DEPARTMENT OF VETERINARY PATHOBIOLGY

http://vetmed.tamu.edu/vtpb

Head: Ramesh Vemulapalli

Graduate Advisor: Michael Criscitiello

The Department of Veterinary Pathobiology (VTPB) offers programs of graduate instruction and research leading to the degrees of Master of Science (MS) and Doctor of Philosophy (PhD) in Biomedical Sciences. Department faculty also contribute to the academic and research training for university-wide interdisciplinary programs in Biotechnology, Genetics, and Toxicology that lead to MS and PhD degrees. Major specialty areas include infectious diseases (virology, bacteriology, parasitology), biodefense and emerging infectious diseases, metabolic diseases, genetics/genomics, neuroscience, cardiovascular science, and immunology and are options for students pursuing any graduate degree awarded by the Department.

The Department also offers post-doctoral (DVM) residency/graduate programs in anatomic pathology, clinical pathology, and laboratory animal medicine. Residents are required to enroll in graduate courses and may pursue either a Master of Science or Doctor of Philosophy degree. Minimum qualifications for residency programs include a DVM/VMD or equivalent degree. Selection of residents is made on the basis of academic achievement, letters of recommendation, and pertinent experience.

For further information regarding these programs, please contact resgrad@cvm.tamu.edu or Dr. Mike Criscitiello (mcriscitiello@cvm.tamu.edu). Also, the following websites may provide additional information: Comparative Medicine Program (http://cmp.tamu.edu/); Veterinary Pathobiology (http://vetmed.tamu.edu/vtpb); Texas A&M University (http://www.tamu.edu/); Office of Graduate and Professional Studies (http://ogaps.tamu.edu/); College of Veterinary Medicine and Biomedical Sciences (http://vetmed.tamu.edu/); and a guide to the Bryan-College Station area (http://vetmed.tamu.edu/area-information).

Faculty

Adams, Leslie G, Senior Professor
Veterinary Pathobiology
PHD, Texas A&M University, 1968
DVM, Texas A&M University, 1964

Arenas, Angela M, Assistant Professor
Veterinary Pathobiology
PHD, Texas A&M University, 2007
DVM, La Salle University, Colombia, 2002

Brightsmith, Donald J, Associate Professor
Veterinary Pathobiology
PHD, Duke University, 1999

Clubb, Fred J, Clinical Professor
Veterinary Pathobiology
PHD, The University of Alabama at Birmingham, 1983
DVM, Auburn University, 1971

Cook, Walter E, Clinical Associate Professor
Veterinary Pathobiology
PHD, University of Wyoming, 1999
DVM, University of California at Davis, 1994

Criscitiello, Michael F, Associate Professor
Veterinary Pathobiology
PHD, University of Miami, 2003

Derr, James N, Professor
Veterinary Pathobiology
PHD, Texas A&M University, 1990

Dindot, Scott V, Associate Professor
Veterinary Pathobiology
PHD, Texas A&M University, 2003

Edwards, John F, Professor
Veterinary Pathobiology
PHD, Cornell University, 1983
DVM, The Ohio State University, 1974

Esteve-Gasent, Maria D, Assistant Professor
Veterinary Pathobiology
PHD, Universidad de Valencia, Spain, 2003

Jeter, Elizabeth A, Lecturer
Veterinary Pathobiology
DVM, Texas A&M University, 1982

Johnson, Mark C, Clinical Professor
Veterinary Pathobiology
DVM, Texas A&M University, 1988

Kier, Ann B, Senior Professor
Veterinary Pathobiology
PHD, University of Missouri - Columbia, 1979
DVM, Texas A&M University, 1974

Krecek, Rosina C, Visiting Professor
Veterinary Pathobiology
PHD, University of Pretoria, 1985

Lawhon, Sara D, Associate Professor
Veterinary Pathobiology
PHD, North Carolina State University, 2003
DVM, Texas A&M University, 1997

Levine, Gwendolyn J, Clinical Associate Professor
Veterinary Pathobiology
DVM, Texas A&M University, 2006

