

**MOLECULAR MICROBIOLOGY & IMMUNOLOGY-VETERINARY PATHOBIOLOGY  
GRADUATE PROGRAM STUDENT HANDBOOK**

(Revised June 3, 2009)

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## I. PROGRAM OVERVIEW

The Department of Molecular Microbiology & Immunology (MMI), in partnership with the faculty from the Department of Veterinary Pathobiology (VPB), offers a comprehensive graduate program leading to the Doctor of Philosophy (Ph.D.) degree. This program provides individualized training that is strongly oriented toward basic research in molecular and cellular biology, microbial pathogenesis, immunology and host-parasite interactions. Graduates completing this training are prepared to pursue challenging and rewarding professional careers that involve research and teaching at supervisory levels in both the academic and private sectors.

Graduate students entering into the program should be highly motivated toward a career in research in microbiology. They must have, as a minimum, a baccalaureate degree with an undergraduate record showing superior performance in introductory and advanced coursework in prerequisite subjects (biology, chemistry, physics, and mathematics). They must have taken the Graduate Record Examination and should have superior scores. Additionally, international applicants will require demonstration of English fluency via TOEFL scores. Letters of recommendation from individuals who are qualified to judge should clearly indicate aptitude for, and dedication to, a career in science.

The MMI and VPB Departments are central components of an interdisciplinary campus eminence program in molecular biology, which also involves molecular biologists in biochemistry and biological sciences as well as many other University departments. Program core facilities provide cell culture and immunology services, DNA sequence analysis, micro array analysis, protein structural analysis, transgenic animals, protein expression, proteomics, electron microscopy and molecular cytology.

### Graduate Training

The wealth of genomic information available at the outset of the 21st Century has illuminated the vast diversity of the earth's microbial biomass. This immense diversity highlights an almost unlimited flexibility among bacteria, viruses and parasites to experiment with genetic combinations and continuously emerge in forms that are capable of adapting to natural and human-driven changes to their environments. There are the enormous potential benefits of harnessing the great diversity in microbial metabolism to tackle significant environmental problems like bioremediation of toxic environmental pollutants and the generation of unlimited energy supplies in microbe-driven fuel cells. In this atmosphere there is an increased emphasis on the important development of strong linkages between the fundamental sciences of microbial pathogenesis and the human and animal immune systems, and to develop translational partnerships that will enable the application of these research findings to infectious disease threats.

### MMI and VPB History

MMI has a long history of providing graduate and postgraduate training opportunities in the laboratories of established scientists with diverse research interests in microbial physiology and genetics, viral gene regulation and pathogenesis, pathogen-host interactions, immunity to infectious diseases, and basic immune function.

Faculty in this training program have achieved international recognition for their scientific contributions and expertise, with their research efforts funded through stringent peer-reviewed grants from federal agencies. Mark A. McIntosh (Ph.D., U. Texas-Austin, 1978) has held the position of department chair since June 1, 2002. Dr. McIntosh is internationally recognized for his work on the molecular genetics of bacterial acquisition and transport of iron.

The first Ph.D. degree was conferred in 1927 on Esther Wagner Stearn who studied under Mazyck P. Ravenel (MD, State College of South Carolina, 1884), Professor of Medical Bacteriology and Preventive Medicine, 1914-1932, 1942-1946. The title of her dissertation was "Mutation of Characters of Bacteria as Defined by the Action of Gentian Violet in its Staining and Bacteriostatic Effect." Dr. Ravenel's major contribution was his comparative studies on the virulence of bovine and human strains of *Mycobacterium tuberculosis* (The Lancet, August 10, 1901, pp. 349-356). His results argued against Robert Koch's opinion that bovine tubercle bacilli were of no consequence to human health and led to the pasteurization of milk.

Since 1927, approximately 230 graduate degrees in microbiology have been awarded. The most recent to be awarded her Ph.D. degree, Bethany Kent, studied, "Functional Characterization of Two Putative Mobile Elements of the '*Mycoplasma mycoides* cluster'." The majority of students completing a Ph.D. degree in MMI, go on to work as a post-doctoral fellow and then obtain positions in either an academic institution or private industry. For more information on student placement history visit <http://mmi.missouri.edu/graduateprogram/graduatetables1.php>.

Veterinary Pathobiology resulted from the merger of two College of Veterinary Medicine departments—Microbiology and Pathology—in the early 1990s. Many of the faculty from both original College of Veterinary Medicine departments and the new merged department Veterinary Pathobiology had secondary appointments in MMI and thus were part of the MMI graduate program. In 2002, VPB and MMI agreed to form a merged graduate program with a research focus in immunology and microbiology but with interests in both human and veterinary medicine, taking advantage of the presence of both a veterinary and medical school on the MU campus. This merged MMI-VPB Graduate Program thus has given students a diversity of research opportunities in both immunology and microbiology as well as veterinary and human medicine. With continued expansion of both departments with regard to expertise in the aforementioned areas, this program has continued to grow in terms of the number of faculty and their funded research opportunities as well as graduate students recruited into this program. Dr. George Stewart represents one of those relative recent recruits and was more recently recruited to become Chair of Veterinary Pathobiology. Dr. Stewart's research focuses on bacterial pathogenesis ranging from virulence gene expression to regulation of sporulation in several different pathogenic bacteria.

## **II. PROGRAM COMPONENTS**

### **Program of Study**

The course of study is designed to build strength in fundamental principles of microbiology, immunology and molecular biology, but can be flexible to meet the interests and needs of individuals. It may involve a minor field and demonstration of competence or completion of appropriate coursework in a scientifically useful discipline outside the usual study plan, such as statistics or computer science.

### **The Doctor of Philosophy (Ph.D.) Degree**

The program involves (i) a course of study which includes required and elective course work, (ii) participation in programmatic seminars and journal clubs, (iii) training in teaching through participation in lecture and laboratory courses for undergraduates, (iv) a comprehensive examination designed to evaluate a student's ability to propose and experimentally evaluate a significant scientific question, and (v) the successful completion of a creative and original scholarly research project.

### **Degree Options**

#### **Ph.D. Degree**

On average, the graduate degree program will require four to five years of full-time effort, although this may vary depending on the ability and previous experience of the individual student. A Master's Degree is not a prerequisite for the Ph.D. degree.

#### **Dual Degree**

A program leading to the combined Ph.D./M.D. degrees can be designed for students who are admitted to the Medical School and to the MMI-VPB Graduate Program. It is anticipated that these students will fulfill their first two years of Medical School PBL academic requirements before entering the MMI-VPB Graduate Program for the research-oriented Ph.D. degree. All coursework, TA responsibilities, rotations, comprehensive examination and research requirements are the same as for any other graduate student. Dual degree students will be encouraged to complete research rotations during the summer semesters of their two years of medical curriculum so that a dissertation research project can be initiated immediately upon entering the Ph.D. program. Typically, clinical responsibilities for the M.D. will be completed after fulfillment of the requirements for the Ph.D.

## **The Master of Science (M.S.) Degree**

Under exceptional circumstances, the Program may also offer the M.S. degree. Admission requirements are the same as for doctoral candidates, though successful completion of a comprehensive examination is not a requirement for the Master's candidate. Students, opting for a M.S. degree, must complete a research project and write and defend a Master's thesis in front of their Doctoral committee. The Masters Committee should consist of at least four faculty members including the mentor. At least three of the faculty members should be from the MMI-VPB Graduate Program and at least one faculty member from outside of the adviser's primary department.

## **Requirements for Qualifying and Comprehensive Exam**

Each student will be required to master two phases of the curriculum, qualifying and advanced, designed to achieve the educational objectives described above. The MMI-VPB Graduate Program Curriculum Committee makes decisions regarding additions or changes to the basic curriculum. Due to the changing environment in this field of research, the MMI-VPB Graduate Program curriculum may be subject to change.

### **Qualifying Phase**

A required basic series of courses is designed to establish a foundation in microbiology and immunology (e.g., MMI 7304 Immunology) with additional courses (depending upon student needs) in biochemistry (Bio chem. 7270 and 7272) and molecular biology (Bio Sic 7976).

### **Advanced Phase**

It is expected that advanced courses in molecular genetics MMI 9430 and 9432, immunology MMI 9407 and microbial pathogenesis MMI 8404 will comprise the core curriculum, although alternative courses may be prescribed by the Graduate Student Advisory Committee and by Doctoral committees based upon individual student needs. Satisfactory performance is defined as a grade of B or above in these 8000/9000 level courses. Unsatisfactory performance(s) must be corrected according to the recommendations of the Graduate Student Advisory Committee. Such recommendations may include retaking the course(s), additional examinations, or dismissal from the Graduate Program.

