



**mu**  
Programs

Handbook  
for Graduate Studies  
in Microbiology



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This handbook was prepared by the Graduate Studies Committee and approved by the faculty. It is intended to supplement, **NOT** replace, the official Handbook of the Graduate School.

***Microbiology Graduate Studies Handbook***  
***Department of Microbiology, Miami University, Oxford, Ohio***  
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## ABOUT THE PROGRAM

### INTRODUCTION

The Department of Microbiology offers research-based graduate programs leading to the Master's and Doctoral degrees. Opportunities are provided for students to pursue research and to engage in graduate-level course work in a broad variety of disciplines in microbiology. The goal of these experiences is to prepare students for professional careers in teaching and/or research.

The Master's degree program is intended to provide students with formal course training in the fundamental disciplines of microbiology, and an opportunity to pursue a research project leading to a thesis, normally to be completed in the second year of study. Students completing this degree may continue study for the doctoral degree.

The Doctoral degree program is intended to be a rigorous academic experience in which the student's knowledge in the discipline is expanded by advanced graduate-level course work, and the completion of an original research project leading to a dissertation. A student may enter doctoral studies after completion of a Master's degree in an appropriate discipline, or with a baccalaureate after completion of 30 credit hours within our Master's program.

The following requirements and procedures of the department are supplemental to the published requirements of the Graduate School. Final responsibility for compliance with the formal procedures required for the Master's or Doctoral degree rests with the student.

### ADMISSION TO THE PROGRAM

Admission to the graduate program is competitive, and based on an evaluation of each applicant by the Graduate Admissions Committee of the department, provisional acceptance by the potential advisor, and final approval by the departmental faculty. Selection will be based on (a) scholastic record in undergraduate and graduate courses; (b) a written statement of professional goals, area of research interest, and the reasons for wanting to enter our program; (c) three letters of recommendation from persons familiar with the student's academic performance (formal letters may not be required for internal candidates); (d) scores on the Graduate Record Examination; and (e) TOEFL scores for international students. Candidates may be asked for an interview by the Graduate Admissions Committee and the potential advisor.

### GRADUATE ASSISTANTSHIPS AND TEACHING ASSOCIATESHIPS

Graduate Assistantships and Teaching Associateships are awarded to those applicants having potential to contribute to the instruction and preparation of materials in microbiology laboratory courses. The award is made on the basis of the student's academic record, Graduate Record Examination scores, TOEFL scores, letters of recommendation, and previous experience in laboratory courses or research. The Graduate Admissions Committee, after reviewing the credentials of each student, will recommend qualified candidates to the faculty. Approval by a majority of the faculty will be required for awarding each Assistantship or Associateship. Students entering with a baccalaureate will be appointed to Graduate Assistantships. Students accepted into the doctoral program will be appointed as a Teaching Associates (TA). Each student may apply for renewal of the award for the subsequent years in residence. Decision for renewal will be made by a majority of the faculty based on the student/course evaluations of teaching performance, and evaluation by the faculty member directing the course in which the student assisted.

**REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN MICROBIOLOGY**

1. **Course Requirements.** The degree of Master of Science in Microbiology requires a minimum of 30 semester hours in graduate credits. Students must complete or demonstrate proficiency in four courses which must be chosen, one each from groups I-IV listed below:

<b><i>I. Infection and Immunity</i></b>
Medical Bacteriology (MBI 505), Immunology Principles (MBI 514), Immunology Principles and Practice (MBI 515), or Medical Mycology (MBI 535)
<b><i>II. Physiology and Ecology</i></b>
Microbial Physiology (MBI 525) or Microbial Ecology (MBI 575)
<b><i>III. Genetics and Molecular Biology</i></b>
Microbial Genetics (MBI 545), Advanced Molecular Biology (MBI 605), or Bioinformatics (MBI 585)
<b><i>IV. Virology and Cell Biology</i></b>
Virology (MBI 564), Advanced Cell Biology (MBI 606), or Bacterial Cell Biology (MBI 595)
<b><i>V. Electives</i></b>
Biochemistry (CHM 533), Electron Microscopy (BOT 481/482 or 481/483), Biological Instrumentation (MBI 524), Microbial and Molecular Genetics Lab (MBI 565), Statistics (STA 671, IES 612, or STA 573/576), Biological Science Education (BOT 688), or others

Master's students must also fulfill the following requirements:

- a minimum of four hours of didactic courses (600 level or above)
- Graduate Seminar (MBI 690) every semester.

