

Department of Biology
New Mexico State University
Graduate Student Handbook
2012-2013

WELCOME! This guide was written with one major goal: to provide you a general reference containing information for your use throughout your graduate career. There is a lot of information, but we have tried to keep it as user friendly as possible. Included in this packet are excerpts from the Graduate School Catalog regarding rules and guidelines in place for a Masters in Science (MS) and Doctorate in Philosophy (PhD) degrees. We strongly recommend you consult the Graduate Catalog website (<http://gradschool.nmsu.edu/Catalog/requirements.html>) to be informed of any changes in guidelines, procedures, forms and deadlines imposed by the Graduate School. The Graduate School also provides very useful workshops on topics relevant to procedures covered in this Handbook and you can find these activities posted on its website.

The Biology Department establishes the details of your graduate program in compliance with Graduate School requirements. This Handbook contains information about the general requirements to successfully complete your MS or PhD program in Biology including: assembling your Graduate Advisory Committee, scheduling annual committee meetings to assess your progress in your graduate training, defining your coursework plan, preparing for the required Qualifying, Comprehensive and final Oral and Written Exams, and generating a timeline to schedule each of these milestone so that you complete your graduate training in a timely manner.

The relatively free-form nature of graduate education, the necessity to become a self-motivator, and the diverse challenges can cause stress, anxiety, and self-doubt. Keeping the lines of communication open between yourself and fellow students, between you and your Graduate Advisory Committee members, and between yourself and your faculty advisor will help you in making your graduate training to be a more positive experience. Please do not hesitate to contact the Department Chair or any faculty member of the Biology Department regarding any concerns, questions, and suggestions that you may have about the Biology graduate degree program.

The BIOLOGY GRADUATE STUDENT ORGANIZATION (BGSO)

Every Biology graduate student is automatically a member of the Biology Graduate Student Organization (BGSO). The BGSO serves several purposes, such as promoting interactions among the graduate students, providing information about the department and the university to the graduate students, and representing graduate student concerns to the faculty and other campus organizations.

The BGSO is the graduate student representative body within the Biology Department at NMSU. Through the BGSO, graduate students are provided a venue to discuss and express concerns and ideas related to graduate student life within the Department and at NMSU. The BGSO participates in numerous activities within the university and the community, including science fairs, fundraisers, and other volunteer activities. Through participation in these activities the BGSO garners funds that can be used for group activities or to deepen the BGSO library. The BGSO actively participates with the Department in sponsoring an annual departmental symposium where students and faculty present

their research through informative presentations and posters. Despite all this work, the BGSO also holds occasional informal social gatherings and activities as well. We welcome you to the Department and NMSU. We hope you look into the BGSO and become an active member.

Subscribe to the Biology Listserve

The way to keep up-to-date on all that goes on in the department as well as get important information regarding safety requirements, funding opportunities, graduate seminars and activities that benefit your training, you must subscribe to the Biology Listserve. To do this, you should contact the Biology Lab Coordinator Linda Perez at liperez@nmsu.edu and provide her with the following information: your name, your email address (NMSU - not Hotmail, Yahoo, etc.), and the name of the Biology faculty for whom you work for or is your principal mentor.

TYPES OF GRADUATE PROGRAMS IN BIOLOGY

Students may obtain a graduate degree in biology by completing one of the following:

- Thesis Masters research program in Biology (M.S.)
- Non-thesis Masters program in Biology (M.S.)
- Non-thesis Masters in Biotechnology (M.S.)
- Doctorate research program in Biology (Ph.D.)

Many of the requirements listed in this handbook also appear in the Graduate School Catalog. Incoming students should familiarize themselves thoroughly with all applicable regulations and begin planning their programs accordingly. Any questions concerning the interpretation of a specific requirement should be addressed to the Department Chair, your faculty mentor, or any member of the Graduate Curriculum Committee. The faculty will assist in any way possible, but the final responsibility for meeting all requirements rests solely with the student.

THE GRADUATE PROGRAM

The ultimate goals of graduate students are to obtain a M.S. or a Ph.D. and to become prepared for a professional career in science. A "professional career in science" can be a great many things, e.g., a professor in a research university, a professor in a small liberal arts college, a professor in a community college, a career in industry, a position in a nongovernmental organization, government work, or entrepreneurship to name a few. Anyone who is admitted to the Biology graduate program at NMSU already has all the raw material to obtain a Master's or Doctorate degree. However, self-motivation, self-discipline, and guidance from faculty and peers are also necessary ingredients. The purpose of this guide is to outline the general steps in graduate school and to reassure you that the attainment of this goal is both possible and rewarding.

In graduate school, there are few formal courses, as most training is done informally in laboratories and/or in the field. You will have quantitative assessments of your performance (e.g., exam grades, course grades), and each assessment is of critical importance. Your rate of progress will depend largely on your own initiative and hard work. Obtaining a Ph.D. requires a set of skills; whether or not you develop these skills is up to you.

ESSENTIAL SKILLS FOR ALL GRADUATE STUDENTS

Communication Skills. You need to be able to write clearly and concisely. If you cannot do this, consider taking a course in technical writing or find another way to improve your writing ability. You need to be able to comfortably give oral presentations that are articulate, engaging and informative. The best way to improve your skills here is by giving plenty of talks in both formal and informal contexts. You need to be able to teach students who know far less than you do. Acting as a Teaching Assistant, and taking the job seriously, is an excellent way to improve your teaching skills. The university also has a variety of workshops to help in this task (check offerings by the Teaching Academy). Finally, you need to be able to interact informally and comfortably with other professionals – both scientists and non-scientists. The best way to improve these communication skills is by taking opportunities to discuss science with your colleagues, with visiting seminar speakers, and with members of your community.

Analytical Skills. You will need to develop a set of analytical skills that allow you to evaluate the logic of scientific arguments; develop a research project that is tightly reasoned, realistic, feasible and fundable; and collect and analyze data and/or develop theoretical models, often under less than ideal conditions. The specifics of these skills will depend on your interests and the details of your thesis or dissertation project, and are likely to be developed over the course of your graduate career, not all at once. Another essential analytical skill is to critically evaluate scientific papers. You should read papers related to your research area not just to obtain additional background information, but to also be able to evaluate each paper's data (i.e., why are they good and/or what are their shortcomings). This is a skill you will develop in a mostly informal fashion, such as journal clubs and lab meetings.