## **Goals and Purpose of Qualifying and Comprehensive Exams**

### **Qualifying Exam**

Because advanced level courses will assume familiarity with biochemistry, students are strongly advised to achieve a basic level of proficiency in biochemistry during their first year in the program. Each student is expected to pass these qualifying courses with a grade of B or above and will be reviewed by the Graduate Student Advisory Committee. In the event of unsatisfactory performance in a basic course, the Graduate Student Advisory Committee will administer a Qualifying Examination in that subject area to remedy the academic deficiency. The Exam will be equivalent to a comprehensive final examination covering the course material for that particular subject area. The student will be considered on Academic Probation until the Qualifying Exam is evaluated. Any required Qualifying Exams will be administered in June of each year and evaluated prior to the student's next academic semester. The Qualifying Exam cannot be used as a substitute for the coursework. Failure to pass the Qualifying Exam or unsatisfactory performance in more than one basic course will initiate an evaluation process by the Graduate Student Advisory Committee that will determine whether the student can continue in the graduate program.

### **Comprehension Exam**

Each graduate student will participate in the Program comprehensive examination, which consists of the preparation and oral defense of an NIH-type grant proposal dealing with specific and unanswered questions in microbiology/molecular biology/immunology. This examination will be administered subsequent to completion of required course work, but prior to the end of the student's third year in residence. The student's doctoral committee administers the examination; however, participation by all other program faculty members is encouraged. Toward this end, the proposal should be on file with the Course Coordinator and an announcement of the time and place of the examination will be announced at least one week prior to the examination. A report from the doctoral committee for each student is due to the Graduate Student Advisory Committee by its June meeting of that year, detailing the outcome of the examination or a time schedule for its completion by the end of the summer semester. If an individual faculty adviser or doctoral committee has

concerns about a specific student completing the examination by the August deadline, an appeal should be made to the Graduate Student Advisory Committee at their June meeting describing these concerns and a course of action (including timetable) to fulfill this important academic obligation; this course of action must be approved by the Graduate Student Advisory Committee.

The examination will be generated from research proposal abstracts developed by the student and presented to the student's doctoral committee. The doctoral committee has jurisdiction over the number and scope of the research proposal abstracts, but at least one detailed abstract (4-5 pages including references) that defines the problem, the rationale, and the research strategy is required. Subjects may be related to the student's thesis research field but may not be the actual research project. Students may submit, or the doctoral committee may require, more than one abstract with the purpose of developing one that is suitable for this exercise. Once the committee has determined the proposal details, the student is expected to develop it further using NIH grant guidelines and format (an NIH 398 form), a process, which usually is given four to six weeks. The proposal should conform to the NIH page limitations and should include the following sections:

**Abstract** – a concise statement of the problem including research objectives (or specific aims), their rationale, and the research strategy for reaching these objectives.

**Specific Aims** – a list of the research objectives and what the specific experiments proposed are intended to accomplish.

**Background and Significance** – a summary of the background information leading to the formulation of this proposal; a critical evaluation of that existing knowledge base and identification of the important questions this project is intended to address; a statement of the importance (health relevance) of the research plan.

**Preliminary Studies** – a recapitulation of relevant experiments from the literature (since the student is not describing his/her own research project) that support the specific objectives of the experimental plan.

**Research Design and Methods** – a detailed description of the research strategies and specific procedures to be used to accomplish the specific aims of the project.

The student will be evaluated both on the written proposal and through an oral examination in which the student will argue the strengths and weakness of this particular research plan. It is expected that both the written document and the oral defense will be of the highest scientific quality. Comprehension Exam Evaluation Criteria includes (but are not limited to) the following:

### Written proposal

a. Adherence to NIH organizational format (NIH 398).

**Presentation** – the proposal should be grammatically correct and checked for spelling errors; it should be well illustrated.

b. **Clarity of scientific content** – the proposal should be clearly and concisely presented; the experimental plan should include a discussion of rationale, expected results, technical limitations, and alternative experimental approaches; techniques (protocols) should be referenced where possible and described in terms of their objectives and expected outcomes, and not their details (except where necessary).

c. **Strength of scientific arguments** – the proposal should critically define the scientific impact of the study proposed and the rationale for the experimental strategy employed; creativity that is scientifically sound, documented by references to the literature and clearly presented will be viewed favorably.

d. **Scope** – representative of an extensive/exhaustive review of the current literature regarding the chosen topic.

### Oral examination

a. **Organization and presentation** – as with any seminar, the student should lead the committee through an organized discussion of the key information that establishes the importance of the question being addressed and the details of the experimental plan to address it; the discussion should be well illustrated to emphasize those key points and not simply a reiteration of the written proposal which the committee has already read.

- b. **Knowledge of the field** – the student is expected to have a thorough understanding of pertinent subject matter relevant to the problem being discussed; responses to questions from the committee should be reasoned, lucid and supported by references to the literature.
- c. **Knowledge of the technical parameters of the experimental plan** – the student should know the details of the design, what parameters are critical to the outcome of the experiment, what technical limitations must be considered, and what alternative strategies are possible should the committee discussion conclude that the proposed experiments fall short of their objectives.
- d. **Cognitive and analytical abilities** – the student will be evaluated on his/her ability to recognize the strengths and weaknesses of the proposal from the committee discussion, to assess the significance of the data generated from this project with respect to the field and to present a reasoned set of theoretical arguments that support the objectives of the research plan.

## **Goals and Purpose of the Thesis/Dissertation**

### **Ph.D. Dissertation Guidelines**

The final education requirement for the Ph.D. degree is the written and oral presentation of a novel and creative piece of scholarly research that represents new information and significantly advances knowledge in that field of research. The dissertation project must be approved by the student's doctoral committee and should demonstrate the student's scientific maturity and ability to write in a scholarly fashion. At the completion of the dissertation research, the student will present his/her research findings in a public seminar for program faculty and personnel and will defend the project before his/her doctoral committee. The project will be detailed in a formal written thesis that conforms to Graduate School guidelines with respect to format. Approval of the scientific content of the thesis is the responsibility of each doctoral committee and requires the signature of each committee member, with no more than one dissenting or abstaining vote. The evaluation will consider the following guidelines with respect to thesis content.

- a. **Introduction** – The manuscript should describe pertinent background material that establishes the foundation for the overall thesis proposed as well as the specific research questions being addressed and the significance of this project with respect to the field.
- b. **Materials and Methods** – The thesis should describe in detail the experimental protocols used in the study; where applicable, references to published protocols should be made, but modifications to such procedures should be defined. The methods may be presented as a component of each Results chapter, or may be combined into a single, separate chapter.
- c. **Results** – Presentation of the data accumulated during the study that is relevant to the thesis being examined and the conclusions reached. The data should be presented in chapter format, with each chapter devoted to particular questions relative to the overall thesis. Since students are encouraged to publish their work during their graduate studies, these chapters may represent those publications (however, the student must be responsible for the writing and presentation of this work in the thesis).
- d. **Discussion** – While each chapter presenting research data may contain a discussion of those specific data, the thesis should be concluded with a summary discussion that presents the student's overall conclusions about the study and the relevance of this work to the field as a whole. This summary provides the student an opportunity for knowledgeable speculation as to the significance of the work and its impact on the field.

### **Program of Study**

The program involves satisfactory completion of a minimum of 72 hours of graduate study as well as completion of original research and a thesis, which demonstrates research competence, although of a more limited scope than the doctoral dissertation. Of the 72 hours graduate credit, 15 hours must be in courses numbered 8000/9000.

