

**Veterinary Microbiology and Preventive Medicine
Graduate Student Manual**

September 2015



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Admission Requirements

Requirements for full admission in VMPPM graduate programs are as follows:

- The Graduate Records Examination (GRE) general aptitude test is required of all applicants. An advanced test in biology is strongly recommended. Students must satisfy the requirements of both the Graduate College of Iowa State University (ISU) and the department. There is no minimum score, as the student's performance is evaluated with all other relevant information. Generally, students accepted in the Department score above the 50th percentile.
- The Test of English as a Foreign Language (TOEFL) is required of all applicants whose native language is not English. The student must meet the requirements of both ISU's Graduate College and VMPPM. A minimum TOEFL score 79 (Internet) of 213 CBT (550 paper) is required for consideration by the Department. The IELTS (International English Language Testing System) test can be substituted for the TOEFL.
- The transcript record must show a strong background in the biological sciences; preferably including biochemistry, biology, calculus, chemistry, genetics, immunology, microbiology, physics and physiology.
- Three letters of recommendation are required.
- Autobiographical statement describing research interests and future plans must be written by the student. (1-2 pages)
- Applicants wishing to pursue a Ph.D. in Veterinary Microbiology (Preventive Medicine Emphasis) must have a Doctor of Veterinary Medicine (DVM) or an equivalent degree.
- Students who have achieved high scores on the GRE test, and who have substantial and appropriately documented research experience in microbiology, may be admitted into the Ph.D. program upon approval of the VMPPM Graduate Admissions Committee and the ISU Graduate College. Students admitted into the M.S. program who demonstrate simultaneously high capabilities in didactic course work and in research may be advanced from the M.S. to a Ph.D. program by their Program of Study (POS) Committee, subject to final approval by the Program Chair and the DOGE. Admittance of students into the program is dependent on the availability of a Major Professor and Laboratory willing to accept and provide financial support to the student.

Concurrent Degree Students

Students in the professional school (College of Veterinary Medicine (CVM DVM program) may also enroll in graduate studies in the M.S. or Ph. D. programs within the department. Only students who have demonstrated exceptional academic achievement and are highly motivated will be considered. Students requesting admission as a concurrent student must fulfill all of the

admission requirements described above for the graduate college in addition to their acceptance in the CVM DVM program. Students must have completed at least 128 semester hours of pre-veterinary or professional course work. Students will be subject to the normal rules and procedures in effect for both the College of Veterinary Medicine and ISU's Graduate College. Students in the concurrent D.V.M.- Graduate Degree Program will need to have Program of Study approved by the Associate Deans of both colleges and the DOGE or Chair of VMPPM. Students must maintain a minimum of a 3.0 grade point average in both programs to remain enrolled.

Students enrolled in the Graduate College must satisfy all academic requirements established by the Graduate College. In meeting these requirements, the only courses in the Veterinary College eligible for graduate credit will be courses identified in the ISU Bulletin as being available for graduate credit. Students enrolled in the concurrent program may elect to use courses from their graduate Program of Study, where applicable, to meet the requirements in effect for the professional curriculum, provided approval is obtained from the Curriculum Committee and the Administration of the College of Veterinary Medicine. Students should check with the department to confirm the availability of the various graduate courses. At present courses that **can** be included are: VMPPM 586 Medical Bacteriology; VMPPM 586 Medical Bacteriology Laboratory; VMPPM 587 Animal Virology; VPth 542 General Pathology; VPth 576 Veterinary Parasitology; and VDPAM 426 Veterinary Toxicology. In order for a graduate course to be acceptable as a substitute for a designated professional course in the Veterinary Curriculum, it must be reviewed by the CVM Curriculum Committee to confirm that the depth and rigor of the course content required by the professional curriculum is adequate as determined by the College Graduate Studies Committee.

If a student does not hold a B.S. or B.A. degrees, a graduate degree would not be granted until all requirements for the D.V.M. degree are completed. By not restricting credits earned, a student may pursue graduate studies during summer and holiday sessions and may elect to postpone the fourth year of professional curriculum for one year in order to facilitate pursuit of graduate courses and research. This latter option may be declared during the second or third year of the professional curriculum, and no later than the first day of the spring semester of the third year of the professional curriculum.

