MOLECULAR PATHOGENESIS AND THERAPEUTICS (MPT)
GRADUATE PROGRAM STUDENT HANDBOOK
(Revised August, 2014)

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I. PROGRAM OVERVIEW

The Molecular Pathogenesis and Therapeutic Graduate Program (MPT) was collaboratively designed by the Department of Molecular Microbiology & Immunology (MMI) and the Department of Veterinary Pathobiology (VPB). The MPT Graduate Program 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 MMI Departmental 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, nearly 300 doctoral degrees in microbiology have been awarded. The majority of students completing a Ph.D. degree in MPT 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://medicine.missouri.edu/mmi/graduate-placement.html

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 microbiology, pathogenesis, and immunology 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 MPT Graduate Program thus has given students a diversity of research opportunities in these areas. 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 was recruited from Kansas State University into the McKee Endowed Professor of Infectious Diseases in 2004 and became the Veterinary Pathobiology Department Chairman in 2006. 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, pathogenesis, 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 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 six 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 MPT Graduate Program. It is anticipated that these students will fulfill their first two years of Medical School PBL academic requirements before entering the MPT 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 Master's committee. The Master's Committee should consist of at least four faculty members including the mentor. At least three of the faculty members should be from the MPT 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 MPT 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 MPT Graduate Program curriculum may be subject to change.

Qualifying Phase
A required basic series of courses are designed to establish a foundation in bacterial pathogenesis (MICROB 7404), virology (MICROB 7303), structure and synthesis of macromolecules (MICROB 7101), and immunology (MICROB 7304).

Advanced Phase
It is expected that combinations of advanced courses in molecular biology of eukaryotes (MICROB 9432), immunology (MICROB 9407), virology (MICROB 9303), infection and immunity (MICROB 9449), and bacterial pathogenesis (MICROB 9404) 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
The goal of this exam is to determine whether the student is qualified to enroll in advanced graduate courses as well as intellectually prepared to perform research in this program. Passage of the four fundamental required courses implemented in Fall 2013 will constitute passage of the qualifying exam. The guidelines for this process are covered in greater detail in Section VI.

Comprehension Exam
The purpose of the comprehensive exam is to certify that the student has sufficient scientific knowledge (from the course work) and research insight to advance to candidacy for the Ph.D. This knowledge and insight are examined in this program through the student writing and orally defending an NIH-style research grant proposal. This examination will be administered after the completion of required course work but prior to the end of the student's third year in the program for students entering the MPT Graduate Program before 2014 or prior to the end of the fall semester of the third year for students entering in 2014 and thereafter. The guidelines for this process are covered in greater detail in Section VII.

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 Office of Graduate Studies 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. Of the 72 hours graduate credit, 15 hours must be in courses numbered 8000/9000 (excluding research and problems courses, but including up to 4 credit hours of seminar courses).

III. COURSE REQUIREMENTS

All students in the program are supported by a stipend (currently $25,000 per year pre- and post-comprehensive exams [taken during 3rd year]) plus tuition costs and basic medical insurance.

Laboratory Rotations
All new graduate students admitted into the MPT Graduate program are required to complete three laboratory rotations starting in the Fall semester and concluding in mid-January before the Spring semester begins. 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 perform his or her doctoral research under the guidance of the mentor in his/her lab.

Students need to perform three six-week rotations with three different faculty members who are seeking students before selecting a dissertation research adviser:

- Before starting rotations, students must first attend research presentations from faculty members who seek students that year.
- Rotations start near the beginning of the Fall semester and end in the middle of January.
- Before the spring semester begins in late January, each student will select an adviser (who must mutually agree to become the student's adviser) for the dissertation research. The student will begin that research immediately after rotations have ended.
- If funding is available and the student wishes, he or she can work in the laboratory of a faculty member in the graduate program during the summer; the student would need to enroll for the summer semester, which begins near the beginning of June. This summer research experience doesn't count as one of

the three required rotations described above. It is noteworthy that the MPT Graduate Program has limited resources to fund these summer research experiences, and thus students accepting matriculation in the MPT Graduate Program earlier after being accepted into the program will have priority for gaining access to this option.

Laboratory Rotation Schedule

The MPT 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 will approximately adhere to the following schedule:

Rotation	Dates*
Summer Research Experience**	Start of summer semester (usually first Monday in June) – August 15
1st	August 25 – October 3 (6 weeks)
2nd	October 6 – November 14 (6 weeks)
3rd	November 17 – January 16 (8.5 weeks with limited time off for holidays and final exams)

*These dates will change from year to year depending on the start date of the Fall semester and will be set by the Director of Graduate Studies

**With permission of Director of Graduate Studies, Executive Committee, and Department Chairs

Students who wish to enter the program early at the beginning of the summer semester preceding their first academic semester may do so, if financial resources are available. However, this will be considered a "summer research experience" with one of the faculty members but not an official rotation. This summer research experience should begin no earlier than June 1 and no later than the first day of the Summer semester, and should end on August 15th. This student will still be required to perform the three rotations with different faculty advisers, starting in the fall. The student would then be able to select one of those advisers including the "summer research experience" adviser as his or her doctoral adviser. Students engaging in the "summer research experience" will register for 4 credit hrs of Microb 9085 Problems (Rotations) for the summer semester and will need to be on campus by the beginning of the MU summer semester (usually first Monday in June).

