Department of Biological Sciences
Richard A Henson School
Of Science and Technology

Guide to MS Program

2016-2017

(file dated August 2016: Latest guide)

ADMISSION TO THE PROGRAM

A. Admission

Admission to the MS in Applied Biology at SU requires an application for graduate program admission, the application fee, official transcripts from all colleges and universities attended, the Residency/Domicile Information form (for those students applying for in-state tuition) and the following program-specific credentials.

1. An undergraduate degree (in biology or related field) with a minimum cumulative grade point average of 3.0 on a 4.0-point scale. In addition to their coursework in biology, student transcripts should demonstrate the completion of pre-requisite courses in Chemistry (two courses in General Chemistry and at least one semester of Organic Chemistry), a course in Statistics, at least one other Physical Science course (For example: Geography, Geology, Physics), and a demonstrable background in Cell Biology/Genetics.
2. Three letters of recommendation from individuals qualified to judge the applicant's potential for success in a graduate program.
3. A personal statement relating the applicant's goals and career objectives as well as research interests.
4. Scores on the General Graduate Record Exam at or above the 50th percentile. Scores on the Biology GRE are not required, but will be considered by the department if submitted.

5. All applicants (thesis and non-thesis) must make contact with prospective graduate advisor(s) in the department prior to submission of an application for admission to the program. **M.S. thesis students must make such contact and will not be admitted without the endorsement of a graduate advisor for their research**. A letter from the graduate advisor must accompany the application.
6. International students are referred to additional guidelines described in the current Salisbury University catalog.

Application materials must be received by the Director of the Biology Graduate Program by March 1, and October 1 for full consideration for admission into the Fall and Spring semesters, respectively.

B. General Program Requirements

1. Departmental Graduate Committee

The Departmental Graduate Committee is a departmental committee consisting of the Graduate Program Director, three other faculty members and the Chair of the SU Department of Biological Sciences (ex-officio). It is the responsibility of the committee to determine the final disposition of all applications for admission to the program, make recommendations for scholarships and assistantships and monitor the progress of graduate students. Each student will be expected to fill out a Graduate Student Self Evaluation form that provides the Departmental Graduate Committee with information regarding their progress. The committee will be responsible for meeting with each student

once a year and for making recommendations concerning continuing improvement of the graduate program. To this end, the committee will actively solicit suggestions from students and faculty and a graduate student representative, selected by the graduate students, will be included in these deliberations. Any student should also feel free to consult the Chair of the committee for assistance in dealing with problems not resolved by other means.

2. **Graduate Advisor (thesis and non-thesis)**

The graduate advisor is a member of the graduate faculty and is the primary mentor who guides a student through the program. If the student is writing a thesis, the graduate advisor is the faculty member who guides the student's research. As part of the application process, students should familiarize themselves with the research interests and philosophies of the various faculty members in the department. Thesis students must make contact with a potential advisor(s) to discuss opportunities for research. The faculty member must agree to assume the role of advisor and the arrangement is subject to the approval of the Chair of the Department. See also requirements for Admission to the Program.

3. **Graduate Advisory Committee (thesis and non-thesis)**

Committee members should be chosen by the student in consultation with the Graduate Advisor. The Graduate Advisory Committee should consist (at minimum) of the Graduate Advisor, a second member of the graduate faculty

from the SU Department of Biological Sciences and a third member whose graduate faculty appointment may be outside the SU department or university. Additional non-voting members may be added in consultation with the Director of the Graduate Program and the student's Graduate Advisor.

Once assembled, the Graduate Advisory Committee, in consultation with the student, will be responsible for advising the student in the completion of the program. These responsibilities include setting requirements for specific course work, defining and evaluating the "Allied Professional Skill" requirement (see "Program Requirements" below), providing a regular review of the student's progress toward the degree, and for thesis students, evaluating the student's planned research and providing editorial input to the drafting of the thesis.

The student should freely consult members of the advisory committee for advice and assistance in research and other appropriate aspects of the degree program. To ensure that the advisory committee is kept well informed of the student's progress toward the degree, the committee should be convened as specified below in "Scheduled Deadlines for the MS degree".

4. Minimum GPA for Graduate Students

Students are required to maintain a GPA of 3.0 (on a 4.0-point scale) each semester. Students who earn any grade below "B" in their first semester will be required to meet with the Departmental Graduate Committee for counseling. Beginning with the grade report at the end of their second semester, students whose GPA falls below 3.0 in any semester will lose all financial aid from the

University and are at risk of being dropped from the program. No more than one grade of “C” is acceptable during the graduate career and the student who earns more than one grade of “C” or below faces dismissal from the program.

5. **Participation in the Departmental Seminar Program**

The seminar program in the department serves the dual purpose of bringing scientists from outside the university to share their research and providing a forum for the presentation and discussion of work being done within the department. Seminars are scheduled at regular intervals and **attendance is required of all fulltime graduate students**. Students who are writing a thesis will present their work in at least one departmental seminar before graduation from the program.