Experimental Skills. Regardless of in which lab you ultimately carry out your dissertation research, you will be expected to master a number of experimental procedures. Generally other members of the lab and your advisor are great for providing hands-on training. However, additional information on experimental approaches is typically available in the literature. The most successful graduate students seek to learn the most about both their projects and the methods used. Understanding the theoretical and technical aspects of your work may help you to find either more robust or simpler approaches and ultimately lead to higher levels of success.

THE ACADEMIC PROGRAM: MASTER'S IN SCIENCE (MS)

A Master's degree in Biology requires that you demonstrate a high-order overview in one of the specific emphases offered in the Biology Department (see Biology Department Emphases below). The M.S. degree is preparatory for a doctoral program in the subject or alternative careers that call for a specialized body of theoretical and/or applied knowledge in biology. The Master of Science in Biology degree can be obtained through either a thesis option or a non-thesis option. Both options require 30 credits of course work. The non-thesis Masters in Biotechnology can be completed as an accelerated (one-year) program concentrating on biotechnology.

A minimum of 30 semester credits is required for the M.S. degree in Biology. You must take at least 15 credits in graduate Biology courses. Students in the M.S. in Biology program are expected to complete their degree in two years, although exceptional circumstances may require a longer degree program. Students should meet with their Graduate Advisory Committee on a yearly basis to provide progress reports and for guidance on meeting requirements for completion of the degree program.

Thesis Masters program in Biology. The general requirements are similar for each area of specialization (except for course requirements) and include:

1. Completion of basic coursework
2. Completion of research and preparation of the M.S. Thesis
3. Passing defense of the Thesis through a final Oral Examination
4. Filing Thesis with the Graduate School

Non-Thesis Masters program in Biology. The general requirements are similar for each area of specialization (except for course requirements) and include:

1. Completion of basic coursework
2. Passing final Oral and Written Examinations

Non-Thesis Masters program in Biotechnology. The non-thesis Masters in Biotechnology requires 30 credits for graduation. The curriculum consists of 12-15 credits per semester over two semesters with an optional summer internship. The general requirements include:

1. Completion of basic coursework
 2. Passing final Oral and Written Examinations
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THE ACADEMIC PROGRAM: DOCTORATE IN PHILOSOPHY (PhD)

The PhD degree in Biology requires that you demonstrate a mastery of biology at the graduate level in your area of emphasis, and a substantial ability to carry out original research. The normative time for completion of the PhD degree requirements is five years. Normative time is defined as the period of full-time registration required to earn the degree, assuming that you enter with a bachelor's degree and have no course deficiencies or need to take any remedial work. During the first three years, emphasis is on coursework and reading in preparation for, as well as completing the Qualifying and Comprehensive examinations. The remaining two years are devoted primarily to research and to the completion of the Dissertation, although some students may take additional coursework during this period.

The general requirements are the same for each area of specialization (except for course requirements) and include:

1. Passing the Qualifying Examination
 2. Completion of basic coursework
 3. Passing the Comprehensive Examination
 4. Completion of research project and preparation of the PhD Dissertation
 5. Passing defense of the Dissertation through a final Oral Examination
 6. Filing Dissertation with the Graduate School
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Satisfactory Academic Progress

In the Biology Program your program of study is planned in consultation and guidance from your Graduate Advisory Committee and your primary faculty mentor. ***You should meet with your Graduate Advisory Committee at least once a year to discuss and evaluate your progress.*** Items such as courses taken and those to be taken, research progress, exam scheduling, and work as a teaching or research assistant should be discussed. The Graduate Advisory Committee is responsible for making specific recommendations concerning your progress. The Graduate Advisory Committee

may also approve exceptions to the normal time schedule occasioned by unusual circumstances. At the end of this meeting, your main faculty advisor should complete the Graduate Progress Form (see Appendix), circulated to all committee members for additions and/or corrections, and signed and dated by all committee members. A copy will be given to you and the original will be kept in your file in the departmental office. This form is used for: Ph.D., Thesis Masters, and Non-thesis Masters students.

Unsatisfactory Academic Progress

It is hoped that you will make good progress in your degree program. Failing to do so will have serious consequences for your career in graduate school. If you do not reach deadlines such as Qualifying and Comprehensive Exams in a timely fashion, if your GPA drops below the minimum level of 3.00, or if you have 12 or more units of "I" grades, opportunities for receiving funding through the Department or the Graduate School become severely limited.

Unsatisfactory progress can also result from lack of progress in completing the requirements, progress in your research project, or academic dishonesty. In case of inadequate performance in research or courses, you will be warned, in writing, by your committee and given three to six months to improve. The warning should specifically state the work or actions required of you. In cases of academic dishonesty or failure upon reexamination in the qualifying procedure, dismissal requires no warning.

Leave of Absence/Continuous Enrollment. Students working on advanced degrees who plan an interruption in studies for a calendar year should address a request for leave of absence through their department head, alerting the dean of the Graduate School. The request should include the beginning date and the anticipated ending date for the period of absence. A graduate student on leave of absence will be expected not to use university facilities and place no demands upon the university faculty and staff, and, therefore will pay no fees. Time spent in leave-of-absence status will not be counted toward time limits. If you fail to register for one calendar year without obtaining a leave of absence from the Graduate School you will be considered withdrawn from the university.

Disciplinary Probation and Suspension. Graduate students are subject to the rules and regulations with respect to disciplinary probation and suspension as listed in the "Student Code of Conduct" section of the Student Handbook.

Time Limit. If more than five years have elapsed since the date of your Comprehensive Examination, you will be required to take another Comprehensive Examination before you are admitted to the Final Examination.

It is your responsibility to review the graduate catalog often for updates on all rules and policies (<http://gradschool.nmsu.edu/Catalog/requirements.html>).

