PATHOLOGY & MICROBIOLOGY (PAMM)

PAMM 509 IMMUNOLOGY 2 Credit Hours
Study of basic and clinical immunological principles.
Prerequisite: P-1 standing.
Instructor: Dhirender Singh, Ph.D.
Capacity: 70

PAMM 550 MED MICROBIOLOGY 3-4 Credit Hours
Study of basic principles of bacteriology, mycology, parasitology, and virology including the pathogenic properties and diseases of medically important species of bacteria, fungi, protozoa, helminths, and viruses.
Prerequisite: P-1 standing.
Instructor: James Booth, Ph.D.
Capacity: 70

PAMM 690 BIOLOGY OF DISEASE 5 Credit Hours
This course is a presentation of normal and abnormal development, structure and growth of human cells, tissues and organs. PAMM 690 is taught by faculty members in the College of Medicine. Histological criteria of the different organ systems will be presented. Emphasis will be made on the cardiovascular pulmonary and renal organ systems.
Prerequisite: Enrollment in the Clinical Perfusion, Cytotechnology, Pharmacy or the Physician Assistant program.
Typically Offered: FALL/SP/SU

PAMM 720 PATHOLOGIC ANATOMY 4 Credit Hours
ELECTIVE
The M4 student enrolled in this program rotates through the following four divisions of the department: Surgical Pathology, Cytopathology, Hematopathology and Autopsy Pathology. The pathology faculty, fellows and residents teach and supervise the M4 students during this experience. Students spend a week on each of the three services (Surgical Pathology, Cytopathology, and Hematopathology) with the option of observing an autopsy at any time during the rotation. While on the surgical pathology service, the students spend half of their time in the gross room assisting the pathology resident in the gross examination and processing of surgical specimens. They spend the other half of their time microscopically examining surgical specimens with a staff pathologist and resident. While on the cytology service, the student is involved with the microscopic examination of both gynecologic (GYN) and non-GYN cytology specimens with a staff pathologist and in observing fine needle aspirations (FNA) performed by staff pathologists. Students also participate on the autopsy service where they assist the resident pathologist in performing autopsies. The students are expected to attend all of the 8-9 a.m. resident teaching conferences. The students are also expected to attend one interdisciplinary conference per week. At the end of the rotation, the student is required to give a 15-20 minute presentation to the residents and staff pathologists on an anatomic pathology topic of their choice. Evaluation is based on attendance and participation in the rotation activities and conferences as well as on case presentations and the formal presentation at the end of the rotation. Activity-Hours/Week.
Contact: Kim Curry; kim.curry@unmc.edu; 402-559-7212; MSB 3545 (Zip 3135).
Typically Offered: Each four weeks.
Capacity: 2.
Visiting Student Information: Visiting Students are not to contact faculty or clinical departments prior to acceptance through VSAS. Doing so is considered a professional breach and may disqualify the student from being offered a rotation.
PAMM 730 LABORATORY MEDICINE FOR THE PRACTICING PHYSICIAN 4 Credit Hours
ELECTIVE
This month long rotation is designed to give all medical students practical education in, be better consumers of, and make more effective use of laboratory services, regardless of their chosen specialty. Throughout the rotation, students will be exposed to the basics of how laboratory tests are done, common sources of error, an overview of office laboratory testing, how to evaluate the utility of new laboratory tests, and the critical role that pathologists and other laboratory professionals play in patient care. Instruction will occur through the lens of practical clinical cases via a mixture of didactic lectures, small group activities, and working with a pathologists that outline the gamut of services included within anatomic and clinical pathology. Students will be evaluated by their engagement in group activities, performance on an end-of-rotation assessment, a short presentation, and reflective journaling.
Instructor: Geoffrey Talmon, M.D.
Contact: Kevin MacCarthy; kevin.maccarthy@unmc.edu; 402-559-7212.
Typically Offered: Each four weeks.
Capacity: 5 per rotation
Visiting Student Information: Visiting Students are not to contact faculty or clinical departments prior to acceptance through VSAS. Doing so is considered a professional breach and may disqualify the student from being offered a rotation.

PAMM 760 OFF CAMPUS ELECTIVE 4 Credit Hours
ELECTIVE
Prerequisite: Off-Campus Approval form completed.
Contact: Kim Curry; kim.curry@unmc.edu; 402-559-7212; MSB 3545 (Zip 3135).
Typically Offered: Each four weeks.
Capacity: Variable. Location: Variable.
Visiting Student Information: This course is NOT available to visiting students.