Required Courses for Graduate Students in Program

- **Fall semester, 1st year (all required):**
  - MICROB 7101 Structure and Synthesis of Macromolecules (2 credit hrs.)
  - MICROB 7303 Fundamental Virology (2 credit hrs.)
  - MICROB 7304 Immunology (2 credit hrs.)
  - MICROB 7404 Bacterial Pathogenesis (2 credit hrs.)
  - MICROB 8050 Graduate Student Survival Skills (1 credit hr.)
- **Three of the following courses** (only one of these may be an approved elective)**:**
  - MICROB 9303 Adv. Virology (4 credit hrs. offered Spring semesters of odd years only).
  - MICROB 9404 Adv. Bacterial Pathogenesis (4 credit hrs.; offered Spring semesters of odd years only)
  - MICROB 9407 Adv. Immunology (3 credit hrs. offered Spring semesters of even years only).
  - MICROB 9432 Molecular Biology II (4 credit hrs. offered every Spring semester).
  - MICROB 9449 Infection and Immunity (4 credit hrs. offered every Fall semester).
  - Approved 8/9000 current literature-based elective (3-4 credit hrs.) 8000/9000-level electives: The Curriculum Committee must approve these elective courses.
  - They should also be approved by the student's doctoral committee (examples of courses still needing approval are given below):

- VPB 8436 - Pathogenic Mechanisms in Vet Path 3 hours
- Bio. Sc. 8350 Advanced Cellular Biology 3 hours
- Bio. Sc./Biochem 9460 Cancer Biology 3 hours
- Bio Sc. 8320 Developmental Genetics 3 hours
- Bio. Sc. 8440 Integrated Neuroscience I 3 hours
- Bio. Sc. 8442 Integrated Neuroscience II 3 hours
- MPP 9426 Transmembrane Signaling 4 hours
- MPP 9435 Skeletal Muscle 3 hours

- **Vet Path 8641 Intro to Research Ethics (1 credit hr.; every Spring semester).**
- **MICROB 9085 Seminar** (required to take this 4 times: 2nd-5th years) (1 credit hr.; every Spring semester)
- **MICROB 9403 Advanced Medical Microbiology** (credit for teaching) (2 credit hrs.; every semester)

Other duties

- Act as a teaching assistant (TA) in MICROB 2800 or MICROB 3200 (Undergraduate Medical Microbiology Laboratory) for two semesters (to be completed during the first two years, but not during the Fall semester of the first year).
- Attend Program seminars (any invited speakers and student seminars) on Wednesdays at 1:15 pm usually in Monsanto Auditorium in the Bond LSC; attendance will be taken; enroll in **MICROB 9087** Seminar for 1 credit hr. in the Spring semesters of years 2-5. **You will need to give a seminar during those years as well, and your grade will be determined by attendance and your presentation.**

Curriculum Timetable

Fall 2013—1st Yr. (10)
MICROB 7101 Struct. & Synth. of Macromol. (2)
MICROB 7303 Fund. Virology (2)
MICROB 7304 Immunology (2)
MICROB 7404 Bact. Pathogenesis (2)
MICROB 8050 Grad. Student Survival Skills (1)
MICROB 9085 Problems (Rotation) (1)

Spring 2014—1st Yr. (9)
9000 level course (4) from menu
VPB 8641 Research Ethics (1)
MICROB 9090 Research (4)

Fall 2014—2nd Yr. (9)
9000 level course (4) from menu
MICROB 9403 TA (2)
MICROB 9090 Research (3)

Spring 2015—2nd Yr. (9)
9000 level course (4) from menu
MICROB 9085 Seminar (1)
MICROB 9090 Research (4)

Fall 2015—3rd Yr. (9)
MICROB 9090 Research (9)

Spring 2016—3rd Yr. (9)
MICROB 9090 Research (8)
MICROB 9087 Seminar (1)

Defend Comps by end of 3rd Yr.

Fall 4th and 5th years (4)
MICROB 9090 Research (4)

Spring 4th and 5th years (4)
MICROB 9090 Research (3)
MICROB 9087 Seminar (1)

Credit Hour Requirements
The Office of Graduate Studies 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 – MICROB 9087 and Research - MICROB 9090, at most, four hours of Seminar – MICROB 9087 can count toward this requirement.

Full-time Student Enrollment

Graduate student full-time enrollment statues pre-comprehensive exam:
9 credit hours for fall and spring, 4 credit hours for summer.

Graduate student full-time enrollment statues post-comprehensive exam:
2 credit hours for fall and spring, 1 credit hour for summer.

Responsible Conduct in Research
Graduate students are required to participate in the Responsible Conduct in Research course, MICROB 9411, VPB 8641, or equivalent. 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 the MICROB 9087 Graduate Program Seminar Series of internal student seminars as well as invited speaker seminars.