Locke, Unity B, Assistant Professor
Veterinary Pathobiology
PHD, Iowa State University, 2011
BA VetMB, University of Cambridge, 2008

Logan, Linda L, Professor
Veterinary Pathobiology
PHD, University of California, Davis, 1987
DVM, Texas A&M University, 1976

Lupiani, Blanca M, Professor
Veterinary Pathobiology
PHD, University of Maryland, 1994
Mulenga, Albert, Professor
Veterinary Pathobiology
PHD, Hokkaido University, 1999
MVM, University of Liverpool, 1993
BVM, University of Zambia, 1990

Musser, Jeffrey M, Clinical Professor
Veterinary Pathobiology
PHD, North Carolina State University, 2000
DVM, VA-MD Regional College of Veterinary Medicine, 1989

Nabity, Mary B, Assistant Professor
Veterinary Pathobiology
PHD, Texas A&M University, 2010
DVM, Cornell University, 2002

Omran, Mohamed T, Clinical Assistant Professor
Veterinary Pathobiology
PHD, Texas A&M University, 1995

Payne, Susan L, Associate Professor
Veterinary Pathobiology
PHD, Louisiana State University, 1983

Pool, Roy R, Clinical Professor
Veterinary Pathobiology
PHD, University of California, Davis, 1967
DVM, Oklahoma State University, 1964

Porter, Brian F, Clinical Associate Professor
Veterinary Pathobiology
DVM, Texas A&M University, 1992

Rech, Raquel R, Clinical Assistant Professor
Veterinary Pathobiology
PHD, Federal University of Santa Maria (UFSM), 2007
DVM, Santa Catarina State University, 1999

Reddy, Sanjay M, Professor
Veterinary Pathobiology
PHD, University of Maryland, 1994
BVSc, Andhra Pradesh Agricultural University, India, 1986

Rivera, Gonzalo M, Associate Professor
Veterinary Pathobiology
PHD, Cornell University, 2002
DVM, National University of Rio Cuarto, Argentina, 1988

Rodrigues Hoffmann, Aline, Assistant Professor
Veterinary Pathobiology
PHD, Texas A&M University, 2011
DVM, Universidade Federal de Santa Maria, Brazil, 2004

Rogovskyy, Artem S, Assistant Professor
Veterinary Pathobiology
PHD, Washington State University, 2014
DVM, National Agricultural University, Ukraine, 2001

Russell, Karen E, Professor
Veterinary Pathobiology
PHD, North Carolina State University, 1997
DVM, VA-MD Regional College of Veterinary Medicine, 1990

Scott, Harvey M, Professor
Veterinary Pathobiology
PHD, University of Guelph, Canada, 1998
DVM, University of Saskatchewan, 1988

Seabury, Christopher M, Associate Professor
Veterinary Pathobiology
PHD, Texas A&M University, 2004

Smith, Roger, Professor
Veterinary Pathobiology
PHD, Baylor College of Medicine, 1984
DVM, Texas A&M University, 1977

Snowden, Karen F, Professor
Veterinary Pathobiology
PHD, North Carolina State University, 1988
DVM, Auburn University, 1979

Threadgill, David W, Professor
Veterinary Pathobiology
PHD, Texas A&M University, 1989

Threadgill, Deborah S, Assistant Professor
Veterinary Pathobiology
PHD, Texas A&M University, 1990

Tizard, Ian R, Professor
Veterinary Pathobiology
PHD, University of Cambridge, 1969
BVM & S, University of Edinburg, 1965

Vemulapalli, Ramesh, Professor
Veterinary Pathobiology
PHD, University of Maryland, 1996
BVSc, Andhra Pradesh Agricultural University, India, 1986

Vemulapalli, Tracy H, Clinical Associate Professor
Veterinary Pathobiology
MS, Purdue University, 2007
DVM, VA-MD Regional College of Veterinary Medicine, 1998