In MBI 690, the student is required to give a research seminar only once per year. Instead of giving a second seminar during the year, the students must take a literature-intensive course (MBI 650, MBI 750, or MBI 500-level courses that include a journal club) in which they present research from the primary literature (first-year students may be excused from this requirement their first semester if their 500 level courses do not include a journal club). MBI 690 may be taken credit/no credit, or optionally, for a regular grade during semesters in which the student presents their research.

Additional course work may be recommended by the student's major advisor or the Thesis Committee. Courses from Group V are not required by the department, but students should note that courses such as Biochemistry and Statistics may be fundamental to their discipline of study and they may therefore be requested to take these courses by their thesis committee. Students and their committees are also urged to consider the benefits of taking education, instrumentation, and/or techniques courses that may enhance their career and research goals. A student must have a scholastic average of 3.0 in all course work to be eligible for a graduate degree in microbiology.

2. **Laboratory Rotations and Choice of Major Advisor.** During the first month of residence the research interests of the faculty will be formally presented to the students, and following the presentations each student will choose three research programs through which he or she will rotate for **two weeks in each** (for a total of one hour MBI 710 credit). The Director of Graduate Studies will arrange the dates of the rotations with the faculty. The student will then select a thesis advisor after

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consultation with the appropriate faculty member, the Director of Graduate Studies and the Department Chair. A student will be accepted into a research program only with the consent of the appropriate faculty member. A faculty member may decide not to accept a student for reasons that do not reflect on the student, for example, limitations of laboratory space or facilities. The advisor should be selected before the end of the student's first semester in residence, and the Director of Graduate Studies and Department Chair should be immediately notified of the selection.

3. **Preparation and Presentation of Thesis Proposal.** The student will write a brief research proposal (no more than 10 double-spaced pages in a font with no more than 12 characters per inch) and present it orally for approval by a Thesis Committee **no later than the end of Summer Term III following the first academic year.** The Thesis Committee will be composed of three departmental faculty members (with an optional member from another department) and the membership will be determined by the student in consultation with the advisor.
4. **Thesis Committee Meetings.** The committee will meet with the student within six months of the presentation of the Thesis Proposal in order to monitor progress and provide advice. The student will provide a two-page summary outlining progress made to date, and future directions for the research project. The student will give a 15-minute presentation of research data and the meeting should last no longer than one hour. The committee will help determine when the student is ready to write the thesis. A written record of the committee's recommendations and the project's future directions will be generated by the student and the advisor, signed by all the members of the Thesis Committee, and placed in the student's file in the departmental office.
5. **Thesis Defense.** All students are required to present themselves for a final oral thesis defense following a formal presentation of their research. The defense will be held **at least one week in advance of the final date for thesis approval by the Graduate School.** The penultimate draft of the thesis will be submitted to the Reader **no later than 30 calendar days before the date of the defense.** The Reader will review the penultimate draft once, before returning it (**within 15 calendar days**) to the student and the major advisor for their consideration of the suggested revisions. The final draft must be in the hands of the other members of the Thesis Committee no later than **seven calendar days before the date of the defense.** The date, time and place of the defense will be posted in the departmental office at that time. Any additional revisions suggested by the committee at the Defense will be implemented at the discretion of the advisor and the student.

Students unable to comply with these time requirements will have their graduations deferred until the following semester.

6. **Required Form.** The form required by the Graduate School, [GS FORM D-6: Certificate for Awarding the Master's Degree](#), must be signed by the members of the Thesis Committee and submitted to the Dean of the Graduate School **at least 10 working days before Commencement.** A copy of the form is included in Appendix I; the pdf version should be obtained from <http://www.units.muohio.edu/gradschool/>.

