

VETERINARY MICROBIOLOGY AND PREVENTIVE MEDICINE (VMPM)

Courses primarily for undergraduates:

VMPM 3300: Global Health Disparities

(Cross-listed with GLOBE 3300).

Credits: 3. Contact Hours: Lecture 3.

Prereq: Junior classification

Historical and contemporary factors contributing to disparities in health outcomes for persons disadvantaged by income, location, ethnicity, sexual orientation, and abilities. Analysis and evaluation of health promotional materials, such as campaigns, and community-based interventions focused on reducing global health disparities. Meets U.S. Diversity Requirement. (Typically Offered: Spring)

VMPM 3600: Global Health

(Cross-listed with GLOBE 3600/ MICRO 3600).

Credits: 3. Contact Hours: Lecture 3.

Prereq: BIOL 2110

Explores human health across the world with particular emphasis on low- and lower-middle-income countries. Attention is given to the interconnectedness of health determinants, problems, and solutions found in global health, including the role of animals and the environment. Broad in scope, highlighting different cultures and the historical foundations of global health. Topics include colonialism, poverty, emerging diseases, climate change, biodiversity, one health, maternal and child health, HIV, malaria, urbanization, noncommunicable diseases and more. Current events will be a feature of all class meetings. Meets International Perspectives Requirement. (Typically Offered: Fall, Spring)

VMPM 4280: Principles of Epidemiology and Population Health

(Dual-listed with VDPAM 5280/ VMPM 5280). (Cross-listed with MICRO 4280/ VDPAM 4280).

Credits: 3. Contact Hours: Lecture 3.

Epidemiology of disease in populations. Disease causality, observational study design and approaches to epidemiologic investigations. This course is available on campus and by distance. (Typically Offered: Spring)

VMPM 4500X: Introduction to a Research Career in Industry

(Dual-listed with BMS 5500X/ VMPM 5500X). (Cross-listed with BMS 4500X).

Credits: 1. Contact Hours: Lecture 2.

Explores research career paths in industry. Course will discuss ways students can prepare competitive applications and skill sets necessary for success. Concepts of regulatory constraints, quality management systems and intellectual property will also be introduced. Material will be presented by industry associates and leaders. Offered on a satisfactory-fail basis only. (Typically Offered: Fall)

Courses primarily for graduate students, open to qualified undergraduates:

VMPM 5010: Basic Principles of Microbiology

Credits: 3. Contact Hours: Lecture 3.

Prereq: Biomedical Science Graduate Student or Permission of Instructor

The general principles of bacteriology, immunology and virology will be discussed. The structure and function of bacteria and viruses, the mechanisms of pathogenesis, and the host response to infectious agents will be reviewed. Vaccines, their failures, and new developments in vaccine development will be explored. (Typically Offered: Fall)

VMPM 5020: Microbial Genetics and Genomics

(Dual-listed with MICRO 4020/ GEN 4020). (Cross-listed with MICRO 5020).

Credits: 3. Contact Hours: Lecture 3.

Prereq: (BIOL 3130 and MICRO 3020) or Graduate Classification

The fundamental concepts of bacterial and bacteriophage genetics including mutagenesis, mechanisms of vertical and horizontal genetic information transfer and gene regulation are covered, along with genetic and genomic-based approaches to study these and other cellular processes of microorganisms. Review and discussion of research literature to examine experimental design, methodology, and interpretation of both historical and contemporary relevance to microbial genetics and genomics. Offered even-numbered years. (Typically Offered: Fall)

VMPM 5170: Gut Microbiome: Implications for Health and Diseases

(Cross-listed with ANS 5170/ MICRO 5170/ FSHN 5170).

Credits: 3. Contact Hours: Lecture 3.

Prereq: 2-3 credits in microbiology and/or immunology.

Explore current research on gut microbiome including modern tools used to study the gut microbiome. Examine the linkages between gut microbiome and health status, diseases, and manipulation of gut microbiome to improve health. (Typically Offered: Fall)

VMPM 5200: Principles of Immunology

Credits: 3. Contact Hours: Lecture 3.

Prereq: MICRO 3100 or Permission of Instructor

Nature of the immune system and its role in health and disease.

Graduation Restriction: Credit for either VMPM 5200 or 5750, but not both may be applied toward graduation. (Typically Offered: Fall)

VMPM 5250: Intestinal Microbiology

(Cross-listed with MICRO 5250).

