



**Master of Science Degree in Biomedical Sciences
Department of Physiology and Biophysics
State University of New York at Stony Brook**

*Department Chair: Todd Miller, Ph.D.
M.S. Program Director: Inefta M. Reid, Ph.D.*

Goals of the Program

The overall goals of the Master of Science degree program in Biomedical Sciences (Physiology and Biophysics track) are to provide students with a biomedical foundation towards their higher professional education or career goals in medicine and research. We seek to ready our students for entry and success into medical and dental programs, as well as positions of research staff scientist in laboratories and industry, a teaching career at the undergraduate college level, or further graduate study leading to the Ph.D. degree. To accomplish these goals, the program of study provides training in cellular and systems-level physiology, membrane biophysics, experimental design, data analysis, and commonly used laboratory techniques in integrative physiology. We provide a heavy emphasis on pathophysiology and clinical case-based learning. Elective coursework in Physiology and Biophysics, Biomedical Engineering, Neuroscience, Molecular and Cellular Biology, and Pharmacological Sciences are then selected to complement and expand on the above core training, and meet the individual needs of each student.

Admission

The minimum requirements for admission to this program are:

1. A Bachelor's Degree with a major in biological sciences or related fields.
2. A minimum overall grade point average of 3.0 (on a 4.0 scale) from undergraduate degree coursework; students below the 3.0 grade point average may be admitted conditionally with approval from both the Department of Physiology and Biophysics and the Graduate School.
3. Evidence that the student is likely to succeed:
 - a. This must include three letters of recommendation, usually the applicant's current or former teachers.
 - b. A complete transcript of previous college studies.
 - c. Scores on the Graduate Record Examination (general exam).
 - d. Evidence of a good command of English (applicants whose first or native language is not English).
4. Acceptance by both the Department of Physiology and Biophysics and the Graduate School.



Requirements

1. Two consecutive semesters of full-time study.
2. At least 30 graduate credits.
3. A Grade Point Average of at least 3.0 in graduate courses taken at Stony Brook.
4. A passing grade (B or better) in each of required coursework (see next page).
5. A laboratory course in Physiology and Biophysics (HBY 564).
6. At least four elective courses in Physiology and Biophysics or related subjects, with Departmental approval.

Advanced Placement

Incoming students with a strong undergraduate background or previous graduate study may be advised to skip courses in the Master's degree curriculum. Students are permitted to transfer up to six credits of graduate work done elsewhere, in appropriate courses, for use towards the 30 credits required for the M.S. degree, subject to the approval of the Master's Degree Program Director and the Graduate School.

The Curriculum

Standard Track (30 credits + thesis)

HBY 501 – Systems Physiology
HBY 530 – Cellular Physiology and Biophysics
HBY 561 – Statistical Analysis of Physiological Data
HBY 562 – Model-based Analysis of Physiological Data
HBY 564 – Experimental Techniques in Systems Physiology
HBY 570 – Student Journal Club
HBY 590 – Seminar in Physiology and Biophysics
GRD 500 – Integrity in Science

4 Elective Courses including up to 6 credits total of HBY 591 – Physiology and Biophysics Research

Research Track (36 credits + research thesis)

HBY 501 – Systems Physiology
HBY 530 – Cellular Physiology and Biophysics
HBY 561 – Statistical Analysis of Physiological Data
HBY 562 – Model-based Analysis of Physiological Data
HBY 564 – Experimental Techniques in Systems Physiology
HBY 570 – Student Journal Club
HBY 590 – Seminar in Physiology and Biophysics
GRD 500 – Integrity in Science
HBY 599 – MS Thesis Research

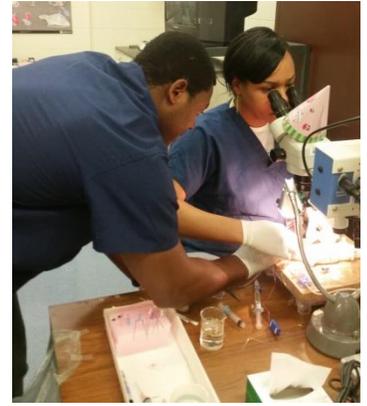
4 Elective Courses including up to 6 credits total of HBY 591 – Physiology and Biophysics Research

Note. All required coursework requires that students receive a grade of B or better to be counted towards their MS degree. Students who have not demonstrated success in an undergraduate biochemistry course will be required to take either an undergraduate biochemistry course (not to be counted towards graduate credit load) or a graduate level biochemistry course (to be counted towards graduate elective credits).



Thesis Project

The M.S. Program currently requires students to complete a thesis project in order to meet the requirements set forth by the New York State Department of Education. The completion of this task will require students to complete a 2-credit mandatory laboratory course (HBY 564), followed by the submission of an individual laboratory research report that outlines experimental background, methods, and results obtained in the classroom experimental setting. This thesis project must also include interpretation of the experimental findings in light of the currently available literature, demonstrating students to have a solid grasp of the cardiorespiratory sciences. All thesis projects will be submitted to the Graduate School at SUNY Stony Brook to meet this requirement. Students who do not submit an acceptable thesis project (i.e. receive a grade of B or better) will be restricted from graduating.



Timeline

The M.S. curriculum is designed to be completed over the course of two to four semesters of study. All students are required to complete the program within 3 years of matriculation, as regulated by the Graduate School. The length of the program is dependent on the academic intensity a student wishes to take on. Most students taking the non-thesis curriculum choose the three semester option, allowing them to focus on coursework, complete research experience in laboratories, and take on extracurricular scholarly and personal activities. Generally, it takes four full-time semesters (including summer laboratory work) to complete the M.S. degree with thesis option.



Medical School Preparation –

Coursework: The M.S. program builds on an already established undergraduate pre-medical education in order to thoroughly prepare students for the rigors of medical education. Students are matriculated into a curriculum which provides an integrated approach to learning physiology; through didactic, laboratory, and discussion-based class sessions. Students build a physiology foundation through completion of our program requirement, HBY501 (Systems Physiology), and then learn to apply and interpret this basic knowledge in courses such as HBY590 (Modeling and Simulation in Systems Physiology) and HBY690 (Clinical Correlates). Additionally, this method utilizes journal clubs to familiarize students with current basic and clinical science approaches to studying topics and problems in physiology and medicine. Our M.S. program also provides students with hands-on experiences tied to learning physiology (as completed through our laboratory course, HBY564 Experimental Techniques in Systems Physiology).

Research: Additional to the coursework required, the M.S. program helps in preparing students for medical education through research opportunities. Problem solving and critical thinking skills are developed as students are paired with department (and university) basic science investigators for the completion of graded research credits.

Mentoring: Individual mentoring is provided to students tailored to their educational goals. Regular meetings with the program director, and associated program faculty, ensures that students are performing to acceptable standards in the required coursework and have the opportunity to have any questions or concerns addressed. Program faculty work with students regarding their medical school applications, personal statements, and provide letters of support.

Additional Opportunities: The M.S. program has sponsored sessions through both counseling services and a learning specialist to address the needs of our graduate students. These sessions have been geared towards time-management topics and learning strategies, in an attempt to make students better prepared for the accelerated pace of both graduate and medical educational tracks. Additional learning specialist sessions have also been offered to select students in an attempt to foster elevated MCAT scores for medical school consideration.



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