**RECOMMENDED TIME-LINE FOR COMPLETION OF M.S. DEGREE**

**Fall**

- Students enter Program as GAs.
- GAs must register for at least 10 (but no more than 14) graduate credit hours, including Graduate Seminar (Advanced Cell Biology, Biochemistry I, Immunology, Medical Mycology, Microbial Physiology, and Microbial Genetics are usually offered in the Fall Semester).
- Attend Faculty Research Presentations and perform Laboratory Rotations (three).  
**December:**
  - Students choose Major Advisor, and notify the Director of Graduate Studies and the Chair

**Spring**

- GAs must register for at least 10 (but no more than 14) graduate credit hours, including Graduate Seminar (Advanced Molecular Biology, Biochemistry II, Pathogenic Microbiology, Microbial Ecology and Virology are usually offered in the Spring Semester).

**Summer I**

- GAs must register for 12 graduate credit hours.

**Summer III**

- Discuss plan of study with Thesis Committee. Complete plan of study checklist and submit to the chair of the Graduate Advancement Committee.
- Prepare and present a Thesis Proposal to the Thesis Committee for its approval, by no later than the last week of Summer Term III.

**Fall**

- GAs must register for at least 10 (but no more than 14) graduate credit hours, including Graduate Seminar.

**Spring**

- GAs must register for at least 10 (but no more than 14) graduate credit hours, including Graduate Seminar.  
**January/February:**
  - Meet with Thesis Committee for Progress Report.

**Summer I**

- GAs must register for at least 12 graduate credit hours.

**Summer III**

**July:**

- Schedule Thesis Defense date with committee, have completed final draft to committee members **seven calendar days before the defense**. Post notice of defense in the departmental office.
- **GS FORM D-6** sent to the graduate school **at least 10 working days** prior to commencement

**August:** Graduate

## REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN MICROBIOLOGY

- 1. Course Requirements.** The degree of Doctor of Philosophy in Microbiology requires a minimum of 60 semester hours in graduate credits beyond the M.S. degree or its equivalent (30 semester hours).

Doctoral students must also fulfill the following requirements:

- a minimum of nine hours of didactic courses (600 level or above)
- Graduate Seminar (MBI 690) or Molecular Biology Seminar (MBI 650) every semester

In MBI 690, the student is required to give a research seminar only once per year. Instead of giving a second seminar during the year, the student must take a literature-intensive course (MBI 650, MBI 750, or MBI 500-level courses that include a journal club) in which they present research from the primary literature (first-year students may be excused from this requirement their first semester if their 500 level courses do not include a journal club). MBI 690 may be taken credit/no credit, or optionally, for a regular grade during semesters in which the student presents their research.

Additional course work may be recommended by the student's major advisor or the Dissertation Committee. Courses from Group V are not required by the department, but students should note that courses such as Biochemistry and Statistics may be fundamental to their discipline of study and they may therefore be requested to take these courses by their thesis/dissertation committee. Students and their committees are also urged to consider the benefits of taking education, instrumentation, and/or techniques courses that may enhance their career and research goals. A student must have a scholastic average of 3.0 in all course work to be eligible for a graduate degree in microbiology.

Students entering with a baccalaureate degree must complete courses as stated for the M.S. degree program as part of the 30-hour requirement to meet the equivalency of the M.S. degree (see pg 3).

- 2. Laboratory Rotations, Choice of Major Advisor, and Establishment of the Dissertation Committee.**

During the first month of residence the research interests of the faculty will be formally presented to the students, and following the presentations each student will choose three research programs through which he or she will rotate for two weeks in each (for a total of one hour MBI 710 credit). The Director of Graduate Studies will arrange the dates of the rotations with the faculty. The student will then select a major advisor (Dissertation Director), after consultation with the appropriate faculty member, the Director of Graduate Studies and the Department Chair. A student will be accepted into a research program only with the consent of the appropriate faculty member. A faculty member may decide not to accept a student for reasons that do not reflect on the student, for example, limitations of laboratory space or facilities. The major advisor (Dissertation Director) should be selected before the end of the student's first semester in residence, and the Director of Graduate Studies and the Department Chair should be immediately notified of the selection.

Students should arrange to have a Dissertation Committee meeting during Summer I following their first academic year. The purpose of this meeting will be to review the student's current and planned coursework, and will give the Dissertation Committee the opportunity to suggest courses to appropriately train the student for their research project and prepare for the comprehensive exam. The composition of the Dissertation Committee will be determined by the student in consultation with the major advisor. The Dissertation Committee must include the student's major advisor, three

additional faculty members from the department, and a Graduate School representative from outside the department. The major advisor will be the chair of the Dissertation Committee.