Credits: 3. Contact Hours: Lecture 3.

Overview of commensal microbiota in the health and well-being of vertebrates. Topics include diversity of intestinal structure, microbial diversity/function, innate immune development, community interactions and metabolic diseases associated with alterations of the intestinal microbiome. Offered even-numbered years. (Typically Offered: Spring)

VMPM 5280: Principles of Epidemiology and Population Health

(Dual-listed with VDPAM 4280/ VMPM 4280/ MICRO 4280). (Cross-listed with VDPAM 5280).

Credits: 3. Contact Hours: Lecture 3.

Epidemiology of disease in populations. Disease causality, observational study design and approaches to epidemiologic investigations. This course is available on campus and by distance. (Typically Offered: Spring)

VMPM 5360: Zoonoses and Environmental Health

Credits: 3. Contact Hours: Lecture 3.

Pathogenesis and control of zoonotic diseases. Factors influencing transmission and survival of pathogenic microorganisms in the environment. Offered odd-numbered years. (Typically Offered: Spring)

VMPM 5400: Livestock Immunogenetics

(Cross-listed with MICRO 5400/ ANS 5400).

Credits: 2. Contact Hours: Lecture 2.

Prereq: ANS 5610 or MICRO 5750 or VMPM 5200 or Graduate Classification

Basic concepts and contemporary topics in genetic regulation of livestock immune response and disease resistance. Offered odd-numbered years. (Typically Offered: Spring)

VMPM 5420A: Introduction to Molecular Biology Techniques: DNA Techniques

(Cross-listed with BMS 5420A/ EEOB 5420A/ FSHN 5420A/ GDCB 5420A/ HORT 5420A/ NREM 5420A/ NUTRS 5420A/ VDPAM 5420A/ BBMB 5420A).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Includes genetic engineering procedures, sequencing, PCR, and genotyping. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

VMPM 5420C: Introduction to Molecular Biology Techniques: Cell Techniques

(Cross-listed with BMS 5420C/ EEOB 5420C/ FSHN 5420C/ GDCB 5420C/ HORT 5420C/ NREM 5420C/ NUTRS 5420C/ BBMB 5420C/ VDPAM 5420C).

Credits: 1. Contact Hours: Laboratory 2.

Repeatable.

Includes: immunophenotyping, ELISA, flow cytometry, microscopic techniques, image analysis, confocal, multiphoton and laser capture microdissection. ular biology techniques and related procedures. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

VMPM 5420D: Introduction to Molecular Biology Techniques: Plant Transformation

(Cross-listed with BMS 5420D/ EEOB 5420D/ FSHN 5420D/ GDCB 5420D/ HORT 5420D/ NREM 5420D/ NUTRS 5420D/ BBMB 5420D/ VDPAM 5420D).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Includes: Agrobacterium and particle gun-mediated transformation of tobacco, Arabidopsis, and maize, and analysis of transformants. Offered on a satisfactory-fail basis only. (Typically Offered: Spring)

VMPM 5420E: Introduction to Molecular Biology Techniques: Proteomics

(Cross-listed with BMS 5420E/ EEOB 5420E/ FSHN 5420E/ GDCB 5420E/ HORT 5420E/ NREM 5420E/ NUTRS 5420E/ BBMB 5420E/ VDPAM 5420E).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Includes: two-dimensional electrophoresis, laser scanning, mass spectrometry, and database searching. Offered on a satisfactory-fail basis only. (Typically Offered: Fall)

VMPM 5420F: Introduction to Molecular Biology Techniques: Metabolomics

(Cross-listed with BMS 5420F/ EEOB 5420F/ FSHN 5420F/ GDCB 5420F/ HORT 5420F/ NREM 5420F/ NUTRS 5420F/ BBMB 5420F/ VDPAM 5420F).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Includes: metabolomics and the techniques involved in metabolite profiling. For non-chemistry majoring students who are seeking analytical aspects into their biological research projects. Offered on a satisfactory-fail basis only. (Typically Offered: Fall)

VMPPM 5420G: Introduction to Molecular Biology Techniques: Genomic

(Cross-listed with BMS 5420G/ EEOB 5420G/ FSHN 5420G/ GDCB 5420G/ HORT 5420G/ NREM 5420G/ NUTRS 5420G/ BBMB 5420G/ VDPAM 5420G).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Sessions in basic molecular biology techniques and related procedures.