Weeks, Bradley R, Professor
Veterinary Pathobiology
PHD, Kansas State University, 1988
DVM, Oklahoma State University, 1983

Womack, James E, Senior Distinguished Professor
Veterinary Pathobiology
PHD, Oregon State University, 1968

Zhu, Guan, Professor
Veterinary Pathobiology
PHD, University of Georgia, 1993

Courses

VPAR 601 Parasitology
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Important helminth parasites of animals and humans; their identification, distribution and life history.
Prerequisites: VTPB 487/BIOL 487 or equivalent or approval of instructor.
VPAR 604 Parasitic Protozoa
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Taxonomy, morphology, life cycle, physiology, distribution, genetics, host relations, methods and diagnosis concerned with protozoan parasites affecting vertebrates including humans.
Prerequisite: VTPB 487/BIOL 487 or ENTO 208 or BIOL 438 or equivalent or approval of instructor.

VPAR 605 Molecular and Immunological Parasitology
Credits 3. 3 Lecture Hours.
Basic concepts and recent advancement in molecular biology and molecular immunology of parasitic diseases. Molecular-based host-parasite interactions.

VPAR 685 Directed Studies
Credits 1 to 4. 1 to 4 Other Hours.
Special problems concerned with parasites of animals or humans.
Prerequisites: VPAR 601 or equivalent; approval of instructor.

VPAR 689 Special Topics in...
Credits 3. 3 Lecture Hours.
Selected topics in an identified area of biomedical parasitology. May be repeated for credit.

VPAR 691 Research
Credits 1 to 23. 1 to 23 Other Hours.
Research for thesis.

VPAT 601 Comparative Pathology
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Pathologic processes occurring in diseased cells, tissues and organs of animals and humans; their pathogenesis and morphologic manifestations.
Prerequisites: Courses in gross and microscopic mammalian anatomy and physiology and approval of instructor.

VPAT 610 Cell Mechanisms of Disease
Credits 3. 3 Lecture Hours.
Cellular mechanism, morphologic manifestations and clinical presentation of illustrative disease processes.
Prerequisites: Graduate classification with a major in BIMS, VTPB, or BMEN; approval of instructor.

VPAT 620 Humane, Public Health and Regulatory Aspects of Animal Use
Credit 1. 1 Lecture Hour.
Emphasizes thoughtful and humane use of animals in teaching, research and service; human and animal health benefits of biomedical research, governmental policies regulations, public health implications, management practices, and public relations pertaining to animal use in research and teaching.

VPAT 640 Advanced Mechanisms of Disease
Credits 2. 2 Lecture Hours.
Concepts of pathogenesis of disease processes.
Prerequisite: DVM degree or approval of instructor.

VPAT 641 Systemic Pathology I
Credits 4. 2 Lecture Hours. 4 Lab Hours.
Disease manifestations in special organs and tissues and interrelations of pathologic processes in individual and functionally related organs.
Prerequisite: DVM degree or equivalent.

VPAT 642 Mechanisms of Metabolic Disease
Credits 2. 2 Lecture Hours.
Characteristics and mechanisms of diseases caused either by deficiency, imbalance, excess of specific nutrients or chemicals, or by regulatory disturbances of metabolism.
Prerequisite: DVM degree or approval of department head.

VPAT 643 Applied Pathology
Credits 1 to 6. 1 to 6 Other Hours.
Application of information and concepts of anatomic and clinical pathology to the diagnosis of animal disease; gross pathological changes observed in necropsy are correlated with and corrected by histopathologic observations; confirmatory methods of clinical pathology and laboratory medicine used where indicated. May be taken more than once but not to exceed 6 hours of credit toward a graduate degree.
Prerequisite: DVM degree or equivalent.

VPAT 645 Neoplastic Diseases
Credits 1 to 8. 1 to 8 Other Hours.
Theoretical, histopathological and clinical aspects of neoplasia. Diagnosis of neoplastic and related conditions in all species. May be taken more than once but not to exceed 8 hours of credit toward a graduate degree.
Prerequisite: DVM degree or equivalent.