This seminar series is a forum to learn and practice oral communication skills as each student describes recent research data to the MPT 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 spring 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 teach (TA) in laboratory courses at least two semesters for undergraduate students in MICROB 2800 or MICROB 3200, usually in Spring semester of year 1 and Fall semester of year 2. Student TA's will enroll in MICROB 9403, Advanced Medical Microbiology, only during their second semester of teaching and will be graded on their teaching performance according to guidelines established by the course coordinator(s). Teaching assignments will be assigned by the Director of Graduate Studies and the two course directors.

Additional teaching positions on campus and resources for teaching (see Teaching minor: http://gradstudies.missouri.edu/resources/preparing-faculty/minor-college-teaching/index.php) are available to students wishing to enhance their teaching experience, with approval of their mentors.

English-Language Proficiency Requirements for International Students
Any graduate student who completed 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. The Speaking Proficiency English Assessment Kit (SPEAK) test is conducted through the Office of Graduate Studies. 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 may be recommended for the student to increase their language skills before their English language is reassessed.
http://gradschool.missouri.edu/resources/preparing-faculty/international-teaching-assistant/assessment/types-of-tests.php

ONITA training is offered during the week preceding the Fall and Spring semester. The training is required for all new international graduate students before the first semester of teaching or assisting with teaching at MU. http://gradstudies.missouri.edu/resources/preparing-faculty/international-teaching-assistant/new-international-tas-instructor-orientation/index.php

IV. SELECTION OF THESIS/DISSERTATION ADVISER

Adviser for New Graduate Students
During the first year of study, the Director of Graduate Studies will be responsible for consulting with and advising graduate students in the MPT 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 meet with incoming students prior to or early in their first semester (August or September) to introduce the graduate program's education requirements and their timetable. In addition, the Graduate Student Advisory Committee will meet with all first year students at the end of the Fall and Spring semesters to evaluate their progress. Once each student has formed his or her doctoral (or master's) committee, it will be responsible for monitoring the student's progress toward degree. However, the Director of Graduate Studies and the Graduate Student Advisory Committee will continue to monitor student progress through the online annual reports from those doctoral (or Master's) 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; students have access to everything in their graduate program files except for confidential letters of reference supplied for admission. 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 for stipend funding changes.

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. http://gradstudies.missouri.edu/academics/progress/probation-termination.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://gradstudies.missouri.edu/academics/scholarly-integrity-ethics/guidelines-good-practice.php)

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://gradstudies.missouri.edu/academics/scholarly-integrity-ethics/guidelines-good-practice.php)

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 that 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 Probation and Dismissal, http://gradstudies.missouri.edu/academics/progress/probation-termination.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 Probation and Dismissal, http://gradstudies.missouri.edu/academics/progress/probation-termination.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 that 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.

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, one to two hours (with one hour of seminar in years 2-5) in spring semesters, and one hour in summer sessions up to and including the term in which the dissertation is defended. 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 MICROB 9090 Research until the doctoral degree is awarded terminates candidacy. http://gradstudies.missouri.edu/academics/process/doctoral-process/comprehensive-exam.php

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 a doctoral committee (dissertation committee) composed of at least five members. The committee will be composed of not less than three members of the MPT Graduate Program 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://gradstudies.missouri.edu/forms-downloads/repository/cocform.pdf is then submitted to the Office of Graduate Studies 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 student should convene his or her committee as often as needed to provide advice on his or her project, at least once per year. These meetings should be listed in the student's annual report in the online Graduate Student Progress System, and should form the basis of the doctoral committee's evaluation of the student's progress (independent of the adviser) on the annual report in year 2 and beyond.

Below is a list of Doctoral Forms, their titles and explanations of their purpose, and the deadlines for completion of those forms. For the most part, the Graduate Student Advisory Committee will oversee your

progress for the first year and upon completion of the D1 form will mostly transfer responsibility for your progress to your doctoral committee.

Forms	Form Title (Explanation)	Deadline
D1	Qualifying Examination Results and Doctoral Committee Approval (Formation of student's committee)	Prior to the beginning of Fall semester of 2nd year
D2	Plan of Study for the Doctoral Degree (Approval of completed and planned course work by doctoral committee)	Prior to the beginning of Fall semester of 2nd year
D3	Doctoral Comprehensive Examination Results (advancement to candidacy for doctorate)	Prior to end of summer semester of third year
D4	Report of the Dissertation Defense	When ready

Annual Online Student Assessment Report
All MPT Graduate Program students are required to submit an annual online assessment report. The web address for accessing the report is: https://gsps.missouri.edu/. 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.

Doctoral Forms
The Office of Graduate Studies requires a series of forms to be completed by the doctoral student
http://gradstudies.missouri.edu/forms-downloads/index.php
APPENDIX.
D-1 form – Qualifying Examination Results and Doctoral Committee Approval From
Submit by the end of the first semester of the second year in the program. This form reports the student's doctoral committee.

D-2 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. (MPT example template
http://medicine.missouri.edu/mmi/uploads/Example_PlanofStudy_MPT_Doctoral_Degreepdf.pdf

D-3 form – Results of the Comprehensive Exam
Submit by the end of year three. This form reports the results of the comprehension exam.