Offered on a satisfactory-fail basis only. (Typically Offered: Spring)

VMPPM 5500X: Introduction to a Research Career in Industry

(Dual-listed with BMS 4500/ VMPPM 4500). (Cross-listed with BMS 5500X).

Credits: 1. Contact Hours: Lecture 2.

Explores research career paths in industry. Course will discuss ways students can prepare competitive applications and skill sets necessary for success. Concepts of regulatory constraints, quality management systems and intellectual property will also be introduced. Material will be presented by industry associates and leaders. Offered on a satisfactory-fail basis only. (Typically Offered: Fall)

VMPPM 5750: Immunology

(Dual-listed with MICRO 4750). (Cross-listed with MICRO 5750).

Credits: 3. Contact Hours: Lecture 3.

Prereq: MICRO 3100 or *Graduate Classification*

An examination of humoral and cellular immune function as well as the interaction of the cells and factors of the immune system that result in health and disease. MICRO 4750L optional. Graduation Restriction: Credit for either MICRO 4750 or VMPPM 5200, but not both, may be applied to graduation. (Typically Offered: Spring)

VMPPM 5860: Medical Bacteriology

(Cross-listed with MICRO 5860).

Credits: 4. Contact Hours: Lecture 4.

Prereq: MICRO 3100 or *Graduate Classification*

Bacteria associated with diseases of vertebrates, including virulence factors and interaction of host responses. Concurrent students need to register for 5860L. (Typically Offered: Fall)

VMPPM 5860L: Medical Bacteriology Laboratory

Credits: 2. Contact Hours: Laboratory 6.

Laboratory in clinical bacteriology and mycology. Credit or enrollment in VMPPM 5860 or VMPPM 6250. (Typically Offered: Fall)

VMPPM 5870: Animal Virology

Credits: 4. Contact Hours: Lecture 4.

Prereq: *Instructor Permission for Course*

Principles of animal virology. Biology of viruses associated with diseases of veterinary importance, including mechanisms of pathogenesis. (Typically Offered: Spring)

VMPPM 5900: Special Topics

Credits: 1-5. Repeatable.

Prereq: *Instructor Permission for Course*

(Typically Offered: Fall, Spring, Summer)

VMPPM 5990: Creative Component

Credits: 1-30. Repeatable.

Prereq: *Instructor Permission for Course*

A written report based on laboratory research, library reading, or topics related to the student's area of specialization and approved by the student's advisory committee. (Typically Offered: Fall, Spring, Summer)

Courses for graduate students:**VMPPM 6040: Seminar**

Credits: 1. Contact Hours: Lecture 1.

Repeatable.

Offered on a satisfactory-fail basis only. (Typically Offered: Fall)

VMPPM 6080: Molecular Virology

(Cross-listed with MICRO 6080/ PLP 6080).

Credits: 3. Contact Hours: Lecture 3.

Prereq: *BBMB 4050 or GDCB 5110*

Advanced study of virus host-cell interactions. Molecular mechanisms of viral replication and pathogenesis. Offered even-numbered years. (Typically Offered: Fall)

VMPPM 6150: Molecular Immunology

(Cross-listed with MICRO 6150/ BBMB 6150).

Credits: 3. Contact Hours: Lecture 3.

Current topics in molecular aspects of immunology: T and B cell receptors; major histocompatibility complex; antibody structure; immunosuppressive drugs and viruses; and intracellular signaling pathways leading to expression of genes that control and activate immune function. Offered odd-numbered years. (Typically Offered: Fall)

VMPPM 6250: Mechanisms of Bacterial Pathogenesis

(Cross-listed with MICRO 6250).

Credits: 3. Contact Hours: Lecture 3.

Review of current concepts in specific areas of microbial pathogenesis including the genetic basis for bacterial disease, genetic regulation and control of virulence factors and their mechanisms of action, and host-pathogen interactions at the cellular and molecular levels. The application of microbial genetics to understanding pathogenesis will be included. Offered odd-numbered years. (Typically Offered: Spring)

VMPM 6290: Advanced Topics in Cellular Immunology

Credits: 2. Contact Hours: Lecture 2.

Prereq: VMPM 5200 or VMPM 5750

Current topics and literature in cellular immunology. Topics include thymocyte development and selection, T cell interactions with antigen presenting cells, and lymphocyte effector functions. Offered even-numbered years. (Typically Offered: Spring)

VMPM 6600: Pathogenesis of Persistent Infections

(Cross-listed with VPTH 6600).

