DEPARTMENT OF BIOLOGICAL SCIENCES

Ph. D. Degree Requirements

Approved by Graduate Affairs Committee – February 08, 2017
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Introduction

Listed below are the requirements that must be fulfilled for the Ph.D. Degree in the Biology, Cell, and Molecular Biology Concentration in the Department of Biological Sciences, at the University of Toledo. Failure to successfully complete these requirements according to the timeline established in this document may result in the student's dismissal from the program. The Biological Sciences faculty will evaluate graduate student progress each year during the fall and spring semester. At that time, each graduate student will be required to complete the Progress Checklist attached to the end of this document. The student's major professor must endorse the Progress Checklist.

Specific Requirements

To earn a Ph.D. degree in the Department of Biological Sciences, a student must:

1. Choose a major professor prior to the completion of the first year in the program. The student will perform their dissertation research in the major professor's laboratory, and the major professor will serve as chairperson of the dissertation committee (see also section 2c below).

    a. It is highly recommended that a student chooses a major professor before joining the program, with the expectation that the student will complete their dissertation in this lab.

    b. While not as widely used, a student may join the program without first choosing a major professor. In this case, the student has the option of conducting rotations in 2-3 laboratories (based on availability) during their first year of graduate school, to gain exposure to the studies and approaches carried out in different research groups. After the rotations, the student will select a major professor with whom to conduct dissertation research.

    c. Under either track, students must discuss their decision with their potential major professor and understand the specific expectations of students in that laboratory. Both parties must be in agreement before a final decision is made. Students should be aware that not every laboratory will have openings in any given year.

2. Choose a Dissertation Committee prior to the completion of the second year in the program. This committee will consist of at least five members:

    a. The major professor must be a faculty member in the Department of Biological Sciences holding full graduate faculty status.

    b. At least two other full-time faculty members from the Biological Sciences Department. These members must also have graduate faculty status.

c. Two members from outside the Biological Sciences Department. All members of the Dissertation Committee must hold a Ph.D. degree or the equivalent. The Departmental Chair will appoint the chairperson for this committee, and retains the authority to replace the committee chair at his/her discretion. The Dissertation Committee may be composed of members from the Exam Committee described below (see #4). Approval of committee composition is required from the Departmental Chair and Chair of the Graduate Affairs Committee.

The student is required to meet annually with and provide a Progress Checklist to the Dissertation Committee, with the first meeting taking place no later than the last day of the fall semester of the student's third year. The Committee will evaluate the student's progress and provide comments on the Annual Dissertation Committee Meeting Report (attached to this document).

3. An approved "Graduate Research Advisory Committee Approval & Assurances" form must be filed with the College of Graduate Studies at the time the student determines the nature of the research project.

4. Prepare independently a written Qualifying Research Grant Proposal, in the format of a NIH/NSF/USDA proposal. The guidelines for the Qualifying Research Grant Proposal are attached to the end of this document. An Exam Committee for this proposal will be composed of at least three members of the Biological Sciences Department. The major professor is a member of the Exam Committee, but cannot serve as the chairperson (the qualifying exam chairperson will be selected by the department chair from the exam committee). The student will identify a topic for the proposal after consulting with their major professor. The exam will also have an oral component and the student must pass both phases of the exam in order to become eligible for "Candidate Status" and to remain in the Ph.D. program. The topic is to be selected before November 1 of the student's second year and the written proposal turned in by April 15 of the following spring. The oral component will follow within two weeks. Students who fail the qualifying exam are no longer eligible to remain in the Ph.D. program. However, the Exam Committee may decide to allow a redo of the exam (written and/or oral portion). Submission and/or defense of the revised proposal must be completed within 60 days of the original exam. Those failing the second attempt are no longer eligible to remain in the PhD program. If a student fails to meet any of these deadlines, that student must receive approval from the Graduate Affairs Committee to remain in the Ph.D. program.

