### 465. Therapeutic Recreation Techniques
Winter. 3(2-2) PRR 467.
Instructional, intervention, and interaction techniques in therapeutic recreation. Treatment planning, terminology, documentation, and leisure counseling. Field trip required.

### 470. Commercial Recreation Enterprises
Fall. 4(4-0) Juniors; EC 201; ACC 202 or ACC 230; PRR 384 or concurrently.
Management methods and problems in commercial recreation enterprises with an emphasis on small business.

### 471. Recreation Products Consumption
Winter. 4(4-0) PRR 470 or approval of department.
Recreation, economic and personality theories of consumption. Specific recreation product industry case studies.

### 480. Supervised Study
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 10 credits. Approval of department.
Seminars on current problems. Supervised readings. Individual undergraduate research on selected topics.

### 501. Dimensions of Recreation and Leisure
Fall. 3(3-0) Approval of department.
Concepts of recreation and leisure in the United States and their implications for professional development. Extensive reading into concepts, definitions, values, educational components and historic roots of recreation and leisure.

### 540. Recreation Economics
Spring. 4(4-0) FOR 809 or approval of instructor. Interdepartmental with the departments of Forestry and Resource Development.
Applications of economic analysis to recreation resource problems including measurement of demand and supply, valuation of recreation resources, determination of economic impact, economic decision making and policy considerations.

### 581. Park and Recreation Policy
Winter. 3(3-0) Interdepartmental with the Department of Resource Development.
Recreation, leisure and work concepts. Determination of needs for recreation facilities. Factors affecting public and private allocation of resources for provision of needed facilities.

### 584. Recreation Research Methods
Winter. 4(4-0) Approval of department.
Relate recreation research to broader context of social scientific investigation and to the nature and philosophy of social scientific research. Examine the theoretical and methodological approaches in recreation research.

### 586. Urban and Regional Recreation Resource Planning
Fall. 4(4-0) Approval of department.
Evaluation and application of recreation planning techniques at urban and regional levels. Analysis of programs, policies, land areas, facilities, and populations as they pertain to leisure service delivery systems.

### 848. Recreation Resource Law
Spring. 3(3-0)
Legal basis for public recreation. Methods of acquiring recreational resources, including contracts and condemnation procedures. Administrative problems, including zoning, liability, civil rights and law enforcement. Study of cases and statutes.

### 871. Selected Topics
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 12 credits. Approval of department.
Selected topics in recreation resource planning, administration, management, policy, and research.

### 850. Special Problems
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 10 credits. Approval of department.
Independent study in recreation, leisure, recreation travel, and tourism.

### 889. Applied Professional Project
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 4 credits. PRR 544, approval of department.
Master's degree Plan B research paper.

### 999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

### PATHOLOGY  PTH

#### College of Human Medicine

#### College of Osteopathic Medicine

#### College of Veterinary Medicine

### 410. General Pathology
Spring. 3(3-0) ANT 316; PSL 432 or concurrently. Interdepartmental with and administered by Medical Technology.
Features of lethal and sub lethal cell injury and inflammation and repair process. Definition of the major causes of pathologic change with a consideration of specific associated diseases.

### 411. Basic Histopathology
Spring. 2(1-2) ANT 420; PSL 432; M T 410 or concurrently. Interdepartmental with and administered by Medical Technology.
Microscopic examination of cell injury and death, inflammation and tissue repair. Pathologic tissue changes in diseases resulting from degenerative changes, abnormal metabolism, neoplasia, immunologic processes, infection, mechanical trauma and malnutrition.

### 501. Introduction to Human Pathology
Spring. 2(1-2) Admission to the College of Human Medicine and ANT 543; or approval of department.
Pathologic processes and specific disease syndromes with emphasis on clinical applications. Concepts of disease. Pathologic processes in selected common diseases or conditions.

### 502. Human Pathology I
Winter. 2 to 5 credits. Admission to a college of medicine or approval of department. ANT 560 for College of Osteopathic Medicine students.
Pathologic processes and specific disease syndromes with emphasis on clinical applications. Concepts of disease and pathologic process in selected common diseases or conditions for the beginning medical student with a limited knowledge of anatomy, physiology and biochemistry.