PAMM 799 SPECIAL PROBLEM&RSCH 4-6 Credit Hours
ELECTIVE
Students interested in specific aspects of pathology or desiring a background in pathology for a clinical specialty may undertake intensive study with the staff pathologist(s). The department faculty has diverse interests to compliment the needs of most students. These rotations may be tailored to include clinic-pathologic study, or basic research. Students will be expected to attend appropriate resident conferences and interdisciplinary conferences related to the specialty area they are studying as agreed upon by their supervising faculty. Independent study may also be arranged with pathology faculty not listed here. Specialty-Staff. Cardiovascular Pathology-Dr. Radio.
Prerequisite: Pre-arranged with Dr. Lele and Staff Pathologist in charge of specialty of interest.
Contact: Kim Curry; kim.curry@unmc.edu; 402-559-7212; MSB 3545 (Zip 3135).
Typically Offered: Variable.
Capacity: 1 per specialty.
Visiting Student Information: Visiting Students MUST apply through VSAS and may add a specialty interest by attaching a document in VSAS with their selection. DO NOT CONTACT STAFF.

PAMM 813 PRINCIPLES OF BIOSAFETY 3 Credit Hours
This course is designed for graduate students and health professionals to explore biosafety principles and practices with the purpose of developing a Biorisk Management approach to biosafety. This will enable participants to "effectively identify, monitor and control the laboratory biosafety and biosecurity aspects of activities. This integrated education will allow the student to recognize risky activities from unintentional and intentional incidents involving biological materials and develop mitigation strategies to reduce exposures to these materials. The student will participate in hands on training using engineering controls as well as administrative controls. Competencies in donning and doffing personal protective equipment and use of a biosafety cabinet will be discussed and assessed. Participates will also learn how to develop a risk mitigation plan following the identification of hazards and risk assessment. The targeted audience include doctoral students interested in occupational health, researchers, professional students, and the biosafety profession.
Typically Offered: SPRING

PAMM 825 INTRODUCTION TO R PROGRAMMING FOR BIOMEDICINE 3 Credit Hours
The main objective of this course is to introduce data manipulation methods for health professionals by using R programming language. Major topics include basic concepts of R, data manipulation and processing, statistical analysis, graphical presentation and simulation, genomic databases retrieval, and commonly used R packages.
Cross List: BMI 825
Typically Offered: FALL/SPRING
PAMM 830 CLINICAL LABORATORY MANAGEMENT 3 Credit Hours
An introduction to the theory, practical application and evaluation of laboratory management principles in health care and laboratory information systems, research, educational methodology, quality control, ethics, laboratory operations, and laboratory accreditation standards. Opportunities for building critical thinking, problem-solving, teamwork, communication, professionalism, research, management, and leadership skills are provided. Prerequisite: Enrolled in MS in PAMM Program focused on CLS training, and permission of instructor. Typically Offered: FALL

PAMM 857 INTRODUCTORY IMMUNOLOGY 2 Credit Hours
A study of the basic concepts and mechanisms of modern immunology with discussion of the applications of these principles to the study of diseases. Typically Offered: SPRING

PAMM 871 ANTIBIOTICS: MECHANISMS OF ACTION AND RESISTANCE 3 Credit Hours
This course is designed to give students an in-depth understanding of how antibiotics inhibit growth in bacterial cells. Genetics of the mechanisms of resistance to multiple classes of antibiotics within both gram-negative and gram-positive bacteria will be covered extensively. In addition, pros and cons of various antimicrobial-resistance testing methodologies will be assessed and discussed. Prerequisite: Permission of instructor. Prior completion of PAMM 898 is suggested. Typically Offered: SPRING

PAMM 873 INTRO GENETIC SEQUENCE 2 Credit Hours
Fundamentals of using online search techniques for the analysis of genetic sequence databases. The course will be taught in UNMC computer clusters by lecture and by the completion of assignments using computer programs available on campus. Programming experience is not required. Prerequisite: Introduction to Computational Molecular Biology, undergraduate course in biochemistry or molecular biology, or permission of instructor. Typically Offered: SPRING

PAMM 880 PRINCIPLES AND METHODOLOGIES IN CANCER RESEARCH 2-3 Credit Hours
A survey of the biology and biochemical mechanisms underlying cancer development, prevention, and therapy. Prerequisite: Permission of instructor. Cross List: BMB 880, CRGP 880, PHSC 880. Typically Offered: FALL/SPR

PAMM 890 MOLECULAR BIOL VIRUSES 3 Credit Hours
The principles of molecular biology and their application to the study of virology will be presented. The contributions of virology to the understanding of general mechanisms of pathogenesis will be discussed. Typically Offered: FALL

PAMM 896 NON-THESIS RESEARCH 1-9 Credit Hours
Student research that is clearly distinct from ongoing or planned thesis/dissertation work, or research/lab rotations performed prior to selecting a permanent advisor or supervisor. Typically Offered: FALL/SP/SU