D-4 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 Office of Graduate Studies requires a series of forms to be completed by the master's student
APPENDIX.
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.

Please note that all **Comprehensive exams** and both the **Doctoral** and **Master's thesis defenses** should be completed within the timeline/ deadlines per semester set by the Office of Graduate Studies. Special permission will need to be sought to complete them outside of these deadlines.
http://gradstudies.missouri.edu/academics/graduation-commencement/timeline-deadlines/index.php

VI. QUALIFYING EXAM

Qualifying Exam

The goal of this exam is to determine whether the student is qualified to enroll in advanced graduate courses as well as intellectually prepared to perform research in this program. The curriculum implemented in Fall 2013 in which all first year students are required to enroll in four 7000-level fundamental courses (Bacterial Pathogenesis, Fundamentals of Virology, Structure and Synthesis Macromolecules, and Immunology) in their first fall semester should prepare all incoming first year students for advanced (current literature-driven) 9000-level courses offered in our curriculum. Passage with a grade of B or better in each of these four 7000-level fundamental courses will constitute passage of the qualifying exam. If a student fails to achieve a B or better in any one of these courses, the Graduate Student Advisory Committee may place the student on probation and provide a means to remediate the material in that course (perhaps coordinating with the director of the course that the student failed); the failure of the student to meet the probationary terms issued by the Graduate Student Advisory Committee could result in their consideration of the student's dismissal from the program. If a student fails to achieve a B or better in two of the four required fundamental courses in the fall semester, the Graduate Student Advisory Committee may consider dismissal of the student from the graduate program.

VII. COMPREHENSIVE EXAM

Students entering the MMI-VPB/MPT Graduate Program before 2014 may either utilize the pre-existing comprehensive examination format described immediately below (in section A) or the format outlined for students entering in or after 2014 and thereafter further below (in section B). However, if these more senior students utilize the newer format, they will provide an R21 style grant proposal either on an extension of their own research focus or a related topic. Furthermore, the topic of the proposal (whether either distantly related or directly on their own research) must be approved by their doctoral committee. No preproposals will be required unless the doctoral committee requires one. Furthermore, the timelines for writing and defending the written proposal will be along the lines of the pre-existing guidelines rather than the new guidelines. Additionally, the doctoral committee including the adviser will comprise the examination committee for these students (an Oral Examination Committee member will not be added).

Students entering the MPT Graduate Program in or after 2014 will be subject to the new comprehensive examination guidelines (described further below in section B).

A. Comprehensive Exam Guidelines for MPT students who entered program before 2014

Each graduate student will participate in the Program comprehensive examination, which consists of the preparation and oral defense of an NIH-type grant proposal (R01 format) dealing with specific and unanswered questions in microbiology, pathogenesis, molecular biology, and/or 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 placed on file with the Student 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. *Please note that, as described in the italicized section above, the doctoral committee may opt to have the student write a proposal on their own research which may obviate the need for a research proposal abstract.* 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, a process, which usually is given four to six weeks. The proposal should conform to the NIH page limitations as indicated below. *Please note that, as stated in the italicized section above, students who entered the program before 2014 may opt, with their doctoral committee's approval, to write an R21 format proposal focused on their own doctoral research or closely or distantly related themes; the R21 proposal format is described in the new comprehensive exam description (for students entering in or after 2014; see section B).*

NIH R01 Grant Proposal Format for Comprehensive Exams (for students entering program prior to 2014

Use Arial or Helvetica 11 pt font (or larger), single-spaced, with at least 0.5 inch margins (left, right, top and bottom) on all pages.

Section 1: SPECIFIC AIMS (1 page maximum)

Section 2: RESEARCH STRATEGY (12 pages maximum) Organize the research strategy in the specified order and using the instructions provided below. Start each section with the appropriate section heading—Significance, Innovation, Approach. Experimental details should be cited using the Bibliography and References Cited section.

A. Significance

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

B. Innovation

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

C. Approach

- Describe the background studies that lay the foundation for the proposed studies (*some of these studies may also need to be included in the Significance section above in terms of describing the importance of the problem*).

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

Section 3: BIBLIOGRAPHY AND REFERENCES CITED (No page limit)

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. **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 pf 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.

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 Office of Graduate Studies 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 (Office of Graduate Studies 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 Office of Graduate Studies, 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. http://gradstudies.missouri.edu/academics/process/doctoral-process/comprehensive-exam.php

B. Comprehensive Exam Guidelines for MPT students who entered program in or after 2014

General description of the process: A student will submit their written proposal to the Doctoral/Preliminary Examination Committee (PEC), the Student Coordinator, and the Director of Graduate Studies. Upon evaluation and "passing" the written portion of the exam process the student will be allowed to progress to the oral portion of the exam. Upon successfully completing and passing the oral exam, the student has successfully completed and passed the comprehensive exam. The final phase of the comprehensive examination, the oral examination, must be completed **BEFORE** the end of the fall semester of the student's third year in the MPT program.

