

SUNY Buffalo State
Department of Biology

Graduate Student Handbook

Guidelines for the Degree of

M.A. in Biology

May 2015

This Handbook is designed to help students fulfill their responsibilities and to make steady progress toward completion of a Master's Degree in Biology at Buffalo State. These requirements and procedures have been established by the Graduate Faculty of the Biology Department acting within guidelines set by the Graduate School. Students should consult the Graduate Catalog in effect when they entered the graduate program for other policies that may be applicable. Graduate degree programs are characterized by the high level of initiative that is expected of graduate students in meeting program requirements, setting up meetings with their committees, or completing their research. Your faculty mentor or committee members should not be expected to remind you of approaching deadlines or requirements.

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Degree Overview

The **M.A. in Biology** degree is designed for those who desire advanced knowledge of biology. It prepares students for research, professional employment, and/or study at the Ph.D. level. There are two options for the Biology M.A. degree:

- a) a thesis degree requiring completion of an original scholarly research activity plus coursework,
- b) a non-thesis degree requiring coursework culminating in a comprehensive exam.

M.A. in Biology Program Outline

	<i>Credits</i>
BIO600 Foundations of Graduate Studies.....	3
Biology Electives (600-level) ¹	15-26
General Graduate Electives ¹	0-6
Thesis <u>or</u> Comprehensive Exam	
a. BIO695 Master's Thesis.....	6
b. BIO699 Comprehensive Exam.....	1
<i>Total Required Credits</i>	<i>30</i>

¹selected by advisement

Graduate Assistantships

Graduate Teaching Assistants assist faculty in their teaching responsibilities and are recommended for appointment by the Department Chairperson after consultation with the Graduate Committee. An assistantship is a form of financial aid (it provides a stipend for the academic year and a tuition scholarship of up to 9 credits per semester). It is awarded on the basis of academic ability and the department's needs. The Chairperson will recommend appointment initially for one semester; reappointment is contingent on a student's effectiveness as a graduate assistant, his or her performance in course work and progress on their degree. Graduate assistants must be full-time students and carry an approved academic load. The work performed by a graduate assistant requires an average of 20 hours per week. Although graduate assistants are usually assigned to a particular professor, they are ultimately responsible to the Department Chairperson. M.A. students in the Thesis Option are given priority for Teaching Assistantships.

Graduate Research Assistants are appointed by professors who hold outside grants and contracts. The details of the arrangement are worked out between the research assistant and the professor. However, research assistants, like graduate teaching assistants, must carry an approved academic load each semester and are expected to put in an average of 20 hours per week on the projects assigned to them.

Student Advisement

Arranging a course of study and/or designing a research project are complex tasks which the student carries out with the aid of a faculty adviser and committee. The advisement guidelines and expectations vary depending on the course of study and are described below.

Introduction to Graduate Studies (BIO600)

This required course is an introduction to the culture and structure of graduate studies in Biology. The course is taught each autumn semester and examines the methodology and tools used by biologists, scientific writing, experimental design, and develops students' abilities to effectively communicate biological research.

Description of Graduate Programs in Biology

I. The Thesis-Based M.A. in Biology

Advisement

Early in the application process thesis students should identify a faculty mentor to supervise their research and serve as their major professor. The major professor should be consulted each term before registering for courses. In addition, students should select a thesis committee prior to the completion of their first semester of coursework (for full time students) or first year of coursework (for part-time students). This committee will consist of three Biology faculty, or two Biology faculty and one adjunct Biology faculty. One of these three individuals must be the student's major professor. Additional committee members may be selected at the discretion of the student and the major professor. External committee members must have graduate faculty status and may include Biology faculty, adjunct Biology faculty, or qualified individuals from other departments or institutions. As a general rule, keeping the committee at three simplifies arrangement of committee meetings and thesis discussions. Students must schedule a meeting with their committee at least once each semester to keep members abreast of progress and to avoid obstacles. The major professor, with the help of the student will take minutes and maintain records of all committee meetings. Finally, in order to demonstrate satisfactory progress on their degree, at the end of each semester, students must complete and submit a **Thesis Progress and Evaluation Form** to the Biology Department chairperson. A copy of this form is found at the end of this document.

