UNIVERSITY OF PUERTO RICO
MEDICAL SCIENCES CAMPUS
SCHOOL OF MEDICINE
DEPARTMENT OF MICROBIOLOGY AND MEDICAL ZOOLOGY

MANUAL FOR THE MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY DEGREES REQUIREMENTS AND REGULATIONS

This document describes the rules and regulations of the MS and PhD Program of the Department of Microbiology and Medical Zoology, and is intended to complement the document titled: "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations, Revised February 2013" of the Division of Biomedical Sciences and Graduate Studies, University of Puerto Rico, School of Medicine, approved by the Institutional Academic Senate, Certification 021, 2013-2014.

Revised, amended and approved by the Departmental Graduate Studies Committee on October 23, 2013 (Initial document revised in July 11, 1996 (CLC/mnf/cavm).

Dr. Guillermo J. Vázquez, Chair of the Department of Microbiology and Medical Zoology

Dr. Ana M. Espino, Coordinator, Departmental Graduate Studies Committee

Dr. Edna E. Aquino, Member, Departmental Graduate Studies Committee

Dr. Idalí Martínez, Member, Departmental Graduate Studies Committee

Dr. Iraida E. Robledo, Member, Departmental Graduate Studies Committee

Dr. Wieslaw Kozek, Member, Departmental Graduate Studies Committee

This manual was revised, amended and approved by the Faculty of the Department of Microbiology and Medical Zoology on November 12, 2013

TABLE OF CONTENTS

I. REQUIREMENTS FOR ADMISSION

Students may enter the graduate program in Microbiology and Medical Zoology after receiving a bachelor's, a master's degree, or an equivalent degree in Science from an accredited institution. According to the rules and regulations of the University of Puerto Rico, the applicant must complete the application process of the Graduate School of Biomedical Sciences. In addition:

1. It is expected that the applicant have completed the following basic science courses:

    a. General Biology (8 semester credits)
    b. Organic Chemistry (8 semester credits)
    c. General Chemistry (8 semester credit)
    d. General Physics (8 semester credits)
    e. Mathematics (at least one course in Calculus, 3 semester credits)
    f. Other courses are recommended (but not required) like: Analytical Chemistry, Biochemistry, Molecular Biology, Immunology, Parasitology, Microbiology, Statistics, Bioinformatics, Computer Sciences and English Writing for Science majors.

2. It is required that the student has a minimum general grade point average (GPA) of 3.0 (in a scale of 4.0) as well as in science courses (GPS).

3. It is required that the student has taken the General Graduate Record Examination (GRE). The Advanced Graduate Record Examination or GRE subject/advanced (GREs) test in Biology, Chemistry, or Biochemistry is highly recommended. If a student takes the GREs, the score of the test will be used for extra bonus points in the admission formula. The GRE should have been taken no later than five years before the application date.

4. The applicant must be interviewed by the Departmental Graduate Studies Committee or by at least two members of the Departmental faculty.

5. The applicant must be fluent in both Spanish and English.

6. The applicant should submit three letters of recommendation; at least two of these must be from professors in the major field of study.

7. The applicant needs to write an essay in English with a maximum of 250 words with a brief description of his/her interest in the field of Microbiology.

8. The applicant should provide evidence of any previous research experience (abstracts, papers, etc.).

9. Additional information about admission requirements, application forms, recommendation

letters official form, etc. is available at www.md.rcm.upr.edu/biomed/qualifications.php (as of September 1, 2013) and in Section I of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations"

Applicants will be admitted to the program for the first Semester of each academic year. The application deadline for admission is December 1. Admission is subject to the approval by the Departmental Graduate Studies Committee, and the Graduate Program Committee of the Graduate School, Division of Biomedical Sciences, School of Medicine of the University of Puerto Rico, Medical Sciences Campus. Only applicants with fully completed application forms and application requirements will be considered for admission.

II. ACCREDITATION OF COURSES

Students admitted to the PhD Program, which have completed a MS degree in our Department or any other Graduate Program of the UPR School of Medicine Division of Biomedical Sciences could substitute up to 24 credits of the courses approved for the MS degree during a period of no more than 4-6 natural years to the approval.

If the MS degree was completed in an accredited public or private institution in Puerto Rico or in the United States, the Department will review the academic record of the student and the course Syllabi (descriptions) to determine which Master's courses completed at the other institutions may be validated. The maximum number of credits that will be validated from other institutions is 24. Only graduate courses completed during a period of no more than 4-6 natural years at the time of approval, and for which grades of "B" or higher has been obtained, will be considered for validation based on the nature of their content and the student's major area of specialization.

Either the substitution or validation of courses must be made at the time of application to the Graduate School of the Medical Sciences Campus. The substitution or validation of courses will be processed according to the rules and regulations of the Registrar's Office of the University of Puerto Rico, Medical Sciences Campus. For more information see Appendix H of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations".

Students enrolled in the Master's Degree Program of the Department of Microbiology and Medical Zoology with an accepted transfer to the PhD Program will have all the approved graduate courses transferred to the PhD Program.

