

448. Field Studies in Park Administration
Fall. 3 credits. Approval of department.

Investigation and analysis of outstanding park and recreation programs. Visits to areas under local, state, and federal jurisdiction. Evaluation of administrative practices, area management, and operation policies. Conducted as a traveling class with agency assistance.

449. Recreation Land Management
Winter. 3(3-0) Not open to majors.

Fundamentals of outdoor recreation resource management. Planning, development, and administration of programs and facilities.

450. Natural Resource Administration
Winter. 4(4-0) Seniors; not open to forestry majors. Interdepartmental with Agriculture and Natural Resources and the departments of Fisheries and Wildlife, Forestry, and Resource Development. Administered by the Department of Forestry.

Concepts and methods of administering wild-land properties. The legal, economic and social environment. Benefit-cost analysis of management changes. Unit organization, personnel management and accounting. Presents a systems view of administration.

451. Environmental Interpretation II: Methods and Devices
Spring. 4(4-0) PRR 351.

Methodology and equipment used in information transmission in natural, historic, and scenic areas. Site selection and development criteria for natural resource interpretation.

452. Sky Interpretation
Spring 3(2-2) PRR 351 or approval of department.

Observations of celestial objects and phenomena; past and present concepts of the sky; and procedures and materials for interpreting the sky.

455. Natural Resource Economics
Fall. 4(4-0) Approval of department. Interdepartmental with Agriculture and Natural Resources and the departments of Fisheries and Wildlife, Forestry, and Resource Development. Administered by the Department of Forestry.

Basic economic and political principles and techniques that govern the production and consumption of forest land products, including basic forest valuation procedures.

467. Principles of Therapeutic Recreation
(HPR 447.) Winter. 3(3-0) PRR 362.

Basic principles and procedures related to the planning, conducting and evaluation of Therapeutic Recreation services. Activity analysis, assessment and treatment plans are presented in depth.

468. Techniques in Therapeutic Recreation
(HPR 448.) Spring. 3(2-2) PRR 467.

Presentation of a variety of instructional, intervention and interaction techniques used when working with special populations in recreation.

469. Professional Issues and Trends in Therapeutic Recreation
(HPR 449.) Winter. 2(2-0) PRR 468.

Concepts of professionalism including current trends and issues, ethical and organizational considerations. Interpretation of the field and procedures of employment will be covered.

470. Commercial Recreation Enterprises
Fall. 4(4-0) EC 201; AFA 202 or approval of department.

The planning, design, impact, and natural resource base of privately-owned outdoor recreation businesses.

471. Recreation Products Consumption
Winter. 4(4-0) PRR 470 recommended; EC 201, AFA 202, 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.

484. Senior Proseminar
Winter. 1(1-0) Senior majors.

Seminars on current professional problems and literature.

495. Recreation Management Practicum
(HPR 495.) Fall, Winter, Spring, Summer. 12(1-34) to 18(1-52) Senior recreation major and approval of department. Prerequisite courses dependent upon recreation emphasis.

Application of academic experiences to a professional recreation setting through an extended period of placement. Incorporating leadership, planning, organization, and evaluation of programs within the professional recreation setting.

801. Dimensions of Recreation and Leisure
Fall. 3(3-0) PRR 344 or 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.

840. 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.

842. 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.

844. 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.

846. 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.

850. Development of Water Recreation Resources
Winter. 3(3-0) Approval of department.

Administration, research, design, and construction of water recreation facilities. Policy issues, use conflict, and fiscal planning reviewed in light of interagency relationship and legislative mandate.

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.

880. Special Problems
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 10 credits. Approval of department.

Advanced work for non-thesis projects or advanced individual study in recreation: policy, land use, planning, systems administration and management, economics, recreation forestry, commercial recreation enterprises, recreation and social problems, environmental interpretation, travel and touring, spatial analysis, leisure concepts, research.

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

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. May reenroll for a maximum of 36 credits. Approval of department.

PATHOLOGY

PTH

College of Human Medicine College of Osteopathic Medicine College of Veterinary Medicine

404. General Pathology
Fall, Spring. 5(3-6) ANT 420, Junior Medical Technology majors, or approval of department. Interdepartmental with and administered by Medical Technology. Approved through Winter 1984.