All applications for admission should be directed to:

US and international application

website: http://www.admissions.iastate.edu/apply/index.php?type=us_grad

Requirements for Non-English Speaking Students

Graduate students whose native language is not English and who do not have a bachelor's degree from ISU or a US institution must take the English Placement Test prior to beginning of their first semester. This test is required by the Graduate College and is administered by the Department of English. It must be taken in addition to the TOEFL (Test of English as a Foreign Language), which is taken as part of the admissions process. A student who does not pass this examination is assigned to one or more courses in the English 99 and 101 series. This course work must be completed during the first year of study, and registration holds are placed if the student does not register for these courses during the first year of study. (There is a developmental course fee for the English 99 course.)

Non-native English speaking ISU graduate students who meet or exceed the TOEFL or IELTS scores below are exempted from taking the English Placement Test. Self-enrollment in English 099 or 101 courses remains possible.

- Paper-based TOEFL (PBT)--640 (and above)
- Internet-based TOEFL (iBT)--105 (and above)
- IELTS--8.0 (and above)

Assistantships and Employment Expectations

Research assistantships (RA) or adjunct instructor positions are available through the designated laboratory and major professor. A 100% tuition credit is awarded to PhD RAs and a 50% tuition credit is awarded to MS students with RAs. Additional fellowships and RAs may be available through agreements with the USDA laboratories in Ames and training grants from NIH or USDA.

Assistantship Time Limit

The time limit for assistantships will vary greatly depending on the type of support. Research assistantships are related to the life of a research grant or availability of departmental, USDA or other support. Students should discuss their support with their major professor, DOGE, Chair or supervisor and plan accordingly. Most VMPM faculty members assume that a M.S. should be completed within two to three years and a Ph.D. in approximately five years. Students should not expect support to be automatically provided beyond these time intervals. Students making inadequate progress will be notified in writing and support may be terminated.

Required Teaching and Research Responsibilities

Teaching responsibilities are generally determined by the Chair. Students receiving Departmental TAs will be expected to take part in TA orientations, workshops and testing set up by the University and the Department.

Research responsibilities are determined by the major professor in consultation with the POS Committee. There are no specific departmental research responsibilities.

Benefits

Sick Leave and Vacation for RAs and TAs

All RAs and TAs on 12-month appointments are entitled to vacation and sick leave in the same manner as A-base faculty, except at a rate proportional to the fraction of their appointment.

TAs on 9-month appointments are entitled to sick leave, but do not accrue vacation time. They have the same policy as B-Base faculty at a rate proportional to the fraction of their appointment.

Example:

Research Assistants appointed on a 1/2 C-Base appointment would accrue 8 hours of vacation and 6 hours of sick leave per month. Using one day of vacation would subtract 4 hours and one day of sick leave would subtract 4 hours from your balance. In the same manner, Teaching Assistants on 1/2 C-Base appointment would accrue 6 hours of sick leave per month. Using one day of sick leave would subtract 4 hours from your balance.

All leaves/absences must be reported to the departmental office in 2182 Vet Med via the Absence Request Card (Appendix A, page 29) and approved by the student's major professor.

Sick Leave and Vacation for Adjunct Instructors

Students with adjunct instructor appointments accrue sick leave and vacation in the same manner as A-base faculty, except at a rate proportional to the fraction of their appointment (usually 3/4 time or 12 hours of vacation and 9 hours of sick leave).

All students should arrange vacation time with their major professors since, in most cases; the major professor is responsible for the support of the student.

All leaves/absences must be reported to the departmental office via the Absence Request Card (Appendix A, p. 28) and approved by the student's major professor.

Insurance

All C-base graduate assistants (TAs and RAs) receive single student medical insurance coverage free of charge under the ISU Student Health Insurance Plan. Coverage for hospital, accident expenses, surgical care and maternity care are included. For more information, please consult the ISU Graduate College Handbook and the ISU Benefits Office in Room 100 Wallace Rd.

Maternity and Paternity Leave

The departmental guidelines are essentially those of the University. Basically, faculty, staff and students are expected to use sick leave or a leave-of-absence for the purpose of maternity or paternity leave. The federal Family and Medical Leave Act (FMLA) may apply in certain circumstances; consult the ISU Office Procedure Guide. All leaves/absences should be arranged with the major professor and the Chair.

Holidays

All employees, regardless of appointment base, are not required to be on duty during official university holidays, which include New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the Friday after Thanksgiving, Christmas, and two additional days each year determined by the President and ISU Administration.

Guidance for New Students

Registration

Registration is done over the web through Access Plus

<http://catalog.iastate.edu/registration/#registrationprocesstext>

Registration ends according to posted dates in the University Calendar. This date is usually before the end of the previous term. Questions regarding the registration process can be answered at the previous URL, the departmental office or your major advisor.