Courses taken with "Special Permission", if approved with a minimum grade of "B", could be transferred to the student graduate academic profile if they are accepted in the Graduate Program, but **CANNOT** be used to calculate the GPS for admission to the Graduate Program.

III. STUDY PROGRAM

A. GRADUATE COURSES

A student who fully satisfies the admission requirements and is admitted to the program becomes a regular student with a full time commitment of 9 or more credits per semester, unless registered in special courses. **The students are obligated to comply with a residency requirement of a minimum of 40 hours per week (including the summer period)** when enrolled for thesis/dissertation credits for a period of one (1) year for MS students and two (2) years for PhD students (Section VIII of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations"). The admitted student should be familiar with the **departmental bylaws** described in this manual to comply with all requirements, regulations and responsibilities.

All students pursuing an MS or PhD degree in Microbiology will be required a **full time** commitment to his/her program of study. The following is an outline of the sequence of steps expected from each student regarding their academic program.

1. Admission as regular student
2. Master's degree students will take one and half years of course work while PhD students will take two years of course work under the guidance of the Departmental Graduate Student Coordinator.
3. Selection of the Thesis/Dissertation Advisor and Thesis/Dissertation Committee no later than the first semester of their second year for MS students and no later than the first semester of the third year for PhD students.
4. For PhD students the Qualifying Examination should be taken as soon as the departmental and/or course requirements have been met.
5. Doctoral's degree students will have an approved degree candidacy after meeting all Departmental and Graduate Program requirements, passing the Qualifying Examination and approval of the research proposal.
6. Master's degree students should have an approved thesis proposal to get the MS candidacy.
7. Evaluation of satisfactory research progress by the Thesis/Dissertation Committee should be once per academic year (see Appendix A and E of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations"). Students must demonstrate their full time commitment to their graduate studies and research project.
8. Completion of research and writing of the thesis/dissertation. The student should consult frequently with the committee members, to avoid the need for major revisions of the final copy or other unusual delays.
9. Approval of the final oral examination. The student must defend the quality of his/her research, the quality of the written thesis/dissertation, and his/her competence in other

matters that the Thesis/Dissertation Committee consider important.

10. The office of the Associate Dean for Biomedical Sciences will certify granting the degree.

The maximum estimated time for completion of all requirements for a Master's Degree is six (6) years and for a Doctoral Degree is six (6) years for those students admitted with a MS degree and eight (8) years for those students admitted with a BS degree, as listed in the Registrar's Office Manual ("Manual de Normas y Procedimientos de la Oficina de Registrador" Certificación SA # 70, 2010-2011 del 16 de mayo de 2011; page 50).

A total of 28 semester credits of course work plus six (6) semester credits of thesis research (MICR 8599) for a total of 34 credits is the minimum required for the completion of the MS Degree Program. A total of 48 semester credits of course work plus fifteen (15) semester credits of thesis research (MICR 8599) for a total of 63 credits is the minimum required for the completion of the PhD Program. Only courses approved with a grade of A, B or P will be taken into account for the total number of credits of course work.

The course Introduction to Medical Microbiology (MICR 8499; 6 credits) has to be approved with a B or higher grade. If the student obtains a C grade in the course, a reposition exam will be given, which he/she has to pass with a minimum grade of B to continue in the program. This reposition exam will be given before the last date of late registration. A failure (C, D or F) or withdrawal from the Introduction to Medical Microbiology course will automatically dismiss the student from the Microbiology Graduate Program. Students academically dismissed will not be considered for readmission in the Microbiology Graduate Program.

A student that has C in any of the required Departmental courses must repeat the course and pass it with a minimum grade of B.

A student that has C in any other Departmental elective course could take another elective course to substitute for the one that he or she has with C.

If a student has a C in the Biochemistry courses (BCHM 8511 and BCHM 8512), he/she must repeat the course and pass it with a minimum grade of B. Those students that withdraw or failed (C, D or F) the Biochemistry Courses must repeat the same courses. Students with a C grade in any of the Biochemistry courses could be allowed to take departmental courses which require Biochemistry as a pre-requisite if approved by the coordinator of the affected departmental courses.

A student whose GPA falls below 3.0 will immediately be put on probation by the Graduate Program and would not be able to participate from the "Ayudantía" Program. If the grades of the probation semester do not bring the cumulative grade point average to $\geq$3.00, the student is automatically dismissed from the Microbiology Graduate Program. For details of the extension of the probationary period see Appendix A of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations".

Graduate students are not allowed to withdraw from any course without the previous approval of the Departmental Graduate Committee.

A student may request a leave of absence (personal or sickness leave) from the Graduate Program by submitting a written request to the Graduate Studies Coordinator, and the Department Chair, meeting and discussing with them the petition. If the student is not in a good academic standing, that issue will not be used to request a leave of absence. The Department Chair or Graduate Studies Coordinator will present the request, with all pertinent documents and information submitted by the student, to the Graduate Committee for their perusal. The Graduate Committee, through the office of the Deanship will inform the student of the decision. For more details of the terms of leave of absence time period and eventual readmission see Appendix A of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations".