### III. DEGREE REQUIREMENTS

#### Program requirements for students entering prior to 2007

The 72 hours of graduate credit are composed of the following:

MMI 8404 Mechanisms of Microbial Pathogenesis	4 hours
MMI 9403 Advanced Medical Microbiology (teaching assistant)	2 hours
MMI 9407 Advanced Immunology	3 hours
MMI 9411 or VPB 8641 or equivalent Research Ethics course	1 hour
MMI 9430 Molecular Biology I	4 hours
MMI 9432 Molecular Biology II	4 hours
MMI 9085 Problems (rotations)	
MMI 9087 Seminar (a maximum of 4 hours toward the required 72 hours)	
MMI 9090 Research	
Other 7000, 8000, and 9000 level courses not listed above	

#### Program requirements for students entering in 2007 and beyond

The 72 hours of graduate credit are composed of the following:

MMI 9087 Seminar (1)-4 semesters (taken for credit in the Spring semesters of years 2-5; maximum of 4 hrs toward the required 72 hours)

MMI 9411 or VPB 8641 or equivalent Research Ethics course 1 hour

MMI 9403 Advanced Medical Microbiology (teaching assistant) 2 hours

Preparatory (7000-level) courses as necessary in the first year, depending on the background of the student (almost all students take at least one of these):

- MMI 7304 Immunology 3 hours
- Bio. Sc. 7976 Molecular Biology 3 hours
- Biochem 9001 Macromolecular Structure and Function 4 hours

MMI 9001 Graduate Student Survival Course 1 hour

MMI 8404 Mechanisms of Microbial Pathogenesis 4 hours

Menu 1. One of the following courses is required:

- MMI 9430 Molecular Biology I 4 hours
- MMI 9432 Molecular Biology II 4 hours
- MMI 9407 Advanced Immunology 3 hours
- MMI 8303 Virology 3 hours

Menu 2. One of the following courses is required:

- Any of the courses in Menu 1, not taken to fulfill Menu 1
- 8000/9000-level electives: these are being examined by Curriculum Committee and need to be approved (examples are given below):
  - Bio. Sc. 8350 Advanced Cellular Biology 3 hours
  - Bio. Sc./Biochem 9460 Cancer Biology 3 hours
  - MMP 9426 Transmembrane Signaling 4 hours
  - Bio Sc. 8320 Developmental Genetics 3 hours
  - Bio. Sc. 8440 Integrated Neuroscience I 3 hours

- Bio. Sc. 8442 Integrated Neuroscience II 3 hours
- Plant Sciences 9001 Plant Genomics 3 hours
- MPP 9435 Skeletal Muscle 3 hours
- VPB 8436 Pathogenic Mechanisms in Vet Path 3 hours

While only 3 of the more formal 8/9000 level courses (see above) are required, the Curriculum Committee recommends that advisers and doctoral committees add an additional course (or courses) as deemed necessary for any student. This should be the norm rather than the exception. This is meant to give faculty advisers and students as much flexibility as possible to best prepare students in their subdisciplines. Extra courses could include 7000-level (statistics) or even professional courses (veterinary parasitology) as well as any of the above 8/9000-level courses.

### Laboratory Rotations

All new graduate students admitted into the MMI-VPB Graduate program are required to complete three laboratory rotations within their first six months. Students will meet with the Director of Graduate Studies prior to each rotation to determine the appropriate laboratory and rotation adviser. Laboratory rotations expose graduate students to research activities within the Program and to the experimental laboratory environment in which they will evolve. Prior to finishing the third laboratory rotation the graduate student selects a mentor. Mentor selection is a mutual agreement between the student and the mentor. Once the mentor has been selected the student will continue to do research under the guidance of the mentor in his/her lab.

### Laboratory Rotation Schedule

The MMI-VPB Graduate Student Laboratory Rotation Program represents a vehicle to introduce the research laboratory to incoming students and to stimulate a direct interaction between students, faculty and other program personnel. The program is designed to expose students as quickly as possible to research activities within the Program and to the experimental laboratory environment in which they will evolve.

Laboratory rotations should adhere to the following schedule:

Rotation	Dates
Optional	June 1 or Start of summer semester – August 15*
1	September 1 – October 31
2	November 1 – December 31
3	January 1 – February 28
Optional	March 1 – April 30*

\*With permission of Director of Graduate Studies and Department Chairs

Students who wish to enter the program early and complete a laboratory rotation during the summer semester preceding their first academic semester may do so and thereby eliminate the January 1 through February 28 rotation. This summer rotation should begin no earlier than June 1 and end no later than the first day of classes for the fall semester.

### Responsible Conduct in Research

Graduate students are required to participate in the Responsible Conduct in Research course, MMI 9411, VPB 8641, or equivalent (latter must be pre-approved by Graduate Student Advisory Committee). This course offers an open format to discuss important ethical issues concerning the practice of biomedical research. Topics include data management, authorship and citation, animal and human experimentation, and patent issues such as ownership and confidentiality with respect to the products of research. Graduate students may be required to attend this course several times during their tenure in this program as mandated by granting agencies.

### Seminars

Graduate students are required to attend Program and internal student seminars. A Program seminar consists of visiting scientists presenting an up-to-date research discussion that continually exposes students to theories

and practices of modern microbiology and immunology. An internal seminar consists of research presentations by program graduate students. This seminar series is a forum to learn and practice oral communication skills as each student describes recent research data to the MMI-VPB Graduate Program Faculty and their peer graduate program students. It also provides a means to evaluate research progress in comparison to student peers and to gain an appreciation of the breadth of research activities within the program. While students are enrolled in Micro 9087 (four semesters), 50% of grade will come from attendance and 50% of grade will come from presentation. Participation in both seminar series is mandatory for all students independent of enrollment in the course. Students in their second through fifth years will enroll in the seminar course during the winter semester. Students are expected to present in the student seminar series during their second and subsequent years unless there are extenuating circumstances (approved by the Director of Graduate Studies) or they will be defending their dissertation in that academic year. When presenting, students should be careful to credit other individuals for research performed by those other individuals when that work is presented in their seminars.

### **Teaching Assistants (TA)**

Graduate students are required to (TA) laboratory courses at least two semesters (~ six laboratory sessions each semester) for undergraduate students in MMI 3200, usually in Winter semester of year 1 and Fall semester of year 2. Student TAs will enroll in MMI 9403, Teaching Advanced Medical Microbiology, only during their second semester of teaching will be graded on their teaching performance according to guidelines established by the course coordinator(s). Teaching assignments will be made for the year based upon the number of TAs required and prior teaching experience of the individual graduate students.

Additional teaching positions on campus and resources for teaching are available to students, with approval of their mentors, wishing to enhance their teaching experience.

### **English-Language Proficiency Requirements for International Students**

Any graduate student who did primary and secondary education (equivalent of K-12 in the U.S.) in a country where English is not the primary language is required by the state of Missouri law to be assessed for English language proficiency. Any student in this category will have to have their language assessed. International graduate students must receive a level 2 or higher on their language assessment to meet the requirements to TA. If they receive a score below 2 additional courses will be recommended for the student to increase their language skills before their English language is reassessed. (Program for Excellence in Teaching, <http://gradschool.missouri.edu/ita/index.html>)

### **Credit Hour Requirements**

The Graduate School requires 72 hours of advanced study to be completed for the Ph.D. degree. A minimum of 15 hours of 8000-level course work, not including Problems 9087 and Research 9090, at most, four hours of seminar 9087 can count toward this requirement.

### **Full-time Student Enrollment**

Graduate student full-time enrollment statuses pre-comprehensive exam:

9 credit hours for fall and winter, 4 credit hours for summer.

Graduate student full-time enrollment statuses post-comprehensive exam:

2 credit hours for fall and winter, 1 credit hour for summer.

Before the student is appointed as a TA they must attend the College Teaching Institute course. In the College Teaching Institute course, students review the principles of good teaching, learn about the cultural practices of American college classes/labs, and then practice those principles in microteaching sessions. The Program will pre-register students upon admission into the program (usually immediately prior to the beginning of the Fall semester of the first year).

## **Reports and Forms**

### **Annual Online Student Assessment Report**

All MMI-VPB Graduate Program students are required to submit an annual online assessment report. The web address for accessing the report is: <https://web.missouri.edu/~umcgradweb/policies/progress/annual-review/progress-system/> . The report describes the student's academic and research progress throughout the year and is due to the Graduate Student Advisory Committee by June 15th of each year. The Graduate Student Advisory Committee is responsible for the report at the end of year 1 for each new student, and the Doctoral committee will be responsible for the annual report thereafter. In each circumstance, the adviser will enter an assessment of the student for the year, and either the Graduate Student Advisory Committee (year 1) or the Doctoral committee (subsequent years) will enter an independent assessment of the student.

### **Graduate School Forms**

The Graduate School requires a series of forms to be completed by the doctoral student: APPENDIX I.