BIOLOGY DEPARTMENT EMPHASES

Core (graduate core) courses. It is highly recommended that you complete your core courses during your first four semesters if at all possible. If you wish to request an exemption, you must submit a written request for an exemption to your Graduate Advisory Committee justifying the reason for the exemption.

- ① **Cell and Organismal Emphasis.** The cell and organismal curriculum is appropriate for graduate students who wish to emphasize those areas of biology that integrate function and structure in cells, tissues, and organisms. This curriculum includes courses in cell and molecular biology, neurobiology, developmental biology, and physiology. Our goal is to prepare students for careers in this field through research experiences and formal coursework, as well as through seminars and discussion groups. We also provide a framework for practical career preparation through seminars and other activities that focus on professional written and spoken presentations, employment approaches, ethics in science, proposal preparation, interview guidance, and teaching methodologies.

Required Core Courses

- * BIOL 520: Molecular Cell Biology (3 cr)
- * BCHE 542 Biochemistry (3 cr)
- * Physiology Theme Core Course (3 cr)

One from:

- BIOL 581: Physiology of Animals
- BIOL 533: Environmental Physiology of Plants
- BIOL 560: Seminar in Cell and Organismal Biology (1 cr; repeated 3x)
- * BIOL 540: Ethical Issues in the Biological Sciences (1cr)
- * BIOL 541: Professional Development Seminar (1cr)

- ① **Ecology and Evolution Emphasis.** The Ecology/Evolution core curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that encompass the ecology and evolution and behavior of living and extinct taxa.

Students in the Ecology and Evolution Emphasis are expected to take a minimum of four courses from the following list:

- * BIOL 567, Individuals and Populations (3 cr)
- * BIOL 568, Communities and Ecosystems (3 cr)
- * BIOL 570, Ecological Biogeography (3 cr)
- * BIOL 586, Advanced Molecular Systematics (3 cr)
- * BIOL 587, Behavioral and Evolutionary Ecology (3 cr)
- * BIOL 588, Principles of Evolutionary Genetics (3 cr)
- * BIOL 589 Speciation and Adaptation (3 cr)

- ① **Microbiology Emphasis.** The Microbiology core curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that occur in microbes (bacteria, viruses, fungi and protists) such as their physiology, ecology, development or evolution.

Required Core Courses

- * BIOL 451, Microbial Physiology (3 cr)
- * BIOL 474, Immunology (3 cr)
- * BIOL 478, Molecular Biology of Microorganisms (3 cr)
- * BIOL 479, Medical Microbiology (3 cr)
- * BIOL 479L, Medical Microbiology Lab (1 cr)

Advanced graduate courses. The department offers advanced graduate seminar courses on special topics. If you don't have enough regular courses to make up the 12-credit hours required each

semester to satisfy the full-time student status, the difference can usually be made up with research units (Bio 498 or Bio 598). You should check with their advisor for approval. You are strongly advised to meet each semester with your advisors to discuss core courses and non-core courses that will optimize your graduate training preparation.

Departmental Seminar Series. Every semester, the Departmental Seminar Series is scheduled on Thursday afternoons when scientists from NMSU as well as other universities deliver scientific talks. All graduate students are expected to attend these seminars.

GRADUATE ADVISORY COMMITTEE

In consultation with your primary faculty advisor, you will select committee members according to your research and career interests, the individual specialties of the faculty, and the time constraints of the faculty. One member of the committee must serve as the Dean's representative. The Dean's representative can be either the member from the related area or minor area or an independent member appointed by the Dean of the Graduate School but must not be from your own department. In programs where more than one department is a participant, the Dean's representative may not be from any of those departments.

You and your primary faculty advisor may structure your advisory committee to include more than the minimum number of members as long as the stated conditions of membership are satisfied (see "Guidelines for Graduate Faculty Appointments" in the NMSU Graduate Catalog). Additional voting and nonvoting members may be any person approved or appointed by the Dean of the Graduate School. Changes in committee membership are often necessary due to faculty travel, sabbatical, or any other cause for inability to responsibly and efficiently serve as a committee member. However, no change in membership of the doctoral committee may be made without prior approval from the Dean of the Graduate School.

Graduate Committee: Masters. The master's degree committee will consist of a minimum of three faculty members holding at least master's degrees. The committee chair and one other member must be faculty from the Biology Department. The third person on the committee must serve as the representative for the Dean of the Graduate School. The Dean's representative may come from a related area (recommended by the committee chair) or be appointed independently by the Dean of the Graduate School.

Graduate Committee: Doctoral. The doctoral committee will be composed of at least four members of the graduate faculty holding doctoral degrees. At least three committee members must be from doctoral-granting departments. The fourth committee member is the Dean's representative who may come from a related area (recommended by the committee chair) or be appointed independently by the Dean of the Graduate School. The committee chair is commonly your primary research mentor from the Biology Department. In addition to the committee chair, at least one other member must be from a discipline within your emphasis area, which may encompass more than one degree-granting department.

Members of the Graduate Advisory Committee for the Qualifying Exam may or may not serve as future members of your committee for your Comprehensive and Dissertation Defense Committees. Students are encouraged to include faculty from at least two of the Department's three thematic research areas on the Qualifying Exam Committee.

As mandated by the Graduate School, all members of the Graduate Advisory Committee for the

Comprehensive Exam will also serve in the Defense for the Dissertation Oral Examination. No change in membership of the doctoral committee may be made without prior approval of the Dean of the Graduate School. Your Graduate Advisory Committee can include more than the minimum number of members as long as the stated conditions of membership are satisfied. Additional voting and nonvoting members may be any person approved or appointed by the Dean of the Graduate School.

ROLE OF INDIVIDUALS INVOLVED IN GRADUATE TRAINING IN THE BIOLOGY DEPARTMENT

Faculty advisor – student relationship

Selecting your primary faculty advisor is a crucial step in your graduate student career. It is one of the most important elements in maintaining normal progress toward your Ph.D. or M.S. degree. In the Biology Department, your faculty advisor may be any ladder rank (Assistant Professor, Associate Professor, Professor). As a graduate student, you should proactively seek mentors for research, creative activities, teaching, and career development to enrich your graduate study at NMSU. Choose mentors carefully to address your interests and needs, and work hard to build a trusting, comfortable, professional relationship. Your mentors may not only provide you with knowledge and skills in graduate school, but may also offer support and guidance throughout your future career.