Late Registration

For late registration (beginning on the first day of class), a Student Schedule form is required. The Student Schedule form (available in the office), with signatures of the major professor and all instructors, should be presented along with a \$20.00 late registration fee to 1220 Beardshear and then to 10 Alumni Hall. A \$50 fee is charged the second week of classes and \$100 the third week or anytime later.

Add/Drop Slips

Students can use AccessPlus to process drops until the fifth day of classes. After the fifth day of classes, a Request for Schedule Change or Restriction Waiver (Add/Drop Slip) form is needed for any changes to the class schedule. Add/Drop Slips require the signatures of the major professor, instructor and Chair. A pass/no pass grading option is also offered. The Add/Drop Slip is used to designate this option. The pass/no pass option requires only the signature of the major professor. The forms are available in the departmental office.

Cy-Ride Bus Passes/Fares

All ISU students ride free by showing their student ID card.

Internet/E-Mail

Every VMPM student must register for an ISU NET-ID - this gives you access to the Internet and an email account. The Department will send information at various times via electronic mail, so it is imperative that you register as soon as possible for an ID. By doing this, you will be assured that you will receive information sent electronically to our students.

Keys

Keys will be issued upon request of the major professor. The application for building, room and laboratory keys is completed in the departmental office. Processing of key applications may

take up to two days. Keys must be returned to the Key Issue Desk, Facilities, Planning and Management Building, prior to graduation. Currently there is a fine of \$25 per lost key.

F-1 and J-1 Credit Requirements

International students with an F-1 or J-1 nonimmigrant visa are required to maintain full time student status. During Fall and Spring semester:

- All students are required to be enrolled for a minimum of 9 credit hours.
- If it is in the student's best interest to be enrolled for less than 9 credits, a 'short course load' form is to be completed. This form is available in the Office of International Students and Scholars (OISS).

During Summer semester:

- If the first semester that an international student is enrolled at ISU is Summer, the student is required to be enrolled for 5 credits. If it is in the student's best interest to take less than 5 credits, a 'short course load' form is to be completed. This form is available in the OISS.
- If the student has been enrolled during the previous semester, the student is not required to be enrolled during the Summer semester.

Additional Information

All of the University regulations and requirements for graduation can be found in the Graduate College Handbook and the Graduate College Thesis Manual. They are available on the web through the ISU Graduate College Homepage (<http://www.grad-college.iastate.edu>). ISU Graduate College Forms are available on the web at. Other references you may wish to obtain include: General Catalog, Graduate College Catalog, Schedule of Classes, Iowa State University phone/e-mail directory (ISU Bookstore). Most, if not all, of these resources are available on the web at the ISU homepage (<http://www.iastate.edu>).

Program Requirements

M.S. in Veterinary Microbiology (Thesis and Non-Thesis)

Ph.D. in Veterinary Microbiology

Required courses for all MS and PhD students:

VPth 554 Ethics in Scientific Research and Writing Cr. 1

OR

GR ST 565 Responsible Conduct of Research Cr. 1

STAT 401 Statistical Methods for Research Workers Cr.4

VMPPM 604 Seminar VMPPM 604 **OR** Micro 604 **OR** Imbio 604
(1 for MS students and 3 for Ph.D students over the course of their program)

Additionally, MS students are required to take 1 course in 2/4 areas and PhD students are required to take 1 course in 3/4 areas.

Required Areas:

Bacteriology:

VMPPM 586 Medical Bacteriology Cr. 4

VMPPM 625 Mechanisms of Bacterial Pathogenesis Cr. 4

Micro 552 & 553 & 555 Combined:

552: Bacterial molecular genetics and physiology Cr. 1

553: Pathogenic microorganisms Cr. 1

555: Fungal biology Cr. 1

Virology:

VMPPM 587 Animal Virology Cr. 3

VMPPM 608 Molecular Virology Cr. 3

Immunology:

VMPPM 520 Medical Immunology Cr. 4

OR

VMPPM 575 Immunology Cr. 3

Epidemiology:

VMPPM 522 Introduction to Epidemiology and Prev. Med. Cr. 3

VMPPM 527 Applications to Statistics to Pop Studies Cr. 3

VMPPM 529 Epidemiological Methods for Population Research Cr. 3

Ph.D. in Veterinary Microbiology (Preventive Medicine Emphasis)