Coursework

The thesis-based M.A. degree requires the completion of 30 credits of graduate coursework, of which six credits will be in BIO695 (Research Thesis in Biology). The remaining 24 credits will include BIO600 (described below), several 600-level biology electives, up to 6 credits of special project (BIO590), credits for attending Biology Seminar (Bio 617) and other elective credits recommended by their major professor.

Full-time students making satisfactory progress toward completion of the thesis M.A. degree shall meet the following minimum expectations:

1. Maintain a cumulative GPA of ≥ 3.0 (B) on a 4-point scale, earning no grade $< C$ for any graduate course,
2. Select a thesis committee prior to the end of the first semester,
3. Have thesis proposal approved and presented prior to the end of the second semester, and
4. Complete and submit a Thesis Progress and Evaluation form each semester.

Failure to maintain satisfactory progress toward completion of the thesis degree may prevent a student from being awarded a graduate assistantship in biology.

NOTE: Students earn no credit for any graduate course in which they receive less than a C. However, the grade will still count in the cumulative grade point average. In all graduate coursework, the student must maintain a minimum grade point average of 3.0 (B) on a 4-point scale, but cannot take more than 36 credits to achieve this average.

The department recommends that a minimum of 15 credits are obtained in 600-level Biology electives. However, in cases where the major professor supports enrollment in graduate courses at the 500-level, attempts will be made to accommodate the request.

Thesis Proposal

One of the features of the thesis-based MA is the central role of research. The thesis proposal outlines the research goals of the student and places the research in context of current knowledge. The proposal should be approved before research begins in earnest. Since graduate research in this department often contributes to papers published in scientific journals, it is useful to keep in mind the goal of a publishable piece of work when proposing thesis research.

Your proposal should include a title page listing members of your committee, an overview section (similar to an abstract), an introduction section which reviews the literature and places your investigation in some context (this section will also generally contain the goals or hypotheses directing your research), a description of the investigative procedures to be followed (i.e., a materials and methods section), including an outline of the statistical analyses to be used, a timeline, and a literature cited section.

In your proposal you should include sufficient detail for the committee to judge whether the investigation proposed is likely to yield answers to the questions posed and if it can be conducted within a reasonable amount of time using available resources. It is essential to include a timetable in each proposal, indicating when one expects to accomplish the various components of the investigation; this is especially important in projects involving fieldwork. You should carefully consider your experimental design. Replications may be required and the results should be analyzed statistically. The thesis committee may ask the student to specify the statistical analyses he or she plans to use. It also may be necessary to ascertain that all equipment needed is available and functional.

The proposal should be written with input from members of the committee. The student should circulate a rough draft among the committee members and get comments before submitting the final draft for the committee's approval. It is important that the proposal be written carefully but with the realization that during the actual research the procedure followed may have to be altered. Remember that although the scientific problem to be addressed may be obvious to the student writing the proposal and his or her adviser, it needs to be made comprehensible to other members of the committee, to fellow graduate students, and to the faculty of the Biology Department.

After the proposal has been approved by the committee, the substance of the proposal must be presented orally before the "public" (meaning faculty and other graduate students) as soon as possible. This oral presentation (the Thesis Proposal Seminar) should occur before you begin research in earnest. The seminar should be announced in advance by distributing and posting appropriate announcements. Although this may seem like an intimidating prospect, experience has shown that the most successful investigations are those that have benefited from substantial constructive criticism during the planning stages. Careful preparation of the proposal and a public presentation of the proposal are good investments toward a successful thesis or project.