[D1 form](#) – Qualifying Examination Results and Doctoral Committee Approval Form

Submit by the end of the first semester of the second year in the program. This form reports the student's doctoral committee.

[D2 form](#) – Plan of Study for the Doctoral Degree Form

Submit by the end of the first semester of the second year in the program. This form reports the student's plan of study.

[D3 form](#) – Results of the Comprehensive Exam

Submit by the end of year three. This form reports the results of the comprehension exam.

[D4 form](#) – Report of the Doctoral Dissertation Defense

Submit after the dissertation defense. This form reports the results of the dissertation defense.

### **Master's Forms**

The Graduate School requires a series of forms to be completed by the master's student: APPENDIX II.

[M1 form](#) – Program of Study Form

Submit by the end of second semester.

[M2 form](#) – Request for Thesis Committee Form

Submit by the end of second semester.

[M3 form](#) – Report of the Master's Examining Committee Form

Submit after thesis defense.

## Curriculum Timetable

The following timetable illustrates a typical curriculum.

First Year			
Fall	Credits	Spring	Credits
Preparatory 7000 level course <sup>a</sup>	3-4	8/9000 level course (Menu 1 or 2)	3-4
MMI 8404 Microbial Pathogenesis	4	MMI 9085 Problems (Rotations)	0-2
MMI 9085 Problems (Rotations)	0-4	VPB 8641 Research Ethics	1
MMI 9001 Grad. Student Survival	1	MMI 9090 Research <sup>b</sup>	0-5
		Other preparatory course <sup>a</sup>	0-3
Second Year			
Fall	Credits	Spring	Credits
8/9000 level course (Menu 1 or 2)	3-4	8/9000 level course (Menu 1 or 2)	3-4
MMI 9403 Advanced Med. Micro. (TA) <sup>c</sup>	2	MMI 9087 Seminar <sup>d</sup>	1
MMI 9090 Research <sup>c</sup>	3-4	MMI 9090 Research <sup>b</sup>	4-5
Subsequent year(s) (pre-comprehensive exam)			
Fall	Credits	Spring	Credits
MMI 9090 Research <sup>b</sup>	9	MMI 9087 Seminar <sup>d</sup>	1
		MMI 9090 Research <sup>b</sup>	8
Subsequent year(s) (post-comprehensive exam)			
Fall	Credits	Spring	Credits
MMI 9090 Research <sup>b</sup>	2	MMI 9087 Seminar <sup>d</sup>	1
		MMI 9090 Research <sup>b</sup>	1
Summer sessions (all years)			
MMI 9090 Research <sup>b</sup>			

<sup>a</sup>If needed.

<sup>b</sup> Research hours to be determined by adviser, but usually 9 total hrs (4 in summer) are required to maintain full time status pre-comprehensive exam.

<sup>c</sup>~6 laboratory sessions per semester of teaching assistant responsibilities extend for 2 semesters although only 1 semester is to be taken for credit (usually Fall semester, 2nd year).

<sup>d</sup>Seminars should be attended every semester; however only 4 hours count toward degree requirements. Students will take the MMI 9087 during the spring semesters of their 2<sup>nd</sup>-5<sup>th</sup> years, but will be graded on their presentation and attendance throughout the academic year.

## **Doctoral Candidacy**

Candidacy for a doctoral degree is established by passing the comprehensive examination. Status as a continuous enrollment doctoral student begins the term after the term in which the comprehensive exam was successfully completed. Candidacy is maintained by enrolling in 9090 Research for two hours in fall semesters, for one hour (with one hour of seminar) in winter semesters, and for one hour in summer sessions up to and including the term in which the dissertation is defended (only four hours of seminar allowed total). Continuous enrollment provides access to an adviser's support, doctoral program committee guidance and University research facilities for completion of the dissertation. Failure to continuously enroll in 9090 Research until the doctoral degree is awarded terminates candidacy. (Graduate Catalog, <http://gradschool.missouri.edu/programs/catalog/> )

## **IV. SELECTION OF THESIS/DISSERTATION ADVISER**

### **Adviser for New Graduate Students**

During the initial two years of study the Graduate Student Advisory Committee will be responsible for consulting with and advising graduate students in the joint MMI-VPB Graduate Program regarding 1) graduate course requirements, 2) participation in the Graduate Student Laboratory Rotation Program and 3) other Programmatic and university requirements pertinent to their graduate education. The Director of Graduate Studies will also meet with incoming students early in their first semester (August or September) to introduce the graduate education requirements and their timetable. Once a doctoral committee has been appointed by each student, the Director of Graduate Studies and the Graduate Student Advisory Committee will continue to monitor student progress through formal annual reports from those committees.

### **Selecting an Adviser**

The student and the Director of Graduate Studies shall meet prior to each rotation to determine the appropriate laboratory and rotation adviser. The rotation adviser selected must concur in this decision. After the student has completed three lab rotations, he or she will select an adviser by mutual consent from doctoral faculty members who are dissertation supervisors in the graduate program and who can financially support the student. The adviser for each rotation will provide a rotation evaluation of each rotating student to the Director of Graduate Studies within two weeks after the student completes the rotation, and the evaluations will be placed in the student's file for viewing if desired by the student. It is recommended that the adviser verbally communicate the contents of the evaluation report to the student at the end of the rotation before submitting the report to the Director of Graduate Studies.

During the last of the three required rotations, the student should communicate with the advisers with whom he or she is interested in performing his or her dissertation research, and if the faculty member is mutually interested, select an adviser. The final selection shall be communicated to the Director of Graduate Studies by the end of the final rotation, so that the decision can be communicated to the appropriate fiscal officer.

If the graduate student should fail to find an adviser after three rotations, the Graduate Student Advisory Committee may place the student on probation depending on the rotation evaluations and allow the student to perform additional rotations to facilitate the student finding an adviser. If the student fails to find an adviser after additional lab rotations, the Graduate Student Advisory Committee may either allow the student to withdraw from the program or dismiss the student from the program following the procedures in the Graduate Student catalog.

(Guidelines for Termination, Dismissal, Extensions, and Appeals, <http://gradschool.missouri.edu/policies/progress/probation-dismissal.php> )

### **Responsibilities of the Adviser**

- Impartially and constructively evaluate student performance.
- Acknowledge any student contributions to research and/or creative activity, as appropriate, when the results of such activities are presented at conferences, in professional publications, or in applications for copyrights and patents.
- Have a clear understanding with graduate students about their specific responsibilities regarding academic, creative activity, and/or research activities responsibilities, including time lines for completion of comprehensive examinations, research, and the thesis or dissertation, as applicable.

- Discuss the laboratory's authorship policy with graduate students in advance of entering into collaborative projects.
- Perform all of the responsibilities above without regard to religion, race, gender, sexual orientation, nationality, or other criteria that are not germane to the execution of those responsibilities.

(Guidelines for Good Practice in Graduate Education, <http://gradschool.missouri.edu/policies/best-practice/> )

### **Responsibilities of the Advisee**

- Recognize that the faculty adviser provides the intellectual and instructional environment in which the student plans a program of study, is involved with the research, and that he or she, through access to teaching and research funds, provides the student with financial support for the research project.
- Expect that his or her research results, with appropriate recognition, may be incorporated into progress reports, summary documents, applications for continuation of funding, and similar documents authored by the faculty adviser, to the extent that the student's research is related to the faculty adviser's research program and the grants which support that research.
- Recognize that the faculty adviser is responsible for monitoring the accuracy, creativity, validity, integrity, and effective dissemination of the student's research. Careful, well-conceived research reflects favorably on the student, the faculty adviser, the degree program, and MU.
- Exercise the highest integrity in taking examinations, completing master's and doctoral projects, and/or collecting, analyzing and presenting research data in theses, dissertations, and presentations.
- Acknowledge the contributions of collaborators and colleagues to research results that are presented in seminars, on posters, in committee meetings, and in other formats, in accordance with appropriate professional ethics.

(Guidelines for Good Practice in Graduate Education, <http://gradschool.missouri.edu/policies/best-practice/> )

### **Adviser-Advisee Dissolution**

If a student decides that he or she no longer wishes to work with an adviser, he or she may request of the GSAC to find another adviser in the program. Upon this request, the GSAC will meet with the advisee and adviser separately, and solicit input from the student's doctoral committee when possible. If the student is making satisfactory progress, the Graduate Student Advisory Committee will aid the student's search for a new adviser in the program who can financially support the student. If the search for a new adviser fails, the student will either be dismissed from the program following the procedures in the Graduate Student catalog or be allowed to withdraw from the program. Alternatively, if the student is not making satisfactory progress, the Graduate Student Advisory Committee may dismiss the student from the program, following the procedures in the Graduate Student catalog.