In addition to your primary research mentor, you may need to seek out additional faculty members who can provide you with other elements of these relationships. Graduate educators agree that students benefit from having multiple mentors. For example, both senior and junior faculty may assist your academic development – senior faculty may be of greater help with teaching and career networking, while junior faculty may be more knowledgeable about new interdisciplinary research in your field. Every faculty advisor and graduate student is unique because each partner's experience, personality, and professional development track will differ.

Open, regular, timely, respectful, and professional communication between you and your faculty advisor will facilitate a positive relationship. Communication should be frequent and both parties should be accessible to one another in order to be effective. Faculty and students should work together to clearly delineate the roles and expectations of each party in relation to specific activities, such as course work, dissertation completion, professional training, and academic performance.

Department of Biology Ombudsman: Dr. Marvin Bernstein

This is the person who acts as a trusted intermediary between you and the faculty at any time differences of opinion may need to be resolved.

The Role of all Biology Graduate Faculty (especially those in your Advisory Committee)

- Foster the intellectual development of graduate students
- Teach strategies for accessing research literature to students
- Know the programmatic requirements of deadlines
- Inspire students to think independently, critically, and creatively
- Expose the graduate students to the latest trends in their field
- Advise the student on the selection of dissertation, thesis committees
- Assist students in the selection/design of a timely and significant dissertation/thesis topic
- Evaluate and help students resolve problems encountered in their program
- Provide timely feedback on assignments

- Support students in their career development
- Inform students of funding opportunities
- Provide opportunities for students to develop successful grant writing skills
- Assure that students understand and comply with the standards of safety/moral/ethical behavior within their research discipline

The Role of the Graduate Student

- Know and follow the programmatic requirements
- Understand the advising process
- Carefully consider the advice of faculty
- Recognize the constraints and other demands on the faculty
- Understand the standard moral/ethical behavior with the discipline
- Review the graduate catalog and departmental guidelines/handbook for all policies and deadlines

Graduate students are expected to observe and maintain the highest academic, ethical, and professional standards of conduct. Students should consult Section III of the “Student Code of Conduct” in the Student Handbook (<http://www.nmsu.edu/~vpsa/SCOC/index.html>) for more specific information regarding the rules of conduct and definitions of misconduct such as plagiarism, cheating, nondisclosure or misrepresentation of academic credentials, fabrication of data, or other forms of academic misconduct.

MILESTONES IN YOUR GRADUATE PROGRAM (PhD)

The basic milestones listed below can be used to reflect satisfactory progress in your graduate training. Because this document has been written for a diverse group, there are undoubtedly many additional interest area specific or lab-group-specific expectations that may require completion of a doctorate program beyond 5 years.

YEAR ONE

- **Fall Semester.** Plan to hit the ground running. A course work plan should be initiated, and usually there is at least one obvious course that should be taken right away. In addition, you should begin reading the primary literature in your selected field, and become involved with a journal club if one is available. You should get to know all the faculty and students who work in your general area of interest. Learn the specific expectations for the lab you are in. Read through some recent doctoral dissertations at your institution in your field to get a sense for their scope. Ask your advisor for recommendations.
- **Spring Semester.** Continue with courses, learning lab techniques, or devising a specific research plan. Again, know the expectations for your lab. By the end of spring semester, you should have a very good idea of the lab in which you will carry out your research, your specific research area, and have shown significant improvement in reading the primary literature.

You should form a graduate supervisory committee and have this committee meet. During this initial meeting, you should work out a schedule for your remaining courses and prepare to take your Qualifying Exam. Qualifying exams vary somewhat depending on your research area, but generally entail the following three parts:

- (1) A written exam to evaluate your ability to analyze and synthesize an area of research and present it in a clear and concise manner in writing.
- (2) An oral exam in which you will be asked to answer questions about any other topic the committee deems relevant. Goals: a) to evaluate your ability to orally explain basic concepts and the more advanced ones behind your proposal research, b) to evaluate your ability to think on your feet; and c) to refine the plan of action towards completion of your Ph.D. degree.

Your committee should approve the written and oral portions of this exam. Most students find this exam a nerve-wracking, humbling, yet constructive experience. Note that students are expected to continue carrying out some research, course work, and/or teaching at the same time as they prepare for their Qualifying exam. Keep in touch with your lab and your committee members, know their expectations, and all should turn out well.

- **Summer Semester.** You should be becoming proficient in a set of basic research techniques, and working to identify the specific scientific question that will be addressed by your Ph.D. research. This first research project is usually developed in close consultation with your research advisor. As you gain experience, you will take on a larger role in determining the direction of the project.

YEAR TWO

- **Fall Semester.** Take your Qualifying Exam if you did not schedule them for Spring semester of your first year (see above). As you work towards completing specific courses decided during your Qualifying exam, you should be carrying out additional lab/field/literature work to develop a defensible Ph.D. project proposal in close collaboration with your faculty mentor.

- **Spring Semester.** This is the time that you develop your dissertation project. In addition to specific course work, you should be working towards obtaining preliminary data for your dissertation. These data can be used for the following:
 - (1) Obtain sufficient data to present at local scientific meetings (e.g., Annual Biology Symposium and the Graduate Research and Arts Symposium) and make a presentation. During the meeting, you should attend talks and interact with students and professors from other universities. Goals: make important contacts that could serve you well in the future, and develop oral communication skills.
 - (2) You should plan to give an informal seminar in your field of study in an existing journal club that is not your lab meeting. Goal: learn to give well-organized presentations to your peers.
 - (3) Begin to prepare you for your Comprehensive exams (see below).
- **Summer Semester.** Dissertation research should be progressing in earnest. Continue to participate in journal clubs or make use of other strategies to keep you reading the literature in your field.

