

**892. Park and Recreation Resources Seminar**  
Fall, Spring. 1 to 2 credits. A student may earn a maximum of 2 credits in all enrollments for this course.  
Current policy issues, problems and research in parks, recreation and tourism.

**899. Master's Thesis Research**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 99 credits in all enrollments for this course.  
R: Open only to graduate students in Park and Recreation Resources. Approval of department.

**923. Theory of Resource and Environmental Economics**  
Spring of even-numbered years. 3(3-0) Interdepartmental with Agricultural Economics, Resource Development, Forestry, and Economics. Administered by Agricultural Economics.  
P: AEC 829, EC 805.  
Economic theory of environmental change and control. Market and non-market allocation mechanisms. Temporal issues of conservation and growth. Contemporary issues in research and policy.

**944. Advanced Research Methods**  
Summer. 3(3-0)  
P: PRR 844.  
Applications of advanced and specialized research methods to problems in recreation and tourism. Measurement, sampling, and research design.

**999. Doctoral Dissertation Research**  
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.  
R: Open only to Ph.D. students in Park and Recreational Resources.

## **PATHOLOGY**

## **PTH**

**Department of Pathology  
College of Human Medicine  
College of Osteopathic Medicine  
College of Veterinary Medicine**

**525. Neuropathology Problem Solving Exercises**  
Fall, Spring, Summer. 2(0-4)  
R: Open only to graduate-professional students in College of Human Medicine or Osteopathic Medicine.  
Independent study of 24 neuropathology problem solving exercises.

**542. Basic Principles of Pathology**  
Spring. 2 credits.  
R: Graduate-professional students in colleges of Human and Osteopathic Medicine.  
Fundamental pathologic processes; clinical applications.

**551. General Pathology**  
Spring. 3(2-2)  
R: Completion of 1 semester of the graduate-professional program in the College of Veterinary Medicine. Not open to students with credit in PTH 550.  
Host responses to injury, including cell degeneration, necrosis, disturbances of growth and development, neoplasia, circulatory disturbances and inflammation.

**553. Clinical and Systemic Pathology**  
Fall. 5(4-2)  
R: Completion of 2 semesters of the graduate-professional program in the College of Veterinary Medicine. Not open to students with credit in PTH 552.  
Hematology. Pathology of hematopoietic, lymphatic, digestive, urinary, respiratory, integumentary, cardiovascular, nervous, reproductive, musculoskeletal, endocrine, ocular, and otic systems.

**590. Special Problems in Pathology**  
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Open only to graduate-professional students in College of Human Medicine or Osteopathic Medicine.  
Individual directed work on an experimental, theoretical, or applied problem in pathology.

**592. Special Problems in Veterinary Pathology**  
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.  
R: Open only to graduate-professional students in the College of Veterinary Medicine. Not open to students with credit in PTH 632.  
Student works under faculty direction on an experimental, theoretical or applied problem.  
Temporary approval effective from Fall Semester 1992 through Spring Semester 1996.

**608. Pathology Clerkship**  
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course.  
R: Open only to graduate-professional students in College of Human Medicine or Osteopathic Medicine.  
Anatomic and clinical pathology with emphasis on clinical-pathological correlation. Conducted in pathology departments of affiliated hospitals.

**609. Laboratory Medicine Clerkship**  
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 16 credits in all enrollments for this course.  
P: For graduate-professional students in College of Human Medicine: FMP 602, FMP 608, MED 608, PHD 600. For graduate-professional students in College of Osteopathic Medicine: Completion of Units I and II. R: Open only to graduate-professional students in College of Human Medicine or Osteopathic Medicine.  
Laboratory procedures. Correlation of laboratory data with morphologic abnormalities in patients with pathophysiology.

**621. Histopathology Clerkship**  
Fall, Spring. 2 credits.  
R: Completion of the third year of the graduate-professional program in the College of Veterinary Medicine.  
Supervised instruction in the examination and interpretation of histologic lesions caused by animal diseases.  
Temporary approval effective from Fall Semester 1992 through Spring Semester 1996.

**630. Diagnostic Pathology Clerkship**  
Fall, Spring. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.  
P: Completion of semester 5 of the graduate-professional program in the College of Veterinary Medicine. R: Not open to students with credit in PTH 651 or PTH 652. Not open to students with credit in PTH 651 OR PTH 652.  
Necropsy and surgical and clinical pathology. Interpretation of gross findings and laboratory data.

**631. Necropsy Clerkship**  
Fall, Spring. 3 credits.  
P: PTH 630. R: Completion of 5 semesters of the graduate-professional program in the College of Veterinary Medicine.  
Supervised necropsy. Interpretation and presentation of findings.