Comprehensive exam proposal: WRITTEN PROPOSAL AND ORAL EXAMINATION.
In the MPT comprehensive examination, each student must be able to:

1) Develop, write and orally defend an original hypothesis-driven research proposal that outlines a series of experimental approaches that will test the validity of their proposed hypothesis.
2) Demonstrate knowledge of core information and concepts in the student's field of interest. Demonstrate knowledge of core information and concepts in the fields of microbiology, immunology and/or pathobiology.

Time line:
A draft of the Proposal Abstract (or Specific aims page) on a topic previously approved by the student's PEC/Doctoral Committee must be submitted no later than **July 15 after completion of Spring semester of the second year (summer of the second year).** The completed written proposal must be submitted to the PEC, Student Coordinator, and the DGS no later than **September 15** near the beginning of the Fall semester of the student's **third** year in the MPT program.

The PEC will provide their evaluation of the written proposal to the chair of the MPT Oral Exam Committee* and the student on or before **Oct. 1st.** Proposals requiring revision will be due back on or before **Nov 1st.** The PEC must provide their evaluation of the revised written proposal to the PEC chair within 7 days, no later than **Nov 8th.** Once the written portion is passed the student is cleared to schedule the oral portion of the comprehensive exam within 30 days.

Preliminary Examination Committee (PEC):
The MPT program requires that the preliminary exam committee consist of ***a minimum of four faculty members, excluding the student's thesis adviser,*** *plus one member of the MPT Oral Exam Committee member* who will serve as chair of the PEC during the oral examination****.*** This committee can be the same as the Doctoral Committee (expected default choice). The student's adviser may NOT be an official member of the preliminary oral exam committee, but may attend the oral exam. If the student's adviser attends the oral exam, he/she may not vote or answer questions during the oral exam. However, the adviser may clarify issues during and after the exam if asked by committee members. The student's adviser is allowed (encouraged) to ask questions during the exam. The adviser may participate in the discussion after the student has finished the exam, prior to the committee's vote.

The PEC need not be identical to the Doctoral Committee. Substitutions can be made to accommodate scheduling conflicts as long as the committee composition still adheres to the Graduate School requirements including inclusion of an outside member. The PEC (Doctoral Committee) should consist primarily of faculty with relevant expertise in the student's focus area. The Office of Graduate Studies requires that one committee member be outside their adviser's primary department or student's graduate program.

A member of the MPT Oral Exam Committee (see below) will serve as the chair and voting member of the oral exam committee during the comprehensive exam process. This is to help ensure there is a form of standardization of the comprehensive exam process.

MPT Oral Exam Committee: The Oral Exam Committee (OEC) will consist of 2-4 MPT Faculty (the actual number will depend on the number of students who are expected to present orals in a given year). MPT faculty members will be assigned to the OEC by the Executive Committee. Members of this committee will serve for one year. Their responsibilities are for at least one of them to attend (as a voting member) and chair of the oral exams of all students defending a comprehensive exam proposal during their year of service. While OEC member is not required to read each proposal in detail, he or she is expected to have at least cursory/general knowledge of the proposal being defended. The OEC member is to monitor the exam process and work with each PEC to ensure a fair and standard oral exam process for MPT students. In the event that a member of the student's doctoral thesis committee is a member of the OEC, that faculty member CAN also serve as chair of that student's oral exam. If the student's mentor/thesis adviser is a member of the OEC, he or she is NOT allowed to serve as chair of the oral exam.

The Written Proposal:
The written proposition should be written a NIH-style (R-21) research grant proposal.
The proposal must be hypothesis-driven. It can focus on an original unsolved problem that is either within the area of a student's doctoral research or developed into a proposal distinct from the student's thesis research.

If, at any point, it becomes clear that the written proposal is copied from any source, including grant proposals from the student's mentor, the student will be immediately referred to the DGS and GSAC to consider the student's immediate dismissal from the program.

NIH R21 Grant Proposal Format for Comprehensive Exams (for students entering program in or after 2014)

Use Arial or Helvetica 11 pt font (or larger), single-spaced, with at least 0.5 inch margins (left, right, top and bottom) on all pages.

Section 1: SPECIFIC AIMS (1 page maximum)
Begin with one or two brief paragraphs of background and introduction of the issues (open question(s)/gap in our knowledge) to be addressed. State the central hypothesis and specific aims, followed by an outline of the experimental plan. End with a conclusion paragraph that states the significance, contribution and rationale of the proposal upon completion of the work.

Section 2: RESEARCH STRATEGY (**6 pages maximum**, sections A-D)

- Organize the Research Strategy in the order specified below.
- Start each section with the appropriate section heading – Significance, Innovation, Background and Preliminary Data, Approach.
- Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section. *This section is excluded from the page limit.*

A. Significance (1-2 pages; page limits listed for each subsection are suggested guidelines, not rigid requirements; however, the whole research section is limited to 6 pages total)
The proposal must contain a review of literature pertinent to the specific question(s). This provides the intellectual framework and rationale for the proposal. It should provide the reviewer with a clear understanding of the current state of the field, the important questions that remain unanswered, why these questions are important, and which one(s) will be addressed.

