Twin Cities Campus
Comparative and Molecular Biosciences M.S.
College of Veterinary Medicine - Adm
College of Veterinary Medicine

Link to a list of faculty for this program.

Contact Information:
College of Veterinary Medicine, 1365 Gortner Avenue, Room 443 VMC, Saint Paul, MN 55108 (612-625-3770; fax: 612-626-2825)
Email: cvmmsphd@umn.edu
Website: http://www.cvm.umn.edu/cmb

- Program Type: Master's
- Requirements for this program are current for Fall 2011
- Length of program in credits: 30
- This program requires summer semesters for timely completion.
- Degree: Master of Science

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The mission of the Comparative and Molecular Biosciences (CMB) program is to train outstanding scientists in the basic mechanisms of animal and human health and disease.

The CMB program is transdisciplinary, bringing together basic, applied, and clinical scientists from a number of departments to provide students with individualized, cutting-edge biomedical research training. Areas of emphasis include genetic and infectious diseases, and comparative aspects of biology and pathology across animal species and humans. Students receive scientific training that prepares them for careers as independent investigators and educators in academia, industry, and government. The CMB program focuses on health that spans a wide range of species, from laboratory animal, companion animal, and livestock species to humans, and is unique within the University of Minnesota.

Note: The primary emphasis of the CMB program is the training of doctoral students; however, a small number of individuals complete a master's degree. The purpose of the master's degree is to provide technical training and scientific competence in the basic mechanisms of animal and human health and disease.

Program Delivery
This program is available:
• via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission
The preferred undergraduate GPA for admittance to the program is 3.25.

A bachelor's degree in a biological or basic science is required. Previous laboratory experience is strongly preferred.

Applicants must submit a C.V. or résumé; three letters of recommendation from persons familiar with their scholarship and research potential; and a statement of any research experience, as well as career interests, goals, and objectives.

Special Application Requirements:
Submission of all application materials by December 15 is required to ensure consideration for fellowships and research assistantships awarded for the next academic year. Students are typically admitted for fall semester.

Applicants must submit their test score(s) from the following:
• GRE

International applicants must submit score(s) from one of the following tests:
• TOEFL
  - Internet Based - Total Score: 79
  - Internet Based - Writing Score: 21
  - Internet Based - Reading Score: 19
  - Paper Based - Total Score: 550
• IELTS
- Total Score: 6.5
  - MELAB
  - Final score: 80

The preferred English language test is Test of English as Foreign Language

Key to test abbreviations (GRE, TOEFL, IELTS, MELAB).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements

**Plan A:** Plan A requires 14 major credits, 6 credits outside the major, and 10 thesis credits. The final exam is written and oral.

This program may be completed with a minor.

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

A minimum GPA of 3.00 is required for students to remain in good standing.

The M.S. requires a core curriculum of fundamental coursework and laboratory experiences as well as at least 6 course credits in a minor or related field. Students complete a minimum of 20 course credits and 10 thesis credits; the thesis is based on original laboratory research.
Twin Cities Campus
Comparative and Molecular Biosciences Ph.D.
College of Veterinary Medicine - Adm
College of Veterinary Medicine

Link to a list of faculty for this program.

Contact Information:
College of Veterinary Medicine, 1365 Gortner Avenue, Room 443 VMC, Saint Paul, MN 55108 (612-625-3770; fax: 612-626-2825)
Email: cvmmsphd@umn.edu
Website: http://www.cvm.umn.edu/cmb

- Program Type: Doctorate
- Requirements for this program are current for Fall 2011
- Length of program in credits: 60
- This program requires summer semesters for timely completion.
- Degree: Doctor of Philosophy

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The mission of the Comparative and Molecular Biosciences (CMB) program is to train outstanding scientists in the basic mechanisms of animal and human health and disease.

The CMB program is transdisciplinary, bringing together basic, applied, and clinical scientists from a number of departments to provide students with individualized, cutting-edge biomedical research training. Areas of emphasis include genetic and infectious diseases, and comparative aspects of biology and pathology across animal species and humans. Students receive scientific training that prepares them for careers as independent investigators and educators in academia, industry, and government. The CMB program focuses on health that spans a wide range of species, from laboratory animal, companion animal, and livestock species to humans, and is unique within the University of Minnesota.

Program Delivery
This program is available:
- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission
The preferred undergraduate GPA for admittance to the program is 3.25.

A bachelor's degree in a biological or basic science is required. Previous laboratory experience is strongly preferred.

Applicants must submit a C.V. or résumé; three letters of recommendation from persons familiar with their scholarship and research potential; and a statement of any research experience, as well as career interests, goals, and objectives.

Special Application Requirements:
Submission of all application materials by December 15 is required to ensure consideration for fellowships and research assistantships awarded for the next academic year. Students are typically admitted for fall semester.