(Guidelines for Termination, Dismissal, Extensions, and Appeals, <http://gradschool.missouri.edu/policies/progress/probation-dismissal.php>)

If an adviser chooses no longer to advise a student, the Graduate Student Advisory Committee will meet with both the adviser and advisee separately, as well as solicit input from the student's doctoral committee. If the student is making satisfactory progress, the Graduate Student Advisory Committee will help the student find another adviser within the program who can financially support the student. If the search for a new adviser fails, the student will either be dismissed from the program following the procedures in the Graduate Student catalog or be allowed to withdraw from the program. Alternatively, if the student is not making satisfactory progress, the Graduate Student Advisory Committee may dismiss the student from the program, following the procedures in the Graduate Student catalog.

(Guidelines for Termination, Dismissal, Extensions, and Appeals, <http://gradschool.missouri.edu/policies/progress/probation-dismissal.php>)

### **Adviser Retires or leaves MU**

In the event that an adviser retires or leaves MU, he/she may continue to serve as a student's adviser. If an adviser is unable to continue to serve, the Graduate Student Advisory Committee will assist the student in finding another adviser in the program who can financially support the student, providing the student is making satisfactory progress. If an adviser who is either retiring or leaving the University is unwilling to continue to serve, see second paragraph of Adviser-Advisee Dissolution.

### **Satisfactory Progress**

During the first year of study, satisfactory progress will be defined as passing grades in coursework and satisfactory rotation evaluations, culminating in the student finding a funded adviser for his or her doctoral

research. Subsequently, it will be defined as successful completion of academic coursework and the comprehensive examination, as well as continued research progress toward the student's degree as judged by the adviser and the student's doctoral committee, and usually culminating in publication(s) in refereed journals and continued grant funding for the project.

## V. FORMATION OF THE DOCTORAL COMMITTEE

### Functions of Doctoral committee

The Doctoral committee has primary responsibility for (1) approval of the student's course of study, (2) administration of the individual student comprehensive exam and (3) critical review and approval of the student dissertation project.

### Forming a Doctoral committee

Each student, with advice from his/her mentor and the Director of Graduate Studies, will assemble an Doctoral committee (dissertation committee) composed of at least five members. The committee will be composed of not less than three members of the MMI-VPB graduate faculty and at least one member from a department outside of the adviser's primary department (but at MU). The Chairperson of this committee need not be the student's adviser.

### Changing Doctoral Committee Members

In the event that an adviser retires or leaves MU, he/she may continue to serve as a student's adviser. If an adviser is unable or unwilling to continue to serve, the director of graduate studies and the Graduate Student Advisory Committee will assist to ensure that a replacement is found. In the event of a change of committee member during a student's degree program, the Director of Graduate Studies and the Graduate Student Advisory Committee must approve the changes. A Change of Committee form - <http://gradschool.missouri.edu/downloads/cocform.pdf> is then submitted to the Graduate School for approval.

### Responsibilities of Doctoral Committee members

The Doctoral committee will meet regularly (see timetable below) with the student to evaluate progress toward the graduate education requirements and will produce a formal annual report to program describing this progress.

The committee chair (usually the student's adviser) is responsible for annual completion of the committee's responsibilities according to this timetable. It is suggested that one of these two annual meetings coincide with the student's annual research presentation in the Program student seminar series, rather than adhere strictly to the January/June guidelines.

Year	January	June
1		
2	A, C (Forms D1 & D2), D	A, D, E
3	A, D	A, C (Form D3?), D, E
4	C (Form D3)*, D	D, E
5	D, E	C (Form D4?), D, E
A) Oversee course requirements and academic progress. C) Responsible for completion of D-forms. D) Oversee student research progress. E) Produce annual progress reports.		

\*Form D3 (result of comprehensive exam) must complete by the end of the third year and prior to this meeting.

## VI. THESIS/DISSERTATION DEFENSE AND FINAL ORAL EXAMINATION

### Dissertations

The dissertation must include the results of original and significant investigation, and it must be the candidate's own work.

### Dissertation Guidelines

The final education requirement for the Ph.D. degree is the written and oral presentation of a novel and creative piece of scholarly research that represents new information and significantly advances knowledge in that field of research. The dissertation project must be approved by the student's Doctoral committee and should demonstrate the student's scientific maturity and ability to write in a scholarly fashion.

Students preparing to write a thesis or dissertation have the option of submitting their work to the Graduate School either as a hard copy or on a CD. Thesis/dissertation Guidelines - <http://gradschool.missouri.edu/policies/thesis-dissertation/>

For hard copies the original, unbound dissertation is presented to the Graduate School in a box conforming to its size. One bound copy of the final dissertation is submitted to the mentor and one bound copy is submitted to the Program. All dissertations submitted to the Program will be shelved in MMI library. Deadlines are established each semester for submission of the dissertation to the Graduate School. Consult the Graduate School for these deadlines and for a checklist of the materials to be submitted for graduation.

**Note: Electronic submission will be mandatory fall, 2006.** Electronic Thesis/dissertation Guidelines - <http://gradschool.missouri.edu/academics/etd-guidelines/basics-ch1.htm>

### Dissertation Announcement

At the completion of the dissertation research, the student will present his/her research findings in a public seminar for program faculty and personnel and will defend the project before his/her Doctoral committee. The Program will announce thesis dissertations.

### Dissertation Passing/Failing Criteria

The project will be detailed in a formal written thesis that conforms to Graduate School guidelines with respect to format. Approval of the scientific content of the thesis is the responsibility of each student's doctoral committee and requires the signature of each committee member, with no more than one dissenting or abstaining vote. The evaluation will consider the following guidelines with respect to thesis content.

**Introduction** – The manuscript should describe pertinent background material that establishes the foundation for the overall thesis proposed as well as the specific research questions being addressed and the significance of this project with respect to the field.

**Materials and Methods** – The thesis should describe in detail the experimental protocols used in the study; where applicable, references to published protocols should be made, but modifications to such procedures should be defined. The methods may be presented as a component of each Results chapter, or may be combined into a single, separate chapter.

**Results** – Presentation of the data accumulated during the study that is relevant to the thesis being examined and the conclusions reached. The data should be presented in chapter format, with each chapter devoted to particular questions relative to the overall thesis. Since students are encouraged to publish their work during their graduate studies, these chapters may represent those publications (however, the student must be responsible for the writing and presentation of this work in the thesis).

**Discussion** – While each chapter presenting research data may contain a discussion of those specific data, the thesis should be concluded with a summary discussion that presents the student's overall conclusions about the study and the relevance of this work to the field as a whole. This summary provides the student an opportunity for knowledgeable speculation as to the significance of the work and its impact on the field.

**Credit** – Since in many cases, publications are being included as chapters in dissertations, and since often multiple authors contribute to a publication, only publications on which a student has made a major contribution should be included in a student's dissertation. Furthermore, any of the research

performed by another individual or other individuals (technician, other graduate students, post-doctoral fellows, faculty members, et al.) in that publication should be specifically attributed to that or those individual(s). Thus, students should provide information at the end of each chapter as to which individuals helped or performed which experiments in the chapter other than those performed by the defending student.

## VII. PROGRAM POLICIES

### Academic performance

**Grade Point Average:** A graduate student's grade point average is based on the student's entire graduate record at MU. To remain in good standing, a graduate student must maintain a cumulative GPA of 3.0 or better. To graduate, a student must have an overall GPA of 3.0 in all graduate courses taken at MU and not just those courses listed on a program of study.

(Graduate Catalog, <http://gradschool.missouri.edu/catalog/gradingreq.htm>)

### Incomplete Grades

An incomplete grade (I) may be recorded when the student's work is incomplete but otherwise worthy of credit, or when the instructor is unable to assign a grade at the end of the semester. The student must finish this work (Problems and Research courses exempted) within the next calendar year or the "I" will not be removed.