- 3. Comprehensive Examinations.** All Ph.D. candidates will complete a total of 22 hours of course work at the graduate level (500 and above) including six hours at the 600/700 level before taking their comprehensive exam. The comprehensive exam should be taken no later than the fifth semester in residence. The comprehensive exam consists of a grant proposal written and defended by the student on a topic different from his/her dissertation research. The grant proposal fulfills both the written and the oral components of the comprehensive exam, with the proposal itself being the written component and the oral defense of the proposal being the oral component. A timeline for completion of the comprehensive exam and further explanation of each component is given below:

**Time-Line of the Comprehensive Exam**

Meet with committee to discuss and approve the candidate’s pre-proposal, and select the Chair of the Oral Comprehensive Exam (OCE)							Previous semester
Candidate submits proposal at the beginning of the week to the committee = Written Comprehensive Exam (WCE); committee has 2 weeks to evaluate, deliberate and determine a grade on WCE							Week 1
Committee returns grade (P/F) on WCE; candidates that pass take the OCE, candidates that fail meet with committee to discuss the deficiencies in the proposal and resubmit							Week 3
OCE							Week 5
Candidate passes OCE	Candidate resubmits proposal at the beginning of the week to the committee = WCE-II; committee has 2 weeks to evaluate, deliberate and determine a grade on WCE-II					Week 7	
	If candidate fails OCE, retake = OCE-II		Committee returns grade (P/F) on WCE-II; candidates that pass take the OCE, candidates that fail meet with the committee chair			Week 9	
	Candidate passes OCE-II	Candidate fails OCE-II	OCE		Candidate fails WCE-II	Week 11	
			Candidate passes OCE	If candidate fails OCE, retake = OCE-II		Week 15	
			Candidate passes OCE-II	Candidate fails OCE-II			
P	P	F	P	P	F	F	FINAL RESULT

**Dissertation Committee meeting and approval of the student’s pre-proposal for the Comprehensive exam.** Students will convene a meeting of their Dissertation Committee, during week 2-3 in the semester **prior** to the semester during which the comprehensive exam will be taken. The chair of the Comprehensive exam will be selected from the departmental committee members other than the major advisor, and the choice is subject to approval by the Director of Graduate Studies. **It is the responsibility of the student to verify the availability of the selected Graduate School Representative, to complete [GS Form D-1](#) and submit it to the Dean of the Graduate School (with copies to each of the members of the committee) following this meeting.** Students and their Committee members will discuss a pre-proposal for the grant proposal they expect to write and

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then defend during the comprehensive exam. Students are expected to go through the process of defining and developing an investigative approach for a novel multidisciplinary research problem outside the purview of their previous research experience. Therefore the topic chosen should be different from their own (including undergraduate or master's research as well as their current dissertation research) or their advisor's research, and should be different from topics the student has extensively researched for other grant proposals or research intensive papers written for specific classes. In addition, the student should choose an organism different from the one used in his or her research, and the approach to the investigation must also be different. The proposal should cover at least two of the following four topics:

### Topics:

<b><i>I. Infection and Immunity</i></b>
Medical Bacteriology (MBI 505), Immunology Principles (MBI 514), Immunology Principles and Practice (MBI 515), or Medical Mycology (MBI 535)
<b><i>II. Physiology and Ecology</i></b>
Microbial Physiology (MBI 525) or Microbial Ecology (MBI 575)
<b><i>III. Genetics and Molecular Biology</i></b>
Microbial Genetics (MBI 545), Advanced Molecular Biology (MBI 605), or Bioinformatics (MBI 585)
<b><i>IV. Virology and Cell Biology</i></b>
Virology (MBI 564), Advanced Cell Biology (MBI 606), or Bacterial Cell Biology (MBI 595)

Coverage of the two topics can be achieved by working on a combination of two topics such as the "Ecology of Virus XVZ" which would combine Virology and Microbial Ecology and therefore cover topics from group II and IV. Another option would be using methods from one topic area to investigate another topic such as the cell biology of a pathogen which would combine Medical Bacteriology and Cell Biology and therefore cover topic areas I and IV. Combinations like this are the minimum requirements; the students are encouraged to use various methods and background from multiple topic areas in developing their proposal.