Before the Department Chairperson will approve your registration for Biology 695 (Thesis Research) your written proposal must be approved by your committee and you must also have presented your oral seminar. M.A. students should plan to complete the proposal and proposal presentation prior to completion of 12 graduate credits (generally in your second semester of study).

Completing and Defending Your Thesis

Students are expected to work closely with their major professor during the thesis writing stage of the degree. When the major professor is satisfied that thesis is ready for review, the student will provide an electronic copy of the draft thesis to their committee for comments. It is customary to allow the committee two weeks to review and comment on the thesis. Students should schedule a meeting at the end of the review period during which the committee will discuss the thesis and suggest revisions. After the revisions are complete and approved by the major professor, the student may schedule their thesis defense seminar at a mutually agreed upon day and time. Students are expected to make their thesis defense open to the public and post several notices advertising the seminar to fellow graduate students and faculty in the department. During the defense, the student will be expected to report the results of their research and demonstrate command of appropriate related material.

Immediately following the thesis defense, the committee will meet with the student for a final evaluation of the thesis. The student is then asked to leave the room while the committee deliberates and then announces its decision (either pass or fail) to the student. At this point, the committee may ask for additional, minor revisions to the thesis. If the completed thesis does not meet with the committee's approval, the major professor will work with the student and committee to develop a plan for additional research or more extensive revisions. The changes must be made before a new thesis defense can be scheduled.

Approved theses are posted on the Buffalo State Digital Commons, an institutional repository of research and scholarly work. The Biology Department complies with rules and recommendations of the Graduate School regarding formatting. Current formatting guidelines are available on the Graduate School Website (<http://graduateschool.buffalostate.edu/thesis-and-project-guidelines>). Students are advised to work closely with their major professor to ensure formatting errors do not prevent publication of the thesis. It is also important to note that it generally takes more than a week for a thesis to be approved after submission.

A brief timetable is included here, but **BE SURE TO CHECK WITH THE GRADUATE SCHOOL** for any updates on formatting or procedural changes.

Activity	Due Date
Register for thesis credits (Bio695). The major professor will advise students whether they should register for all six credits in one semester or spread the credits over two or more semesters.	See Academic Calendar for registration dates
Complete thesis research, write thesis, and work with committee and major professor to revise and refine thesis	Research and thesis writing takes a year or more. Students should aim to have the thesis completed one month prior to the semester in which they plan to graduate.
Schedule a thesis defense and present the thesis to the committee, peers and faculty	The defense should be scheduled at least 2-3 weeks prior to expected graduation date.
Fine tune thesis for final approval of committee	Minor revisions should be completed within a week of the defense. In the event that more research is required or revisions are extensive the student should work with the major professor to develop a new plan for graduation
Upload thesis to Digital Commons/Graduate School.	The final version of the thesis should be uploaded about 2 weeks prior to the anticipated graduation date.

Checklist of Thesis-Based M.A. Requirements

- ✓ Completion of 30 credits of graduate work, but no more than 36 credits, with a cumulative GPA of ≥ 3.0 .
- ✓ Completion and submission of the Thesis Progress & Evaluation form each semester.
- ✓ Presentation of thesis proposal seminar and proposal approval by the thesis committee.
- ✓ Completion of thesis.
- ✓ Thesis accepted by thesis committee and the presentation of a thesis defense seminar.
- ✓ Thesis submitted to the Graduate College according to their submission and formatting guidelines.

Example Timetable

Students enter the M.A. program with different levels of preparation. Consequently, students will progress toward degree completion at somewhat different rates. However, students should be able to finish their coursework and thesis in two years of full time study with proper planning.