YEAR 3

Take your Comprehensive Exam. The comprehensive exam is mandated by the Graduate School and must include a written and an oral component. This exam evaluates the student's knowledge of biology at the graduate level in the student's emphasis area, and his/her potential to complete original doctoral research. As part of this exam, the student should demonstrate knowledge of the primary literature and the ability to formulate hypotheses and design experiments at a level appropriate with previous research experience (typically 1-2 years of lab or field work). Ultimately, the breadth of the comprehensive exam should be left to the discretion of the committee. This examination must be part written and part oral.

In addition, this is the year you should begin to develop your independence and expertise. Most of your efforts should be devoted to improving your skills at writing, data collection, and data analysis. Complete all course work, and continue to participate in lab meetings, journal clubs, and seminars. With luck and careful planning, you hopefully have made contributions to a manuscript by this year. Try to attend and present at a national meeting in your field.

YEAR FOUR

Continue to develop as an independent scholar and scientist. By now you should be very comfortable doing your research and talking about it in both an informal and formal way. You should expect to be contributing to your lab in many ways, including new ideas or interpretations of data, sharing data, generating reagents or new methodologies, and finding interesting papers others in your lab may have missed. You should be writing a manuscript on your own work, and attending/presenting at a national meeting.

YEAR FIVE

Make a plan, including (1) writing your dissertation; (2) writing up and publishing your remaining papers; (3) finding a career path and begin applying for jobs, internships, or postdoctoral fellowships.

Note: You should determine what best fits your own career goals, your lab's expectations, and your lab's financial situation. Some research projects are simply too exciting, and students wish to stay to produce the subsequent projects, which leads to long Ph.D. times. Be aware that the Graduate School enforces limitations on financial support based on a strict time line for Ph.D. students.

PH.D. EXAM FORMATS: QUALIFYING EXAM

Objective. The qualifying exam is mandated by the Graduate School. The Department of Biology implements the qualifying exam as a diagnostic exam that evaluates the student's knowledge of biology at an undergraduate level and his/her ability to assimilate knowledge at the graduate level. This test is designed to assess the academic future of students individually. The results are used to:

- design the graduate plan of study
- provide recommendations for improvement of written communication skills
- provide recommendations for improvement of oral presentation skills

Outcome. As per the graduate school, the exam has the following potential outcomes: (a) admit the student to further work toward the doctorate; (b) recommend that the program be limited to the master's degree; (c) recommend a re-evaluation of the student's progress after the lapse of one semester; or (d) recommend a discontinuation of graduate work. To pass the exam a student must receive a positive vote from at least 50% of the committee members.

Committee Composition. In consultation with his/her advisor, the student will select committee members according to his/her research interests, the individual specialties of the faculty, and the time constraints of the faculty. The committee must have at least three members and at least two of these must be from the Department of Biology. Qualifying exam committee members may or may not serve as future members of the student's comprehensive and dissertation committees. Students are encouraged to include faculty from at least two of the Department's three thematic research areas on the qualifying exam committee.

Scheduling. The qualifying exam should be completed by the end of the second semester. Students are encouraged to schedule the exam during the first 12 weeks of the semester. Students entering the program with a Master's degree may elect to schedule this exam during the first semester. The student is responsible for identifying a date and a room for the exam. Exams should be scheduled for a 120-minute period.

Qualifying Exam Preparation. Students may wish to refresh their knowledge of biology for the oral component of the exam.

Supporting Materials. Five days before the exam, students should submit a portfolio to all committee members comprising current CV, unofficial undergraduate and graduate transcripts, a tentative course plan of study, a statement of research interest and specialization, and a statement of professional career goals.

Qualifying Exam Written Component. The objective of the optional written portion of the qualifying exam is to assess scientific writing skills, in order to provide recommendations for improvement if needed. The written component should be submitted to the committee 10 working days before the exam. Suggested format: students should prepare a 3-5 page single-spaced essay that describes a research area of interest and potential dissertation projects. At least 10 (non-review) journal articles from the primary scientific literature should be included in the reference list.

Qualifying Exam Oral Component. The exam will follow a round robin question format. Questions will emphasize, but will not be restricted to, the student's research area.

- Students should prepare a 10-15 minute talk that can be used to assess oral presentation skills. The talk can be on a subject that could form the basis for a thesis project.
- After determining the exam outcome, a course plan of study will be recommended that takes into account the professional and scientific goals of the student.
- Students will be provided with feedback about deficiencies in oral and written communication skills identified during the examination process, as well as recommendations for how to improve these skills.
- The faculty advisor is responsible for bringing the paperwork for the exam to the meeting.

Post Exam

- The faculty advisor is responsible for notifying the Graduate School of the results of the exam using the departmental qualifying exam form. Copies of the form should be given to the student, and a copy should be placed in the student's file. A separate report should be prepared and placed in the student's file using the departmental report of student committee meeting form.

PH.D. EXAM FORMATS: COMPREHENSIVE EXAM

Objective. The comprehensive exam is mandated by the Graduate School and must include a written and an oral component. This exam evaluates the student's knowledge of biology at the graduate level in the student's emphasis area, and his/her potential to complete original doctoral research. As part of this exam, the student should demonstrate knowledge of the primary literature and the ability to formulate hypotheses and design experiments at a level appropriate with previous research experience (typically 1-2 years of lab or field work). Ultimately, the breadth of the comprehensive exam should be left to the discretion of the committee.

Outcomes. The committee members will evaluate the student's accomplishments on the written and the oral components when making decisions regarding the outcome of the exam. As per the graduate school, possible exam outcomes include: advancement to candidacy, adjourn, or failure.