Prior to the pre-proposal meeting, students should discuss potential topics with their advisor and committee members to identify an appropriate topic. Students should prepare a 3 page pre-proposal for their committee that includes:

1. Topics that are covered in the proposal and where in the proposal they are covered.
2. Brief summary of the rationale and background information for the proposal.
3. Statement of the hypothesis to be tested, and two to three specific aims that will be addressed in the proposal.
4. Statement how the research is different from the student's PhD project.
5. Statement how the proposed methods are different from the methods that are used by the student in earlier and current projects.
6. Statement how the model organism differs from the model organism that the student used for earlier and current project.

This pre-proposal should be given to each committee member at least one week prior to the meeting during which the committee will decide whether to approve the topic and specific aims. Students are encouraged to consider carefully the rationale and logic for each specific aim, as well as the possible results and interpretations of the planned experiments when they prepare to discuss the pre-proposal with their committee. Ultimately, the committee shall decide whether the proposed investigation is different enough from the student's current and previous research experience to be considered independent. If clarifications or revisions need to be made to the pre-proposal, they should be submitted to the committee not later than week 5 of the semester before the semester in which the comprehensive exam will be taken. Once the pre-proposal is approved, the student should submit the pre-proposal to the chair of the advancement committee

**Written Comprehensive Exam (WCE).** The purpose of the WCE is to determine if the student has an adequate knowledge and understanding of the science of microbiology in general and is able to apply the knowledge to a scientific problem. The written comprehensive exam consists of the written grant proposal. The grant proposal will follow [Kirschstein-NRSA or NSF postdoctoral fellowship guidelines](#) depending on the research topic, and be prepared on a topic chosen by the student but approved by the student's examination (dissertation) committee as described above. Faculty will be encouraged to make their proposals available to the students as examples. Students may seek advice from other scientists during the preparation of their proposals, but must refrain from seeking specific advice from their dissertation committee members or major professors once their pre-proposal has been approved.

The proposal should be well formulated and presented in sufficient detail that it can be evaluated for both its research training potential and scientific merit. It is to be written entirely by the student. It should include sufficient information to permit an effective review without committee members having to refer to the literature or any previous application. Brevity and clarity in the presentation will be considered indicative of a student's approach and ability to conduct a superior project. Sections (1) through (3) of this proposal are not to exceed 10 pages - single spaced, font size not smaller than 11, margins not less than 1 inch at all sides of the document - including all tables and figures. If submitted electronically, please ensure that the file size of the figures and tables is not too large.

Follow the format below:

### **1. Specific Aims**

The proposal should be hypothesis driven and contain two to three specific aims that will be developed by the student assuming a 3-year period of funding, and one investigator. State the specific purposes of the research proposal and the hypotheses to be tested.

### **2. Background and Significance**

Sketch briefly the background to the proposal. State concisely the importance of the research described in this application by relating the specific aims to broad, long-term objectives. Include a statement that describes the intellectual merit of the proposed work in the context of what is to be learned.

### 3. Research Design and Methods

The proposal should describe the rationale for the experiments proposed to test the hypotheses. The research plan should include detailed descriptions of experiments that will test the stated hypotheses and answer the respective questions. The proposal should discuss potential experimental difficulties associated with the experimental approach proposed together with alternative approaches that could achieve the desired aims. The student needs to state what is expected from each specific aim and how the proposed work will move the selected topic forward.

### 4. Timeline and Budget

Inasmuch as postdoctoral research proposals for fellowships are more limited in scope and budget, prepare an appropriate timeline for the proposed research, and be prepared to defend the need for particularly expensive analyses or items.

### 5. Literature Cited

List all literature references. Each reference must include the title, names of all authors, book or journal, volume number, page numbers, and year of publication. The reference should be limited to relevant and current literature. While there is no page limitation, it is important to be selective - use only those literature references pertinent to the proposed research.

Students should plan to spend about one month writing the proposal and significant additional time intensively reviewing course work and reviewing appropriate scientific literature that will prepare them for the oral defense of the proposal.