Credits: 2. Contact Hours: Lecture 2.

Study of current knowledge related to host pathogen interactions during persistent and chronic infections by bacteria, viruses and parasites. Offered odd-numbered years. (Typically Offered: Spring)

VMPM 6900A: Current Topics: Immunology

Credits: 1-3. Contact Hours: Lecture 3.

Repeatable.

Prereq: Instructor Permission for Course

Colloquia or advanced study of specific topics in a specialized field. (Typically Offered: Fall, Spring, Summer)

VMPM 6900B: Current Topics: Infectious Diseases

Credits: 1-3. Contact Hours: Lecture 3.

Repeatable.

Prereq: Instructor Permission for Course

Colloquia or advanced study of specific topics in a specialized field. (Typically Offered: Fall, Spring, Summer)

VMPM 6980: Seminar in Molecular, Cellular, and Developmental Biology

(Cross-listed with BBMB 6980/ GDCB 6980/ MICRO 6980/ MCDB 6980).

Credits: 1-2. Contact Hours: Lecture 2.

Repeatable.

Student and faculty presentations. (Typically Offered: Spring)

VMPM 6990: Research

Credits: 1-30. Repeatable.

Prereq: Instructor Permission for Course

(Typically Offered: Fall, Spring, Summer)

Courses primarily for professional curriculum students:

VMPM 7378: Case Study IV

Credits: 2. Contact Hours: Lecture 2.

Case-based applied learning that relates to the basic science courses. Emphasis on early integration of basic and clinical science concepts. (Typically Offered: Spring)

VMPM 7380: Veterinary Immunology

Credits: 2. Contact Hours: Lecture 2.

Structure and function of the immune system in animals. (Typically Offered: Spring)

VMPM 7386: Veterinary Microbiology

Credits: 5. Contact Hours: Lecture 3, Laboratory 5.

Bacteria and fungi of veterinary importance with emphasis on mechanisms of disease production and laboratory diagnostic procedures. (Typically Offered: Fall)

VMPM 7387: Veterinary Virology

Credits: 3. Contact Hours: Lecture 3.

Basic principles of animal virology. Pathogenesis of viral infections. The nature and ecology of viruses of veterinary and zoonotic importance. (Typically Offered: Spring)

VMPM 7388: Public Health and the Role of the Veterinary Profession

Credits: 3. Contact Hours: Lecture 3.

Fundamental epidemiology, zoonotic diseases, occupational health, food safety, other public health topics. (Typically Offered: Spring)

VMPM 7390: Topics in Veterinary History

Credits: 1. Contact Hours: Lecture 1.

An overview of the history of veterinary medicine focused primarily on disease-specific events. A review of the historical aspects of the veterinary profession's accomplishments in the discovery of the etiological origins of disease and their subsequent control will provide students with insights that are applicable to understanding and solving today's animal and human health challenges. (Typically Offered: Fall, Spring)

VMPM 7437: Infectious Diseases and Preventive Medicine

Credits: 3. Contact Hours: Lecture 3.

Etiology, epidemiology, laboratory diagnosis, regulatory control and preventive medicine aspects of the infectious diseases of swine, sheep, goats, cattle, horses, poultry, and honeybees. (Typically Offered: Spring)

VMPM 7486: Laboratory in Public Health

Credits: 2. Contact Hours: Laboratory 5.

Repeatable.

Discussions, lectures, exercises and field trips related to veterinary public health. (Typically Offered: Fall, Spring, Summer)

VMPM 7490: Independent Study

Credits: 1-30. Repeatable.

Prereq: Instructor Permission for Course

(Typically Offered: Fall, Spring, Summer)

VMPP 7491: CDC Epidemiology Elective Preceptorship

Credits: 6.

Introduction to preventive medicine, public health and the principles of applied epidemiology within the working atmosphere of the Centers for Disease Control and Prevention. (Typically Offered: Fall, Spring, Summer)

VMPP 7496: International Experience

Credits: 1-12. Repeatable.

International Preceptorships and Study Abroad group programs.

Opportunities for students to be involved in applied clinical, production, and/or research experiences in international locations. The course consists of 40 hour per week experiential learning opportunities.

(Typically Offered: Fall, Spring, Summer)