B. Innovation (≤1 page)
The innovation section should contain an explanation of what, specifically, is new and innovative in either the design, approach, methodology or techniques that ensures the success of the proposed experiments

C. Background and Preliminary Data (≤1 page)
Data relevant to the proposition should be embedded as figures/tables in the text. To conserve space, wrap the text around the figures/tables. If the proposal is on an area of research based on a review of the literature, and there is no relevant preliminary data, state so. This will not be counted against the student.

D. Research Design and Methods (3-4 pages)
The proposition must include descriptions of experiments designed to test the hypothesis in sufficient detail to allow the reviewer to assess their feasibility and applicability, a discussion and interpretation of the anticipated results, potential alternative hypotheses and potential pitfalls. It should conclude with a concise statement of the significance of the project. Insight and creativity in solving the problem will be an important basis for evaluation, as well as the ability to present a focused plan. Arguably, the most common criticism of these proposals is a lack of focus.

Section 3: BIBLIOGRAPHY AND REFERENCES CITED (No page limit)

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. **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 pf 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.

Proposal Abstract (or Specific aims page): A student will work with his or her doctoral committee during the Spring semester of the second year to evaluate and approve the topic of his or her comprehensive exam. Once approved, the student will submit a draft of the proposal abstract or specific aims page to the MPT program Student Coordinator and the DGS) by July 15 after the Spring semester of the student's second year. Late proposals will not be accepted and will count as a failure of the written exam.

Evaluation of the Written Proposal:

Upon receipt of the written proposal (due submitted to the PEC, MPT Student Coordinator, and MPT DGS by September 15 of the third year), each examiner will review the document and indicate whether the proposal is acceptable, needs revision or is unacceptable.

- ACCEPTABLE: If all examiners rate the proposal as acceptable, the student may schedule the oral preliminary examination (see below).
- NEEDS REVISION/UNACCEPTABLE: If **more than one** member of the exam committee votes for revision or that the proposal is unacceptable, the written proposal will be returned to the student for revision.

After receiving the comments from the exam committee, students should meet individually with each committee member who requests changes, so that there is a clear understanding of the concerns and how to adequately address them. **The student's thesis advisor is NOT allowed to comment or help with the revision (beyond the initial discussion of any changes they request in their review of the written proposal).**

The revised proposition is due 4 weeks after the evaluation of the initial proposal is returned to the student. (See above for timeline of actual due dates)

Evaluation of Revised Proposal: All revised proposals are evaluated as either acceptable or unacceptable. If all examiners judge the revised proposal to be acceptable, then the oral preliminary examination may be scheduled. If there is disagreement among the committee regarding the revised proposal (i.e., more than one "unacceptable"), then the committee (including the student's advisor) will meet to discuss the proposal. *If after this meeting, **more than one** examination committee member judges the proposal as unacceptable, this would constitute failure of the written portion of the exam. See MPT/Graduate School regulations for Failure (below).* The committee's recommendation at this stage (either "acceptable" or "unacceptable") will be forwarded to the GSAC, which will have final approval.

If the overall decision on the proposal is "acceptable", then the student will have passed the written portion of the exam and be allowed to proceed to the oral preliminary examination. If a revised written proposal is

deemed unacceptable, then the student will have 12 weeks before he or she can be examined on a new proposal (see below) (no later than 16 weeks).

Format of the Oral Examination:
The purpose of the oral examination is:

1) To test the student's ability to present and defend the written proposal.
2) Demonstrate knowledge of core information and concepts in the student's field of interest
3) Demonstrate knowledge of core information and concepts in the fields of microbiology, immunology and/or pathobiology.

Evaluation of the Oral Examination:
Following the exam, the student is excused from the room and each committee member casts a vote of "PASS", "PASS WITH RESERVATIONS" or "FAIL". Following discussion, an overall evaluation of "PASS", "PASS WITH RESERVATIONS" or "FAIL" is given.

- PASS: The student has passed the oral examination and becomes a Ph.D. candidate.
- PASS WITH RESERVATIONS: The student has passed the oral preliminary examination, but the committee has some concerns that must be addressed to remove the reservations. The committee will outline what must be accomplished and a reasonable time frame to achieve this, in order to lift the reservation.
- FAIL: If more than one faculty votes for failure, the student has failed the oral examination. The oral may be taken a second time only and the same committee members must give the exam.

Failure
A failure of either the written or oral section of the exam constitutes failure of the comprehensive exam. If a failure is reported, the committee must also include an outline of the general weaknesses or deficiencies of the student's work in their report to the GSAC. The student and the committee members are encouraged to work together to identify steps the student might take to become fully prepared for the next examination.

Request for clarification
If at any time the student believes that the advice given by the committee is inadequate, the student may send a written request for clarification to the committee. The examining committee must respond to this request in writing within two weeks. A copy of this request will be sent to the Graduate School and MPT GSAC as well.

Retaking the exam
A student who fails may not take a second comprehensive examination for at least 12 weeks. Scheduling of the re-examination should be done within 4 weeks of the 12-week deadline or as otherwise established by the examination committee. Retaking of the comprehensive exam will proceed with similar intervals of deadlines as described for the original comprehensive exam. Failure to pass two comprehensive examinations automatically prevents candidacy.