REQUIRED COURSES

The student's individual course curriculum will be determined taking into consideration the student's research interests and the Departmental course requirements. The Departmental course requirements are the following:

1. Medical Microbiology (MICR 8499)	6 credits
2. Principles of Immunology (MICR 8540)	3 credits
3. Biochemistry-1 (BCHM 8511)	3 credits
4. Biochemistry-2 (BCHM 8512)	3 credits
5. Statistics for Biomedical Sciences (CBIO 8500)	3 credits
6. Graduate Seminar (MICR 8580)	
a. MS students	1 credits
b. PhD students (1 per year)	3 credits
7. Practice Teaching (MICR 8590)*	1 credit
8. Preparation of Thesis Proposal in Microbiology (MICR 8596)	1 credit
9. Introduction to Research (ZOME 8496)	1 credit

* In order to comply with the Practice Teaching Course, the student will have to serve as laboratory proctor under the supervision of one Faculty member. The Departmental Graduate Committee and the Department Chairperson can exempt students that submit evidence of having previous teaching experience in Microbiology, Medical Zoology or related fields from this requirement upon the approval.

ELECTIVE COURSES

The MS a student must take a minimum of two (2) Departmental elective courses (a total of 4-7 credits). The PhD student must take a minimum of four (4) Departmental elective courses (a total of 10 to 13 credits). The Departmental elective courses to be offered are the following:

1. Medical Mycology (MICR 8530) 2 credits
2. Medical Mycology Laboratory (MICR 8531) 1 credit
3. Microbial Physiology (MICR 8550) 3 credits
4. Virology (MICR 8510) 3 credits
5. Diagnostic Bacteriology (MICR 8501) 3 credits
6. Protozoa (ZOME 8506) 2 credits
7. Nematodes (ZOME 8504) 2 credits
8. Genetics and Molecular Biology (MICR 8525) 4 credits
9. Experimental Biotechnology & Immunology (MICR8519) 3 credits
10. Strategies in Vaccine Development (MICR 8517-18) 3 credits
11. Introduction to Parasitology (ZOME 8502) 3 credits

ADVANCED TOPICS COURSES

1. Advanced Topics in Medical Microbiology (MICR 8504-06) (1 to 3 credits)
2. Advanced Topics in Virology (MICR 8514-16) (1 to 3 credits)
3. Selected Topics in Microbiology (MICR 8517-18) (1 and 2 credits)
4. Advanced Topics in Mycology (MICR 8532-34) (1 to 3 credits)
5. Advanced Topics in Immunology (MICR 8542-44) (1 to 3 credits)
6. Advanced Topics in Microbial Physiology (MICR 8552-54) (1 to 3 credits)
7. Advanced Topics in Microbial Genetics (MICR 8562-64) (1 to 3 credits)
8. Laboratory Methods in Parasitology (ZOME 8513-8516) (1 to 3 credits)

At least two elective courses will be offered every semester. Most elective courses will be offered on alternate years making it possible to offer all electives in Microbiology and Medical Zoology every two years. Electives courses outside of the Department of Microbiology and Medical Zoology, and any of the courses listed as Advanced Topics in a particular field of Microbiology and Medical Zoology can be taken, but these extra courses will not count towards the fulfillment of the two (2) Departmental elective courses for MS students or the four (4) elective courses for PhD students **unless is approved by the Departmental Graduate Studies Committee, the Departmental Chairperson and the appropriate Institutional Officers, if needed**. **Any novel departmental structured elective course can be added to the above elective course list upon approval by the Departmental Graduate Studies Committee, the Departmental Chairperson and the appropriate Institutional Officers.**

B. ACADEMIC PROGRAM SCHEDULE FOR MS STUDENTS

The student admitted to the Master Degree program is expected to follow a full-time schedule described as follows:

First Year

1. **First semester**

Introduction to Medical Microbiology (MICR 8499)	6 credits
Biochemistry I (BCHM 8511)	3 credits
Introduction to Research (ZOME 8496)	1 credit
	Total: 10 credits

2. **Second semester**

Basic Immunology (MICR 8540)	3 credits
One departmental elective course	3 credits
Biochemistry II (BCHM 8512)	3 credits
Advanced Topics Course (Lab Rotation) **or**	
One departmental elective course	2 - 3 credits
	Total: 11-12 credits

3. **Summer**

Advanced Topics Course (Lab Rotation)	3 credits

Second Year*

1. **First semester**

Preparation of Thesis Proposal in Microbiology (MICR 8596)	1 credit
Statistics for Biomedical Sciences (CBIO) 8500)	3 credits
One Departmental elective course (Optional)	2-4 credits
	Total: 6-8 credits

2. **Second semester**

Practice Teaching (MICR 8580)	1 credit
Graduate Seminar (MICR 8590)	1 credit
Master's Thesis (MICR 8595)	6 credits
3 credits	
	Total: 8 credits

* The student may take more than two years to complete his (her) degree and should register in the course Master's Thesis (MICR 8595) (0 credits) until graduation time.