- The Graduate School policies for counting votes are as follows. A student will pass the examination if all votes but one are to pass. A student will fail if there are two or more votes to fail, and the examination will be adjourned if there are two or more votes to adjourn. Two votes to fail override two votes to adjourn. One vote to fail and one vote to adjourn are not acceptable and an additional ballot or ballots must be cast.
- If the vote is to adjourn, the examination must reconvene within three weeks.
- Any applicant for candidacy who fails the comprehensive exam may, upon recommendation of the committee and approval of the Graduate Dean, (1) be granted a second examination after a lapse of one semester or (2) be terminated from the doctoral program.
- A committee member may move to delete the designation of a minor with the concurrence of the committee.
- Some additional courses may be recommended for the plan of study after the comprehensive exam is passed, but it is expected that if a student is advanced to candidacy, he/she will take few courses after this exam and will instead focus on dissertation research.
- Students who pass the comprehensive exam and have completed 30 hours of course work at NMSU may petition for an M.S. degree (not an option for students who have already received an M.S. degree in biology from NMSU).

Scheduling. The comprehensive exam should be completed before the beginning of the sixth semester. Students are encouraged to schedule the exam so that the written and oral components are completed during the first 12 weeks of the semester. Students entering the doctoral program with a Master's degree in biology or a related field are encouraged to schedule the comprehensive exam sooner. The student is responsible for informing the committee that he/she wishes to take the comprehensive exam and to begin the exam process that comprises two parts, written and oral. After the written portion is completed, students are responsible for identifying a date and room for the exam. Comprehensive exams should be scheduled for a three-hour period. The advisor is responsible for coordinating all features of the exam after the student identifies a time and room.

Comprehensive Exam: *Written Component.* A written component is a required part of the Comprehensive examination. This component may take one of two forms: a grant proposal or an essay exam. The student and his/her faculty advisor together determine the format of the exam. Commonly used formats include:

Grant Proposal. The grant proposal can be on any topic decided upon by the student and his/her committee, including the student's thesis topic. The proposal should be written in NSF or NIH format and should be limited to a maximum of eight single-spaced pages excluding references and other supporting material. All committee members are expected to evaluate the proposal.

Essay Exam. Each committee member (excluding the Dean's Rep, who may participate if he/she wishes) will write at least one essay question for the student. Committee members will stipulate whether the questions are to be answered in closed book or open book format and are welcome to suggest an appropriate length for each essay answer. Questions will be provided to the student on a single day agreed upon by the committee and the student. The student will have a maximum of three weeks to answer the questions. At the completion of the exam, the student will provide each faculty member with all questions and answers. Each committee member will be responsible for grading the answers to his/her questions.

Comprehensive Exam: *Oral Component*. The oral exam will be scheduled no earlier than two weeks after the written component of the exam has been turned in. Students should prepare a 15-20 minute presentation on their research. The oral exam will follow a round robin question format. Questions will emphasize but will not be restricted to the student's research area, reading list, classes, and research proposal/essay answers. The Dean's Rep is responsible for bringing exam paperwork to the oral examination.

PH.D. EXAM FORMAT: DISSERTATION DEFENSE

Objective. The oral dissertation defense is mandated by the Graduate School; hence, a dissertation cannot be officially accepted until it has been defended. Once your Academic Supervisor feels the thesis is ready to defend, you are responsible for coordinating an acceptable date for all committee members to attend the defense. Once the date is set and your Academic Supervisor has signed the Thesis Defense Approval Form, you should contact the secretary in the Biology Office to book a room.

If you have a committee member who is unable to attend the defense, then the committee member should submit written comments and questions to your Academic Supervisor prior to the defense.

In general, you are expected to give a summary (30 to 45 min long) of the research and work upon which your dissertation is based. Your talk should define what the problem is and then summarize how you attacked the problem and what results you obtained. You need not go into each and every point discussed in your thesis. The objective is to show your command of the material and to explain to the audience (who may not have read your thesis) the main results of your work. More generally, your aim is to make your presentation concise, interesting, informative, and professional. Of course, visual aids should be used to help achieve these goals. You should also spend a significant amount of time practicing and polishing your presentation.

Outcomes. The committee members will evaluate the student's accomplishments when making decisions regarding the outcome of the oral presentation. A defense has several possible outcomes. As per the graduate school, possible exam outcomes include:

- If the committee deems the student's work outstanding, the student will pass with distinction.
- The committee may pass the student pending changes to the written dissertation before submitting the dissertation for binding.
- If the dissertation requires major changes, the committee may defer a pass until a specific date by which time the student must submit an acceptable final draft.
- A student will fail if there are two or more votes to fail, and the examination will be adjourned if there are two or more votes to adjourn. Two votes to fail override two votes to adjourn. One vote to fail and one vote to adjourn are not acceptable and an additional ballot or ballots must be cast.

Scheduling. The student is responsible for informing the committee that he/she wishes to defend his/her dissertation. The student is responsible for identifying a date and a room for the exam. Exams should be scheduled for a three-hour period.

Supporting Materials. Five days before the exam, students should submit a portfolio to all committee members comprising the written dissertation and current CV.

BIOLOGY DEPARTMENT

ANNUAL REPORT OF GRADUATE STUDENT COMMITTEE MEETING

Student:	Meeting Date:
Committee Chair:	
Committee Members:	
Overall Progress: <input type="checkbox"/> Satisfactory	<input type="checkbox"/> Concerns <input type="checkbox"/> Unsatisfactory

SUMMARY AND RECOMMENDATIONS OF COMMITTEE REGARDING PROGRESS TOWARD **MS** **PHD**

Advisor Signature / Date

Student Signature / Date

Department Head Signature / Date

CC: Student File, Committee

Outline of Target Dates for Thesis MS degree

Student Name _____

Chair of Graduate Advisory Committee _____

Entered degree program _____

	Target Date	Date Completed
Year 1		
Select faculty research mentor and name Graduate Advisory Committee	Fall Semester	_____
Define research project	Spring Semester	_____
Initiate research project	Spring Semester	_____
Annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Spring Semester	_____
Year 2		
Annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Spring Semester	_____
Year 3		
Defend thesis	Spring Semester	_____
File Dissertation with Graduate School	Spring Semester	_____
Final annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Spring Semester	_____

Outline of Target Dates for Non-Thesis MS in Biology degree

Student Name _____

Chair of Graduate Advisory Committee _____

Entered degree program _____

_____	Target Date	Date Completed
Year 1		
Select faculty research mentor and name Graduate Advisory Committee	Fall Semester	_____
Define course work	Spring Semester	_____
Annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Spring Semester	_____
Year 2		
Oral and Written Final Exams	Spring Semester	_____
Final annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Spring Semester	_____