With this in mind, the following timetable serves as a guideline for students beginning in fall semester:

- | | |
|------------------------|---|
| Semester 1
(Fall) | a. Coursework: 6-9 credits of BIO600 and any of the following; BIO617, 600-level Biology electives courses, courses needed to complete deficiencies, BIO590. |
| | b. Select a general area of research and begin to identify potential thesis topics. Select and meet with thesis committee. |
| Semester 2
(Spring) | a. Coursework: 6-9 credits of any of the following; BIO617, 600-level Biology electives courses, courses needed to complete deficiencies, BIO590, (BIO600 if not taken previously). |
| | b. Prepare and submit thesis proposal to committee. Make oral presentation of proposal. |
| Summer
Semester | a. optional registration in BIO590 or BIO695 |
| | b. Focus on research. |
| Semester 3
(Fall) | a. Coursework: total 6-9 credits including 0-6 credits of BIO695 (Thesis) and any of the following; BIO617, 600-level Biology electives courses, courses needed to complete deficiencies, BIO590. |
| | b. Continue research. |
| Semester 4
(Spring) | a. Coursework: 6-9 credits of 600-level Biology electives (or thesis). |
| | b. Complete thesis and present thesis defense seminar. |
| | c. File Application for Graduation noting deadline on the Graduate School Website. Submit thesis for final approval. |

NOTE: During the course of an MA degree students may register for a maximum of 6 credits of BIO590, 3 credits of BIO600, 6 credits of BIO695, and 2 credits of BIO617.

II. The M.A. in Biology with a Comprehensive Exam

Advisement

Students will be assigned a major professor that will provide knowledge and advice about courses and procedures. The major professor should be consulted each term before registering for courses and will coordinate the scheduling of the final comprehensive exam. In addition, students are required to complete and submit the “Comprehensive Exam Progress and Evaluation Form” to remain in good academic standing. A copy of this form is found at the end of this document.

Coursework

The M.A. degree requires the completion of 30 credits of graduate coursework and all graduate students must enroll in BIO600 (3 credits). Comprehensive exam students must also enroll in 1 credit of Bio699 (Comprehensive Exam). The remaining 26 credits may be obtained through 600-level graduate electives, BIO590 (Independent Study), BIO617 (Research Seminar) and other graduate-level courses recommended by the major professor.

The following specific regulations relate to coursework in the M.A. program:

In all graduate course work, the student must maintain a minimum grade point average of 3.0 (B) on a 4-point scale, but cannot take more than 36 credits to achieve this average.

Students earn no credit for any graduate course in which they receive less than a C. However, the grade will still count in the cumulative grade point average.

Full-time students making satisfactory progress toward completion of the M.A. degree with the Comprehensive Exam Option shall meet the following minimum expectations:

1. Maintain a cumulative GPA of ≥ 3.0 (B) on a 4-point scale, earning no grade $< C$ for any graduate course

Comprehensive Exam

The comprehensive exam will be based on knowledge from coursework the student has completed over the first two thirds of their degree program, and is administered through registration in BIO699 (Comprehensive Exam, 1 credit). Most M.A. students in the Comprehensive Exam Option will have completed four to six, 600-level biology electives by the time they register for BIO699. Of these, the student will choose three 600-level electives on which to be tested (excluding BIO617). These courses must have been completed at Buffalo State and have been taught by three different professors in the faculty; adjunct and part-time professors cannot administer questions. *Note, BIO600 is a required course and therefore is not eligible for testing.* The three professors chosen will be the evaluating committee for the written and oral portions of the exam. One of the committee members will serve as Chair.

Students are expected to work closely with the major professor to schedule the comprehensive exam. Good academic standing (average GPA of B or above) is required in order to enroll in BIO699 and take the exam. The student should plan on taking BIO699 in the semester which follows the completion of 20 credits of 600-level biology elective courses. The exam should not be scheduled for the semester that the student plans to graduate.

As stated in the Academic Policies of the Graduate School any student earning a grade of C- or less on the Comprehensive Exam may register for BIO699 a second time and retake the comprehensive exam for grade replacement. Students who register for BIO699 a second time will have the same examining committee they had for their first exam. If, upon retaking BIO699 the student fails to earn a "C" grade, the student will not obtain an M.A. degree in Biology. There is no provision in the policies of SUNY Buffalo State for students to earn credit in BIO699 on their third attempt.