Applicants must submit their test score(s) from the following:
- GRE

International applicants must submit score(s) from one of the following tests:
- TOEFL
  - Internet Based - Total Score: 79
  - Internet Based - Writing Score: 21
  - Internet Based - Reading Score: 19
  - Paper Based - Total Score: 550
- IELTS
  - Total Score: 6.5
- MELAB
  - Final score: 80
The preferred English language test is Test of English as Foreign Language
Key to test abbreviations (GRE, TOEFL, IELTS, MELAB).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements
24 credits are required in the major.
12 credits are required outside the major.
24 thesis credits are required.

This program may not be completed with a minor.

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

A minimum GPA of 3.00 is required for students to remain in good standing.

The Ph.D. requires a core curriculum of fundamental coursework and laboratory experiences as well as at least 12 credits of minor/supporting program courses. Considerable flexibility is available for students in selecting their minor/supporting program courses to construct a program around their own interests and research. Students typically complete 24-30 credits in the major field and 12 credits in a minor or supporting program for a recommended total of 36-42 credits. In addition, 24 thesis credits are required. All students are required to complete a teaching experience.
Twin Cities Campus
Veterinary Medicine M.S.
College of Veterinary Medicine - Adm
College of Veterinary Medicine

Link to a list of faculty for this program.

Contact Information:
College of Veterinary Medicine, 1365 Gortner Avenue, Room 443 VMC, Saint Paul, MN 55108 (612-625-3770; fax: 612-626-2825)
Email: cvmmsphd@umn.edu
Website: http://www.cvm.umn.edu/vmed

- Program Type: Master's
- Requirements for this program are current for Fall 2011
- Length of program in credits: 30
- This program requires summer semesters for timely completion.
- Degree: Master of Science

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The mission of the Veterinary Medicine graduate program is to promote science-based research and provide high-quality education to develop scientists working to improve the health and well-being of animals and people.

Program Goals:
- Prepare independent basic and applied scientists for successful careers in academia, industry, government, or veterinary practice
- Foster development of specific skills including leadership, communication, independent and critical thinking, teaching, interdisciplinary research in collaborative environments, scientific and grant writing, experimental and analytical methods
- Contribute to the body of knowledge in basic, translational, and applied sciences in animal health and well-being, and emerging and zoonotic threats

Program Delivery
This program is available:
- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission
The preferred undergraduate GPA for admittance to the program is 3.25.

D.V.M. or equivalent; students with a B.A. or B.S. in biological sciences may be considered. Previous laboratory experience is strongly preferred.

Applicants must submit a C.V. or résumé; three letters of recommendation from persons familiar with their scholarship and research potential; and a statement of any research experience, as well as career interests, goals, and objectives.

Special Application Requirements:
Submission of all application materials by December 15 is required to ensure consideration for fellowships and research assistantships awarded for the next academic year. Students are typically admitted for fall semester, although there is an October 1 deadline for spring semester admission consideration.

International applicants must submit score(s) from one of the following tests:
- TOEFL
  - Internet Based - Total Score: 79
  - Internet Based - Writing Score: 21
  - Internet Based - Reading Score: 19
  - Paper Based - Total Score: 550
- IELTS
  - Total Score: 6.5
- MELAB
  - Final score: 80

The preferred English language test is Test of English as Foreign Language.
Key to test abbreviations (TOEFL, IELTS, MELAB).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements
Plan A: Plan A requires 14 major credits, 6 credits outside the major, and 10 thesis credits. The final exam is written and oral.

Plan B: Plan B requires 14 to 20 major credits and 10 to 16 credits outside the major. The final exam is written and oral.

This program may be completed with a minor.

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

A minimum GPA of 3.00 is required for students to remain in good standing.

Formal coursework for the M.S. degree varies according to the field of study, interests, and career goals of the individual student. Courses for the minor or supporting field as well as for the major may be taken in disciplines other than veterinary medicine.

Program Sub-plans
A sub-plan is not required for this program.
Students may not complete the program with more than one sub-plan.

Comparative Medicine and Pathology
Comparative medicine and pathology focuses on individual animal medicine, where there is a strong demand to further the knowledge of the fundamental nature of diseases so that they may be prevented, or their detrimental effects on health minimized. Although some overlap with the infectious disease discipline is inevitable, the range of disorders addressed in this track is much broader and includes acute and chronic degenerative, metabolic, genetic, neoplastic, nutritional, inflammatory, and immune-mediated diseases. The focus is on pathological processes, their time course and diagnosis, and the search for means by which to prevent or reverse organ deterioration.