Special Circumstances: The graduate program recognizes that these requirements must occasionally be tailored to meet specific conditions that apply to individual students. Alterations in the standard program (such as course substitutions, delay of the Oral Exam, or leave of absence) may be requested by petitioning (in writing) the DGS who will take the request to the GSAC for consideration. These requests should be made well in advance of the above deadlines.

VIII. 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 should follow the Office of Graduate Studies Guidelines for preparation and submission.
Thesis/dissertation Guidelines - http://gradstudies.missouri.edu/academics/thesis-dissertation/index.php

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 Office of Graduate Studies. Consult the Office of Graduate Studies for these deadlines and for a checklist of the materials to be submitted for graduation.
http://gradstudies.missouri.edu/academics/graduation-commencement/timeline-deadlines/index.php

Electronic Thesis/dissertation Guidelines - http://gradschool.missouri.edu/academics/thesis-dissertation/diss-thesis-guideline/electronic-basics.php

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. Please contact the Student Coordinator to help in setting a date within the timeline of the Office of Graduate Studies as well as a room and a flyer to announce the presentation.

Dissertation Passing/Failing Criteria
The project will be detailed in a formal written thesis that conforms to Office of Graduate Studies 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 (first author or co-first author publication only) 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.

IX. 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://gradstudies.missouri.edu/academics/progress/grading-credit.php)

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://gradstudies.missouri.edu/academics/progress/grading-credit.php)

Dismissal
At the end of each semester, graduate students with a cumulative GPA below 3.0 are placed on probation by the Office of Graduate Studies. 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. (Guidelines for Probation and Dismissal, http://gradstudies.missouri.edu/academics/progress/probation-termination.php)

Prior to the formation of a student's doctoral committee (D1 form accepted by Office of Graduate Studies), the Graduate Student 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. 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 Office of Graduate Studies to take effect. http://gradschool.missouri.edu/academics/progress/probation-termination.php

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

Extensions
When there has been unsatisfactory progress with respect to meeting university-wide Office of Graduate Studies 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 Office of Graduate Studies 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 Office of Graduate Studies for more information.

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 Office of Graduate Studies will send the student an official notice of dismissal from the program. http://gradstudies.missouri.edu/academics/progress/requests-for-extensions-appeals.php

X. 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.

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 the student as a more informed investigator. For more information visit
http://gradstudies.missouri.edu/academics/scholarly-integrity-ethics/responsible-conduct-of-research.php

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 .

XI. STUDENT CONDUCT AND CONFLICT RESOLUTION

Mizzou provides policies, training programs and other resources designed to guide graduate students in research, intellectual property, academic honesty and professional conduct.

http://gradstudies.missouri.edu/academics/scholarly-integrity-ethics/index.php

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 relevant department chair and/or the Graduate Student Advisory Committee will work with the student and mentor until a mutual agreement is established.
http://gradstudies.missouri.edu/academics/scholarly-integrity-ethics/guidelines-good-practice.php

XII. 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://gradstudies.missouri.edu/financials/assistantships-fellowships/assistantships/index.php

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 MPT Graduate program are financially supported while they are making acceptable research progress. Graduate students who are not supported by fellowships receive stipends of $25,000 pre-comprehensive exam or post-comprehensive exam.

Tuition and health insurance fees for residential/nonresidential students are waived for all qualifying full-time graduate student in MPT Graduate Program. Students are responsible for paying incidental fees (recreation facility, student activity and information technology, also parking if needed), which total on average of $1,524.50 per year.

Life Science Fellowships
Doctoral fellowships are available through the Life Sciences Program. Doctoral fellowships currently carry a stipend of $27,000 plus tuition and fee waivers and health insurance. Doctoral fellows are usually funded for four years, with evidence of satisfactory performance and progress. For more information visit the life sciences fellowship program. http://bondlsc.missouri.edu/fellowships

Initiative for Maximizing Student Diversity (IMSD) Training Grant Fellowships
IMSD Training Grant Fellowship recipients receive a stipend of $27,000 plus tuition and fees per year for one to two years usually in years 1-3.

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 Student Health 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://gradstudies.missouri.edu/financials/student-medical-insurance/index.php. Health insurance subsidies are waived for all qualifying full-time graduate students in the program.

Health Insurance Enrollment
A graduate student may enroll in the Accident and Sickness Insurance for Graduate Assistants while attending MU. 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 or on myZou, they must do so within 30 days of classes. For more health and medical insurance information visit http://gradstudies.missouri.edu/financials/student-medical-insurance/enrollment-procedure.php

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 Office of Graduate Studies 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. http://gradstudies.missouri.edu/financials/assistantships-fellowships/leaves-of-absence.php

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.