**632. Problems in Veterinary Pathology**  
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.  
R: Completion of 5 semesters in the graduate-professional program in the College of Veterinary Medicine. Approval of department.  
Supervised projects involving gross pathology, histopathology, clinical pathology, or molecular pathology.

**633. Transfusion Medicine**  
Fall, Spring. 3 credits.  
R: Completion of 5 semesters of the graduate-professional program in the College of Veterinary Medicine.  
Management of blood donors, blood banking, and cross match technologies. Administration of blood components. Blood typing in large and small animals.

**651. Veterinary Clinical Pathology Clerkship**  
Fall, Summer. 3 credits.  
R: Completion of the third year of the graduate-professional program in the College of Veterinary Medicine. Not open to students with credit in PTH 630. Not open to students with credit in PTH 630.  
Concepts in laboratory interpretation and diagnosis.  
Temporary approval effective from Fall Semester 1992 through Spring Semester 1996.

**652. Veterinary Necropsy Clerkship**  
Fall, Spring, Summer. 3 credits.  
R: Completion of the third year of the graduate-professional program in the College of Veterinary Medicine. Not open to students with credit in PTH 630. Not open to students with credit in PTH 630.  
Supervised necropsy and interpretation of findings.  
Temporary approval effective from Fall Semester 1992 through Spring Semester 1996.

**656. Problems in Veterinary Necropsy Clerkship**  
Spring. 2 credits.  
P: PTH 652. R: Completion of the third year of the graduate-professional program in the College of Veterinary Medicine. Not open to students with credit in PTH 631. Not open to students with credit in PTH 631.  
Problems in necropsy and interpretation of findings.  
Temporary approval effective from Fall Semester 1992 through Spring Semester 1996.

**812. Advanced Clinical Chemistry**  
Spring of even-numbered years. 2(2-0) Interdepartmental with Medical Technology. Administered by Medical Technology.  
P: BCH 462, MT 414, MT 416.  
Biochemical basis of selected pathologic conditions including inborn errors of metabolism, endocrine and other genetic disorders. Emphasis on current diagnostic techniques.

**820. Advanced Human Hematology**  
Fall of even-numbered years. 2(2-0) Interdepartmental with Medical Technology. Administered by Medical Technology.  
P: MT 422.  
Selected topics in hematology including pathogenesis, mechanisms and morphological pictures. Emphasis on laboratory tests and interpretation of results.

**Descriptions — Pathology  
of  
Courses**

**830. Concepts in Molecular Biology**  
*Spring of odd-numbered years. 2(2-0) Interdepartmental with Medical Technology. Administered by Medical Technology.*

*P: One course in Biochemistry or concurrently. Techniques and theories of molecular biology, nucleic acid synthesis and isolation, enzymatic digestion and modification, electrophoresis, hybridization, amplification, library construction, and cloning.*

**840. Advanced Hemostasis**  
*Fall of odd-numbered years. 2(2-0) Interdepartmental with Medical Technology. Administered by Medical Technology.*

*P: BCH 462, MT 422. Physiology, pathophysiology, and laboratory evaluation of hemostatic disorders.*

**851. Advanced General Pathology**  
*Fall of even-numbered years. 3(3-0)*

*P: PTH 852 concurrently. R: Approval of department. Fundamental concepts of cell injury, inflammation, and oncogenesis. Mechanisms of disease.*

**852. Advanced General Pathology Laboratory**

*Fall of even-numbered years. 1(0-2)  
P: PTH 851 concurrently. Histopathologic and ultrastructural study of general morphologic patterns of inflammation cell injury and neoplasm.*

**853. Advanced Systemic Pathology**  
*Spring of odd-numbered years. 4(3-2)*

*R: Approval of department. Pathological aspects of the nervous, endocrine, cardiovascular, respiratory, urinary, genital, musculoskeletal, integumentary and special sense systems.*

**854. Advanced Clinical Pathology**  
*Spring of even-numbered years. 3(3-0)*

*P: PTH 540, PTH 552, PTH 609, PTH 651. R: Approval of department. Hematology including anemias, leukocyte responses and hemostasis. Clinical chemistry including tests to evaluate organs.*

**855. Proseminar**  
*Fall of odd-numbered years. 2(2-0)*

*R: Approval of department. Preparation, editing, and review of research manuscripts and grants. Critique of oral presentations. Illustrations of research data and thesis preparation. Philosophy and methods of research.*