### 507. Human Pathology I
Fall. 5(4-2) PTH 501.
Diseases of the respiratory, gastrointestinal, urinary and male reproductive systems. Laboratories will emphasize gross and microscopic study of lesions and a problem solving approach to disorders.

### 508. Human Pathology II
Winter. 4(3-2) PTH 501.
Diseases of female reproductive system, bone, skin and blood forming organs. Laboratory sessions will emphasize gross and microscopic lesions.

### 510. Human Pathology IV
Spring. 2(2-0) PTH 501.
Diseases of nervous system and muscle. Problem solving exercises will be utilized.

### 525. Neuropathology Problem Solving Exercises
Fall, Winter, Spring, Summer. 2(0-4)
Medical student or approval of instructor.
Independent study of 24 neuropathology problem solving exercises, including clinical history and brain specimens.

### 540. Introduction to Laboratory Medicine
(OST 551.) Winter. 2 credits. ANT 560, BCH 501, PTH 502.
Introduction to laboratory medicine leading to proficiency in patient evaluation and diagnosis through understanding of common pathologies and basic laboratory procedures in blood, urine and feces analysis.

### 550. Veterinary Pathology
Fall. 5(3-4) Second year Veterinary Medicine students or approval of department.
Principles of pathology, including causes of disease, disturbances of cell growth and metabolism, necrosis, circulatory changes, inflammation and neoplasia.

### 552. Veterinary Clinical Pathology
Winter. 4(3-4) Fifth-term Veterinary Medicine students or approval of department.
Technical aspects, principles and interpretation of selected laboratory procedures in hematology, chemistry, cytology and related areas.

### 590. Special Problems in Pathology
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits if different topics are taken. Admission to a professional program in the College of Osteopathic Medicine or Human Medicine; approval of department.
Each student will work under direction of a faculty member on an experimental, theoretical or applied problem in pathology.
592. Special Problems in Veterinary Pathology  
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Admission to the professional programs in the College of Veterinary Medicine. Each student will work under direction of a faculty member on an experimental, theoretical or applied problem in pathology.

608. Pathology Clerkship  
Fall, Winter, Spring, Summer. 3 to 17 credits. May reenroll for a maximum of 17 credits. Grade P in all courses offered in terms 1 through 8. Anatomic and clinical pathology, with emphasis on clinical-pathological correlations. Conducted in the pathology departments of affiliated hospitals.

609. Laboratory Medicine Clerkship  
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 15 credits. Grade P in all courses offered in terms 1 through 8. Current laboratory procedures. Correlation of data from patients with clinical disease, to morphologic abnormalities and altered pathophysiology. 

621. Histopathology Clerkship  
Winter. 3 credits. Completion of 9 terms of professional program, approval of department. Supervised instruction in the examination and interpretation of histologic lesions caused by animal diseases.

651. Veterinary Clinical Pathology Clerkship  
Fall, Summer. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, approval of department. Concepts in laboratory interpretation and diagnosis.

652. Veterinary Necropsy Clerkship  
Fall, Winter, Spring. 4 credits. Satisfactory completion of term 3 of the professional veterinary curriculum, approval of department. Supervised necropsy and interpretation of findings.

656. Problems in Veterinary Necropsy  
Winter, Spring. 3 credits. PTH 652, approval of department. Problems related to necropsy and interpretation of findings.

800. Problems in Pathology  
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. Approval of department. Elective work for students in medicine interested in pathology as a specialty, or in the special pathology of diseases of a particular class or species, and for graduate students interested in pathological techniques or in nontissue research.

801. Pathology Seminar  
Fall, Winter, Spring. 1(1-0) May reenroll for a maximum of 3 credits for M.S. candidates and 6 credits for Ph.D. candidates. Approval of department. Presentations and discussions by departmental graduate students, faculty or outside speakers on current topics in pathology.

802. Advanced Systemic Pathology I  
Winter of even-numbered years. 4(3-3) Approval of department. Histopathologic aspects of the digestive, respiratory and urinary systems. Pathogenesis related to morphologic change.

803. Advanced Systemic Pathology II  
Fall of even-numbered years. 4(3-3) Approval of department. Histopathologic aspects of the eye and ear and of the nervous, endocrine and integumentary systems. Pathogenesis related to morphologic change.