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

Descriptions – Pathology

of

Courses

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.

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.

503. Human Pathology II

Spring. 3(3-0) PTH 502.

An introductory study of neuropathology in which vocabulary and concepts of neuromuscular diseases are systematically reviewed. Self-instructional option available.

504. Human Pathology III

Fall. 3(2-2) PTH 503 or approval of department.

A continuation of PTH 503. Diseases of the cardiovascular system, including stress effects, arteriosclerosis and disorders of autonomic and endocrine regulation. Laboratory sessions include the study of histologic sections.

505. Human Pathology IV

Winter. 3(2-2) PTH 504 or approval of department.

A continuation of PTH 504. The systems include: lung, kidney, male genitourinary and bone and joints. In the laboratory sections, gross and microscopic changes in diseased tissues are studied and correlated with lecture material. Separate lab sessions covering pulmonary function tests, acid-base balance and urinalysis are included.

506. Human Pathology V

Spring. 3(2-2) PTH 505 or approval of department.

A continuation of PTH 505. The systems include gastrointestinal tract (including liver and pancreas), female reproductive tract and breast.

520. Biology of Blood Diseases Laboratory

Spring. 1(0-3) Enrollment in a college of medicine or a graduate program in a biological science; MED 520 concurrently.

Laboratory experience correlating basic science and clinical concepts of hematology.

550. Veterinary Pathology

Spring. 5(3-4) Third-term 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(3-3) 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.

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 12 credits. Grade P in all courses 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. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, 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, Summer. 4 credits. Satisfactory completion of term 8 of the professional veterinary curriculum, approval of department.

Supervised necropsy and interpretation of findings.

656. Problems in Veterinary Necropsy

Fall, Winter, Spring, Summer. 4 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 nonthesis 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 Histopathology

Fall. 4(3-3) Approval of department.

Comprehensive study of the histopathologic aspects of systemic and special pathology; review of current literature and concepts of pathogenesis, microscopic and ultrastructural pathology.

803. Advanced Histopathology

Winter. 4(3-3) Approval of department.

Continuation of PTH 802.

804. Oncology

(820.) 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.

808. Clinical Pathology Diagnosis

Summer. 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.

812. Advanced Human Hematology

Winter. 5(3-4) M T 407 or approval of department.

Selected topics in hematology including the pathogenesis, mechanisms and morphology of hematologic diseases in humans.

815. Histopathologic Diagnosis

(980.) Fall, Winter, Spring, Summer. 1 to 6 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.

821. Advanced Veterinary Hematology

(811.) 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

(811.) Spring of even-numbered years. 4(3-3) Approval of department.

Selected topics in clinical biochemistry, enzymology, immunopathology and related disciplines that focus on current technology used in the diagnosis of disease.

826. Laboratory Animal Pathology

Winter of even-numbered years. 4(3-3) Approval of department.

Gross, histologic, ultrastructural and clinicopathologic study of diseases of laboratory animals.

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

990. Advanced Correlative Pathology
Fall, Spring. 5(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, Summer. Variable credit. Approval of department.

PEDIATRICS PED

College of Osteopathic Medicine

590. Special Problems in Pediatrics
Fall, Winter, Spring, Summer. 1 to 8 credits. Approval of department.

Each student will work under direction of a faculty member on an experimental, theoretical or applied problem.

600. Pediatrics Clerkship
Fall, Winter, Spring, Summer. 6 or 8 credits. Grade P in all courses offered in terms 1 through 8 or approval of department.

Practical clinical exposure in the area of pediatrics. Program developed to achieve proficiency in motor skills and aptitudes; comprehension of concepts and principles; patient evaluation, diagnosis, management and therapy.

620. Directed Studies
Fall, Winter, Spring, Summer. 2 to 24 credits. PED 600 or approval of department.
Study in general or specialty pediatrics.

PEDIATRICS AND HUMAN DEVELOPMENT PHD

College of Human Medicine

520. Genetics Clinic
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits.
Students will interview and examine patients with inheritable disorders, perform related laboratory diagnostic procedures, and participate in genetic counseling conferences and discussions.

531. Medical Genetics
Fall. 1(1-0) Admission to a college of medicine or approval of department.
Basic genetic principles and their application to clinical medicine, prenatal genetic diagnosis, exercises in genetic counseling and the importance of relevant laboratory tests.