Grades of incomplete, "I" do not automatically convert to an "F" if not completed. (Graduate Catalog, <http://gradschool.missouri.edu/catalog/gradingreq.htm>)

### Dismissal

At the end of each semester, graduate students with a cumulative GPA below 3.0 are placed on probation. If at the end of the following semester the cumulative GPA is 3.0 or better, the probationary status is removed. A student on probation failing to raise the cumulative GPA to 3.0 may be allowed a second probationary semester. A student is subject to dismissal upon failure to raise the cumulative GPA to 3.0 by the end of the second probationary semester, or at any time a semester/term or cumulative GPA falls below 2.0. Note: Summer session is not counted as a semester. (Graduate Catalog, <http://gradschool.missouri.edu/catalog/dismissals.htm> )

Prior to the formation of a student's doctoral committee (D1 form accepted by Graduate School), the Graduate Advisory Committee for this program will rule on probation and dismissal issues for that student. Once a student's doctoral committee has been formed and met, the doctoral committee will first rule on such matters. If a student's doctoral committee has recommended probation or dismissal, that decision will be communicated to the Graduate Student Advisory Committee, and the latter will subsequently rule on this issue as well. If both committees have placed the student on probation and that probation has not been reconciled, the student's doctoral committee followed by the Graduate Student Advisory Committee may recommend dismissal of the student from this graduate program. The departmental chair of the adviser may then execute that recommendation. All committee decisions on either probation or dismissal will be determined by majority vote. Both the student's doctoral committee and the Graduate Student Advisory Committee will meet with the student when possible before a vote for probation or dismissal is taken. If the chair is the student's adviser, then the two committees' recommendations will determine whether the student is dismissed or retained; if that vote is split, a joint session of the student's doctoral committee and the Graduate Student Advisory Committee will make the decision. Once the student is dismissed by the program, the decision must be approved by the Dean of the Graduate School to take effect.

If issues pertaining to satisfactory progress can not be resolved and persist to a point at which dismissal is being considered, the faculty adviser and the student's doctoral committee and/or the Graduate Student Advisory Committee will meet to decide on the length of probation that is appropriate to remediate the problem. Following this decision, the student will be notified in writing of the duration of the probationary period, which may vary from 30 days to a full semester. The letter will also include an explicit statement of what must be accomplished and by what date in order for the student to be removed from probation and returned to good standing in the program. If the student does not comply with the conditions of probation, a letter (signed by the director of graduate studies) will be sent to the student with notification of dismissal from the degree program. In all instances, dismissal letters (including those referenced above), will inform the student of the right to appeal, first, to the program, and second, to the Graduate Faculty Senate. A copy of the program's letter must

be sent to the Dean of the Graduate School at the same time it is sent to the student, and must be approved by the Graduate School to take effect.

### **Extensions**

When there has been unsatisfactory progress with respect to meeting university-wide Graduate School time to degree limits, the student may file a written request for an extension with the Vice Provost for Advanced Studies and Dean of the Graduate School who will grant or deny the request. The Director of Graduate Studies and the student's major adviser must endorse the extension. If an extension is granted, the student will be given a specified period of time to correct the deficiency. Denial of an extension request is final and binding.

Please contact the Graduate School for more information. (Graduate Catalog, <http://gradschool.missouri.edu/catalog/dismissals.htm> )

### **Appealing a Dismissal**

If the student decides to appeal the program dismissal, the appeal process will take effect through the same committees as the original decision; a letter from the student to the Director of Graduate Studies for the program will initiate the process. As long as a student is in an appeal process, the student should maintain enrollment and continue working on degree program requirements. Students must complete the program appeal process prior to considering an appeal to the Graduate Faculty Senate. If the student does not appeal the program's dismissal, the Graduate School will send the student an official notice of dismissal from the program. (Graduate Catalog, <http://gradschool.missouri.edu/catalog/dismissals.htm> )

### **Grading Comprehensive/Qualifying Examinations**

There are several possible outcomes from this examination that depend upon the strengths and weaknesses of both the written and oral presentations. For the examination to be successfully completed, the committee must vote to pass the student on the entire exam, with no more than one dissenting or abstaining vote.

a. The student is passed for both components and advanced to candidacy for the Ph.D.

b. The student is passed on the written proposal but is found deficient on the oral defense of the proposal. The committee may recommend the second oral defense of the proposal and related subject matter. According to Graduate School guidelines, the student "may not take a second comprehensive examination for at least 12 weeks. Failure to pass the second examination automatically prevents candidacy."

c. The student is passed on the oral examination but the written proposal is found deficient. The committee may recommend the preparation of a revised proposal, with specific instructions, so that the student gains a clear understanding of the writing deficiencies being remediated. The doctoral committee sets the deadline for the revised proposal, and the revisions must be approved before the student may be advanced to candidacy.

d. The student is found deficient on both the written and oral exercises. The committee may recommend a second complete examination on the same or an alternative proposal. The second examination must be given no earlier than 12 weeks (Graduate School guideline) and no later than 16 weeks after the first examination. Under extenuating circumstances, students may petition their doctoral committee to extend the upper limit of the time frame for taking the second comprehensive examination; the Graduate Student Advisory Committee must also approve this request. Failure of the second comprehensive examination automatically prevents candidacy.

The doctoral committee administering a particular comprehensive examination must report its decision to the Graduate School, carrying the signatures of all committee members, and to the Graduate Student Advisory Committee not less than two weeks after the examination is terminated. A separate report describing why the student failed, and if and how those deficiencies can be rectified will be sent to the student and included in his or her permanent record. If failure is reported on any part of the exam, the remedial measures recommended are described above.

## VIII. PROGRAM POLICIES: RESPONSIBLE CONDUCT OF RESEARCH

### Responsible Conduct of Research Program

The mission of the Responsible Conduct of Research Program is to improve and institutionalize the training of graduate students and post doctoral fellows in the responsible conduct of research to foster a university culture of research integrity at the University of Missouri. (<http://gradschool.missouri.edu/programs/responsible-conduct-research/>)

### Dean's Certificate in the Responsible Conduct of Research

Doctoral and postdoctoral students from all disciplines are eligible to participate. Benefits include: Provides training in the responsible conduct of research, promotes integrity in the research process and provides information about current and upcoming regulations and certifications necessary to do research and present yourself as a more informed investigator. For more information visit <http://gradschool.missouri.edu/programs/responsible-conduct-research/>

### Animal Care Quality

The Office of Animal Care Quality Assurance (ACQA) is responsible for advising the MU administration on compliance with federal animal care and use policies and regulations. In addition, the ACQA provides administrative support to the MU Animal Care and Use Committee (ACUC) and oversees the institutional training and occupational health and safety programs related to the use of animals in research and teaching.

The ACQA office works closely with the Office of Animal Resources (OAR) to help maximize the quality of animal research at MU. The OAR office manages several animal housing facilities on campus and oversees the veterinary care program for all animals at MU. Staff in the OAR assist faculty and researchers with procurement of animals and supplies, provide technical support, animal husbandry and health monitoring in the OAR-managed facilities.

Animal care and use protocol review forms are available from the Animal Care Quality Assurance (ACQC), WBC 106 Animal Sciences Center. More information may be found on the Research at MU website - <https://research.missouri.edu/acqa/index.htm> .

## IX STUDENT CONDUCT AND CONFLICT RESOLUTION

### Conflict Resolution Seminars

Students are encouraged to attend conflict resolution seminars sponsored by the Graduate School. For more information visit the graduate school web site at, [http://gradschool.missouri.edu/resources/conflict\\_resolution.htm](http://gradschool.missouri.edu/resources/conflict_resolution.htm) .

### Expectations for Graduate Students' Professional Behavior and Acceptable Behavior

- Devote an appropriate amount of time and energy toward achieving academic excellence and earning the advanced degree.
- Be aware of time constraints and other demands imposed on faculty members and program staff.
- Take the initiative to ask questions that promote understanding of the academic subjects and advances in the field.
- Communicate regularly with faculty advisers, especially in matters related to research and progress within the graduate program and with any teaching responsibilities.

### Conflicts with Faculty

Graduate students are encouraged to work out any conflicts with the mentor. If they cannot come to a mutual agreement the student should seek assistance from the Director of Graduate Studies. The Director of Graduate Studies along with the help of the department chair and/or the Graduate Student Advisory Committee will work with the student and mentor until a mutual agreement is established.