Infectious Diseases
Infectious diseases focuses on diseases attributable to pathogenic infectious organisms and their prevention and control. This track includes investigation of etiological agents, the subtleties of the pathogenesis and of the host animal’s resistance and strategies to achieve more effective therapy and prevention. The interaction between pathogen and host requires studies of the dynamic fields of microbiology, virology, cellular and humoral immunology, and genetics, as well as zoonotic mechanisms.

Population Medicine
Population medicine focuses on disease and production problems in animal populations. This epidemiological approach requires rigorous attention to diagnostic and project design methodology, analysis and statistical evaluation, and leads to the development and testing of models for disease and its spread. This includes the evaluation of risk to animals at both the individual and population levels, and the study of human health, food safety, and the environment. These are particular strengths of the graduate program, involving collaboration with the School of Public Health and the Department of Food Science and Nutrition. Through the development of research models for entire systems of livestock production, students and faculty within this branch can provide guidance and leadership in making decisions regarding enhancement of animal health, profitability of production systems, human health, and animal well-being.

Veterinary Surgery, Radiology and Anesthesiology
Surgery/radiology/anesthesiology focuses on the assessment of morphology, physiology and pathophysiology through imaging (radiology), the restoration of health through surgical management (surgery), and the management of pain (anesthesiology) and pathophysiological catastrophes (critical care). These disciplines operate in the arena of individual animals with high economic or sentimental value, which includes both large and small domestic animals. Research may take the form of basic laboratory studies performed under controlled conditions or, alternatively, of clinical or applied studies such as prospective clinical trials or retrospective analysis of archived or imaged data.
Twin Cities Campus
Veterinary Medicine Minor
College of Veterinary Medicine - Adm
College of Veterinary Medicine

Link to a list of faculty for this program.

Contact Information:
College of Veterinary Medicine, 1365 Gortner Avenue, Room 443  VMC, Saint Paul, MN 55108 (612-625-3770; fax: 612-626-2825)
Email: cvmmsphd@umn.edu
Website: http://www.cvm.umn.edu/vmed

- Program Type: Graduate minor related to major
- Requirements for this program are current for Fall 2011
- Length of program in credits (Masters): 6
- Length of program in credits (Doctorate): 12
- This program does not require summer semesters for timely completion.

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The mission of the Veterinary Medicine graduate program is to promote science-based research and provide high-quality education to develop scientists working to improve the health and well-being of animals and people.

Program Goals:
- Prepare independent basic and applied scientists for successful careers in academia, industry, government, or veterinary practice
- Foster development of specific skills including leadership, communication, independent and critical thinking, teaching, interdisciplinary research in collaborative environments, scientific and grant writing, experimental and analytical methods
- Contribute to the body of knowledge in basic, translational, and applied sciences in animal health and well-being, and emerging and zoonotic threats.

Program Delivery
This program is available:
- via classroom (the majority of instruction is face-to-face)

Program Requirements
Use of 4xxx courses towards program requirements is not permitted.
Twin Cities Campus
Veterinary Medicine Ph.D.
College of Veterinary Medicine - Adm
College of Veterinary Medicine

Link to a list of faculty for this program.

Contact Information:
College of Veterinary Medicine, 1365 Gortner Avenue, Room 443 VMC, Saint Paul, MN 55108 (612-625-3770; fax: 612-626-2825)
Email: cvmmsphd@umn.edu
Website: http://www.cvm.umn.edu/vmed

- Program Type: Doctorate
- Requirements for this program are current for Fall 2011
- Length of program in credits: 60
- This program requires summer semesters for timely completion.
- Degree: Doctor of Philosophy

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The mission of the Veterinary Medicine graduate program is to promote science-based research and provide high-quality education to develop scientists working to improve the health and well-being of animals and people.

Program Goals:
- Prepare independent basic and applied scientists for successful careers in academia, industry, government, or veterinary practice
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Program Delivery
This program is available:
- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission
The preferred undergraduate GPA for admittance to the program is 3.25.

D.V.M. or equivalent; students with a B.A. or B.S. in biological sciences may be considered. Previous laboratory experience is strongly preferred.

Applicants must submit a C.V. or résumé; three letters of recommendation from persons familiar with their scholarship and research potential; and a statement of any research experience, as well as career interests, goals, and objectives.

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For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements
24 credits are required in the major.
12 credits are required outside the major.
24 thesis credits are required.

This program may be completed with a minor.

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

A minimum GPA of 3.00 is required for students to remain in good standing.

Formal coursework for the Ph.D. degree varies according to the field of study, interests, and career goals of the individual student. There are no minimum requirements but students usually take 24 credits in the major field and 12 credits in the minor or supporting field. Courses for the minor or supporting field as well as for the major may be taken in disciplines other than veterinary medicine.

Program Sub-plans
A sub-plan is not required for this program.
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Comparative Medicine and Pathology
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