The written comprehensive exam will be graded by all five committee members. The committee members will make a recommendation to the chair of the comprehensive exam committee. If the members agree, the chair will forward the decision to the student. If the members disagree they will meet and discuss to reach a consensus. Two outcomes are possible:

1. **PASS:** The student progresses to the oral comprehensive exam.
2. **FAIL:** The written component is failed when the examination committee identifies deficiencies in the students written proposal. Deficiencies could be but are not limited to: (i) a serious pitfall in an otherwise satisfactory proposal that can be remedied by revision of an experimental design or method of analysis; (ii) the failure to recognize, deal with or interpret a likely alternative outcome(s) of an experiment and its implication; (iii) a poorly written or poorly documented section of the proposal requiring substantial revision; and (iv) the lack of sufficient understanding of a method of data acquisition (e.g. an assay procedure) or analysis (e.g. appropriate statistical method) viewed as a critical component of the research. The committee will compile their comments and suggestions for improvement and meet with the student to discuss them. This meeting should take place during week 2 of the semester. The student has until the end of week 6 to include the changes into the proposal and to resubmit the proposal to the committee. Two weeks after the resubmission the chair of the committee will compile the decisions of the committee members and forwards the decision to the student. Two final outcomes are possible:
  - a. **PASS:** The student progresses to the oral comprehensive exam.

- b. **FAIL:** If this decision is reached, no remediation is possible and the student will be recommended for dismissal from the doctoral program. The student may continue toward an M.S. degree only if they do not hold an equivalent M.S. degree and will be supported for a maximum of one additional year by the department.

**Oral Comprehensive Exam (OCE).** The OCE will be an oral defense of the student's written grant proposal to their examination committee. The defense must take place within two weeks after the student has passed the written component. The student is expected to know the scientific basis of the proposed experiments, and should also be competent to discuss all aspects of the proposed research. In addition, the student will be examined on their depth of knowledge on topics related to their research proposal. The criteria used by the committee to render a decision include an assessment of the candidate's ability to defend their proposed research and their competency in the examined topics.

In arriving at a decision, the oral examination committee will evaluate the student's performance on the seminar presentation and response to questioning. Two outcomes are possible:

1. **PASS:** The student is admitted to official Ph.D. candidacy.
2. **FAIL:** The oral component is failed when the examination committee identifies deficiencies in the oral defense of the research proposal. The committee will explain the nature of the problem(s) and the requirements for successful remediation to the student. The oral exam must be retaken within four weeks. Two final outcomes are possible:
  - a. **PASS:** The student is admitted to official PhD candidacy.
  - b. **FAIL:** If this decision is reached, no remediation is possible and the student will be recommended for dismissal from the doctoral program. The student may continue toward an M.S. degree only if they do not hold an equivalent M.S. degree and will be supported for a maximum of one additional year by the department.

According to University requirements, there can be no more than one dissenting vote for the student to pass the examination. The department also requires no more than one dissenting vote to fail the examination, or to have the outcome delayed.

The chair of the Comprehensive exam is responsible for communicating the results of the exam and submitting a completed [GS form D-2](#) form to the chair of the GAC, who will then be responsible for submitting the form to the Graduate School. **The student is, however, responsible for bringing [GS form D-2](#) to the OCE with appropriate information entered.** Students who pass the WCE and the OCE will proceed with the Ph.D. Program. Students who fail the WCE (after two attempts), or pass the WCE but fail the OCE (after two attempts), may petition for entry into the M.S. Program.

**Students will be expected to perform their normal teaching and research duties during the weeks preceding the comprehensive examinations.**

4. **Preparation and Presentation of Dissertation Prospectus.** After passing the comprehensive exam, the doctoral student will write and submit a research proposal and present it orally for approval by the Dissertation Committee **by no later than the end of the Spring semester of the third academic year.** The format should follow the style of NIH or NSF proposals, and the text should not exceed 10 double-spaced pages.