VPAT 650 Neuropathology of Animals
Credits 1 to 4. 1 to 4 Other Hours.
Pathology and pathogenesis of diseases of the central and peripheral nervous systems. Interpretation of gross and microscopic lesions of the nervous system associated with disease processes. May be taken more than once but not to exceed 4 hours of credit toward a graduate degree.
Prerequisite: DVM degree or equivalent.

VPAT 651 Systemic Pathology II
Credits 2. 1 Lecture Hour. 3 Lab Hours.
Continuation of VPAT 641. Disease manifestations in special organs and tissues and interrelations of pathologic processes in individual and functionally related organs.
Prerequisite: VPAT 641.

VPAT 652 Cell Mechanisms of Disease
Credits 3. 3 Lecture Hours.
Basic cellular mechanisms and general manifestations of disease; illustration of clinical and anatomical/morphological aspects of various diseases.
Prerequisites: Graduate classification; enrollment in BIMS or BMEN curriculum; approval of instructor.

VPAT 653 Diseases of Laboratory Animals
Credits 3. 3 Lecture Hours.
Pathology and pathogenesis of spontaneous infectious, parasitic, metabolic and neoplastic diseases of laboratory animals.
Prerequisite: VTPB 922 or equivalent.

VPAT 681 Seminar
Credit 1. 1 Lecture Hour.
For graduate and special students in veterinary or comparative pathology; presentation and discussion of special topics and research data concerning pathology and pathogenesis of disease.
Prerequisite: Approval of instructor.

VPAT 685 Directed Studies
Credits 1 to 4. 1 to 4 Other Hours.
Advanced special problems concerned with pathogenesis and pathology of disease.
Prerequisite: Approval of instructor.

VPAT 689 Special Topics in...
Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours.
Selected topics in an identified area of veterinary or comparative pathology. May be repeated for credit.
VTMI 690 Theory of Research
Credits 3.3 Lecture Hours.
Theory and design of research related to current biomedical problems especially those involving study of animal diseases; philosophical perspectives underlying historical advances in research pertaining to the study, prevention and treatment of disease.
Prerequisite: Graduate classification.
Cross Listing: VIBS 690 and VTPP 690.

VTMI 691 Research
Credits 1 to 23. 1 to 23 Other Hours.
Research for thesis or dissertation.

VTMI 601 Fundamentals of Pathobiology
Credits 3. 5 Lecture Hours.
Encompasses the concepts of pathobiology including bacterial, viral and parasitic diseases, the host response to infectious agents, pathology, and metabolic and genetic diseases; includes animal and human diseases and provides enough background to facilitate in advanced graduate courses.
Prerequisite: Graduate classification.

VTMI 602 Animal Models of Obesity
Credits 4. 4 Lecture Hours.
Overview of animal models of obesity; emphasis on rodent genetically engineered models of obesity related to diabetes mellitus type 2 (obesity related diabetes) and leptin research to understand metabolism, molecular biology and origin of lipids as signaling molecules important in obesity.
Prerequisite: Approval of instructor; minimum 3 credit hours of undergraduate or graduate biochemistry.

VTMI 604 Amazon Field School
Credits 4.4 Lecture Hours.
Investigation of social and ecological complexities of biodiversity conservation in tropical ecosystems; biological and social science approaches to evaluate causes, consequences and solutions to biodiversity loss through ecology, culture and governance.
Cross Listing: RPTS 654 and WFSC 654.

VTMI 614 Fermentation and Gastrointestinal Microbiology
Credits 3. 3 Lecture Hours.
Fermentation and gastrointestinal ecosystems in terms of microorganisms present, their activities and requirements and their interactions in a dynamic system.
Prerequisite: Beginning microbiology and/or biochemistry or approval of instructor.
Cross Listing: POSC 614 and NUTR 614.