6. **Causes for Termination from the Program**

Students should expect to be terminated from the program for continued failure to perform academically (i.e. for a GPA that falls below 3.0 each semester or for a student who earns multiple grades of “C” or less). Violations of academic integrity (cheating in any form) are not tolerated and will result in termination from the program. All such violations will be reported to the Director of the Graduate Program and the Departmental Graduate Committee will handle terminations.

C. Requirements for the MS degree:

1. MS in Applied Biology

The MS in Applied Biology addresses the growing need for a technologically trained workforce with special skills in laboratory, biotech and environmental science.

The curriculum emphasizes skill development in a research setting and relates practical experiences to a strong background in theory. **The department views the two-year thesis program as the principal choice for most students, especially for those who plan to continue their graduate study beyond the MS level.** However, an accelerated "4+1" MS thesis program for advanced undergraduates who have completed the pre-requisites for the program at the beginning of the senior year and who have established themselves in a research project that could lead to a thesis, and an optional non-thesis program (aimed principally at students looking for continuing education credits) are also available. The choice of program options will be made in consultation with a graduate advisor in the department.

All students are encouraged to choose the thesis program. However, there may be extenuating circumstances where the thesis is not recommended (i.e. students wishing to earn credits for teaching). If a student begins the program as a thesis student and wishes to change to non-thesis, he/she will then be required to meet with the Departmental Graduate Committee for approval. If approved, the student will then be expected to fulfill all requirements for the non-thesis degree (see below). Students who change from thesis to non-thesis will

not be allowed to use additional research credits 515/601 towards their graduate elective course work.

Program Requirements

The complete program consists of 33 credit hours of graduate work, which will generally be completed in a two-year period. Two different program options are offered. These are: 1) MS thesis option and 2) MS non-thesis. Both versions of the program include a substantial component of laboratory and/or fieldwork, certification of an “Allied Professional Skill”, and an “Oral exam”. Graduate students must maintain a 3.0 GPA each semester with not more than one grade lower than a “B”.

Students transferring to SU from other universities may receive a maximum of 6 transfer credits for courses in which they have earned a grade of B or better. Each course will be individually assessed for program equivalency. Determination of allowable credits for work completed elsewhere will be made by the Director of the Graduate Program during the time of admission.

Core Courses – At least 2 of the 4 Core Courses below (6 credit hours)

Biol 501: Modern Concepts in Biology (3 credits)

Biol 502: Biology and Environment (3 credits)

Biol 575: Modern Molecular Biology (3 credits)

MATH 5XX: Statistics (3 credits)

a. Thesis Option

Complete The Core (6 credits) and 27 Additional credits:

Biol 515 Research In Biology, (12 credits)

Biol 601 Thesis Preparation (3 credits)

Graduate Elective Courses* (see below) (12 credits)

b. Non-Thesis Option

Complete The Core (6 Credits) and 27 Additional credits:

Biol 515 Research In Biology (6 credits)

Graduate Elective Courses* (see below) (21 credits)

2. MS in Applied Biology – Accelerated Program (4+1)

The accelerated MS program in Applied Biology is designed to provide exceptional Salisbury University undergraduates of high ability and achievement the opportunity to begin their graduate studies during their senior year. The purpose of the accelerated program is two-fold. It recognizes excellence in undergraduate research by allowing that work to form the basis of a graduate Masters Biology thesis and it enables the excellent student to complete both the

B.S. Biology and M.S. Applied Biology degree programs in approximately 5 years.

Students currently enrolled as undergraduates at SU are eligible to apply for the accelerated program during their Junior year provided that they:

a. have a 3.30 GPA at the end of the semester during which they apply,
b. have engaged in significant undergraduate research with a faculty advisor who can endorse their application for admission to the program,
c. meet all the requirements, including pre-requisite course work, for post-graduate admission to the program by the end of the semester in which they are applying for admission to the accelerated program.

For students accepted into the accelerated program, up to 9 credits of graduate course work may be taken during the senior year and applied to both the BS and MS degree programs. Six of these credits may include the graduate core classes offered during the student's senior year. The remaining three may include research.

Note: 4+1 students, although allowed to enroll in graduate courses, are not formally admitted as graduate students until they have successfully completed their undergraduate degree. Upon graduation with the B.S. degree, 4+1 students will be matriculated in the graduate program provided that: they have maintained a 3.0 GPA, they have a faculty advisor willing to serve as a mentor for their research and their academic record is "clean". A record of past

violations of academic integrity, for example, will preclude continued participation in the program at the graduate level.