Required Coursework:

- VMPM 522 Introduction to Epidemiology and Prev. Med. Cr. 3
VMPM 527 Applications to Statistics to Pop Studies Cr. 3
VMPM 529 Epidemiological Methods for Population Research Cr. 3

A list of additional courses relevant to the VMPM major:

- Micro 551 Microbial diversity and phylogeny Cr. 1
Micro 556 Microbial ecology and environmental monitoring Cr. 1
Micro 554 Virology
VMPM 525 Intestinal Microbiology, Cr. 3
PIP 509 Plant Virology Cr. 4
BMS 575 Cell Biology Cr. 3
V Pth 655 Cellular and Molecular Pathology I Cr. 3
BBMB 645 Molecular Endocrinology; Hormones and Growth Factors Cr. 2
STAT 402 Statistical Design and the Analysis of Experiments Cr. 3
STAT 403 Nonparametric Statistical Methods Cr. 2
STAT 407 Methods of Multivariate Analysis Cr. 3
STAT 415 Advanced Statistical Methods for Research Workers Cr. 3
STAT 421 Survey Sampling Techniques Cr. 3

Interdepartmental Programs

The Course requirements for the Interdepartmental Majors can be found at their respective web sites:

[Bioinformatics and Computational Biology](#) (BCB)

[Genetics](#)

[Immunobiology](#)

[Microbiology](#)

[Molecular, Cellular and Developmental Biology](#) (MCDB)

[Toxicology](#)

VMPPM Graduate Student Annual Report

Continued enrollment in the Graduate College requires that students make satisfactory progress toward their degree. To measure this progress, every VMPPM graduate student must submit the Graduate Student Annual Report. The report is a confidential document that will be deposited in the file of the student.

The signed report will be submitted to the DOGE no later than September 15 of each year.

Program of Study Committee

The POS Committee guides the graduate program of the graduate student. Students are encouraged to establish a POS Committee as soon as a major professor is selected. POS Committees should be in place by the end of the third semester of graduate study.

The following requirements have been established by the Graduate College or the Department of VMPPM for program of study committee makeup:

M.S.

- POS Committee has at least three members of the Graduate Faculty.
- Graduate students with major professors who are collaborators must have a co-major professor who holds VMPPM regular faculty status.
- One committee member must be from outside the area of study. Collaborators do not qualify as outside members.

Ph.D.

- POS Committee has at least five members of the Graduate Faculty.
- The major professor, or one of the co-major professors, must hold graduate faculty status.
- Graduate students with major professors who are collaborators must have a co-major professor who holds VMPPM regular faculty status.
- Three committee members must be members of VMPPM graduate faculty holding regular, or collaborator status.
- Two committee members must be from outside the field of study. Collaborators do not qualify as outside members.
- One committee member must not be a member of the graduate program of the student's major.

Program of Study

The student and the POS Committee develop a Program of Study which is a listing of courses required for the individual's degree. Each graduate student should submit a Program of Study form (POSC) within 3 semesters of entering the graduate program. POSC forms are electronic and can be accessed from the Graduate College web page. Each student's POS should be designed to correct deficiencies in academic preparation, allow study of subject matter that most interests the student, and avoid repetition in areas where the student is well-prepared. The POS Committee assures departmental requirements are met before signing the POS form.

Graduate faculty members are encouraged to establish the POS course work for the student at the first meeting of the POS Committee. It is recommended that the student and major professor discuss appropriate course work prior to the first formal committee meeting. This should be done using the [POSC worksheet](#) which can then be discussed by the full committee at the first meeting. The electronic POSC form should not be submitted until after the first committee meeting. Written research proposals formulated early in the student's graduate work are beneficial for timely completion of the degree.

The POSC is routed electronically for approval by committee members, and the DOGE before being submitted to the Graduate College. All changes in an approved POSC must be made by revising the POSC form and obtaining the signatures of all committee members and the DOGE electronically.

Program of Study Committee and Program of Study Time Table

Before the 2nd semester:	Form POS Committee
Before the 3rd semester:	Develop Program of Study
Before the end of the 3rd semester:	Submit POSC form
Before the end of the 6 th semester:	Take preliminary exam

Graduate Credits Required

Masters of Science with Thesis

At least 30 credits of acceptable graduate work must be completed, not less than 22 of which must be earned from ISU. Any transfer of credits from another institution must be recommended in the Program of Study by the POS Committee. Graduate credit is approved for transfer only if a grade of "B" or better has been earned.