C. ACADEMIC PROGRAM SCHEDULE FOR PhD STUDENTS

A **PhD student** is expected to follow a full-time schedule described as follows:

First Year

1. **First semester**

Introduction to Medical Microbiology (MICR 8499)	6 credits
Biochemistry I (BCHM 8511)	3 credits
Introduction to Research (ZOME 8496)	1 credit
	Total: 10 credits

2. **Second semester**

Basic Immunology (MICR 8540)	3 credits
One departmental elective course	3 credits
Biochemistry II (BCHM 8512)	3 credits
Advanced Topics Course (Lab Rotation)	2 credits
	Total: 11 credits

3. **Summer**

Advanced Topics Course (Lab Rotation)	3 credits

Second Year

1. **First semester**

Advanced Topics Course (Lab Rotation)	3 credits
Statistics for Biomedical Sciences (CBIO) 8500)	3 credits
One departmental elective courses	2-4 credits
Graduate Seminar (MICR 8590)	1 credit
	Total: 9-11 credits

2. **Second semester**

Two departmental elective courses	6 credits
Advanced Topics Course (Lab Rotation)	3 credits
Practice Teaching (MICR 8580)	1 credit
	Total: 10 credits

3. **Summer**

Advanced Topics Course (Lab Rotation)	3 credits

Third Year

1. **First Semester**

Advanced Topics for Comprehensive Exam	3 credits
	Total: 3 credits

2. **Second Semester**
   Graduate Seminar (MICR 8590) 1 credit
   Preparation of Thesis Proposal in Microbiology (MICR 8596) 1 credit

   Total: 2 credits

3. **Summer**

   Advanced Topics Course (Lab Rotation) 3 credits

Fourth Year*

1. **First Semester**
   Graduate Seminar (MICR 8590) 1 credit
   Doctoral Dissertation (MICR 8599) 15 credits
   Total: 16 credits
2. **Second Semester**
   Doctoral Dissertation (MICR 8599) 0 credit

* The student may take more than four years to complete his/her degree and should registered in the course Doctoral Dissertation (MIC 8599) (0 credit) until graduation time.

D. TRANSFER TO THE DOCTORAL PROGRAM

Students who are enrolled in the Master's Degree Program of the Department of Microbiology and Medical Zoology can request transfer to the PhD Program during the second year of studies and the transference will be processed according the regulations established in the "Manual for Master and Philosophical Degrees Requirements and Regulations." There are three minimum requirements for the transfer:

1. Good standing with a cumulative grade point average of 3.0, but a higher grade point average is highly desirable.
2. A supporting letter from the student's advisor expressing his/her willingness to accept the student as a PhD candidate and that he/she has the financial resources to support the student entire dissertation project.
3. The student requesting the transfer complies with the recommended admission formula scores of 60 or higher for admission to the PhD program of the Graduate School Program.

The Departmental Graduate Studies Committee will discuss each transfer request but the Graduate Committee of the Division of Biomedical Sciences, University of Puerto Rico, and School of Medicine will make the final approval. Master's degree students who changed to the PhD Program can request the transfer of all approved graduate courses to the PhD Program except for the six (6) semester credits of thesis research (MICR 8595).

IV. CANDIDACY

A. The Candidacy for the MS Degree

Admission to candidacy will be requested after the student has fulfilled all of the following requirements:

1. Satisfactory completion of all the required courses and the requirements of the Department.
2. Completion of a minimum of 28 semester credits with a minimum 3.0 cumulative grade point average in a scale of 4.0.
3. Accumulation of a minimum of 1 year of residency in the Department.
4. Approval of the thesis proposal.

B. The Candidacy for the PhD Degree

Admission to candidacy will be requested after the student has fulfilled all of the following requirements:

1. Satisfactory completion of all the required courses and the requirements of the Department.
2. Completion of a minimum of 48 semester credits with a minimum 3.0 cumulative grade point average in a scale of 4.0.
3. Accumulation of a minimum of 2 years of residency in the Department.
4. Satisfactory completion of the qualifying examination.
5. Approval of the dissertation proposal.

All the graduate students (candidates) should conduct themselves in an ethical and professional manner and be in compliance with the educational requirements on the "Responsible Conduct in Research Compliance Program" as described in the following website: http://www.md.rcm.upr.edu/biomed/pdf/nuevo%20ingreso/3_RC2P_2011-12_v1.pdf (Section IV of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations."

V. THESIS / DISSERTATION COMMITTEE COMPOSITION

The Thesis/Dissertation Advisor chosen by the student must comply with all the qualifications described in section IV and in Appendix B of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations." The student and thesis advisor should sign the document "Compact between Biomedical Graduate Students and their research Advisors" as recommended by the Division of Biomedical Sciences in the certification number 02 from year 2009-2010. **A signed copy should be send to the Departmental Graduate Studies Committee.** This document is available at Appendix A in this document and at Appendix J of the

"Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations."

The student will select a Thesis/Dissertation Committee in consultation with the Thesis/Dissertation Advisor following the procedures described in section IV and in Appendix B of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations."