PAMM 898 BACTERIAL GENETICS 3 Credit Hours
The principles of bacterial genetics including genome structure, DNA replication and recombination, transcription and translation, as well as quorum sensing and environmental sensing. Instructor: Scot Ouellette, Ph.D. Typically Offered: SPRING

PAMM 899 MASTERS THESIS 1-9 Credit Hours
Independent student research related to the masters thesis. Typically Offered: FALL/SP/SU

PAMM 902 PROTEIN MASS SPECTROMETRY AND PROTEOMICS 3 Credit Hours
The concept and history of proteomics, basic components of mass spectrometry, protein identification and quantification techniques, proteomic analysis of post-translational modifications, protein-protein interactions and cellular organelles, as well as proteomics in medical applications. Includes laboratory work of identifying cheese proteins using mass spectrometry. Prerequisite: BRTP 821 and permission of instructor. Typically Offered: FALL

PAMM 910 BACTERIAL PATHOGENESIS 3 Credit Hours
The genetic mechanisms of bacterial pathogenesis in both Gram-positive and Gram-negative bacteria, as well as the immunological response of the host to these pathogens. Particular importance will be placed on major pathogens including Staphylococcus aureus, Salmonella enterica, pathogenic Escherichia coli, and Mycobacterium tuberculosis; however, lesser studied pathogens will also be discussed. Prerequisite: IPBS 801, 802, 803 Typically Offered: SPRING

PAMM 912 HUMAN SPECIFIC DISEASE MODELING IN MICE 2 Credit Hours
This course introduces the novel mouse models engrafted with human cells, to study human-specific diseases. The course covers research methodologies: 1. For the creation of specific mouse backgrounds that are compatible for the engraftment of human cell, tissue and tumors. 2. To study (a). human-specific infections and immune responses, (b). developmental biology and regeneration of human cells and tissues, and (c). therapeutics development. Prerequisite: BRTP 822, BRTP 823, and permission of instructor. Cross List: PHAR 902 Typically Offered: SPRING

PAMM 930 NEUROIMMUNOLOGY 3 Credit Hours
The objective of this course is to provide essential knowledge towards a better understanding of the principles of neuroimmunology and pharmacology as they apply to the pathogenesis and pharmacotherapeutics of neurodegenerative disorders and disorders in which the immune system is implicated. Prerequisite: IPBS 801, 802, and 803 or equivalent; NSC 922 or 932. Cross List: PHAR 930. Instructor: R. Lee Mosley, Ph.D. Typically Offered: SPRING
PAMM 940 MOLECULAR BASIS OF DISEASE 3 Credit Hours
Beginning with an overview of human genetics, including classical and contemporary methods of genetic analysis, the course explores the relationship between genetic diversity and disease. Human biochemical genetics and inborn errors of metabolism illustrate how specific phenotypes result from specific gene changes. Genetic polymorphism, selection and fitness are also explored with regard to the interactions among human populations and with the environment.
Prerequisite: 800-level biochemistry, or IPBS 801 and 802 (may be in progress).
Typically Offered: SPRING

PAMM 950 SPECIAL TOPICS 1-3 Credit Hours
Advanced study of current concepts and findings in selected areas of pathobiology, microbiology, and immunology. Includes a review of current literature, research and clinical problems.
Prerequisite: Permission of instructor.

PAMM 950B SPECIAL TOPICS/CLINICAL LABORATORY MANAGEMENT 1-3 Credit Hours
SPECIAL TOPICS/CLINICAL LABORATORY MANAGEMENT
Typically Offered: FALL/SP/SU

PAMM 955 ADVANCED IMMUNOBIOLOGY 3 Credit Hours
Conceptual study of cellular and biomolecular immunology. Includes mechanisms of immune recognition, regulatory and effector functions, interleukins and clinical immunology, with discussion of current literature.
Prerequisite: PAMM 857, BRTP 824, or permission of instructor.

PAMM 970 SEMINAR 1 Credit Hour
Attendance at weekly seminars offered by the department/program, or other activities specific to the degree program (contact the program director for more information).
Typically Offered: FALL/SP/SU

PAMM 992 ADV TOPICS IN IMMUNOLOGY, PATHOLOGY AND INFECTIOUS DISEASES 1 Credit Hour
Advanced study in one of several disciplines such as bacteriology, immunology, mycology, virology, cell biology, molecular biology, etc. This course will discuss literature directly published to the broad area of the Research Topic discussed during the semester. The broad topic will be decided by one of the invited Faculty with expertise in the area of research to be discussed during that semester. Student presenter will choose the paper and get it approved for presentation by the invited Faculty expert.
Typically Offered: FALL/SP

PAMM 999 DOCTORAL DISSERTATION 1-15 Credit Hours
Independent student research related to the PhD dissertation. This course may be utilized before or after successful completion of the comprehensive exam.
Typically Offered: FALL/SP/SU