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 NFSC 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 Characterization  
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: NFSC 326/DASC 326; SCSC 405; POSC 429; approval of instructor.  
Cross Listing: SCSC 619, NFSC 619 and POSC 619.

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/VTMI 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 3. 3 Lecture Hours.  
Virus infections of animals and humans; introductory material includes virus replication cycle, taxonomy and methods to study viruses.  
Prerequisite: VTPB 438 or equivalent; or approval of instructor.

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/VTMI 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/VTMI 650.

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 of 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.