To take the Comprehensive Exam, the student must follow these steps:

1. Register for BIO699 (1 credit)
2. Schedule the written and oral examinations with their academic advisor. Both portions of the exam must be completed in order to receive a passing grade in BIO699.
3. Complete the written portion of the exam.
4. Attend an oral exam, in which the three examining professors will meet with the student to review his/her written answers and evaluate his/her depth of knowledge in the three courses chosen.

The examining committee will unanimously award a grade to the student.

Changing Tracks: Moving from the thesis-M.A. to the comprehensive exam M.A.

A thesis-M.A. student can switch at any time into the Comprehensive Exam M.A. option. However, once a student has switched to the Comprehensive Exam option, s/he will not be allowed to complete a thesis or switch back to the thesis option. If the student has completed 20 credits or more of 600-level biology electives before switching to the Comprehensive Exam option, they should register for BIO699 as soon as possible. A student may obtain some credit for work completed towards a thesis (e.g., proposal, proposal presentation, field or lab work, etc.) as BIO590 (Independent Study). Whether or not a student earns credit for thesis work will depend on the number of BIO590 credits received by the student (there is a 6 credit maximum for Bio590), the recommendation of the thesis mentor, the major professor advising the comprehensive exam student and the graduate committee.

Checklist of Comprehensive Exam M.A. Requirements

- ✓ Completed BIO600 (3 credits)
- ✓ Completion and submission of the Comprehensive Exam Progress & Evaluation form each semester.
- ✓ Completion of 30 credits of graduate work, but no more than 36 credits, with a cumulative GPA of ≥ 3.0 .
- ✓ Successful completion of BIO699 (Comprehensive Exam, 1 credit).

Example Timetable

Students will progress toward degree completion at somewhat different rates. However, students should be able to finish their course work and comprehensive exam in two years of full time study with proper planning. With this in mind, the following timetable could be used as a guideline:

- | | |
|------------------------|---|
| Semester 1
(Fall) | <ul style="list-style-type: none"> a. Coursework: 6-9 credits including BIO600 (3 credits) and any of the following; BIO617, 600-level Biology electives courses, courses needed to complete deficiencies, BIO590. b. Meet with major professor. |
| Semester 2
(Spring) | <ul style="list-style-type: none"> a. Coursework: 6- 9 credits of any of the following; BIO617, 600-level Biology electives courses, courses needed to complete deficiencies, BIO590. |
| Summer
Semester | <ul style="list-style-type: none"> a. Optional 1 to 6 credits: BIO590 (Independent Study) |
| Semester 3
(Fall) | <ul style="list-style-type: none"> a. Coursework: 6- 9 credits of any of the following; BIO617, 600-level Biology electives courses, courses needed to complete deficiencies, BIO590. b. Complete BIO699 (Comprehensive Exam, 1 credit). |
| Semester 4
(Spring) | <ul style="list-style-type: none"> a. Coursework: 6- 9 credits of any of the following; BIO617, 600-level Biology electives courses, courses needed to complete deficiencies, BIO590 b. File Application for Graduation. (Note deadline). a. If necessary, retake BIO699 Comprehensive Exam for grade replacement. |

NOTE: During the course of an MA degree students may register for a maximum of 6 credits of BIO590, 3 credits of BIO600 and 2 credits of BIO617.

Final Notes

Satisfactory Degree Progress

If you are failing to make sufficient progress or to meet degree requirements, you will be notified in writing by the Department Chairperson. Failure to improve may result in dismissal from the graduate program. The Department Chairperson will make final decisions regarding dismissal in consultation with the student's major professor, the Thesis or Project Committee and the Biology Department Graduate Committee.