A. MS Degree

Master's degree students are required to have a minimum of three (3) members on their Thesis Committee, which include two (2) members and the thesis director. Two of them (including the thesis advisor) must be members of the Department of Microbiology and Medical Zoology with a regular faculty appointment (including Ad-Honorem or conjoint professors). The other committee member must be from a related field from outside of the department. If the advisor is an Ad-Honorem or conjoint professor, he/she will be considered as thesis director. In such situations, a co-director must be named and this person should be a full-time faculty member of our Department. The specific function of the co-director will be to ensure that all our regulations regarding thesis's committee composition, qualifying examinations, presentation of study proposal, meetings on project's progress, etc. be fully and timely completed. Thus, the co-director will function as a "link" between the student, the thesis committee and the Departmental Director.

B. PhD Degree

Doctoral candidates are required to have a minimum of five (5) members on their Dissertation Committee. The Dissertation Committee will consist of the research advisor as director, at least three faculty members from the Department of Microbiology and Medical Zoology and a minimum of one faculty member from outside the department. If the advisor is an Ad-Honorem or conjoint professor, he/she will be considered as the director. In such situations, a co-director must be named and this person should be a full-time faculty member of the Department of Microbiology and Medical Zoology.

NOTE: Additional members to the Thesis Committee can be added if deemed necessary and with the approval of the departmental Graduate Committee.

C. Acceptance

The student's advisor must inform the Departmental Graduate Studies Committee and the Department Chairperson the composition of the Thesis/Dissertation Committee in writing. The curriculum vitae (CV) from the external members should be submitted to the Graduate Program Committee for approval. This Thesis/Dissertation Committee becomes official once the Graduate Program Committee approves it.

D. Substitutions to the Thesis/Dissertation Committee

To change the thesis advisor, the student must obtain written permission from the Departmental Chairperson. The Graduate Program must be notified, in writing, of any change of Thesis/Dissertation Advisor. If the Advisor is also the Departmental Chairperson, the Graduate Studies Coordinator should notify the Graduate Program (in writing) about the change and provide the name of the prospective Advisor. Any change of Thesis/Dissertation Advisor must obtain the approval of the Graduate Program Committee. The Graduate Program Committee acts as the final authority concerning Thesis/Dissertation Advisor changes.

The student and the Thesis/Dissertation Advisor may recommend changes in Committee members. Such changes must obtain written approval from the Departmental Chairperson. Proposed changes in Committee composition must meet with the approval of the Graduate Program Committee. The Graduate Program Committee acts as the final authority concerning changes in the Thesis/Dissertation Committee.

Substitutions to the Thesis/Dissertation Committee, including the Thesis/Dissertation Advisor are described in Section IV of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations."

VI. QUALIFYING EXAMINATIONS FOR PhD STUDENTS

Doctoral's degree students will take their qualifying examinations in the first semester of the third year of studies. Students will be eligible to take the qualifying examination after they have fulfilled the following requirements:

1. To obtain satisfactory grades in their courses, maintaining a minimum cumulative grade point average of 3.0 in a scale of 4.0, during their graduate studies.
2. Accumulate 42 semester credits in graduate courses and satisfactorily completed all required courses. The student must complete the 6 remaining credits during that academic year including the Advanced Topic for the Qualifying Exam (3 credits), the preparation of proposal (1 credit) and two graduate seminars (2 credits).
3. Approval of the Dissertation Advisor and Committee.

The qualifying examination will be usually offered during the first semester of the third year of study. Under special circumstance with the recommendation of the Departmental Graduate Committee and with the approval of the Chairperson, the exam could be offered the second semester. All students must take the qualifying exams before entering the fourth year of study**.** During the semester the student is preparing and taking the qualifying examination, he/she will register in a three (3) credits Advanced Topics course in the area of his/her specialization and for this semester this will be considered a full-academic load.

The examination will consist of a written and an oral component. The qualifying examination will be prepared by the student's Dissertation Committee and will consist of eight (8) written questions in general concepts of the area of specialization selected by the student with the recommendation of the Dissertation Advisor**. It is not necessary to define the proposal objectives in order to take the qualifying exam.** The areas of specialization from which the student will choose to be examined are the following:

- Immunology
- Microbial Physiology
- Medical Bacteriology
- Medical Virology
- Microbial Genetics
- Molecular Biology
- Medical Zoology
- Medical Mycology

Of the eight (8) questions, the student will have to answer six (6) in two 8 hours periods (2 days). Each day, the student will be given four questions, of which he/she should answer three questions. They will be divided equally to cover basic knowledge in the chosen field, experimental design and interpretation of data. The student will be notified within the next 2 weeks after the written exam when he/she will take the oral portion of the exam, which should be taken within the next 2 weeks after this notification.

The Dissertation Committee will evaluate both components (oral and written) of the examination and rate them on a 0 to 100% scale. An average score of the examination will be computed and a grade will be reported for the entire examination. A passing grade will be recommended if the average grade falls within the 70% to 100% range; and failure will be recommended if the average grade falls below 69%. The results will be promptly reported to the student as approved, or failed.

The Dissertation Advisor and Dissertation Committee will make official notification of the qualifying examination decision in writing to the Departmental Chairperson, who will notify the Graduate Program Committee and the Associate Dean of Biomedical Sciences. In the case of approval, the student will be admitted to candidacy once his/her Dissertation Committee has approved his/her Dissertation proposal. In the case of failure, the student will be allowed to repeat the exam once within one calendar year from the first unsuccessful attempt. Failure to pass the qualifying examination the second time will automatically dismiss the student from the Program (Section II of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations"). This student will have the option to complete a MS Degree.