Masters of Science without Thesis

A Masters without Thesis is offered by Veterinary Microbiology. This requires satisfactory completion of 35 credit hours of acceptable work (not including research) including a creative component of 5 credits. At least 30 credits must consist of didactic courses.

Doctor of Philosophy

A minimum of 72 graduate credits must be earned for a Ph.D. At least 36 credits, including all dissertation research, must be earned under the supervision of the student's Program of Study Committee. At least 24 of these credits must be earned during two consecutive semesters or during a continuous period including two semesters and a summer session while in residence at the University. (This requirement does not apply to doctoral students who are employed more than half time). A Program of Study Committee may recommend transfer of Master's degree research credits earned at another institution toward partial fulfillment of Ph.D. requirements at ISU. To avoid overspecialization, a significant body of pertinent coursework must be taken outside of the major field. Twelve hours of applicable graduate credit is required by the student's POS Committee.

Approvals

All communications to the Graduate College related to the POSC Committee makeup changes, course changes and status changes must be routed through the DOGE.

Preliminary Examinations

A written and oral examination will be given by the POS Committee. Successful completion of written and oral preliminary examinations results in admission to candidacy by the Graduate College.

All the steps mandated by the University must be fulfilled. All members of the University faculty are free to attend preliminary and final examinations. The basic formats of these examinations are as follows:

Preliminary Examination

A date should be set for the written portion of the examination that is at least two weeks prior to the oral examination. The written exam can consist entirely of questions submitted by the POS committee members. The major professor is responsible for requesting the questions. In this type of exam, the major professor or a faculty member designated by the major professor

administers the examination. The POS Committee members then grade the written examination. If the examination is deemed acceptable, the oral portion of the preliminary examination can proceed. If the performance on the written examination is questionable, the committee may allow the oral examination to proceed. If the performance on the written examination is sufficiently poor, the POS Committee should meet and report a failing result.

The oral portion of the preliminary examination may include a short presentation of the student's research results to date, followed by in-depth questioning by members of the POS Committee. The following outcomes are possible:

1. The student passes the exam and is admitted to candidacy for the Ph.D. degree.
2. The student is given a conditional pass for the exam and must make up specified deficiencies within a prescribed time. It is the responsibility of the student and the POS Committee to see that the conditions to be met are clearly understood by all parties. The student may continue his/her studies, but must meet other conditions specified by the POS committee on the "Report of Preliminary Examination" form under "Special conditions" before being recommended for candidacy. The conditional pass is intended for students that have identifiable and limited deficiencies (e.g. they may be weak in one subject area but strong in all others). The conditional pass should be used sparingly and is not a substitute for the designation of failing performance. These conditions will remain in effect until the Graduate College is given written notification by the major professor.
3. The student fails the examination, but is given opportunity to repeat the examination six months after the first attempt. An explanatory letter must accompany the report form. A specific course of action should be outlined to correct deficiencies. This course of action should be signed by both the student and the major professor. A written copy of the proposed course of action should be sent to the DOGE. A copy of this course of action should also be attached to the report form and submitted to the Graduate College. The student fails and is not permitted to continue to work toward a Ph.D. degree at ISU. An explanatory letter must accompany the report form.

Example of Proposal Style of Preliminary Exam

The written exam can also be in the form of a grant proposal. This can take on several different formats; the student should consult with his/her major professor to determine the format of the written exam. An example of the format of this type of exam is given below.

The primary purpose of this format of preliminary examination is to help train students to function as successful scientists and to help in the evaluation of their academic progress. During the examination, the student will have an opportunity to put together ideas and hypotheses in a selected field, to express these ideas in writing and to defend them orally. The student should expect and appreciate sharp criticism of his/her research proposal and should accept the

challenge and confrontation of the exams as valuable aspects of his/her learning experience and preparation as a research scientist and academician.

In order to pass this exam, the student must:

1. Assure the POS committee that he/she is able to:
 1. Envision and formulate a specific problem (hypothesis and experiments, not an approach nor a long-term research problem);
 2. Express a research problem concisely in writing; and
 3. Present and defend these ideas orally in an effective manner
2. Assure the sufficiency of background information. Demonstrated areas of deficiency in the background of the student may be filled in by any of several means (courses, examinations, tutorials, etc.).