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- 5. Dissertation Committee Meetings.** The committee will meet with the student at least once per academic year in order to monitor progress and provide advice. The student will provide a two-page summary outlining progress made-to-date, and future directions for the research project. The student will give a 15-minute presentation of research data and the meeting should last no longer than one hour. The committee will help determine when the student is ready to write the dissertation. A written record of the committee's recommendations and the project's future directions will be generated by the student and the major advisor, signed by all the members of the Dissertation Committee, and placed in the student's file in the departmental office, and a copy given to the chair of the graduate advancement committee. The departmental summer salary supplement awarded to graduate students will be contingent upon satisfying the requirement for completing the yearly committee meeting.
- 6. Teaching Experience.** In addition to laboratory teaching responsibilities, each student must teach one semester of an introductory lecture course in microbiology under the supervision of a member of the microbiology faculty.
- 7. Dissertation Defense.** Each candidate must demonstrate the ability for independent research by completing an original research project and writing a dissertation based upon that research. The candidate must defend the dissertation before the Dissertation Committee in an open examination following a formal seminar to the department. Two members of the Dissertation Committee will be selected as Readers by the student and the major advisor. The penultimate draft of the dissertation will be submitted to the Readers no later than **30 calendar days before the date of the Dissertation Defense**. The Readers will review the penultimate draft once, before returning it (**within 15 calendar days**) to the student and the major advisor for their consideration of the suggested revisions. The final draft must be in the hands of the other members of the Dissertation Committee no later than **seven calendar days before the date of the Dissertation Defense**. Any additional revisions suggested by the committee at the defense will be implemented at the discretion of the major advisor and the student. The dissertation will be approved by the Dissertation Committee on the basis of its value as an original contribution to a specific discipline of microbiology. Evidence of the originality of this contribution should be provided by presentation of the results at a professional scientific meeting at the national level, and submission of a manuscript for publication in a refereed journal before the defense.
- 8. Required Forms.** The following forms are required by the Graduate School for completion of the Doctoral Degree (copies are included in Appendix I; the pdf versions should be obtained from <http://www.units.muohio.edu/gradschool/>):

**GS FORM D-1:** *Request for Appointment of Doctoral Comprehensive Examination Committee* must be submitted to the Dean of the Graduate School **at least 10 working days before the date of the examination**.

**GS FORM D-2:** *Results of the Comprehensive Examination for the Doctoral Degree and Application for Candidacy* must be promptly given to the **Chair of the GAC by the chair of the OCE**. The **Chair of the GAC** will then return the form to the Dean of the Graduate School. It is **NOT** the responsibility of the student to return this form, but it **IS** the responsibility of the student to bring the form to the oral comprehensive examination.

**GS FORM D-3:** *Request for Appointment of Doctoral Final Examination (Dissertation) Committee* must be submitted to the Dean of the Graduate School **at least 10 working days before the date of the oral presentation of the Dissertation Prospectus.**

**GS FORM D-4:** *Results of Final Examination and Certificate for Awarding the Doctoral Degree* must be returned to the Dean of the Graduate School by the **Chair of the Final Examination (Dissertation) Committee at least 10 working days before Commencement.** It is **NOT** the responsibility of the student to return this form, but it **IS** the responsibility of the student to bring the form to the Dissertation Defense.

**Except where noted, it is the student's responsibility to have the forms signed and delivered to the Graduate School at the appropriate times.**

## TIME-LINE FOR PH.D. DEGREE

### Year 1

#### **Fall**

- Students enter Program as GAs. Students with M.S. degrees (or equivalent) enter Program as TAs.
- GAs and TAs must register for at least 10 (but no more than 14) graduate credit hours, including Graduate Seminar (Note that Advanced Cell Biology, Biochemistry I, Immunology, Medical Mycology, Microbial Physiology, and Microbial Genetics are usually offered in the Fall Semester).
- Attend Faculty Research Presentations and perform Laboratory Rotations (three).

#### **December 1:**

- Students choose Major Advisor, and notify Graduate Studies Director and the Department Chair.

#### **Spring**

- GAs and TAs must register for at least 10 (but no more than 14) graduate credit hours, including Graduate Seminar (Advanced Molecular Biology, Microbial Ecology, Biochemistry II, Pathogenic Microbiology, and Virology are usually offered in the Spring Semester)
- Request appointment as TAs for Fall.