VII. PREPARATION OF THE THESIS/DISSERTATION PROPOSAL

Master of Science (MS) students must write their proposal on the first semester of the second year and for PhD students, on the second semester of the third year. Students in this stage should

register in the one (1)-credit MICR 8596 course "Preparation of the Thesis/Dissertation Proposal in Microbiology" under their Advisor section. This course is considered as a full academic load. In this course, a Departmental faculty member assigned by the Departmental Graduate Committee will explain how to write a NIH-like proposal as required by Section IV of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations." The proposal must be based on scientific principles and it is intended as a preliminary outline of research leading to an original contribution to the scientific literature. The student's Advisor is responsible for the supervision, guidance and final grading. The student should present and defend his/her proposal to the Thesis/Dissertation Committee before the semester ends. In case the student does not complete or approve the course requirements in one semester, the student will obtain a grade of "In Progress". If the student does not complete or approve the course in the second semester, he/she will receive a grade of "Incomplete", which must be removed in the following semester.

Students and Advisors that decide to use a different format for the proposal must first obtain approval of the selected style by the Graduate Committee of the Division of Biomedical Sciences.

Students who pass their Dissertation proposal presentation are strongly encouraged to submit an independent pre-doctoral fellowship application to external funding agencies, such as NIH, NSF, Ford Foundation and American Society for Microbiology (ASM) among others. The Ruth L. Kirschstein National Research Service Awards for Individual Pre-doctoral Fellows (F31) format to prepare the proposal document is in the following website:
"http://www.nigms.nih.gov/Training/MARC/MARCPredoctoral.htm."

A. Approval of the Thesis/Dissertation Proposal

A. The student must first obtain approval of the Advisor prior to submit the Proposal to the other members of the Thesis/Dissertation Committee. The proposal is then presented to the Thesis/Dissertation Committee for approval.
B. The Thesis/Dissertation Committee approves the Proposal by signing a final copy.
C. Once approved the Thesis/Dissertation Proposal must be sent to the Associate Dean for Biomedical Sciences. The Thesis/Dissertation Advisor has the responsibility of sending the signed copy to the Graduate Program through the Departmental Chairperson.

VIII. THESIS/DISSERTATION RESEARCH

A. Monitoring the progress of the students

The Thesis/Dissertation Advisor will be responsible for designing the student's research project as soon as the student begins to work in the chosen laboratory. According to Section IV, page 10 of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations" **the student cannot register in Thesis/Dissertation Research until all the requirements for candidacy have been met, including the proposal approval.**

Candidates and their advisors should follow the guidelines in the document titled "Compact between Biomedical Graduate Students and their research Advisors" in the Appendix A of this document.

The Thesis/Dissertation Committee will monitor the progress of the student according to Appendices A and E of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations." **The Advisor and the Thesis/Dissertation Committee should meet with the student at least once a year and submit a brief written annual report (Appendix E) to the Departmental Graduate Committee.** The Departmental Graduate Committee will keep a copy of the written progress report and will forward the original to the Graduate School for inclusion in the student permanent record. The student will also meet with the Thesis/Dissertation Committee when he/she and his/her Thesis/Dissertation Director feel that the work is completed. The student's committee then decides if he/she has fulfilled the proposed research requirements (Section VI, page 13). The student is then allowed to proceed with the writing of his/her Thesis/Dissertation. The decision of the Committee is then forwarded to the Chairperson of the Department with a copy send to the Departmental Graduate Committee.

It is expected that the student publishes at least one (1) research article in a peer review journal prior to the Final Oral Defense (Section VIII, page 22 of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations."

B. Preparation of Thesis/Dissertation Manuscript

Prior to writing the initial Thesis/Dissertation draft, the student must meet with the Thesis/Dissertation Committee to verify that the experimental work has been adequately completed and which style should be used (Traditional or Subdivided in article format). The guidelines to write the thesis/dissertation are specified in Section VI of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations." The student and the advisor will have a maximum of six calendar months to prepare the preliminary thesis/dissertation draft, from the date of the permission granted by the Thesis/Dissertation Committee.

C. Thesis/Dissertation defense and final approval

The thesis/dissertation defense and requirements for final approval will be performed as described in Section VII of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations."

The Departmental Graduate Studies Coordinator will certify that the student has met all the Departmental courses and Graduate Program requirements. The schedule for the thesis/dissertation defense will be issued according to the recommendations of the student and Thesis/Dissertation Advisor following Appendix D of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations."

For the Master's Candidate**,** at least three (3) neat printed copies of the thesis (previously approved by the Thesis Advisor) will be distributed to the Thesis Committee at least two (2) weeks prior to the scheduled defense. For the PhD Candidate**,** at least five (5) neat printed copies of the dissertation will be distributed to the Dissertation Committee at least three (3) weeks prior to the scheduled defense.

Once the Thesis/Dissertation has been corrected and the student feels he/she is prepared, he/she will ask his/her Thesis/Dissertation Director to submit a schedule for the final Thesis/Dissertation Presentation and Defense.