Procedural Guidelines and Schedule

1. The student will propose several possible research objectives for a proposal and discuss these with the major professor. The topic may be laterally related to the students' dissertation research but it not cannot be a recapitulation of the student's research topic.
2. The student will then outline their proposal objectives and a brief description of each aim in an abstract format and send this to their committee members for approval. The student must prepare the abstract (and proposition) on an independent basis without prior editorial assistance or other direct help in its preparation. The student's best possible effort must be represented as it will be seen by the examining committee and placed on record without modification.
3. The major professor will consult with the POS committee and determine as expeditiously as possible (one or two days) whether the abstract meets all of the stated requirements (see below). The student will then be notified of the decision. If the abstract is acceptable, the student and major professor will decide on a suitable date for completion of the completed proposition. Usually the student will have three to four weeks to submit the completed proposition. It should not exceed 2000 words and should contain an introductory statement indicating the pertinent background information justifying the choice of the problem, the original hypothesis to be tested, the experimental approach in testing the hypothesis, a critical evaluation of the possible results, and a selected bibliography.
4. The oral examination will consist of a 15-20 minute presentation by the student to clear up any deficiencies not covered by the written proposition, and several rounds of questioning

Criteria for Evaluating Proposition:

A proposition will be rejected, preferably in the abstract state, if the following criteria

are not met or cannot be met with moderate revision. Inadequacy in any one area will be sufficient grounds for rejection of a proposition. Actual passing or failing of the examination will be determined after the oral exam and will be based on the defense of the proposition and the student's actual performance during the oral examination.

The Abstract should:

1. Be a logical, understandable, clear and concise statement of the problem, hypothesis, and experiments (i.e., be in acceptable scientific prose and free from jargon and excessive abbreviations);
2. State a significant* and original† problem;
3. State a testable hypothesis‡; and
4. Include relevant experiments, which test the hypothesis as stated.

It should be noted that at this stage in the examination procedure a student may not have developed the best approach to test the hypothesis. The student should be given some degree of latitude to discover and formulate more refined and/or better ways of testing the hypothesis during the writing of the proposition and even during the last week when preparing for the oral exam. Thus, neither the abstract nor proposition should be rejected solely on the basis of an inadequate experimental approach and the POS committee should refrain from indicating these deficiencies to the student.

* "Significant" implies that the problem chosen for investigation would appreciably advance knowledge in a relevant area of research. In other words, the planned study should not be a small step forward, a trivial "mop up" of existing phenomenology, a repetition of experiments done with one organism in another, etc.

† "original" implies that the problem proposed for study has not been adequately studied before or the proposed hypothesis has not been formulated before or the proposed experimental approach uses methodologies and/or systems that have not previously been used to study the problem. The problem proposed for study should not be closely related or duplicative of any research endeavor currently being investigated at ISU.

‡ "Testable" implies that methods and procedures needed for the research can be worked out and the appropriate experiments conducted in a one- to two-year period of time; this does not mean that all methods and/or procedures be already worked out at the time the proposition is written. A "hypothesis" is a positive statement of assumption whereas a "null hypothesis" is a negative statement of assumption. Therefore, a "look-see", "either-or" or "whether if" investigation does not contain a hypothesis. Clearly, the testability of the hypothesis requires that the proposed experiments be able to differentiate between the correctness or incorrectness of the hypothesis and to reveal the correctness of alternative hypotheses that could have been proposed based on existing knowledge at the time the proposition is written.

The Proposition

Should:

1. Conform to the criteria outlined for the abstract;
2. Expand the concepts presented in the abstract and present experiments in greater detail (with references);
3. Elaborate possible outcomes of the experiments and conclusions with respect to the hypothesis;
4. Indicate the significance of the possible outcome with respect to new problems and hypotheses; and
5. Include an accurate bibliography with titles of articles.

Thesis & Dissertation requirements

The Graduate College Thesis checklist is available at <http://www.grad-college.iastate.edu/current/thesis/checklist/>

It is the responsibility of the student and major professor to ensure that the thesis or dissertation is ready for critical evaluation. Copies of the thesis or dissertation must be submitted to the members of the POS Committee at least two weeks before the final oral examination.

The Application for Graduation should contain the exact thesis or dissertation title, and should be submitted by the end of the first week of the semester of graduation. During the term in which the diploma is submitted, a fee of \$145 for processing the thesis or dissertation is billed by the university accounting system.

Master's Thesis

A Master's thesis is a scholarly composition that demonstrates the ability of the author to do independent and creative work. It explores in some depth a problem or issue related to the major field of study. Although considerable variations in format and style are acceptable, precise expression, logical construction and meticulous attention to detail are essential. A thesis is required in all areas in which a Master's degree is awarded, except for the non-thesis degree.