#### **Summer**

- GAs and TAs must register for 12 graduate credit hours (Summer I).
- GAs petition to enter the Ph.D. program and become TAs.
- Students establish and meet with Dissertation Committee to discuss their plan of study. Complete plan of study checklist and submit to the chair of the GAC.

### Year 2

#### **Fall**

- TAs must register for at least 10 (but no more than 14) graduate credit hours including Graduate Seminar.

#### **Spring**

- TAs must register for at least 10 graduate credit hours, including Graduate Seminar, and for every semester thereafter.

#### **Summer**

- TAs must register for 12 graduate credit hours, and for every summer thereafter (Summer I).
- Student meets with Dissertation Committee for approval of pre-proposal (topic and specific aims) for the grant proposal for their Oral Comprehensive Exam. [GS FORM D-1](#) is submitted to the Dean of the Graduate School.
- Students must convey their choice of course topics on which they will be examined during the WCE to the chair of the GAC on or before the start date of Fall classes.

**Year 3**

**Fall**

- Doctoral students take their comprehensive exams

**3<sup>rd</sup> week:**

- Deadline for Grant Proposal topic and specific aims approval

**5<sup>th</sup> week:**

- Written Comprehensive Exam

**6<sup>th</sup> week:**

- Scores on written exams will be returned

**11<sup>th</sup> week:**

- Grant Proposal must be submitted to their Examination Committee

**13<sup>th</sup> week:**

- Oral Comprehensive Exam
- [GS FORM D-2](#) submitted to the Chair of the GAC

**Spring**

- Meet with Dissertation committee to present Research Prospectus for approval

**Year 4 and subsequent**

**Fall**

- Meet with Dissertation Committee, and every six months thereafter

**Dissertation Defense**

- [GS FORM D-3](#) submitted to the Dean of the Graduate School **at least 10 working days** before date of defense
- submit penultimate draft of dissertation to readers 30 days before the date of defense
- draft returned to student 15 days before the date of the defense
- final draft given to dissertation committee 7 days prior to the date of the defense
- [GS FORM D-4](#) sent to the Dean of the Graduate School by the Chair of the Dissertation Committee **at least 10 working days** before Commencement

### FINANCIAL RESPONSIBILITIES OF THE STUDENT

In addition to the fees imposed by the University, the following items will be the financial responsibility of the student:

1. Personal notebooks, texts required for courses and personal computer supplies. [Laboratory notebooks will be supplied by the major advisor.]
2. Typing of thesis or dissertation drafts and final preparation, including the cost of bond paper, laser printing, photocopying and binding. [The cost of photographs and slides of figures and tables in the thesis or dissertation will be covered by the research funds of the major advisor. The cost of binding two copies of the thesis or dissertation - one for the major advisor and one for the departmental library - will be met by the department.]
3. Costs of travel to meetings (in excess of the amount offered by the department).

### TERMINATION FROM THE GRADUATE PROGRAM IN MICROBIOLOGY

1. **Academic Performance.** Although prime emphasis in the training of graduate students is placed on research, a student is unlikely to succeed in the Microbiology Graduate Program if he or she is unable to master the basic microbiological disciplines. Accordingly, earning a grade of less than "B-" or "S" in two microbiology courses, or earning a grade lower than "C-" in any course shall be grounds for dismissal from the graduate program.

The student's performance in formal course work will be reviewed at the end of each semester by the Department Chair. In addition, the GSC will annually review the progress of each student toward completion of the degree. Criteria for determining progress will include satisfactory performance in formal course work and satisfactory progress in directed research evaluated by the student's major advisor and the members of the Thesis or Dissertation Committees.

2. **Professional Responsibilities.** It is the obligation of each graduate student to meet specific deadlines and to fulfill all requirements for the degree. In addition, all graduate students are expected to share in the responsibility for the care and protection of departmental resources, satisfactory execution of assigned duties, and professional interaction with colleagues.

Should there be any deficiency in, violation of, or failure to comply with the areas described above, it will be reported to GSC members who will, with the student's major advisor, investigate and evaluate the allegations. The GSC may then recommend appropriate action. If dismissal is recommended, a report will be submitted to the faculty of the department. Dismissal will be effected only after approval by a majority of the faculty. Appeal of the decision to dismiss may be initiated by the student through the departmental Grievance Committee.