532. Phenomena of Development
Fall. 5(5-0) PHD 531 or approval of department.
Normal psychological and physical development of the human including intellectual, social, emotional and endocrinological growth from infancy through adolescence. Clinical examples highlight deviations from the normal course of development.

590. Special Problems in Human Development
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Human Medicine students or approval of department.

Each student will work under direction of a staff member on an experimental, theoretical or applied problem.

607. Ambulatory Care Clerkship
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. H M 602. Interdepartmental with the departments of Community Health Science, Family Practice, and Medicine. Administered by the Department of Family Practice.

Outpatient experience, lasting an equivalent of 34 half-days and extending over a minimum of 26 weeks. Continuous and comprehensive patient care under supervision of appropriate physicians.

608. Pediatric Specialty Clerkship
Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll for a maximum of 43 credits. H M 602; primary clerkship.

Clinical experience with pediatric patients under the direction of members of the faculty of the Department of Human Development and community pediatricians. Fall, Saginaw. Winter, Lansing. Spring, Grand Rapids. Summer, Flint.

609. Human Development and Pediatric Sub-Specialties
Fall, Winter, Spring, Summer. 1 to 17 credits. May reenroll for a maximum of 34 credits. H M 602.

Elected experiences in selected clinical and basic sciences related to pediatrics and human development.

610. Ambulatory Pediatrics
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.

Clinical experience in outpatient and community settings involving ongoing child health care including chronic medical illnesses and common behavioral problems.

611. Infectious Diseases
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.

Combined office or clinic and inpatient experience in evaluating and managing pediatric patients with infectious diseases.

612. Neonatology
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.

Clinical experience involving modern neonatal techniques and care patterns for the sick neonate.

613. Pediatric Cardiology
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.

Office, clinic and hospital experience in diagnostic and therapeutic pediatric cardiology including special diagnostic procedures.

614. Pediatric Endocrinology and Metabolism
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.

Clinic and hospital experience in evaluating patients with endocrine and metabolic disorders.

615. Pediatric Hematology and Oncology
Fall, Winter, Spring, Summer. 1 to 12 credits. May reenroll for a maximum of 12 credits. PHD 608.

Clinical experience in evaluating and managing pediatric patients with common hematologic and oncologic disorders.

PHARMACOLOGY AND TOXICOLOGY PHM

**College of Human Medicine
College of Osteopathic Medicine
College of Veterinary Medicine**

350. Introductory Human Pharmacology
Spring. 3(3-0) PSL 432 or PSL 241 or concurrently; or approval of department.

General principles; central nervous system, autonomic nervous system, cardiovascular and renal drugs; chemotherapy; and other selected basic topics.

430. Drug Abuse
Fall of odd-numbered years. 4(4-0) Juniors or approval of department. Biology and chemistry recommended.

Actions, mechanism of action, toxicity and uses of drugs of abuse. Sociological and psychological aspects of drug abuse and the legal aspects of the sale and distribution of drugs are considered.

450. Introduction to Chemical Toxicology
Spring. 3(3-0) B S 210, B S 211, B S 212, CEM 242.

Potential risk of environmental chemicals to animal and human health.

480. Special Problems
Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 9 credits. Approval of department.

Limited amounts of individual work on selected research problems for undergraduate students.

503. Introduction to Medical Biology
Fall. 5(5-0) Admission to the College of Human Medicine. Interdepartmental with the departments of Biochemistry, Microbiology and Public Health, and Physiology. Administered by the Department of Microbiology and Public Health.

Principles of medical biology for medical students.

520. Medical Pharmacology I
(520B.) Fall. 4(4-0) PSL 500A or PSL 500E; BCH 501 or BCH 512.

Drug absorption, distribution, biotransformation, elimination, antagonism; receptor theory and pharmacogenetics. Chemotherapy: antineoplastic, antiviral and antimicrobial agents. Toxicology and emergency therapies. Pharmacology related to the autonomic nervous system.

521. Medical Pharmacology II
(521B.) Winter. 4(4-0) PHM 520.

Pharmacology of the central and peripheral nervous systems. Cardiovascular, renal and gastrointestinal drugs. Endocrine and autacoid pharmacology.