Doctoral Dissertation

A doctoral dissertation must demonstrate conclusively the ability of the author to conceive, design, conduct and interpret independent, original and creative research. It must attempt to

describe significant original contributions to the advancement of knowledge and must demonstrate the ability to organize, analyze and interpret data. In most instances, a dissertation includes a statement of purpose, a review of pertinent literature, a presentation of methodology and results obtained, and a critical interpretation of conclusions in relation to the findings of others. When appropriate, it involves a defense of objectives, design and analytical procedures. Dissertation research should be worthy of publication and should, ideally, appear in appropriate professional journals of quality or in book form.

Writing and Editing Responsibility

Since satisfactory completion of the thesis or dissertation can constitute one of the most gratifying experiences in graduate study, the document should reflect the highest standards of scholarship, serving as a measure of quality for the student, major professor and the department.

Responsibility for writing and editing the thesis or dissertation rests with the student, under the supervision of the major professor. The Graduate College does not permit joint authorship of theses or dissertations. It is the responsibility of the professor in charge of a candidate's program to supervise the preparation of preliminary and final drafts of the thesis or dissertation, so as to assure the highest level of quality when the student presents the thesis or dissertation to the POS Committee for final approval.

Finishing up

Final Examination

1. Students should schedule the final examination well in advance.
2. Copies of the thesis or dissertation must be distributed to the POS Committee at least two weeks in advance of the final examination. Students are strongly advised to ask committee members if they wish to review draft copies of the thesis or dissertation and provide comments prior to scheduling the final examination and distribution to the whole committee. The thesis or dissertation should be of very high quality and the final examination should not be an exercise in thesis editing. Members of the POS Committee may request that the final examination be delayed until deficiencies are corrected.
3. Students should expect a broad range of questions in the final examination.

Seminar and Publication Requirements

All students are required to deliver a special seminar summarizing their graduate research during the final semester of their graduation. The seminar does not necessarily have to be held

in conjunction with the final defense, but frequently is. Additionally, a student should have submitted at least one manuscript for publication prior to the final defense of dissertation.

Application for Graduation Information

Students must complete and submit an Application for Graduation according to the instructions listed on the form. The form should be submitted by the date listed on the graduate college website http://www.grad-college.iastate.edu/graduation/masters_deadlines.php

Students who determine they cannot complete the requirements or meet deadlines for the semester they have indicated, should notify the departmental office and the Graduate College as soon as possible so their names can be removed from the commencement list. Failure to graduate as indicated requires a new application so that intent to graduate is formally re-established. A \$75 graduation fee will be charged to all students during the term of actual graduation.

Exit Survey

All graduating students will receive an exit survey from the DOGE during the semester of graduation.

Academic Standards

Probation policy

If a graduate student does not maintain a cumulative 3.0 grade point average on all course work taken, exclusive of research credit, he or she is placed on academic probation by the Graduate Dean. Grades earned by graduate students in undergraduate courses are included in the calculation of the grade point average. Academic probation judgments are made on the basis of grades in course work only; research grades are excluded.

While on academic probation, a student cannot be admitted to candidacy for a degree and usually cannot be appointed to an assistantship. The Graduate College places a hold on future registration to ensure that registration does not take place without a review by the Department. Before the student registers for the next term, it is necessary for the Department to review his or her record and recommend whether the Graduate College should continue to permit registration.

Before graduation is approved, the student must complete all courses listed on the Program of Study with a minimum of "C" and have a 3.0 average, unless an exception is recommended by the student's committee and approved by the Graduate Dean.

In order to remain eligible to receive financial aid from student aid programs, a student must meet both qualitative and quantitative academic standards. Qualitative standards refer to minimum expectations of academic performance in course work; quantitative standards refer to limits on the number of semesters in which enrollment is permitted in combination with a minimum number of credit hours to be earned per year. The Student Financial Aid Office can provide more details.

Dismissal Policy

Students may be dismissed from the VMPPM graduate programs, that is, removed from the degree program and not permitted to register as a VMPPM graduate student. Dismissal may occur for the any of the following reasons:

1. Lack of a major professor.

Because graduate degrees in VMPPM are centered about a mentored research project, it is impossible to complete the degree without a research mentor (major professor). To maintain good standing and earn a degree in VMPPM, a student must have a VMPPM faculty member serving as major professor.