The Thesis/Dissertation Oral Presentation must cover the following content:

Thesis/Dissertation Oral Presentation	**Time**
Introduction, Long-term Goals, Hypothesis and Specific Aims	15 min
Materials and Methods, Results and Discussion	30 min
Conclusions, Future Plans and Acknowledgments	5 min
Total	**50 min**

During the Thesis/Dissertation Presentation, the student will take 50 minutes to describe briefly the thesis research, after which the presentation will be opened for questions from the members of the audience on matters pertaining directly to the area of the thesis research. Afterwards, the Thesis/Dissertation Committee will meet in private with the student and members of the Committee to conduct a final oral examination of the thesis work. Finally, the student will be excused and the Committee will vote as to the final approval of the thesis, content, and presentation. A majority vote in favor will be required for final approval of the thesis and the oral presentation. If the Thesis/Dissertation Committee feels that the student has not demonstrated sufficient knowledge of the matters discussed, the student will be asked to present again and resubmit a new date within 6 months for his/her oral presentation according to the requirements described in the document Section VII of the "Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations".

IX. STUDENT'S RESPONSIBILITY

The student is required to attend all scientific and academic activities sponsored by the Department of Microbiology and Medical Zoology (Seminars and Thesis/Dissertation Presentations) during the course of his/her studies.

It is the student responsibility to understand and comply with the rules and regulations of the Master or Doctoral Program in Microbiology and Medical Zoology (summarized in this document) as well as those of the Graduate School of Biomedical Sciences ("Manual for the Master of Science and Doctor of Philosophy Degrees Requirements and Regulations").The Thesis/Dissertation Advisor and the Thesis/Dissertation Committee, as well as the student, have the responsibility to make sure that the student has fulfilled and complied with all of the requirements for the degree.

APPENDIX A

Compact Between Biomedical Graduate Students and Their Research Advisors

These guiding principles, known as the Compact Between Biomedical Graduate Students and Their Research Advisors, are intended to support the development of a positive mentoring relationship between the pre-doctoral student and their research advisors. A successful student-mentor relationship requires commitment from the student, mentor, graduate program, and institution. This document offers a set of broad guidelines which are meant to initiate discussions at the local and national levels about the student-mentor relationship.

Compact Between Biomedical Graduate Students and Their Research Advisors

Pre-doctoral training entails both formal education in a specific discipline and an apprenticeship in which the graduate student trains under the supervision of one for more investigators who are qualified to fulfill the responsibilities of a mentor. A positive mentoring relationship between the pre-doctoral student and the research advisor is a vital component of the student's preparation to become not only an independent and successful research scientist but also an effective mentor to future graduate students.

Individuals who pursue a biomedical graduate degree are expected to take responsibility for their own scientific and professional development. Faculty who advise students are expected to fulfill the responsibilities of a mentor, including the provision of scientific training, guidance, instruction in the responsible conduct of research and research ethics, and financial support. The faculty advisor also performs a critical function as a scientific role model for the graduate student.

Core Tenets of Pre-doctoral Training

Institutional Commitment

Institutions that train biomedical graduate students must be commitment to establishing and maintaining high-quality training programs with the highest scientific and ethical standards. Institutions should work to ensure that students who complete their programs are well-trained and possess the foundational skills and values that will allow them to mature into independent scientific professionals of integrity. Institutions should provide oversight for the length of study, program integrity, stipend levels, benefits, grievance procedures, and other matters relevant to the education of graduate students. Additionally, they should recognize and reward their graduate training faculty.

PO Box 365067, San Juan, PR 00936-5067
Tel. (787) 758-4639, Fax (787) 767-8693

Program Commitment

Graduate programs should endeavor to establish graduate training programs that provide students with the skills necessary to function independently in a scientific setting by the time they graduate. Programs should strive to maintain scientifically relevant course offering and research opportunities. Programs should establish clear parameters for outcomes assessment and closely monitor the progress of graduate students during their course of study.

Quality Mentoring

Effective mentoring is crucial for graduate school trainees as they begin their scientific careers. Faculty mentors must commit to dedicating substantial time to graduate students to ensure their scientific professional and must commit to dedicating substantial time to graduate students to ensure their scientific, professional and personal development. A relationship of mutual trust and respect should be established between mentors and graduate students to foster healthy interactions and encourage individual growth. Effective mentoring should include teaching the scientific method, providing regular feedback in the form of praise and constructive criticism to foster individual growth, teaching the "ways" of the scientific enterprise, and promoting students' careers by providing appropriate opportunities. Additionally, good graduate school mentors should be careful listeners, actively promote and appreciate diversity, possess and consistently exemplify high ethical standards, recognize the contributions of students in publications and intellectual property, and have a strong record or research accomplishments and financial support.

Provide Skills Sets Counseling that Support a Broad Range of Career Choices

The institutions, training programs, and mentor should provide training relevant to academic, industrial, and research careers that will allow their graduate students to appreciate, discuss, and develop their career choices. Effective and regular career guidance activities should be provide, including exposure to academic and non-academic career options.