VTMI 615 Immunogenetics and Comparative Immunology
Credits 3. 3 Lecture Hours.
Genetic mechanisms used to diversify immune receptors; immunoglobulins, T cell receptors, major histocompatibility complex, natural killer cell receptors, toll-like receptors and many others; selected comparative and veterinary examples of different immune recognition systems; evolution of the immune system; theoretical immune surveillance and vaccine development.
Prerequisite: Graduate classification; GENE 320/BIMS 320 and VTPB 409, or equivalent, or approval of instructor.

VTMI 619 Molecular Methods for Microbial
Credits 3. 2 Lecture Hours. 2 Lab Hours.
Underlying principles of molecular methods for microbial detection and characterization in natural and man-made ecosystems; emphasis on method application and data interpretation; emphasis on microbial pathogens and indicator organisms in foods and environment; laboratory covers select protocols.
Prerequisite: POSC 429/FSTC 326/DASC 326/SCSC 405/approval of instructor.
Cross Listing: SCSC 629/VTPP 629.

VTMI 629/SCSC 629 Laboratory Quality Systems
Credits 3. 3 Lecture Hours.
Quality systems and method development used within a laboratory; ensuring the integrity of procedures used in lab processes, chain of custody, information management, and international laboratory standards; regulatory requirements for laboratory operation; bio-security precautions; laboratory management.
Cross Listing: SCSC 629/VTPP 629.

VTMI 643 Pathogenic Bacteriology I
Credits 4. 3 Lecture Hours. 4 Lab Hours.
Pathogenic bacteria, their cultural and biological characteristics and pathogenicity.
Prerequisite: Minimum of 8 hours of undergraduate microbiology.

VTMI 645 Host-Agent Interaction
Credits 3. 3 Lecture Hours.
Basic concepts of infection versus disease; molecular approaches to problems in microbiology; inducible host responses, agent escape mechanisms and movement of potential pathogens in the ecosystem.
Prerequisite: GENE 431/BICH 431 or equivalent.

VTMI 647 Virology
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Virus infections in animals and humans; types of infections, mode of transmission, intracellular pathology, epidemiology, isolation and identification of inciting agents; tissue cultivation, animal inoculations and diagnostic tests.
Prerequisite: VTPB 438 or equivalent.

VTMI 648 Medical Mycology
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Actinomycetes, yeasts and molds that are pathogenic to humans and animals; morphology, cultural characteristics, pathogenicity and identification; practice consists of exercises in cultural methods, morphological characteristics, biochemical reactions and diagnosis.
Prerequisite: Minimum of 8 hours of undergraduate microbiology.

VTMI 649/POSC 649 Immunology
Credits 3. 3 Lecture Hours.
Cellular basis of the immune response; relationships between inflammation and acquired immunity, MHC and cell activation; the role of cytokines in immunoregulation and hypersensitivity, vaccines, and the mechanism of immunity to viruses, bacteria and parasites.
Prerequisite: VTPB 409 or equivalent.
Cross Listing: POSC 649/VTPP 649.

VTMI 650/POSC 660 Experimental Immunology
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Familiarization, development and integration of techniques into experimental design of immunologic investigation; antibody production, protein purification, immunofluorescence, agar-gel diffusion, immunoelectrophoresis and specialized serologic tests.
Cross Listing: POSC 660/VTPP 660.
VTMI 654 Cell Culture Techniques
Credits 3. 1 Lecture Hour. 6 Lab Hours.
Introduction to the theory and practice of cell culture and provides illustrations of its applications; how to maintain a cell culture unit and culture cell lines; how to derive new cell cultures from animal tissues, characterize cultured cells, optimize in vitro conditions and introduce genetic changes into cultured cells.
Prerequisite: Approval of instructor.

VTMI 662 Advanced Immunologic Concepts
Credits 1 to 5. 1 to 5 Lecture Hours.
Modular course with detailed discussions, workshops and assigned reading/problem solving on advanced topics; structural organization of molecules; genetic regulation; cytokine cascades; pathophysiology of autoimmunity. May be repeated for credit.
Prerequisites: VTMI 649/POSC 649; BICH 603 or equivalent; approval of instructor.