Outline of Target Dates for Non-Thesis MS in Biotechnology degree

Student Name _____

Chair of Graduate Advisory Committee _____

Entered degree program _____

DATE

_____ Prior to your first semester meet with the Program Director to go over a proposed sequence of courses.

_____ Prior to your final semester in the program, meet with the program director to verify that graduation requirements will be met by the end of the semester

_____ The program director will fill out and approve a "Program of Study Form". You are responsible for turning this into the Graduate School

_____ If there are any course substitutions, you and the Program Director must complete any "Course Exception" or "Degree Audit Exemption" forms. You are responsible for turning this into the Graduate School

_____ File all other paperwork required by the Graduate School and the Registrar for graduation. These requirements change from time to time, please check with the Graduate School and with the Registrar to be certain you have filed the appropriate documents

_____ By the fifth week of your final semester, notify the Program Director of your intent to take the final oral and written exams required for degree completion. The Program Director will help to schedule these exams – scheduled for the last two weeks of the semester. You must fill complete and file the appropriate examination scheduling paperwork with the Graduate School and have this signed by the Program Director prior to submission. **Examination paperwork should be filed at least three weeks before the exam.**

_____ Complete the final Written and Oral Examinations (see description below). Faculty supervisors are responsible for the submission of paperwork documenting the outcome of these exams.

_____ If you are counting any "Master's Research" credit hours toward your degree, request that your instructor file a "Change of Grade" form to assign the appropriate grade to replace "PR". Failure to do so will delay your date of graduation.

MASTER'S DEGREE CHECKLIST

For nonthesis master's, skip sections marked **(T)**.

_____ Familiarize yourself with specific departmental requirements. If seeking to transfer graduate credits from another university, submit the "Transfer of Credit" form for approval by department head and graduate dean in your first semester. File an "Application for Admission to Candidacy for Master's Degree" (Program of Study) after completing 12 credits. By filing an approved program of study, you are advanced to candidacy. This program may be amended as necessary by a memorandum initiated by you and signed by you, your adviser, and your department head.

_____ **(T)** Register for master's thesis credits during the appropriate semesters.

_____ File an "Application for Degree (Diploma)" with the Office of the Registrar (see the current academic calendar for deadlines). Late fees are assessed for students filing after the deadlines. If you fail to complete all degree requirements by the deadline specified on the "Application for Degree (Diploma)," you forfeit any fees paid, and you must reapply and pay all required fees for the term in which you complete all degree requirements.

_____ During your last semester of study, confirm that your program of study is accurate and contains no incompletes. Make arrangements with your committee to schedule the final examination. Notify the Graduate School TEN WORKING DAYS PRIOR to the date of the examination by filing the "Application of Committee for Final Examination" form.

_____ **(T)** After successful completion of the oral defense, request that the instructor submit a "Change of Grade" for your master's thesis credits.

_____ **(T)** If a thesis has been written, consult the Guidelines for Preparing a Thesis or Dissertation for information on preparing and completing your thesis. The Graduate School editor encourages students to consult with her on format issues prior to the final typing of the thesis. The consultation must occur before the submission deadline for any semester. All theses must be formatted and completed in accordance with the Guidelines for Preparing a Thesis or Dissertation.

_____ **(T)** After successful completion of the oral defense, with approval of the committee, and in accordance with the schedule published by the Graduate School (inside the back cover of this catalog and also at the URL listed above), submit the unbound thesis to the editor for final editing. The graduate editor will email you a list of corrections/changes.

_____ **(T)** After the editor has approved the format of the thesis, duplicate the three required copies (four copies are required for molecular biology and astronomy majors) on 25, 50, or 100% cotton 20- or 24-pound weight, watermarked, white bond paper and obtain the signature of your committee chair on each approval (signature) page of the thesis.

_____ **(T)** Pay the binding fee for the required copies at the Business Office then access the library's web page and complete the "Thesis/Dissertation Processing Form." This step may be done at any time during the editing process but must have been completed before copies are deposited at Branson Library.

_____ **(T)** Obtain the signature of the Dean of the Graduate School on each approval (signature) page of the thesis. The graduate dean will affix the date. Deposit the required number of signed copies of the thesis at the binding section in Branson Library. Personal copies may also be deposited at this time. Be sure to include a money order or cashier's check payable to the binder for the exact amount.

_____ **(T)** Additional details regarding the above procedures can be found in Guidelines for Preparing a Thesis or Dissertation.

Outline of Target Dates for PhD degree

Student Name _____

Chair of Graduate Advisory Committee _____

Entered degree program _____

	Target Date	Date Completed
Year 1		
Select faculty research mentor and name Graduate Advisory Committee for Qualifying Exam	Fall Semester	_____
Qualifying Exam	Spring Semester	_____
Annual review of progress by Qualifying Exam Committee and submission of progress report to Biology Department online	Spring Semester	_____
Year 2		
Name Graduate Advisory Committee for Comprehensive Exams	Fall Semester	_____
Annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Spring Semester	_____
Year 3		
Comprehensive Exam	Fall Semester	_____
Annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Spring Semester	_____
Year 4		
Annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Spring Semester	_____
Year 5		
Defend Dissertation	Fall Semester	_____
File Dissertation with Graduate School	Fall Semester	_____
Final annual review of progress by Graduate Advisory Committee and submission of progress report to Biology Department online	Fall Semester	_____

DOCTORAL DEGREE CHECKLIST

_____ File the “Program of Study and Committee for Doctoral Students” form after successfully passing the qualifying examination given by your department. By filing an approved program of study, you are admitted to further work toward the doctorate. This program may be amended as necessary by a memorandum initiated by you and signed by you, your adviser, and your department head.