Commitments of Graduate Students

- **I acknowledge that I have the primary responsibility for the successful completion of my degree.** I will be committed to my graduate education and will demonstrate this by my efforts in the classroom and the research laboratory. I will maintain a high level of professionalism, self-motivation, engagement, scientific curiosity and ethical standards.

- **I will meet regularly with my research advisor and provide him/her with updates on the progress and results of my activities and experiments.**

PO Box 365067, San Juan, PR 00936-5067
Tel. (787) 758-4639, Fax (787) 767-8693

- **I will work with my research advisor to develop a thesis/dissertation project.** This will include establishing a timeline for each phase of my work. I will strive to meet the established deadlines.

- **I will work with my research advisor to select a thesis/dissertation committee.** I will commit to meeting with this committee at least annually (or more frequently, according to program guidelines). I will be responsive to the advice of and constructive criticism from my committee.

- **I will be knowledgeable of the policies and requirements of my graduate program, graduate school, and institution.** I will commit to meeting these requirements, including teaching responsibilities.

- **I will attend and participate in laboratory meetings, seminars and journal clubs that are part of my educational program.**

- **I will comply with all institutional policies, including academic program milestones.** I will comply with both the letter and spirit of all institutional safe laboratory practices and animal-use and human-research policies at my institution.

- **I will participate in my institution's Responsible Conduct in Research Compliance Program, and practice those guidelines in conducting my thesis/dissertation research.**

- **I will be a good lab citizen.** I will agree to take part in shared laboratory responsibilities and will use laboratory resources carefully and frugally. I will maintain a safe and clean laboratory space. I will be respectful of, and work collegially with all laboratory personnel.

- **I will maintain a detailed, organized, and accurate laboratory notebook.** I am aware that my original notebooks and all tangible research data are the property of my institution but that I am able to take a copy of my notebooks with me after I complete my thesis/dissertation.

- **I will discuss policies on work hours, sick leave and vacation with my research advisor.** I will consult with my advisor and notify fellow lab members in advance of any planned absences.

- **I will discuss policies on authorship and attendance at professional meetings with my research advisor.** I will work with my advisor to submit all relevant research results that are ready for publication in a timely manner prior to my graduation.

PO Box 365067, San Juan, PR 00936-5067
Tel. (787) 758-4639, Fax (787) 767-8693

- **I acknowledge that it is primarily my responsibility to develop my career following the completion of my doctoral degree.** I will seek guidance from my research advisor, career counseling services, thesis/dissertation committee, other mentors, and any other resources available for advice on career plans.

Commitments of Research Advisors

- **I will be committed to the life-long mentoring of the graduate student.** I will be committed to the education and training of the graduate student as a future member of the scientific community.

- **I will be committed to the research project of the graduate student.** I will be help to plan and direct the graduate student's project, set reasonable and attainable goals, and establish a timeline for completion of the project. I recognize the possibility of conflicts between the interests of externally funded research programs and those of the graduate student, and will not let these interfere with the student's pursuit of his/her thesis/dissertation research.

- **I will be committed to meeting one-on-one with the student on a regular basic.**

- **I will be committed to providing financial resources for the graduated student through, the requirements and deadlines of his/her graduate program as well as those of the institution, including teaching requirements and human resources guidelines.**

- **I will help the graduate student select a thesis/dissertation committee.** I will assure that this committee meets at least annually 9or more frequently, according to program guidelines0 to review the graduate student's program.

- **I will expect the graduate student to share common laboratory responsibilities and utilize resources carefully and frugally.**

- **I will not require the graduate student to perform task that are unrelated to his/her training program and professional development.**

- **I will discuss authorship policies regarding papers with the graduate student.** I will acknowledge the graduate student's scientific contributions to the work in my laboratory, and I will work with the graduate student to publish his/her work in a timely manner prior to the student's graduation.

PO Box 365067, San Juan, PR 00936-5067
Tel. (787) 758-4639, Fax (787) 767-8693

- **I will discuss intellectual policy issues with the student with regard to disclosure, patent rights and publishing research discoveries.**

- **I will encourage the graduate student to attend scientific/professional meetings and make an effort to secure and facilitate funding for such activities.**

- **I will provide career advice and assist in finding a position for the graduate student following his/her graduation.** I will provide honest letters of recommendation for his/her next phase of professional development. I will also be accessible to give advice and feedback on career goals.

- **I will provide for every graduate student under my supervision an environment that is intellectually stimulating, emotionally supportive, safe, and free of harassment.**

- **Throughout the graduate student's time in my laboratory, I will be supportive, equitable, accessible, encouraging, and respectful.** I will foster the graduate student's professional confidence and encourage critical thinking, skepticism and creativity.

I hereby certify that both (the student and the advisor) read and discuss with each other the document above, and we are committed in benefit of the research and the developing of the student training in the Graduate Program.

_____	_____
Advisor's Name and Signature	Student's Name and Signature
_____	_____
Department	Program
_____	_____
Date	Date

Aprobado: Comité Graduado (4-nov-2009)

PO Box 365067, San Juan, PR 00936-5067
Tel. (787) 758-4639, Fax (787) 767-8693