VTMI 663/MPIM 663 Molecular Biology of Viruses
Credits 3. 3 Lecture Hours.
In-depth studies of the biochemistry and the replication strategies of viruses and molecular mechanisms of pathogenesis for selected viral systems.
Prerequisite: Graduate classification in pathology, molecular biology, biochemistry, or approval of instructor.
Cross Listing: MPIM 663/VTMI 663.

VTMI 664 Mammalian Genome Modification for Biomedical Research
Credits 3. 3 Lecture Hours.
Reviews the uses of genetic manipulation in biomedical research and provides a working knowledge of the various strategies used to modify mammalian genomes including transgenes, homologous recombination, gene-trapping, RNA interference, cloning, and gene therapy.

VTMI 665 Viral Vectors and Gene Therapy
Credits 3. 3 Lecture Hours.
Describes various viral vector systems, their development and their use as research tools in biotechnology and gene therapy; consists of a mixture of short lectures and discussion papers from the literature.
Prerequisites: VTMI 663/MPIM 663, VTMI 647, PLPA 616, or PLPA 620 or approval of instructor.
Cross Listing: MPIM 665 and PLPA 665.

VTMI 681 Seminar
Credit 1. 1 Lecture Hour.
Review and discussion of current scientific work and research in field of microbiology and related subjects.
Prerequisite: Approval of instructor.

VTMI 685 Directed Studies
Credits 1 to 4. 1 to 4 Other Hours.
Problems course in microbiology.
Prerequisite: Approval of instructor.

VTMI 689 Special Topics in...
Credits 1 to 4. 1 to 4 Lecture Hours.
Selected topics in an identified area of veterinary microbiology. May be repeated for credit.
Prerequisite: Approval of instructor.

VTMI 691 Research
Credits 1 to 23. 1 to 23 Other Hours.
Research for thesis or dissertation.

VTPB 613 Mammalian Genomics and Bioinformatics
Credits 3. 3 Lecture Hours.
Exploration of fundamental concepts and principles in mammalian genomics and bioinformatics; includes case studies involving applications of modern technologies and experimental practices that are foundational for historic and modern discovery.
Prerequisite: Graduate classification.

VTPB 910 Veterinary Immunology
Credits 2. 2 Lecture Hours.
Introduction to veterinary immunology; mechanisms of resistance of infectious diseases and tumors; tissue injury caused by the immune system, including hypersensitivity reactions and autoimmunity; immunization theory and practices; immunologic methods for diagnosis of disease.
Prerequisite: Enrollment in the first year of professional curriculum.

VTPB 911 Veterinary Microbiology
Credits 4. 3 Lecture Hours. 2 Lab Hours.
Introduction to veterinary microbiology; bacterial, viral, and mycotic agents of veterinary significance; mechanisms of host injury by pathogenic microorganisms; principles of disinfection, antisepsis, and sterilization; classes and mechanisms of mechanisms of action of antibacterial, antifungal, and antiviral drugs; diagnostic procedures and methods of sample collection.
Prerequisite: Enrollment in the first year of professional curriculum.

VTPB 913 Infectious Diseases
Credits 2. 2 Lecture Hours.
Case-based approach to infectious diseases of animals; includes infectious diseases of major body systems; etiologic agents include viruses, bacteria, fungi, protozoa, helminths, and arthropods; differential diagnosis of infectious agents, diagnostic approaches, prevention, and treatment emphasized; management practices to control infectious diseases covered by host species.
Prerequisite: Enrollment in second year of the professional curriculum.

VTPB 920 Parasitology
Credits 5. 3 Lecture Hours. 4 Lab Hours.
Taxonomy, biological and clinical aspects of the commonly occurring helminth, protozoan and arthropod parasites of domestic and laboratory animals. Signs, pathogenesis, diagnosis, treatment, prevention, and control, public health and economic importance of parasitic diseases.
Prerequisite: Enrollment in the second year of professional curriculum.