- **a.** Travel funds from Adviser's grants (additional criteria at the discretion of the professor).
- **b.** Funding from the Office of Graduate Studies (must be a doctoral student, have successfully completed comprehensive examination and be admitted to doctoral candidacy [post-comprehensive exam]). Forms for the Office of Graduate Studies travel awards may be obtained from the Student Coordinator. These usually are only awarded once during a student's graduate career.
- **c.** Funding from the Life Sciences Program travel awards (student must have completed comprehensive examination and be presenting his or her research at a national meeting; can only be awarded once during graduate career).
- **d.** Funding of up to $400.00 per fiscal year (July 1-June 30) can be requested from the either the Department of MMI or VPB (depending on the primary appointment of the adviser) for both pre- and

post-comprehensive exam students including first year students after selecting a doctoral research adviser.

- 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, 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 needing to present 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).

Links for Travel Award Applications

- Travel award application from the Graduate School (student needs to be ABD to apply): http://gradstudies.missouri.edu/financials/graduate-awards-travel-scholarships/travel-scholarships/index.php
- Travel award application for Profession Presentation Travel Award (many only receive one time award either Professional or Dissertation award): http://gradstudies.missouri.edu/financials/graduate-awards-travel-scholarships/travel-scholarships/professional-presentations/index.php
- Travel award application for Dissertation Research Travel Scholarship (student needs to be ABD and may only receive one time): http://gradstudies.missouri.edu/financials/graduate-awards-travel-scholarships/travel-scholarships/dissertation-research/index.php
- Travel award application through the Graduate Professional Council (student need not be post-comprehensive exam): http://gpc.missouri.edu/funding/travel-awards/
- Travel award application through the Graduate Student Association (student need not be post-comprehensive exam): http://gsa.missouri.edu/
- Travel award application through Life Sciences Program (need not be a LS fellow, but needs to be post-comprehensive exam): Travel Award Application for Life Sciences PhD Candidates
- Mizzou Advantage Student Travel Award: http://mizzouadvantage.missouri.edu/opportunities/student-travel-awards-graduate-students/

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

XIII. UNIVERSITY RESOURCES

Association of Black Graduate and Professional Students:
http://abgps.students.missouri.edu/

Blackboard Resources - http://gradstudies.missouri.edu/resources/electronic-resources-for-online-learners.php

Fellowships at Mizzou - A database of external Fellowships
http://fellowships.missouri.edu/

Academic Writing Presentations - http://gradstudies.missouri.edu/resources/writing-research-presentation/index.phpWorkshops for TA's in Writing Intensive courses, Resources on Writing, Writing Intensive course evaluations.

Job Search & Career Development Resources - http://gradstudies.missouri.edu/resources/graduate-student-career-exploration/index.php Resources on job searches, writing, and relationships in Office of Graduate Studies, financial aid, etc.

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

Dissertation Binding available at Printing Services.
http://ps.missouri.edu/PS2/upload/stationery/HTMLFlash/thesisDissertation/

Graduate Student and Postdoctoral Scholar Networks - http://gradstudies.missouri.edu/resources/grad-postdoc-networks.php

Graduate Travel, Scholarships & Awards
http://gradstudies.missouri.edu/financials/graduate-awards-travel-scholarships/index.php
Travel awards available through different Office of Graduate Studies organizations. 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://gpc.missouri.edu/
For information about travel scholarships given by GPC: http://gpc.missouri.edu/funding/travel-awards/

Graduate Students as Parents: Learn about school or daycare options
http://gradschool.missouri.edu/admissions/admitted-students/index.php

Graduate Student Association: http://gsa.missouri.edu/
For information about travel awards given by GSA: http://gsa.missouri.edu/travel-grants-information/

Tuition Support Program: Assistants, Fellows, Instructors (Health Insurance and Fee Waivers)
http://gradstudies.missouri.edu/financials/tuition-support-program/index.phpContact: Karen Gruen 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://gradstudies.missouri.edu/financials/graduate-awards-travel-scholarships/travel-scholarships/john-bies-international/index.php

MU Library - http://library.missouri.edu/

Minor in College Teaching - http://gradstudies.missouri.edu/resources/preparing-faculty/minor-college-teaching/index.php12 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://counseling.missouri.edu/
The MU Counseling Center promotes the success and growth of individuals in the MU community and the campus as a whole, fostering personal, intellectual and psychological well-being.

NEXUS - http://nga.missouri.edu/index.php The goal of Nexus is to increase the role, broaden the participation, and strengthen the voice of underrepresented minorities within the science community found in and outside the University of Missouri.

Preparing Future Faculty - PFF: http://gradstudies.missouri.edu/resources/preparing-faculty/preparing-future-faculty/index.php 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://gradstudies.missouri.edu/financials/graduate-awards-travel-scholarships/index.php

Program for Excellence in Teaching - http://etatmo.missouri.edu/
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://etatmo.missouri.edu/
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. https://writingcenter.missouri.edu/

XIV. SURVIVAL SKILLS FOR GRADUATE STUDENTS

Role of Business Support Specialist II (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.

Prepares course syllabuses, evaluations and hands out consent forms for classes taught in MMI, Schedules rooms for courses and 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 will register through the student system, myZou, on the internet. Registration instructions and pawprints are mailed to the students upon acceptance by the Office of Graduate Studies.

Student ID Cards
Students will obtain a University Student ID card for access to the student recreation center, natatorium, most buildings, 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. The campus ID can be set to access assigned buildings and animal quarters.

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