Occasionally, a faculty member who has previously agreed to serve as a major professor becomes unable or unwilling to serve. A faculty member who wishes to terminate service as major professor for a VMPPM student may do so by notifying the student, the DOGE and the VMPPM Chair in writing. A student who has lost his/her major professor has up to three months (after the date the Chair was notified) to identify another VMPPM faculty member willing to

serve. It is the responsibility of the first faculty member to continue to support the student during this time in order to provide continuity of support. The VMPPM DOGE or Chair will help the student search for a new major professor, if the student desires.

2. Failure to progress satisfactorily in their degree program and/or maintain their academic standing.

A student's POS committee, or if the student has no POS committee, the student's major professor, temporary advisor or a member of the VMPPM Graduate Programs Committee have the right to recommend dismissal of any student who, in their view, is failing to progress satisfactorily in his/her degree program, or who has failed to maintain their academic standing, as defined by the Iowa State University Graduate College Handbook. In addition, recommendations for dismissal can be made based upon a lack of research progress or a lack of aptitude. Recommendations for dismissal are made by sending a memo to the VMPPM Chair and a copy to the DOGE.

3. Academic dishonesty

The proper conduct of science requires the highest standards of personal integrity. Because of this, the University and VMPPM consider dishonesty in the classroom or in the conduct of research to be a serious offense. Students accused of academic dishonesty will be dealt with according to the procedures outlined in the University Catalog and the Faculty Handbook. Possible punishments can include dismissal from the program and expulsion from the University, depending upon on the severity of the offense.

Dismissal Procedures

Procedures for dismissal are as described in the Iowa State University Graduate College Handbook. It is the responsibility of the VMPPM DOGE to discuss the situation with the student, as well as their POS Committee, Major Professor, Temporary Advisor, and/or Supervisory Committee, in an attempt to find a satisfactory resolution. This discussion constitutes the informal conference as described in the Graduate College Handbook. If a satisfactory resolution cannot be reached, either party may bring the issue to the attention of the Associate Dean of the Graduate College for a decision. The student may appeal the decision of the Associate Dean, as described in the Graduate College Handbook.

Graduate Student Organizations

M.G.S.O. (Veterinary Microbiology Graduate Student Organization)

The M.G.S.O. is an academically oriented organization whose main purpose is to unite fellow graduate students pursuing similar career goals in areas of microbiology. It is an active forum for the discussion of microbiology related topics and actively sponsors guest speakers. Students are located at NADC, NVSL, NSTL, Animal Science, Poultry Science, Science I and the Veterinary Medicine Complex.

I.G.S.O. (Immunobiology Graduate Student Organization)

The purpose of the I.G.S.O. is to promote interest in the field of immunology and to provide a means for the widely scattered members of the Immunobiology Program to discuss research, exchange ideas, and to interact in academic as well as non-academic settings. Students are located at NADC, NVSL, Animal Science, Poultry Science, Science I and the Veterinary Medicine Complex.

Journal Clubs

VMPM graduate students take an active part in several journal clubs available at the University. Virology, Immunobiology, Immunogenetics, MCDB, and Neuroscience to mention a few. For more information on journal clubs, please contact the VMPM Departmental Office.

List of Forms and Due Dates

Name of form	Due by
Annual report	<ul style="list-style-type: none"> September 15 each year
POSC	<ul style="list-style-type: none"> End of 3rd semester
Request for preliminary oral exam (PhD only)	<ul style="list-style-type: none"> No later than 2 weeks prior to exam. POS form must have been filed the semester before the prelim.
Report of the preliminary oral exam	<ul style="list-style-type: none"> Filed immediately after exam
Application for graduation	<ul style="list-style-type: none"> 1st week of the semester that graduation is planned. (Must be re-submitted if you do not graduate as scheduled).
Request for final oral exam	<ul style="list-style-type: none"> No later than 3 weeks before the scheduled exam. You must be registered for at least 2 credits the semester of the exam
Report of the final oral exam	<ul style="list-style-type: none"> Filed immediately after exam
Graduate student approval form	<ul style="list-style-type: none"> After the final exam is passed in the term you plan to graduate
Additional forms some students may need to file	
Concurrent enrollment for graduate / DVM degrees	<ul style="list-style-type: none"> With application for graduate study
Transfer of courses for concurrent graduate	<ul style="list-style-type: none"> On-going
Summer graduates request to attend spring or fall commencement ceremony	<ul style="list-style-type: none"> By cancellation date for spring or fall term