804. Oncology  
Spring. 4(3-3) Approval of department. Benign and malignant neoplasms with emphasis on gross and microscopic characteristics and diagnosis. Current concepts of oncogenesis and tumor therapy.

805. Pathology Proseminar  
Fall. 2(2-0) Approval of department. Instruction in preparation and presentation of seminars; philosophy and methods of research; theses and other research reports; literature review; illustration of research data; practical assignments.

806. Advanced General Pathology  
Fall of odd-numbered years. 3(0-3) Approval of department. Fundamental concepts of cell injury, inflammation and oncogenesis. Emphasis on molecular and biochemical mechanisms of pathologic processes.

806L. Advanced General Pathology Laboratory  
Fall of odd-numbered years. 1(0-3) Approval of department, PTH 806 concurrently. Histopathologic and ultrastructural study of morphologic patterns in inflammation, cell injury and neoplasia.

807. Advanced Systemic Pathology III  
Winter of odd-numbered years. 4(3-3) Approval of department. Histopathologic aspects of the cardiovascular, hemolymphatic, musculoskeletal and reproductive systems. Pathogenesis related to morphologic change.

808. Clinical Pathology Diagnosis  
Spring. 3(0-9) Approval of department. Diagnosis of animal diseases based on hematologic, cytologic and biochemical tests. Emphasis on the correlation of laboratory data with clinical history and physical findings.

810. Postmortem Diagnosis  
Fall. 3(0-9) May reenroll for a maximum of 6 credits. Approval of department. Diagnosis of animal diseases by means of necropsy and other laboratory techniques. Emphasis on correlation and interpretation of gross and microscopic lesions and results of other tests.

815. Histopathologic Diagnosis  
Fall, Winter, Spring, Summer. 1 to 8 credits. May reenroll for a maximum of 6 credits. PTH 802, PTH 803, PTH 804, PTH 810, approval of department. Preparation, histopathologic examination, description, diagnosis and reporting of specimens from biopsy and necropsy.

818. Pathotoxicology  
Summer of even-numbered years. 4(4-0) One graduate course in pathology or approval of instructor. Pathologic changes in tissues of animals used in toxicologic studies. Clinical pathologic assessments. Gross, histologic and ultrastructural changes in organ systems.

820. Advanced Human Hematology  
Fall of odd-numbered years. 2(0-9) M T 420, M T 423 or approval of department. Interdepartmental with and administered by Medical Technology Program. Selected topics in hematology including the pathogenesis, mechanisms and morphological picture of hematologic diseases in humans.

821. Advanced Veterinary Hematology  
Spring of odd-numbered years. 4(3-3) Approval of department. Current concepts in the pathogenesis, mechanisms and morphology of hematologic diseases of animal species.

822. Advanced Clinical Biochemistry  
Spring of even-numbered years. 4(3-3) Approval of department. Selected topics in clinical biochemistry, enzymology, immunopathology and related subdivisions that focus on current technology used in the diagnosis of disease.

826. Laboratory Animal Pathology  
Summer of odd-numbered years. 4(3-3) Approval of department. Gross, histologic, ultrastructural and clinical-pathologic study of diseases of laboratory animals.

840. Advanced Hemostasis  
Fall of even-numbered years. 2(2-0) M.S. candidates in Clinical Laboratory Science or approval of department. Interdepartmental with and administered by Medical Technology Program. Physiology, pathophysiology and laboratory evaluation of hemostatic disorders.

899. Master's Thesis Research  
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

901. Investigating the Lung  
Fall of even-numbered years. 3(3-0) Approval of department. Interdepartmental with the departments of Large Animal Clinical Sciences, and Physiology. Administered by the Department of Large Animal Clinical Sciences. Classic and current concepts of respiratory structure and function in health and disease and mechanisms of lung injury.

900. Advanced Correlative Pathology  
Fall, Spring. 3(1-15) Approval of department. Compilation and formal presentation of the correlative findings of case material in anatomic and/or clinical pathology.

999. Doctoral Dissertation Research  
Fall, Winter, Spring. Variable credit. Approval of department.

PEDiATRICS  PED

College of Osteopathic Medicine

580. Substance Abuse for Health Professionals  
Winter. 1(1-0) Student in the College of Human Medicine or College of Osteopathic Medicine. Practical knowledge of ways to recognize and effectively deal with individuals affected by substance abuse.