5. Apply for admission to candidacy. For admission to candidacy, the student must have a cumulative GPA of at least 3.0 for all required graduate courses (see #6 below) and may not have earned a grade less than a C in any of these courses. Students must also have successfully passed both the written and oral parts of the Qualifying Research Grant Proposal (see #4 above). It is the student's responsibility to initiate the application for candidacy. Forms are available from the College of Graduate Studies website.

6. In accordance with the College of Graduate Studies regulations, if a student's overall grade point average (GPA) falls below 3.0 at any point in the degree program, he/she will have a probationary period of one semester to raise their GPA to 3.0 or higher. If after that semester the student's GPA is still below 3.0, then one of two courses of action will be followed:

a. If the student's GPA is between 2.75 and 3.0, then a sub-committee of the Graduate Affairs Committee may administer an oral exam to the student. This is a separate evaluative oral exam not required of doctoral students who have maintained a 3.0 or better GPA. Based on the student's performance during that exam, the committee may recommend one of three options:

i. If the student's performance is clearly below expected graduate student standards, then the student will be dismissed from the program.

ii. If the student performs well in the oral exam, he/she may be given an additional probationary semester to bring their GPA up to 3.0. If the student fails to raise their GPA during that additional semester, then he/she will be dismissed from the program.

iii. The committee may recommend switching from the Ph.D. to the M.S. program, with a corresponding change in stipend and teaching expectations.

b. If the student's cumulative GPA is below 2.75 after the first two semesters, then the student will automatically be dismissed from the program. Students removed from the program under this mechanism may appeal to the Biological Sciences Graduate Affairs Committee for special consideration, but retention in the program will require compelling and documented reasons for the poor academic performance (serious illness, family emergency, etc.).

7. Complete the residency requirement of at least two consecutive semesters of full-time graduate study at the University of Toledo.

8. Complete at least one semester of teaching.

9. Complete a program of study in the Department of Biological Sciences that is approved by the student's Dissertation Committee and the Department. The College of Graduate Studies requires a minimum of 90 semester hours of approved graduate course work. Doctoral Program Plans (DPP) may include 30 semester hours from a Master's degree. Each program of study must include the following courses: BIOL 8000 (Introduction to Scientific Thought and Expression), BIOL 8010 (Advanced Molecular Biology), BIOL 8090 (Advanced Cell Biology), BIOL 8100 (Research Methodologies), BIOL 8200 (Advanced Signal Transduction), 3 semester hours of BIOL 8930 (Seminar in Biology), and additional courses and research credits to meet minimum required number of semester hours. The student and the major professor must sign the DPP. The DPP is then submitted to the department for faculty approval, after which the Department Chair will sign the DPP and forward to the Dean of the College of Natural Sciences and Mathematics and the Dean of the College of Graduate Studies for approval.

10. Apply for graduation by the published College of Graduate Studies deadline.

11. Complete a dissertation and successfully pass the dissertation defense. The student must present the dissertation as an exit seminar prior to departure from the department. If possible, this seminar should be part of the departmental seminar series and attended by the entire department (students and faculty) and open to the university community. The seminar will be followed by a closed session with only the Dissertation Committee members in attendance, during which time the student will defend their dissertation. The Dissertation Committee must approve the student's dissertation and defense by majority vote. Committee members will signify approval by signing a signature page that will be included in the student's final dissertation.

12. Have first-authorship on at least one manuscript of original research accepted to a peer-reviewed scientific journal. The manuscript must be accepted before the dissertation defense. Note that one first-author publication is a minimum degree requirement. Successful Ph.D. students typically generate multiple first-author manuscripts.

13. Submit an original and two copies of the approved dissertation to the College of Graduate Studies and one copy to the Department of Biological Sciences prior to graduation. The College of Graduate Studies requires an electronic submission of the approved dissertation no later than one (1) day prior to the commencement date. The dissertation should be prepared in accordance with the format determined by the advisory committee and consistent with the guidelines presented in the "Manual for the Formatting of Graduate Dissertations and Theses" issued by the College of Graduate Studies.

14. A Progress Checklist that all PhD students must fill in and submit to the department every year is attached to this document. All requirements on the checklist must be completed before scheduling the dissertation defense.