* **Graduate Electives**:

_____4	BIOL 500	Wetlands Ecology
_____3	BIOL 503	Contemporary Cell Biology
_____3	BIOL 504	Perspectives in Modern Genetics
_____4	BIOL 505	Ornithology
_____3	BIOL 507	The Biology of Fishes
_____3	BIOL 510	Estuarine Biology
_____4	BIOL 513	Entomology
_____4	BIOL 521	Mammalogy
_____4	BIOL 522	Vertebrate Physiology
_____3	BIOL 525	Toxicology
_____4	BIOL 530	Plant Physiology
_____4	BIOL 533	Environmental Microbiology
_____3	BIOL 535	Evolutionary Biology
_____4	BIOL 540	Contemporary Genetics
_____3	BIOL 545	Virology
_____1-3	BIOL 550	Internship in Biology
_____3	BIOL 552	Advanced Human Physiology/Pathophysiology
_____3	BIOL 560	Biology of Cell Membranes
_____3	BIOL 565	Advanced Cell Biology
_____1-4	BIOL 590	Special Topics in Biology

Students who take a 400 level elective course co-listed at the 500 level at Salisbury University will not be allowed to receive credit at the graduate level (500+) for retaking the same course. If a 400-level course is retaken at the 500 level, those graduate credits will not apply towards the graduate degree.

Allied Professional Skills requirement

Students completing the MS degree in Applied Biology must demonstrate their applied expertise by developing proficiency in an Allied Professional Skill. Allied Professional Skills include, but are not limited to, computer programming, geospatial analysis, foreign language, technical writing, demonstrable expertise in advanced laboratory or field techniques or instrumentation, policy analysis, etc. The choice of Allied Professional Skill is left to the student in consultation with the advising committee. Skills should be relevant to the student's research or career goals, should be chosen early in the student's program of study and are subject to approval of the Graduate Advisory Committee.

C. MS requirements and Schedule

1. **Course work** as described in "Program Requirements" above.
2. **Oral Exam**

All students, thesis and non-thesis, will take an oral examination with their advising committee covering their graduate course work and their specific areas of interest in biology. Guidelines for the oral exam including areas of concentration and format will be discussed by the graduate advising committee with the student prior to scheduling of the exam.

Students whose performance in the oral exam is unsatisfactory may retake the exam once on a date no later than the end of the following semester. For all such second exams, an additional examiner will be appointed by the Department Graduate Committee**.** Students may also be required to complete an additional course if their knowledge in the subject matter appears lacking.

3. **Degree Candidacy**

Students may petition for candidacy to the MS degree when course work is within one semester of completion, the Allied Professional Skill Requirement has been met and a research plan (for thesis students) has been approved by the Graduate Advisory Committee.

4. **Thesis Preparation and Thesis Defense**

Students writing a thesis should register for Biol 601: Thesis Preparation, during the semester in which they plan to graduate. Permission to register for the course must come from the student's graduate advisor. Subsequent to registration for Biol 601, the graduate advisor will see that the student receives guidelines for thesis preparation. Prior to scheduling the thesis defense, students must allow at least 10 working days for review of the completed thesis by members of the advising committee.

The student must provide their advisory committee with a copy of their thesis two weeks prior to their defense. The student must give a seminar presentation, which is formally open to the public and may be attended by other interested faculty, students or friends, to be followed by the thesis defense (not open to the public). The advising committee is responsible for administration of

the thesis defense. Students will give all members of the advising committee the opportunity to provide editorial input. Once the thesis defense is complete, the student will be responsible for making all changes to their thesis as requested by their committee members, before submitting it the University.

The student is responsible for determining a date for their thesis defense when all committee members can be present. Students must notify the faculty of the department of their seminar/thesis defense date at least two weeks prior to the exam. Notice must include the abstract of the thesis and the time and location of the seminar.

Scheduled Deadlines for MS students:

First Year:

First year students include both post-baccalaureate MS students and undergraduate seniors admitted to the 4+1 accelerated MS program. Students are required to attend an orientation program at the beginning of the semester, to meet with members of the Departmental Graduate Committee for advising and to register for classes. Early in the semester, MS students must also be available for instruction in Animal Use and Care and Occupational Health and Safety.

1 December: Choose Graduate Advisory Committee. This committee should convene prior to registration for the spring semester. At this meeting, the course plan and allied professional skill requirement should be discussed. Thesis students should also discuss their planned research and present their committee with a draft of their proposal.

January: Meet with the Departmental Graduate Committee to review their progress.

1 March: The Graduate Advisory Committee should be presented with a complete picture of planned research if this has not already been done. Students starting the program in the spring are strongly advised to present their research proposal to their advisory committee before the end of their first semester.

Second Year:

1 October: Meet with the Graduate Advisory Committee to review progress.

1 November: Oral Exam (thesis and non-thesis students)

January: Meet with the Departmental Graduate Committee to review progress.

1 February: Meet again with the Graduate Advisory Committee for review.

15 February: Petition for candidacy to the degree.

1 March: Schedule Thesis defense and Final exam (thesis students only)

MS students who find it necessary to continue past a second year in the program must convene their Graduate Advisory Committee at least once a semester. After each such meeting, the Committee should report on progress to the Director of the Graduate Program.