_____ File a “Committee for Doctoral Examination (Comprehensive)” form.

_____ Register for doctoral dissertation hours during the appropriate semesters.

_____ Consult the Guidelines for Preparing a Thesis or Dissertation for information on preparing and completing your dissertation. The Graduate School editor encourages students to consult with her on format issues prior to the final typing of the dissertation. The consultation must occur before the submission deadline in any semester. All dissertations must be formatted and completed in accordance with the Guidelines for Preparing a Thesis or Dissertation.

_____ File an “Application for Degree (Diploma)” with the Office of the Registrar (see the current Schedule of Classes or the academic calendar located inside the back cover of the Graduate Catalog or at the URL listed above for these deadlines). Late fees are assessed for students filing after the deadlines. If you fail to complete all degree requirements by the deadline specified on the “Application for Degree (Diploma),” you forfeit any fees paid, and you must reapply and pay all required fees for the term in which you complete all degree requirements.

_____ During your last semester of study, make arrangements with your major department to schedule the final examination. Notify Jimi Ickes in the Graduate School **TEN WORKING DAYS PRIOR** to the date of the examination by filing the “Committee for Doctoral Examination (Final)” form.

_____ After successful completion of the oral defense, request that the instructor submit a “Change of Grade” form for your doctoral dissertation credits.

_____ After successful completion of the oral defense, with approval of committee, and **in accordance with the schedule published by the Graduate School**, the unbound dissertation must be submitted to the editor for final editing. The graduate editor will email you a list of corrections/changes.

_____ After the format of the dissertation has been approved, the editor will provide these forms, which are required to complete the dissertation: the Survey of Earned Doctorates booklet and the “Doctoral Dissertation Agreement Form.”

_____ Duplicate the three required copies (four copies are required for molecular biology and astronomy majors) on 25, 50, or 100% cotton 20- or 24-pound weight, watermarked, white bond paper and obtain the signature of your committee chair on each approval (signature) page of the dissertation.

_____ Pay your binding and microfilming fees at the business office—\$93.50 for the three required copies; \$103.50 for the four required copies for molecular biology and astronomy majors. Access and complete the “Thesis/Dissertation Processing Form.” This part of the process may be done at any time but must be done before copies can be deposited in Branson Library.

_____ Obtain the signature of the Dean of the Graduate School on each approval (signature) page of the dissertation. The graduate dean will affix the date. Submit the completed Survey of Earned Doctorates booklet with the approval (signature) pages.

_____ Deliver the required number of signed copies of the dissertation, along with the “Doctoral Dissertation Agreement Form,” to the binding section at Branson Library.

_____ If personal copies are desired they may be deposited at this time. Be sure to include a money order or cashier’s check payable to the binder for the exact amount.

_____ Additional details on these procedures can be found in Guidelines for Preparing a Thesis or Dissertation.

REQUIRED FORMS

Available at:

<http://prospective.nmsu.edu/graduate/forms/index.html>

<http://biology-web.nmsu.edu/bgso/web/graddocs.html>

For Master's and Doctoral Students

- Change of Advisor Form
- Request for Letter of Completion
- Application for Completion of Graduate Certificate
- Examination Fee Form
- Guidelines on Employment of Graduate Assistants
- Program of Study Change Form
- Frequently Asked Questions for Thesis Review
- Report of Graduate Student Committee Meeting (Biology Department)

For Doctoral Students

- Thesis/Dissertation Intake Form
- Dissertation Title Submission Form for Doctoral Students
- Doctoral Qualifying Examination Form
- Doctorate of Philosophy Examination Form
- Program of Study and Committee for Doctoral Students
- Doctoral Degree Check List

For Master's Students

- Master's Final Examination Form
- Program of Study and Committee for Master's Students

DEADLINES FOR 2011

Spring 2011	
January 21	Deadline to file your Application for Degree at the Registrar's office (without a late fee).
February 28	Deadline to file your Application for Degree at the Registrar's office (with a late fee).
March 16	Deadline to submit dissertation titles to the Graduate School.
March 18	Deadline to turn in the Final Exam Form for thesis or dissertation students.
April 1	Deadline to hold a thesis or dissertation final oral or written exam.
April 13	Deadline to submit thesis or dissertation to the Graduate School.
April 20	Deadline to turn in the Final Exam Form for non-thesis students.
April 27	Deadline to turn in a Request for Letter of Completion Form (optional).
May 4	Deadline to hold a non-thesis final oral or written exam.
May 5	Deadline to submit the three required copies of your thesis or dissertation to the Branson Library.

Summer 2011	
July 1	Deadline to turn in the Final Exam Form for thesis or dissertation students.
July 8	Deadline to file your Application for Degree at the Registrar's office. No late Application for Degree deadline for Summer - July 9th is the only deadline for the summer term.
July 15	Deadline to hold a thesis or dissertation final oral or written exam.
July 18	Deadline to turn in the Final Exam Form for non-thesis students.
July 20	Deadline to submit dissertation titles to the Graduate School.
July 20	Deadline to submit thesis or dissertation to the Graduate School.
July 27	Deadline to turn in a Request for Letter of Completion Form (optional).
August 1	Deadline to hold a non-thesis final oral or written exam.
August 3	Deadline to submit the three required copies of your thesis or dissertation to the Branson Library.

Fall 2011	
August 26	Deadline to file your Application for Degree at the Registrar's office (without a late fee).
September 30	Deadline to file your Application for Degree at the Registrar's office (with a late fee).
October 12	Deadline to submit dissertation titles to the Graduate School.
October 21	Deadline to turn in the Final Exam Form for thesis or dissertation students.
November 4	Deadline to hold a thesis or dissertation final oral or written exam.
November 9	Deadline to submit thesis or dissertation to the Graduate School.
November 18	Deadline to turn in the Final Exam Form for non-thesis students.
December 2	Deadline to turn in a Request for Letter of Completion Form (optional).
December 7	Deadline to hold a non-thesis final oral or written exam.
December 9	Deadline to submit the three required copies of your thesis or dissertation to the Branson Library.

Check for updates on the following websites from the Graduate School:

<http://www.nmsu.edu/~registra/degree-app/index.html>

<http://prospective.nmsu.edu/graduate/forms/index.html>

<http://prospective.nmsu.edu/graduate/current/deadlines.html>