15. Students beyond the first year must present a poster at the Departmental Graduate Symposia and all students must attend the Careers in Science day each year.

General Notes:

In general, work for the Doctoral Degree will require a minimum of four years of full-time study beyond the bachelor's degree, but no more than six years of full-time study.

There is no formal mechanism in place to allow students to change labs (e.g. major professors) once dissertation research has started, and so students should take seriously the task of identifying a major professor. In the event that a conflict arises between a student and their major professor, an effort should be made to work out the conflict in private or with moderation by the Departmental Chair and/or Graduate Affairs Chair. Only in extreme situations where all parties involved, including a neutral third party, agree that a change is necessary will students be permitted to switch to another major professor to complete their dissertation research, following approval of the Graduate Affairs Committee.

Students that elect to switch from the Ph.D. to the M.S. program must submit a written request to the Department Chair and the School of Graduate Studies stating their reasons for making this change. They must also provide a letter in support of this decision from their major professor. Final approval will require a majority vote of the Graduate Affairs Committee members. Stipends will be adjusted to reflect the degree program change beginning with the semester that the change goes into effect.

Students in the M.S. program that wish to change to the Ph.D. program must submit a formal application prior to the deadline for outside applications. In addition to the information required of all applicants, the student must clearly state their reasons for requesting the degree program change, and must provide a supporting statement from their major professor.

Students are required to regularly attend the lab and perform the research necessary for completion of their dissertation, as deemed appropriate by the student's advisor.

A student who does not meet the program requirements will be placed on academic probation. If this student does not correct these requirement deficiencies within two semesters, the student will be dismissed from the program.

Any changes in the above requirements must be approved by a majority vote of the Biological Sciences faculty.

Qualifying Research Grant Proposal Guidelines

The suggested guidelines for Ph.D. qualifying proposals, given below, follow the format required by NIH for RO1 research grants. However, the exact qualifying proposal format will be at the discretion of the student's qualifying proposal committee.

Start with a cover page containing the proposal title and student name.

In total, there is a 20-page limit for the following four sections.

1) **Specific Aims (2 pages)**

"List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology".

Provide a clear, concise summary of the aims of the work proposed and their relationship to the project's long-term goals. State the hypothesis to be tested.

2) Significance (1-2 pages)

"Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses. Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields. Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved".

3) Innovation (1 page)

"Explain how the application challenges and seeks to shift current research or clinical practice paradigms. Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions. Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions".

4) Approach (~16 pages)

Divide this section into individual specific aims. For Each Specific Aim have the following sections:

- Introductory paragraph
- Justification and Feasibility, which has two subsections: Review of Literature, and Preliminary Results
- Research Design
- Expected Outcomes
- Potential Problems and Alt. Strategies
- Timeline (optional for qualifying)
- Future Directions

"Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate. Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims. If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work."

Formatting:

0.5-inch margins (all around), Arial 12 point, pages numbered and double-spaced.

Progress Checklist For PhD Students

Student name: _____

Year admitted into PhD program: _____

YEAR 1

Course Work Completed in Year 1, with grades:

_____ _____

_____ _____

_____ _____

Total Credit Hrs_____

Overall GPA after Year 1: _____ Met GPA requirement:_____

Student has given a Monday noon seminar: _____

Seminar abstract on file: _____

Student has had all necessary laboratory safety training:_____

By end of Year 1, student has chosen a major professor: _____

By end of Year 1, student has completed a Doctoral Program Plan (DPP): _____

YEAR 2

Course Work Completed in Year 2, with grades:

_____	_____
_____	_____
_____	_____

Total Credit Hrs_____

Overall GPA after Year 2: _____ Met GPA requirement:_____

Student has given a Monday noon seminar: _____

Seminar abstract on file: _____

Student has presented a poster at the Departmental Graduate Symposium: _____

Student has had all necessary laboratory safety training:_____

In Year 2, student has formed an Exam Committee, consisting of:

_____

_____

_____

By end of Year 2, student has successfully defended the Qualifying Research Grant Proposal:

Passed written _____

Passed oral _____

Student has applied for PhD candidacy and has met requirements: _____

By end of Year 2, student has selected a Dissertation Committee, consisting of:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

YEAR 3

Course Work Completed in Year 3, with grades:

_____ _____

_____ _____

Student has given a Monday noon seminar: _____

Seminar abstract on file: _____

Student has presented a poster at the Departmental Graduate Symposium: _____

Student has had all necessary laboratory safety training:_____

Student has held Year 3 Annual Meeting with Dissertation Committee: _____

YEAR 4

Course Work Completed in Year 4, with grades:

_____ _____

_____ _____

Student has given a Monday noon seminar: _____

Seminar abstract on file: _____

Student has presented a poster at the Departmental Graduate Symposium: _____

Student has had all necessary laboratory safety training:_____

Student has held Year 4 Annual Meeting with Dissertation Committee: _____

YEAR 5

Course Work Completed in Year 5, with grades:

_____ _____

_____ _____

Student has given a Monday noon seminar: _____

Seminar abstract on file: _____

Student has presented a poster at the Departmental Graduate Symposium: _____

Student has had all necessary laboratory safety training:_____

Student has fulfilled all course and credit hour requirements for PhD:_____

Student has held Year 5 Annual Meeting with Dissertation Committee and approved for Dissertation defense: _____

Student has completed one semester of teaching: _____

Student has one first-author publication in a peer-reviewed journal: _____

Student has successfully defended Dissertation:

Passed written _____

Passed oral _____

Student has completed all the requirements and is awarded the PhD Degree:_____

Annual Dissertation Committee Meeting Report

A Dissertation Committee meeting will be held yearly, to help students accomplish the expected milestones (listed below in yearly report pages), and graduate in a timely manner. Dissertation Committee members will evaluate student progress toward each milestone, and assign a score of “Satisfactory”, “Needs Improvement”, or “Not Satisfactory”, reflecting the consensus of the Committee. Student and Committee Members will sign the report each year.

If the student’s progress is deemed “Satisfactory” on all milestones, no further action is required. The Dissertation Committee will meet again with the student in the following year.

If the student’s progress is deemed “Needs Improvement” or “Not Satisfactory” on any milestone, the student will **write a summary of** the comments made during the Committee meeting, addressing all Committee concerns, and summarizing corrective steps. The summary must be submitted to all Dissertation Committee members for review **within one month** of the meeting. If this summary is satisfactory, all committee members will sign and return a copy to the student and mentor, and all copies will be added to the student’s permanent file. The Dissertation Committee will meet again with the student in **one year**, unless progress in any category was deemed “Not Satisfactory”, in which case, the committee will hold a supplemental meeting **within six months**.

Dissertation Committee Annual Meeting Report: Year 3

MILESTONE	SATISFACTORY	NEEDS IMPROVEMENT	NOT SATISFACTORY
Hypothesis			
Aims			
Preliminary data			
Strategy for publication			

Comments:

Date:

Student name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee Annual Meeting Report: Year 4

MILESTONE	SATISFACTORY	NEEDS IMPROVEMENT	NOT SATISFACTORY
Hypothesis			
Aims			
Preliminary data			
Paper outline			

Comments:

Date:

Student name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee Annual Meeting Report: Year 5

MILESTONE	SATISFACTORY	NEEDS IMPROVEMENT	NOT SATISFACTORY
Year 5 Meeting			
Hypothesis			
Aims			
Preliminary data			
Status report on publication (in preparation, submitted, in review, published)			

Comments:

Date:

Student name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee member name and signature:

Dissertation Committee Annual Meeting Report: Supplemental

Purpose of Meeting:

MILESTONE	SATISFACTORY	NEEDS IMPROVEMENT	NOT SATISFACTORY
Hypothesis			
Aims			
Preliminary data			
Publication Status Report			

Date:
Student name and signature:
Dissertation Committee member name and signature:
Dissertation Committee member name and signature:
Dissertation Committee member name and signature:
Dissertation Committee member name and signature:
Dissertation Committee member name and signature: