member to convene the Thesis presentation. The Graduate Coordinator's Office will schedule a room for the presentation and send announcements at least one week in advance inviting all members of the department to attend. An abstract of the Thesis must accompany the announcement. A copy of the Thesis must be available in the Graduate Coordinator's Office for examination at the time the announcement is made.

v. Thesis defense:
At the Thesis defense, the convener will moderate the proceedings. The defense will begin with an oral presentation of 30-45 minutes by the student in which the contents of Thesis will be summarized followed by a question-and-answer period from the general audience. Subsequently, the student will meet with members of the Thesis Committee to answer any remaining questions about the Thesis or the presentation. The Thesis Committee will then vote to determine whether or not the student has successfully defended the Thesis. The vote of the majority will prevail. The convener for the Thesis defense or student will send a signed Final Thesis Project Approval Form to the Graduate Coordinator's Office. If the student does not defend the Thesis successfully, the Thesis Committee, in consultation with the MS Area Advisory Committee will schedule a new presentation or provide for other appropriate action.

vi. Final Thesis Approval:
Acceptance of the Thesis by the Thesis Committee is indicated by signatures on the M.S. Final Thesis Project Approval Form and publication of the thesis.

VIII. RESPONSIBILITY OF THE GRADUATE STUDENT

It is the responsibility of the student to meet the requirements and deadlines of the Graduate School of the College of Arts and Science concerning submission of the final Thesis copies to the Graduate Office.

The graduate student is also responsible for fulfilling the provisions of this policy document and for reading the Arts & Sciences current Graduate Bulletin and fulfilling all provisions detailed therein. Failure of the student to comply with the appropriate procedures outlined in this document and/or the Bulletin may lead to a delay in graduation.

All candidates for a degree must file a formal application for graduation with the Graduation Office. Graduate degree candidates must apply at least two semesters in advance of the expected semester of graduation.

IX. PETITIONS

If a Master's Degree student desires to deviate from the policies set forth in this document, the student must submit a written petition to the Graduate Coordinator's Office for consideration by the MS Graduate Director. After the MS Graduate Director has acted on the request, a letter will be sent to the student and the major professor stating the action taken on the petition. Requests for deviation from any college or university requirements must be made in writing to the Petitions Committee of the College of Arts and Sciences.
Request forms can be obtained from the Graduate Office (25 Park Place, 3rd floor).

X. CONTINUOUS ENROLLMENT POLICY

As part of the university's continuous enrollment policy, students in all graduate programs must maintain enrollment totaling 6 or more hours over all consecutive three semester periods (including summers). In other words, the total enrollment of the current term plus the two terms preceding it must add to 6 hours or more at all times. The status of all students will be checked by the midpoint of each term for compliance with the continuous enrollment requirement. Any student whose enrollment is out of compliance will be placed on inactive status effective at the end of the current term and all pre-registration for subsequent terms will be canceled. Those students will be notified by an e-mail message sent to their official Georgia State University e-mail account.

To resume their programs, inactive students must file for re-entry by the published deadline and must enroll at a level sufficient to satisfy the continuous enrollment criterion. That is, their enrollment in the re-entry term plus the two terms preceding it must total to 6 hours or more. The maximum required enrollment level for the re-entry term is 6 hours. For more information on the re-entry process, see section 1100 of the Graduate Catalog or visit http://www.cas.gsu.edu/re-entry.html.

a. Completion-Term Enrollment Requirement:
   Additionally, all students must be enrolled in the term in which they complete the requirements for their degree. Normally, this is the term in which they will graduate. However, if the requirements are completed after the deadline for graduation in a term, but before the first day of classes in the subsequent term, then it is not necessary to enroll in the subsequent term. If the continuous enrollment criterion is not met in the term in which degree requirements are completed, then it must be met in the term of graduation. Students who have enrolled for a total 6 or more hours in the two terms preceding the term of completion may register for 1 hour in that term, unless their department requires a higher number of hours.

XI. MS IN BIOLOGY, MEDICAL SCIENCES CONCENTRATION (MBMS)

The MBMS Program is designed to provide advanced medical instruction to students. Full acceptance into the MBMS concentration is contingent on passing the three prerequisite courses listed below. Students will then complete 28 CH of specific medical course electives, 6 CH of allied health related electives, 2 CH of seminar, and 4 CH of capstone courses for a total of 40 credit hours. Students must complete all 40 CH prior to matriculation into a graduate medical program and are encouraged to meet with the MBMS directors to verify graduation date.

Degree Requirements (40 hours)

1. Prerequisite Courses. The credit hours in this section will not count toward the Master's Degree. The student MUST take the following prerequisite courses the first semester, or have taken equivalent courses (as determined by MBMS directors) at the undergraduate level and received a grade no lower than a B in the following:
   Biol 3800/7800 Cell Molecular Biology (3)
   Biol 3240/7240 Applied Medical Physiology (3)
   Biol 3250/7250 Human Physiology Lab (1)
   If the student does not meet the above required prerequisites, he/she will be not eligible for full acceptance into the MBMS concentration. If the student wants to pursue a Master's Degree in another biology concentration, they must reapply.
2. Seminar Courses (2 CH).
   Biol 8700 Graduate Seminar (2 credit hours)
3. Science Elective Courses (28 hours). The student must complete 28 credit hours of the following courses with a grade no lower than a B:
   Biol 6687 Surgical Anatomy (4)*
   Biol 6246 Advanced Human Physiology (4)
   Biol 6428 Medical Microbiology (4)
   Biol 6115 Medical Neurobiology (4)
   Biol 6102 Neurobiology (4)
   Biol 6278 Immunology (4)
   Biol 6074 Developmental Biology (4)
   Biol 6240 Endocrinology (4)
   Biol 6686 Pathophysiology (4)
   Biol 6685 Functional Histology (4)
   Biol 6282 Tumor Immunology (4)
   Biol 6284 Medical Biochemistry (4)
   Biol 6248 Cell Physiology (4)
   Biol 6675 Virology (4)
   Biol 6930 Special Topics (4) *must get pre approval from MBMS director
   Biol 6800 Advanced Cell Biology (4)
   Biol 6241 Hormones and Behavior (4)
   Biol 6580 Microbial Pathogenesis (4)
   Biol 6545 Bioethics (4)
   *Physician's Assistant Admissions require 4 credit hours of a physiology and lab course and 4 credit hours of an anatomy course /lab. Biol 7240/7250 and Biol 6687 Surgical Anatomy would meet these requirements. Check with your institution to verify prerequisite requirements as these may differ.

4. Additional Elective Courses (6 hours) choose from the following:
   GERO 7200 Health and the Older Adult (3)
   GERO 8320 Psychology of Aging (3)
   PH 7011 Intro to Epidemiology (3)
   Biol 7021 Infectious Disease and Society (3)
   HA 8160 Intro to Health Care System (3)
   HA 8190 Health Policy & Ethics (3)
   NUTR 6500 Macronutrients (3)
   NUTR 6700 Micronutrients (3)
   NUTR 7280 Nutrition Genomics (3)
   Biol 6744 Biostatistics or PH 7017 Fundamentals of Biostatistics (3)
   Chem 6610 Biochem II (3)
   CNHP 6010 Medical Terminology (3) online course
   CHNP 7800 Interprofessional Collaboration for Advanced Practice (3)
   CHNP 6400 Spanish for Healthcare Professionals (3)
   CHNP 7810 Interpretation of Lab Values (3) online
   CHNP 6900 EKG Interpretation (3) online
   CHNP 8000 Trends Affecting Healthcare Policies (3) online
5. Capstone Courses (choose 4 hours).
   Biol 8888 Non-thesis Masters Research project (4 CH)
   OR
   Biol 6916 Clinical Internship (2 CH) * this course has a prerequisite of Biol 6687 and Biol 6686. Plus 2 CH of Biol 8888.
   Students opting for the non-Thesis research paper would follow the same policies and procedures required for other M.S. concentrations. Students who select the Clinical Internship and non-Thesis Research combination would substitute the paper with clinical writing assignments that are a requirement for internships.

APPENDICES

APPENDIX I

Graduate Directors/ Coordinator/ Academic Advisor

GRADUATE DIRECTORS:

Graduate Director:
Ritu Aneja
PSC 616
(404) 413-5417
raneja@gsu.edu

Associate Graduate Director:
Zehava Eichenbaum
PSC 510
(404) 413-5401
zeichenbaum@gsu.edu

MS Graduate Director:
Robert Maxwell
Langdale 814
(404) 413-5342
rmaxwell@gsu.edu

MBMS Director:
Carmen Eilertson
PSC 283
(404) 413-5355
ceilertson@gsu.edu

GRADUATE COORDINATOR'S OFFICE:

Graduate Coordinator:
Robin Nguyen
PSC 481
(404) 413-5430
rnguyen8@gsu.edu

Graduate Academic Advisor:
Larialmy Allen
PSC 480
(404) 413-5405
lallen47@gsu.edu

APPENDIX II

Approved Courses from the Schools of Law and Public Health

Approved Courses from the Schools of Law and Public Health (up to nine credit hours). Please contact the College of Law or the School of Public Health to register for these courses.

Law 7098 Biotechnology Law, Policy & Ethics

Law 7200 Environmental Law

Law 7239 Health Law: Liability

Law 7243 HIV & the Law

Law 7244 Public Health Law

Law 7255 Comparative Health Law

Law 7351 Law & Psychiatry

PH 7011 Epidemiology for Public Health

PH 7012 Health Program Planning Implementation and Evaluation

PH 7014 Introduction to HIV /STD Public Health

PH 7015 Cancer and Society

PH 7017 Public Health Biostatistics

PH 7150 Environmental Health

PH 7275 Chronic Disease Epidemiology

PH 7280 Infectious Disease Epidemiology

PH 7293 Environmental Health Toxicology

PH 7295 Topics in Environmental Epidemiology

PH 7300 Urban Health

PH 7350 Biological Basis of Disease

PH 7540 Intro to Public Health Lab

APPENDIX III
M.S. Student Forms

All of the forms listed below are available in the Biology Department, Main Office-Petit Science Center 4th floor, and via the website under Graduate Forms: http://biology.gsu.edu/graduate-student-forms/

You may also ask the Graduate Coordinator's Office for assistance with locating and completing these forms.

Non-thesis Students:

M.S. Non-Thesis Committee Selection Form

M.S. Final Non-Thesis Project Approval Form

Thesis Students:

M.S. Research Requirement Form

M.S. Appointment of M. S. Thesis Committee Form

M.S. Thesis Proposal Approval Form

M.S. Final Thesis Project Approval Form