## **X. ASSISTANTSHIP AND FELLOWSHIP POLICIES**

The purpose of a graduate assistantship is to provide a professional development opportunity consistent with a student's educational objectives and to provide financial support for a graduate student within the context of program or grant-related tasks to be performed for a set period of time during which the student is expected to pursue academic and/or professional activities towards the advanced degree. To hold a graduate assistantship, a student must be admitted to a program or area with a specific graduate degree objective and must be enrolled and be making satisfactory progress (3.0 GPA) toward degree attainment during the period of the assistantship. Rights, Privileges and Responsibilities of Graduate Assistants and Fellowship Recipients. <http://gradschool.missouri.edu/financial/assistantships-fellowships/>

### **Graduate Research Assistantships**

To hold a graduate assistantship, a student must be admitted into the program and must be enrolled and be making satisfactory progress (3.0 GPA) toward degree attainment during the period of the assistantship.

All graduate students accepted into the MMI-VPB Graduate program are financially supported while they are making acceptable research progress. Graduate students who are not supported by fellowships receive stipends of \$21,000 pre-comprehensive exam and \$22,000 post-comprehensive exam.

Tuition and health insurance fees for residential/nonresidential students are waived for all qualifying full-time graduate student in MMI-VPB Graduate Program. Students are responsible for paying incidental fees (recreation facility, student activity and information technology), which total on average of \$808.00 per year.

### **Life Science Fellowships**

Both [doctoral](#) and [postdoctoral](#) fellowships are available through the Life Sciences Program. Doctoral fellowships for the 2004-05 academic year carry a stipend of \$21,000 plus tuition waiver and health insurance. Doctoral fellows are generally funded for four years, with evidence of satisfactory performance and progress. For more information visit the life sciences fellowship program, <http://bondlsc.missouri.edu/education/index.php>

### **Minority Biomedical Researchers Training Initiative (MBRTI)**

MBRTI fellowships receive \$21,000 salary plus tuition and fees plus \$3,000 per year for supplies, travel, etc. (One year support guaranteed, second year via discussion). For more information about qualifications visit the MBRTI program, <http://gradschool.missouri.edu/financial/fellowships/fands.pdf> .

### **Health Insurance**

Health benefits are available to all MU students: the Student Health Center, and the Accident and Sickness Insurance program. Payment of the Student Health Center fee is mandatory for full-time students and optional for part-time students. The Center treats short-term conditions such as colds and flu and refers students to specialists or hospital care if necessary. Accident and Sickness Insurance has been available for all students for many years, on a voluntary basis for domestic students, but mandatory for international students since 1998. For detailed information about the optional insurance plans, consult [http://www.aetnastudenthealth.com/stu\\_conn/student\\_connection.aspx?groupID=890430](http://www.aetnastudenthealth.com/stu_conn/student_connection.aspx?groupID=890430) . Health insurance subsidies are waived for all qualifying full-time graduate students in the program.

### **Health Insurance Enrollment**

A graduate student needs to be enrolled in the Accident and Sickness Insurance for Graduate Assistants Attending MU, either Plan I or Plan II. Students can enroll when they register for classes, either in person or by phone. If the student wishes to enroll in the insurance through the cashier's office, they must do so within 30 days of classes. For more health and medical insurance information visit <http://gradschool.missouri.edu/financial/medical-insurance/> .

## Leave of Absence

It will be the responsibility of the student to resolve all issues pertaining to their support (e.g., GRA, GTA, Fellowship or Scholarship) with their adviser or other relevant authority prior to taking an approved leave of absence. These issues include the date when support will be terminated and whether or under what conditions the student will be reinstated for support upon their return. Prior to the completion of the Leave of Absence, the student must notify the program's Director of Graduate Studies (DGS) and the Graduate School so that the reentry process can be initiated.

A graduate assistant unable to fulfill the duties of his or her appointment because of illness or injury shall notify the administrator of his or her major unit as soon as circumstances permit. Similarly, a graduate assistant unable to fulfill the duties of her or his appointment because of birth or adoption of a child shall notify the administrator of her or his major unit as soon as circumstances permit. The appointing unit may adjust the graduate assistant's workload duties as the assistant's physical circumstances reasonably dictate. If total absence from duties becomes necessary, the major unit shall hold the appointment, provided the graduate assistant is still enrolled, for a period of two months, or to the end of the appointment period or of the semester, whichever should occur first. The graduate assistant shall have the right to return to the assistantship, within the original terms of the appointment, at such time as he or she is able to reassume the duties of the position. (Graduate Catalog, <http://gradschool.missouri.edu/policies/enrollment-registration/absence/> ).

## Graduate Student Maternity/Paternity Leave Policy:

Graduate students are allowed a total of two months maternity/paternity leave, of which up to one month may be paid leave upon the approval of the adviser and/or chair.

## Travel Funds

Students wishing to obtain travel money to attend scientific conferences have a variety of sources from which they may apply for funding. These sources should be applied to in the order listed. Forms for the travel awards may be obtained from the MMI website <http://mmi.missouri.edu/studentindex.php>

- a. Travel funds from Adviser's grants (additional criteria at the discretion of the professor).
- b. Funding from the Graduate School (must be a doctoral student, have successfully completed comprehensive examination and be admitted to doctoral candidacy [post-comprehensive exam]).
- c. Funding from the Molecular Biology Program travel awards (must have completed comprehensive examination and want to present research at a national meeting).
- d. Funding of up to \$400.00 year (year being Sept. 1 – Aug. 31<sup>st</sup>) can be requested from the either the Department of MMI or Veterinary Pathobiology (depending on the primary appointment of the adviser) for both pre and post comp students including first year students after permanent lab as been established.
  - The mentor must submit a letter to the Director of Graduate Studies documenting that sources A-C above have been explored and stating purpose for attending the meeting. The Director of Graduate Studies with or without the help of the Graduate Student Advisory Committee, and after consultation with either the MMI or VPB Chair, will consider such requests.
  - Presentations are not required, but strongly encouraged. First year students are waived from presenting at the meeting.
  - Requires 50% cost sharing from mentor.
  - Mentors can request a report from the students following the meeting about the outcome of the meeting.
- e. Students are also encouraged to apply for travel awards from the societies sponsoring research conferences (e.g., ASM and AAI) and directly from the conferences themselves (e.g., Keystone Symposia and Gordon Conferences).

Questions concerning this important Program resource should be directed to the Director of Graduate Studies.

## XI. UNIVERSITY RESOURCES

### **Association of Black Graduate and Professional Students:**

<http://www.students.missouri.edu/~abgps/>

### **Bulletin Board of Funding Opportunities** - A database of external Fellowships

<http://gradschool.missouri.edu/fellows/>

### **Career and Student Development Resources** <http://gradschool.missouri.edu/student-development/>

Resources on job searches, writing, and relationships in graduate school, financial aid, etc.

**Computer Information.** IATS Everything Technology Guide <http://doit.missouri.edu> or Help Desk 573-882-5000

### **Dissertation Research Travel Scholarships**

[http://gradschool.missouri.edu/financial/fellowships/professional\\_presentation.htm](http://gradschool.missouri.edu/financial/fellowships/professional_presentation.htm)

Doctoral students who have successfully completed doctoral comprehensives and have been admitted to candidacy are eligible to compete for a maximum of \$400 for Dissertation Research Travel Scholarships to defray transportation expenses associated with dissertation research. See details, deadline dates, and specific requirements under Application for Dissertation Research Travel Scholarships at this website.

### **Educational Technologies at Missouri** - <http://etatmo.missouri.edu>

Online early feedback, Course management tools (Blackboard & WebCT), Web page design assistance for courses, Instructional design, Access to resources on instructional technology

### **Graduate Professional Council:** <http://students.missouri.edu/~gpc/>

For information about travel scholarships given by GPC:

<http://students.missouri.edu/~gpc/download/travelapp.pdf>

### **Graduate Student Association:** <http://gsa.missouri.edu/>

For information about travel awards given by GSA: <http://gsa.missouri.edu/grants.shtml>

### **Graduate Student Extramural Fellowship Incentive Program**

Graduate students who successfully obtain nationally competitive fellowships of \$10,000 or more annually are eligible for a 5% bonus for each year of the award. See specific requirements at this website.

