VETERINARY AND BIOMEDICAL SCIENCES (VBMS)

VBMS 805 Introduction to Mechanisms of Disease
Description: Offered odd-numbered calendar years. Designed for students of biological, animal, and veterinary sciences. Introduction to general pathology emphasizing etiology, pathogenesis, morphologic features, and fundamental alterations associated with the fundamental changes of disease.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 808 Functional Histology
Crosslisted with: BIOS 408, BIOS 808, VBMS 408
Description: Microscopic anatomy of the tissues and organs of major vertebrate species, including humans. Normal cellular arrangements of tissues and organs as related to their macroscopic anatomy and function, with reference to sub-cellular characteristics and biochemical processes. Functional relationships among cells, tissues, organs and organ systems, contributory to organismal well being. General introduction to pathological processes and principles underlying some diseases.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC

VBMS 811 Introduction to Veterinary Epidemiology
Description: Offered summer semester of odd-numbered years. Introduction to concepts of epidemiology including definition and uses of epidemiology. Casual web theory of causation discussed and compared to the Henle-Koch postulates. Students use sampling methods to define population characteristics, detect disease and test hypotheses. Practical application of confidence, power, and sample size. Use of descriptive epidemiology to discuss population characteristics.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC

VBMS 820 Molecular Genetics
Crosslisted with: BIOS 420, BIOS 820, BIOS 420H, MBIO 420
Description: Molecular basis of genetics. Gene structure and regulation, transposable elements, chromosome structure, DNA replication, and repair mechanisms and recombination.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: FDST 908B

VBMS 824 Basic Molecular Infectious Diseases
Crosslisted with: VBMS 424
Description: Introduction to the molecular, genetic and cellular aspects of microbial pathogenesis in humans and animals.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 830 Veterinary Anatomy I
Crosslisted with: VMED 630
Description: Comparative and topographic anatomy of the dog, cat, and pig.
Credit Hours: 6
Max credits per semester: 6
Max credits per degree: 6
Format: LEC
Prerequisite for: VMED 631, VBMS 831

VBMS 831 Anatomy II
Crosslisted with: VMED 631
Prerequisites: VBMS 830
Description: Gross anatomy of domestic ruminants, horses, and birds. An advanced course in detailed gross anatomy incorporating intensive dissection laboratory sessions and classroom lectures.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC

VBMS 840 Microbial Physiology
Crosslisted with: BIOS 440, BIOS 840, MBIO 440
Description: Molecular approaches to the study of prokaryotic cell structure and physiology, including growth, cell division, metabolism, and alternative microbial life styles.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 841 Pathogenic Microbiology
Crosslisted with: BIOS 441, BIOS 841, VBMS 441, VBMS 441H
Description: Fundamental principles involved in host-microorganism interrelationships. Identification of pathogens, isolation, propagation, mode of transmission, pathogenicity, symptoms, treatment, prevention of disease, epidemiology, and methods of control.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 841L Pathogenic Microbiology Laboratory
Crosslisted with: VBMS 441L
Description: Application of diagnostic microbiological techniques to the isolation, propagation and identification of common pathogens of human beings and animals. Case studies used, in the laboratory setting, to explore and test fundamentals of transmission, epidemiology and pathogenesis of selected infectious agents and to relate these to disease signs, treatments and methods of control.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LAB
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Crosslisted with</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBMS 842</td>
<td>Endocrinology</td>
<td>ASCI 442, ASCI 842, BIOS 442, BIOS 842</td>
<td>Mammalian endocrine glands from the standpoint of their structure, their physiological function in relation to the organism, the chemical nature and mechanisms of action of their secretory products, and the nature of anomalies manifested with their dysfunction. Credit Hours: 3 Max credits per semester: 3 Max credits per degree: 3 Format: LEC</td>
</tr>
<tr>
<td>VBMS 843</td>
<td>Immunology</td>
<td>BIOS 443, BIOS 443H, BIOS 843, MBIO 443</td>
<td>Fundamental consideration of cellular and humoral mechanisms of immunity, the structure and function of immunoglobulins, antigen-antibody interactions, hypersensitivity; transplantation and tumor immunity; immune and autoimmune disorders. Credit Hours: 3 Max credits per semester: 3 Max credits per degree: 3 Format: LEC</td>
</tr>
<tr>
<td>VBMS 845</td>
<td>Animal Physiology I</td>
<td>ASCI 845, BIOS 813</td>
<td>Mammalian physiology and cellular mechanisms. Physiology of the cell, embryology, and neuro-sensory, neuromuscular, endocrine, and reproductive systems. Credit Hours: 4 Max credits per semester: 4 Max credits per degree: 4 Format: LEC</td>
</tr>
<tr>
<td>VBMS 846</td>
<td>Animal Physiology II</td>
<td>ASCI 846, BIOS 814</td>
<td>Mammalian physiology and cellular mechanisms. Physiology of the digestive, cardiovascular, respiratory, and renal systems. Credit Hours: 4 Max credits per semester: 4 Max credits per degree: 4 Format: LEC</td>
</tr>
<tr>
<td>VBMS 847A</td>
<td>Interdisciplinary Concepts in Beef Production I</td>
<td>ASCI 847</td>
<td>The contributions and interactions of the major academic disciplines upon the production, performance, health, profitability, and sustainability of beef cow and cattle feeding operations. Credit Hours: 3 Max credits per semester: 3 Max credits per degree: 3 Format: LEC</td>
</tr>
<tr>
<td>VBMS 847B</td>
<td>Interdisciplinary Concepts in Beef Production II</td>
<td>ASCI 847</td>
<td>The contributions and interactions of the major academic disciplines upon the production, performance, health, profitability, and sustainability of beef cow and cattle feeding operations. Credit Hours: 3 Max credits per semester: 3 Max credits per degree: 3 Format: LEC</td>
</tr>
<tr>
<td>VBMS 848</td>
<td>Introduction to Veterinary Biotechnology</td>
<td></td>
<td>Information and assignments for VBMS 848 exchanged in the classroom and via Internet. Theoretical basis for emerging cellular, molecular and reproductive technologies, and their potential applications and impacts in the practice of food animal veterinary medicine. Credit Hours: 1-2 Min credits per semester: 1 Max credits per semester: 2 Max credits per degree: 2 Format: LEC</td>
</tr>
<tr>
<td>VBMS 852</td>
<td>Molecular Virology and Viral Pathogenesis</td>
<td></td>
<td>Introduction to virology with emphasis on molecular biology and pathogenesis. Concepts of virus replication strategies, virus-host interactions and virus pathogenesis. Credit Hours: 3 Max credits per semester: 3 Max credits per degree: 3 Format: LEC</td>
</tr>
<tr>
<td>VBMS 899</td>
<td>Masters Thesis</td>
<td></td>
<td>Application of the principles of pathology to current problems in the diagnostic laboratory. Credit Hours: 1-10 Min credits per semester: 1 Max credits per semester: 10 Max credits per degree: 99 Format: IND</td>
</tr>
<tr>
<td>VBMS 901</td>
<td>Diagnostic Techniques</td>
<td></td>
<td>Application of the principles of pathology to current problems in the diagnostic laboratory. Credit Hours: 1-10 Min credits per semester: 1 Max credits per semester: 10 Max credits per degree: 10 Format: LEC</td>
</tr>
</tbody>
</table>
VBMS 908 T Cell Biology: Repertoire and Effector Functions

Description: Analysis of the literature of the cellular and molecular biology of T cell recognition and effector functions. Subject areas: Scientific Methodologies; Antigen Presentation; T Cell Receptor and Coreceptor; Thymic Structure and Self/Nonself Discrimination; T Cell Regulation; Allergy and Autoimmune Diseases; and T-Cell-Mediated Inflammation and Cytokine Network.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 909 Seminar

Credit Hours: 1-4

Min credits per semester: 1
Max credits per semester: 4
Max credits per degree: 4
Format: LEC

VBMS 910 Topics in Immunology

Prerequisites: VBMS 843 or BIOS 843

Description: Basics of immunology; critical analysis of reports taken from scientific literature of immunology.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 919 Regulation of Eukaryotic Gene Expression

Description: Basic mechanisms regulating gene expression in eukaryotes during various physiological states. Emphasis on understanding specific and unique mechanisms in mammalian systems. Techniques used to study gene regulation.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 920 Measurement of Animal Disease and Production

Description: Measurements of disease and production, the basic tenants of epidemiology, taught in detail including incidence density, risk rates, morbidity, mortality, cause specific rates, and life tables. Methods and implications of measuring disease at the farm, regional, and national levels. Sampling strategies and the impact of these on the standard error of the estimate. Implications and biases of using retrospective production data versus prospective data. Clinical epidemiology which includes definition of tests in veterinary medicine, individual and herd level sensitivity and specificity, receiver operating characteristics curves, positive and negative predictive values, serial and parallel interpretation of tests, Kappa statistics, and issues of precision, validity, and accuracy.

Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC

VBMS 921 Analytic Observational Studies in Veterinary Epidemiology

Description: Design, implementation, and analysis of cross-sectional, cohort, and case-control studies and field trials. Limitations, biases, implications of the results, and current uses of each. Evaluation of these methods as used in the scientific literature. Analyses includes chi-square tests, Cochrane Chi-square tests, and epidemiologic measures of strength of association, effect, and total effect. Design, implementation, analysis and interpretation of field trials taught specifically as they relate to the practitioner.

Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC

VBMS 925 Critical Reading of the Epidemiology Literature

Description: Analysis of current epidemiology and animal health literature. Critical evaluation of study design, methods of analysis, biases, field applicability, and basis for conclusions. May be repeated for credit.

Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 4
Format: LEC

VBMS 930 Advanced Food Animal Production Medicine

Description: Inter-relationships between animal health, disease, and well-being as they relate to the productivity and profitability of food animal production units. Integrates aspects of veterinary medicine, animal science, and agricultural economics. General concepts related to cattle, swine and sheep production systems, followed by specific issues that relate to different species.

Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC

VBMS 931 Concepts in Experimental Immunology

Description: Recent advances in immunological techniques and review of conventional methods.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 932 Immunovirology

Description: Pathogenic microbiology recommended. Description of virus and immune system interactions, with emphasis on mouse and human models. Mechanism of antigen presentation of viral proteins and relationship to health and disease. Analysis of the hosts immune response to selected viral infections of the major systems: neural, respiratory, gastrointestinal and immune.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 942 Genetics, Genomics, and Bioinformatics of Prokaryotes

Crosslisted with: BIOS 942

Description: Prokaryotic gene regulation, DNA exchange, DNA recombination and repair, comparative prokaryotic genomics and computer-based methods of analysis.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 944 Immunovirology

Description: Pathogenic microbiology recommended. Description of virus and immune system interactions, with emphasis on mouse and human models. Mechanism of antigen presentation of viral proteins and relationship to health and disease. Analysis of the hosts immune response to selected viral infections of the major systems: neural, respiratory, gastrointestinal and immune.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 948 Concepts in Experimental Immunology

Description: Recent advances in immunological techniques and review of conventional methods.

Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
VBMS 949 Vaccinology
Description: Analysis of the theory and mechanisms involved in the development of efficacious vaccines. Microbiological and immunological aspects as well as the manufacturing and regulatory aspects of vaccine development.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC

VBMS 950 Medical Molecular Virology
Prerequisites: BIOS/CHEM/BIOC 431/831 and 432/832; VBMS 852
Description: Current topics in molecular virology relevant to the natural history and pathogenesis of viral diseases of humans and animals.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 951 Advanced Molecular Infectious Diseases
Description: Molecular and cellular aspects of microbial pathogenesis. Key literature, synthesis of scientific problems into research proposals.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 964 Signal Transduction
Crosslisted with: BIOS 964
Description: Molecular basis of genetics in eukaryotes. Gene structure and regulation, transposable elements, chromosome structure, DNA replication and repair mechanisms and recombination.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 966 Advanced Viral Pathogenesis
Crosslisted with: BIOS 966
Description: Advanced analysis on the mechanisms of cell and tissue damage by viruses, the spread of viruses through the body, and the host response.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

VBMS 975 Seminar in Veterinary Histopathology
Description: Descriptive veterinary histopathology covering diseases of all body systems in animal species including domestic, laboratory, wildlife, birds, fishes, reptiles, and amphibians. Source material is worldwide in scope. May be repeated for credit.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

VBMS 996 Research on Selected Problems in Veterinary Science
Credit Hours: 2-10
Min credits per semester: 2
Max credits per semester: 10
Max credits per degree: 10
Format: IND

VBMS 998 Special Topics in Veterinary Science
Description: The subject will be dependent on student demand and availability of staff. Reviews of specialized subject areas.
Credit Hours: 1-10
Min credits per semester: 1
Max credits per semester: 10
Max credits per degree: 10
Format: LEC