Research Involving Human or Animal Subjects

If a thesis or project involves the use of vertebrate animals or human subjects, campus-level approval is required. Research involving human subjects requires review at the departmental level and may require review through the Institutional Review Board on campus. Approval should be sought PRIOR to undertaking the investigation. Information on research involving human subjects and all forms are available through the Research Foundation website (<http://www.rf.buffalostate.edu/research-compliance/human-participants.html>). Research requiring the handling or care of vertebrate animals requires review by the Institutional Animal Care and Use Committee (IACUC). Information and forms related to vertebrate research are found on the Research Foundation website (<http://www.rf.buffalostate.edu/research-compliance/animal-subjects.html>).

Approval for animal or human subject research is required before a thesis or project proposal is approved. This means you will need to have your IACUC permit on file with your advisor at the proposal stage. The Department Chair will not sign off on a thesis or project without the necessary IACUC or human subjects approval.

The Lighter Side

Graduate school is an important stepping stone in your career and a time of great academic learning and freedom. You will undertake a wide variety of specialized courses, read many research papers and possibly undertake a research project that is entirely your own. You should value the time that you think long and hard about specific questions and ponder how best to investigate them. You will be challenged in many new ways and will (hopefully) develop a surprising level of commitment and pride in your academic accomplishments.

You will join a group of graduate students in biology who are motivated by similar questions and experiences and who also 'thirst' for knowledge on their topic. Hopefully, that similarity in purpose leads to further scientific interaction as you practice seminars, discuss papers, take classes, or work together.

All graduate students will attend the annual Graduate Student Picnic each autumn, meeting new students and reacquainting with faculty. Your time invested during this important stage in your life will help build your peer family here at Buffalo State, and help guide your future decisions. Although department expects high quality learning and research from its students, you should also have fun while you are here. Upon completion you will enter the ranks of valued graduate alumni, so please keep us informed of your success by calling the departmental office (716-878-5203) or emailing your major professor. Good Luck!

Current Semester: _____

Biology M.A. Thesis Progress and Evaluation Form

Student Name: _____

Semester of Admission into the Program: _____

Mentor's Name: _____

Date of Submission of Candidacy Form: _____

Names of Committee Members: _____

Committee Meetings Dates:

First Semester Date: _____

Second Semester Date: _____

Third Semester Date: _____

Fourth Semester Date: _____

Other Semesters Dates: _____

Thesis Work Status:

Proposal (to be submitted and presented BEFORE end of second semester):

Submitted to Committee Date: _____

Presented to Committee Date: _____

Proposal Oral Presentation Date: _____

Approved by Committee Date: _____

Research Work:

Initiation of Thesis Research Date: _____

Thesis and Oral Thesis Presentation:

Submission of First Draft of Thesis to Advisor Date: _____

Submission of Draft to Committee Members Date: _____

Oral Thesis Presentation Date: _____

Approval of Final Draft by Committee Date: _____

Submission of Thesis to Graduate School Date: _____

OFFICE USE ONLY

Electronic Submission of Thesis to Graduate School and Department Date: _____

Current semester: _____

Biology M.A. Comprehensive Exam Progress and Evaluation Form

Student Name: _____
Semester of Admission into the Program: _____
Advisor's Name: _____
Date of Submission of Candidacy Form: _____

Meetings with your Advisor:

First Semester Date: _____
Second Semester Date: _____
Third Semester Date: _____
Fourth Semester Date: _____
Other Semesters Dates: _____

Evaluating Committee for Comprehensive Exam - Identification of THREE faculty members:

Names: _____

First Examination Schedule:

Written Exam Dates: _____
Oral Exam Date: _____

Evaluating Committee Decision for First Exam:

- Pass
- Fail

If student failed first examination -
Rescheduled Dates for Second Examination:

Written Exam Dates: _____
Oral Exam Date: _____

Evaluating Committee Decision for Second Exam:

- Pass
- Fail

OFFICE USE ONLY

Graduate School informed of final outcome of Comprehensive Exam Date: _____