**856. Pathotoxicology**  
*Summer of even-numbered years. 3(3-0)*

*R: Approval of department. Pathologic changes in tissues of animals used in toxicologic studies. Clinical pathologic assessments. Gross, histologic, and ultrastructural changes in organ systems.*

**857. Correlative Diagnostic Pathology**  
*Fall, Spring, Summer. 3(0-6)*

*R: Approval of department. Diagnosis of animal diseases by necropsy, biopsy, or clinical pathology. Correlation of diagnostic test results with history, laboratory data and morphologic findings. Compiled and formal presentation of findings.*

**858. Pathology of Avian Diseases**  
*Spring of even-numbered years. 2(2-0)*

*C: Pathology students must take PTH 859. R: Approval of department. An overview of disease and pathology affecting domestic poultry, pet birds, and wild birds.*

**859. Avian Histopathology Laboratory**  
*Spring of even-numbered years. 1(0-2)*

*C: Pathology students must take PTH 858. R: Approval of department. Recognition and description of microscopic lesions of avian diseases.*

**860. Clinical Laboratory Diagnosis of Infectious Diseases**

*Spring of even-numbered years. 2(2-0) Interdepartmental with Medical Technology. Administered by Medical Technology.  
P: MIC 451, MIC 464.*

*Laboratory techniques for diagnosing infectious diseases in humans. Emphasis on differential diagnosis and correlation of microbiological results with serology, hematology, and clinical chemistry.*

**890. Problems in Veterinary Pathology**

*Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.*

*R: Approval of department. Faculty supervised work on an experimental, theoretical or applied problem in veterinary pathology.*

**891. Problems in Pathology**

*Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course.*

*R: Approval of department. Faculty supervised work on an experimental, theoretical or applied problem in pathology.*

**892. Pathology Seminar**

*Fall, Spring. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course.*

*R: Approval of department. Presentation and discussion of current topics in pathology by departmental graduate students, faculty or outside speakers.*

**899. Master's Thesis Research**

*Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 10 credits in all enrollments for this course.*

*R: Approval of department.*

**901. Investigating the Lung**

*Fall of even-numbered years. 3(3-0) Interdepartmental with Large Animal Clinical Sciences and Physiology. Administered by Large Animal Clinical Sciences.*

*R: Open only to M.S. and Ph.D. students in Large Animal Clinical Sciences, Small Animal Clinical Sciences, Physiology, and Pathology. Approval of department.*

*Classic and current concepts of respiratory structure and function in health and disease. Mechanisms of lung injury.*

**999. Doctoral Dissertation Research**

*Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course.*

*R: Admission to doctoral program in Pathology.*

**PEDIATRICS PED**

**Department of Pediatrics  
College of Osteopathic Medicine**

**590. Special Problems in Pediatrics**

*Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 48 credits in all enrollments for this course.*

*R: Open only to graduate-professional students in the College of Osteopathic Medicine. Approval of department.*

*Experimental, theoretical, or applied problems under faculty direction.*

**600. Pediatrics Clerkship**

*Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.*

*R: Open only to graduate-professional students in the colleges of Osteopathic Medicine and Human Medicine upon completion of Units I and II.*

*Practical clinical exposure in the area of pediatrics.*

**619. Ambulatory Care Clerkship**

*Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 15 credits in all enrollments for this course. Interdepartmental with Family Practice and Medicine. Administered by Family Practice.*

*P: FMP 602. R: Open only to graduate-professional students in College of Human Medicine.*

*Continuous and comprehensive patient care under supervision of appropriate physicians.*

**620. Directed Studies**

*Fall, Spring, Summer. 1 to 30 credits. A student may earn a maximum of 30 credits in all enrollments for this course.*

*P: PED 600. R: Open only to graduate-professional students in the College of Osteopathic Medicine. Approval of department.*

*Study in general or specialty pediatrics.*

**PEDIATRICS AND HUMAN  
DEVELOPMENT PHD**

**Department of Pediatrics and  
Human Development  
College of Human Medicine**

**523. Genetics for Medical Practice**

*Summer. 1(1-0) Interdepartmental with Biochemistry.*

*R: Graduate-professional students in colleges of Human and Osteopathic Medicine.*

*Basic principles of genetics for medical students.*

**524. Genetics Clinic**

*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.*

*P: PHD 523. R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Role of genetics in health care delivery under the direction of a faculty member.*

**591. Special Problems in Human Development**

*Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 12 credits in all enrollments for this course.*

*R: Graduate-professional students in colleges of Human and Osteopathic Medicine.*

*Work under the direction of a faculty member on an experimental, theoretical, or applied problem.*