<http://gradschool.missouri.edu/about-us/initiatives/>

### **Graduate Student Support Program (Health Insurance and Fee Waivers)**

<http://gradschool.missouri.edu/financial/medical-insurance/> Contact: Karen Gruen [GruenK@missouri.edu](mailto:GruenK@missouri.edu)

573-884-2326

### **International Center** - <http://international.missouri.edu/>

Funding opportunities, International fellowships and scholarships, Curators Grants-In-Aid Program for International Students, News and Resources

### **John Bies International Professional Presentation Travel Scholarships and International Dissertation Research Travel Scholarships.**

<http://gradschool.missouri.edu/financial/scholarships-awards/bies-international-travel-scholarship.php>

Doctoral students who have successfully completed doctoral comprehensives and been admitted to doctoral candidacy are eligible for a maximum of \$1500 to defray transportation expenses associated with travel to international professional meetings or defray international transportation expenses associated with dissertation research. See details for deadline dates and specific requirements under John Bies International Professional Presentation Travel Scholarship and International Dissertation Research Travel Scholarship.

**Library Tours** - New graduate students to the MU campus may find it useful to take one of the library tours offered. <http://mulibraries.missouri.edu/guides/classestours/default.htm>

**Minor in College Teaching** - <http://gradschool.missouri.edu/catalog/minors.htm>

12 credit hours beyond major program; 6 hours of core courses, 3-6 hours of Teaching Practicum, 3 hours of Teaching Electives, Teaching Portfolio.

### **MU Counseling Center**

<http://www.missouri.edu/~councwww/index.html>

The Counseling Center assists students who are having difficulties with their experiences at MU. Services include individual, couples, and group counseling, crisis intervention, biofeedback and stress management, testing, outreach presentations, and consultation to university departments, faculty, and staff. The Counseling Center has also begun offering a Dissertation Support Group.

**Preparing Future Faculty - PFF:** <http://gradschool.missouri.edu/programs/preparing-future-faculty/>

PFF Fellows visit a mentor at a partner institution 1-2 times per semester, and participate in monthly class meetings and professional development/career workshops. GRS 9010 and 9020 for 1 credit hour each semester.

### **Professional Presentation Travel Scholarships:**

<http://gradschool.missouri.edu/financial/scholarships-awards/presentation-travel-scholarship.php>

Doctoral students who have successfully completed doctoral comprehensives and been admitted to doctoral candidacy are eligible for a maximum of \$250 Professional Presentation Travel Scholarship. See details for deadline dates and specific requirements under Application for Professional Presentation Travel Scholarship.

**College Teaching Resources** - <http://gradschool.missouri.edu/student-development/college-teaching/>

College Teaching Seminar, TeachNet, Multicultural Community Hour, Early Feedback, Class Observations, English Language and teaching courses for International Teaching Assistants, Teaching Renewal Conference.

**Online Teaching Manual** - <http://teachandlearn.missouri.edu/guide>

Practical suggestions for beginning teachers including topics such as handling crises in the classroom, lectures, labs, first day of class, classroom management, communication, problem based learning, etc.

**Software training courses** - Offered at no charge to students.

<http://iatservices.missouri.edu/training/catalog.html>

**Statistics Help** <http://sssc.coas.missouri.edu>

The Social Science Statistics Center provides MU graduate students with assistance with projects, theses, and dissertations. Check this website for a description of their services.

### **Writing Help**

The Learning Center Writing Lab offers free, fifty-minute writing consultations for MU graduate students. Graduate students may come for help with short papers, seminar reports, letters, or vitas. To make appointments, call the Learning Center Writing Lab at 573-882-2493.

<http://gradschool.missouri.edu/financial/assistantships-fellowships/fellowships/external/writers-guide-2008.pdf>

## **XII. SURVIVAL SKILLS FOR GRADUATE STUDENTS**

### **Role of staff**

Graduate Student Coordinator – Serves as an informational source for students with regard to revision of curriculum, university rules, regulations and policies. Maintains student's files and monitors student's progress towards meeting degree requirements. Assists graduate students in registering for classes and makes sure they have enrolled in the correct number of hours each semester. Prepares students tuition fee waivers and assist students in signing up for medical insurance.

Secretary – Prepares course syllabuses, evaluations and hands out consent forms for classes taught in MMI. Schedules rooms for courses and seminars. Arranges seminar and defense schedules and prepares flyers for the seminars. Acts as a liaison between faculty and the bookstore rep for ordering textbooks for each course.

Administrative Associate II – Prepares paperwork for payroll, hospital ID badges, lab keys and parking permits.

### **Registering for classes**

New students will meet with the director of graduate studies to determine which courses to take. Students can register either in person, by phone or by internet. Registration instructions and PIN numbers are mailed to the students by the office of the registrar. If the PIN number has been lost or forgotten students can contact the registrar's office and a new PIN number will be given to them within one business day.

### **Student ID Cards**

Students will obtain two ID cards, one for the hospital and one for campus. The ID card for the hospital is used when working in the medical school and the Administrative Associate will assist in getting this ID. The ID card for campus gives students access to the student recreation center, natatorium, campus computing labs, student health services, and charge purchases at the University Bookstore. The campus ID card office is located inside the University Bookstore. Students must present a photo ID to obtain a campus ID card.

### **Setting up email**

All students are automatically provided an e-mail account. Each student will be giving a PawPrint which is the ID needed to access most MU-technology resources. The PawPrint consists of a student's initials and three random characters to ensure uniqueness. New students must activate their PawPrint using the four-digit Personal Identification Number (PIN) provided by the Registrar at this web address, <http://mizzouit.missouri.edu/accounts/> . To access your Mizzou e-mail account go to <http://webmail.mizzou.edu>

## **APPENDIX I**

### **[Using the Doctoral Degree Program Forms](#)**

All original documents are maintained in the Graduate School's official student files. Each form is completed at the departmental level, routed for the required signatures, and forwarded to the Graduate School, 210 Jesse Hall. Each form is then reviewed by the Graduate School, receives the dean's signature if approved, and a copy is returned to the department. If changes need to be made or if signatures are missing, corrective measures will be requested of the department. If any faculty signatures are illegible, we ask that departments print a correct spelling of the signature.

**[D-1 Form](#)** - Qualifying Examination Results and Doctoral Committee Approval Form.

The purpose of this form is to show the student's name as it should appear on the diploma, and indicate the correct degree, degree program, emphasis area (if applicable), minor or collateral field (if applicable), previous degrees, results of the qualifying process, and the correct adviser. This form is also used for the Graduate School to notify departments if student's official transcript(s) have not yet been received.

This form also officially records the members of the student's doctoral committee and insures that the configuration of the committee meets stated requirements. This form should be submitted to the Graduate School by the end of the student's first semester of the second year.

**[D-2 Form](#)** - Plan of Study for the Doctoral Degree Form

The purpose of this form is to plan the program of study, which the student will follow and certify that all committee members approve the program, including the recommended hours of transfer credit. This form should be submitted to the Graduate School by the end of the student's first semester of the second year.

**[D-3 Form](#)** - Result of the Comprehensive Exam

The purpose of this form is to record the official result of the doctoral comprehensive examination. Submit this form to the Graduate School within one month of exam completion.

**[D-4 Form](#)** - Report of the Doctoral Dissertation Defense

The purpose of this form is to record the official results of the dissertation defense. It is recommended that this form be taken to the defense, along with the dissertation approval page (printed on the required cotton bound paper) so that committee members can sign both forms for students who successfully defend their dissertation.

## **APPENDIX II**

### **[Using the Master's Degree Program Forms](#)**

All original documents are maintained in the Graduate School's official student files. Each form is completed at the departmental level, routed for required signatures, and forwarded to the Graduate School, 210 Jesse Hall. Each form is then reviewed by the Graduate School, receives the dean's signature if approved, and a copy is returned to the department. If changes need to be made or if signatures are missing, corrective measure will be requested of the department. If any faculty signatures are illegible, we ask the departments print correct spelling of the signature.

**[M-1Form](#)** - Program of Study for the Master's Degree

This form is required of all master's degree students. The purpose of this form is to plan the program of study the student will follow, including recommended hours of transfer credit. This form should be submitted to the Graduate School by the end of the second semester in order to facilitate the certification of degree completion later.

**[M-2 Form](#)** - Request for Thesis Committee

This form is required only for students who will write a thesis. Students completing a professional paper, master's project, or comprehensive master's exam do not need to have this form submitted. The purpose of this form is to have an official record of the student's master's committee and to insure that the configuration of the committee meets stated requirements. Submit this form to the Graduate School by the end of the second semester.

**[M-3 Form](#)** - Report of the Master's Examining Committee

This form is required of all master's degree students. The purpose of this form is to have an official record of the final examining process, whether it is a thesis defense, presentation of a project, or master's comprehensive examination.