VTPB 922 Pathology I
Credits 3. 2 Lecture Hours. 2 Lab Hours.
Structural and functional changes in cells, tissues and organ systems of animals; pathogenesis, mechanisms and morphologic features of diseases and their relationship to clinical signs; laboratory consists of studies of gross and microscopic pathology.
Prerequisite: Enrollment in the first year of professional DVM curriculum.

VTPB 923 Pathology II
Credits 3. 2 Lecture Hours. 2 Lab Hours.
Structural and functional changes in cells, tissues and organ systems of animals; pathogenesis, mechanisms and morphologic features of diseases and their relationship to clinical signs; laboratory consists of studies of gross and microscopic pathology.
Prerequisite: Enrollment in the second year of professional DVM curriculum.
VTPB 925 Agents of Disease I  
Credits 4. 3 Lecture Hours. 2 Lab Hours.  
Introduction to the agents of infectious diseases: bacteria, fungi, viruses, prions, protozoa, helminths and arthropods; agents by general taxonomy and structural features as they relate to diagnosis and therapy, replication strategies, diagnostic procedures and mechanisms of disease production; infectious diseases representing each class of agents with emphasis on characteristics of infectious diseases for each body-system, establishing differential diagnoses for disease syndromes and developing a diagnostic approach.  
Prerequisite: Enrollment in first year professional DVM curriculum.

VTPB 927 Clinical Laboratory Medicine-Clinical Pathology  
Credits 5. 4 Lecture Hours. 2 Lab Hours.  
Laboratory testing and data interpretation to support and/or confirm disease processes, assess prognosis and assist in determining treatment options and monitoring response to treatment; validation and accuracy of laboratory tests.  
Prerequisite: Enrollment in the second year of professional DVM curriculum.

VTPB 930 Agents of Disease II  
Credits 4. 3 Lecture Hours. 2 Lab Hours.  
Continuation of Agents of Disease I: bacteria, fungi, viruses, prions, protozoa, helminths and arthropods; emphasis on characteristics of infectious diseases for each body system, establishing differential diagnosis for disease syndromes and developing a diagnostic approach.  
Prerequisite: Enrollment in second year professional DVM curriculum.

VTPB 932 Organ Dysfunction: Recognition, Diagnostics and Supportive Care  
Credits 4. 3 Lecture Hours. 2 Lab Hours.  
Recognition and diagnosing disorders of various body systems using clinical scenarios and laboratory data analysis; introduction to evaluation and implementation of basic treatment options to provide supportive care to animals given a disorder(s) of the body systems.  
Prerequisite: Enrollment in the second year of professional DVM curriculum.

VTPB 940 Diagnostics  
Credits 2. 3 Lab Hours.  
Student group participation on a rotating schedule in applied clinical activities in the area of diagnostic medicine including clinical pathology, necropsy, microbiology, parasitology, and serology.  
Prerequisite: Enrollment in the fourth year professional curriculum.

VTPB 941 Clinical Microbiology and Parasitology I  
Credits 2. 35 Lab Hours.  
Clinical rotation in microbiology and parasitology with emphasis on performance and interpretation of diagnostic procedures.  
Prerequisite: Enrollment in the fourth year of professional curriculum.

VTPB 948 Didactic Elective  
Credits 1 to 12. 1 to 12 Lecture Hours.  
Elective course in veterinary microbiology, pathology, genetics, immunology or parasitology for professional students who wish to supplement required curriculum. May be repeated for credit.  
Prerequisite: Enrollment in the third year of professional curriculum.

VTPB 985 Directed Studies  
Credits 1 to 4. 1 to 4 Other Hours.  
Problems in various subdisciplines.  
Prerequisite: Approval of instructor.

VTPB 989 Special Topics in...  
Credits 1 to 4. 1 to 4 Lecture Hours. 1 to 4 Lab Hours.  
Selected topics in an identified area of microbiology, pathology, genetics, immunology or parasitology. May be repeated for credit.  
Prerequisite: Approval of department head.