

**404. Survey of Nursing**  
Fall, Winter, Spring. 4 credits. Seniors.

Development of nursing to present status, current problems and long-term goals. Fields of service open to graduate nurses; nursing organizations, national, state and local, their services and objectives.

**406. Senior Nursing**  
Fall, Winter, Spring. 8(3-20) Senior majors.

A study of basic principles of leadership and their application in the practice of team nursing.

## PACKAGING PKG

### College of Agriculture and Natural Resources

**210. Principles of Packaging**  
Fall, Winter, Spring, Summer. 3(3-0)

A general course in packaging principles covering the growth and development of the field, and the technological and motivational problems involved in present day packaging. Consideration will be given to the basic functions of the package and their relation to the needs and wants of our society.

**320. Packaging Materials**  
Fall, Winter, Spring. 5(4-4) CEM 132.

Detailed study of common packaging materials such as wood, paper, paperboards, plastics, metal foils and sheets, glass, and cushioning media. A one-day field trip required.

**330. Graphics for the Packaging Industry**  
Spring. 4(3-3) 320 or approval of school.

Designing graphics for specific types of printing processes and for various packaging materials. Considerations in ink formulation, identification of the various printing processes used, and the advantages and disadvantages of various reproduction methods as used for packaging.

**422. Packaging Systems**  
Fall, Winter, Spring. 5(4-4) 320 or approval of school.

Design, use and evaluation of packages and packaging systems. A one-day field trip is required.

**423. Dynamics of Packaging**  
Winter, Spring. 5(4-3) MTH 215.

A study of the protective function of the packaging systems in relation to their environment and shock and vibration isolation methods. A one-day field trip is required.

**424. Packaging Problems**  
Fall, Winter, Spring, Summer. 1 to 3 credits. 422 or 423. Approval of school.  
Development of solutions to specific packaging problems.

**425. Packaging Process Analysis**  
Fall, Winter, Spring. 4(3-3) 422; CPS 110.

The integrated study of the operation structure and control of the packaging and package-making process. A one-day field trip is required.

**428. Packaging Development**  
Fall, Winter, Spring. 4(3-2) 320.

A study of the functions of each area concerned with the development of packages to meet present-day requirements of protection and merchandising.

**430. Packaging Machinery**  
Winter. 4(3-3) 320 or approval of school.

The components for automated packaging lines, and auxiliary materials handling equipment, including consideration of design, selection, specification and operation of machinery for the package-making and package-filling operations.

**463. Seminar**  
Fall. 2(0-4) Must have job experience to enroll.

Detailed report on work performed in fulfillment of practical experience requirements must be submitted.

**801. Package Design**  
Fall. 4(3-3)

Advanced work in the development of the graphic and structural design of packages.

**834. Special Investigations in Packaging**  
Fall, Winter, Spring, Summer. Variable credit.

**899. Research**  
Fall, Winter, Spring, Summer. Variable credit. Approval of school.

## Building Construction\* B C

**200. Dynamics of American Housing**  
Fall, Winter, Spring, Summer. 3(3-0)

Impact of housing on the economic and social welfare of America. Analysis of the residential building industry and its problems in providing adequate housing.

**312. Structural Design**  
Fall. 4(4-0) 200 or approval of department.

Consideration of structural design systems as used in light construction.

**314. Methods, Analysis and Controls I**  
(F P 314.) Fall. 4(2-2) 312.

Design, analysis and controls of work methods and operations in construction.

**412. Housing Utilities Design**  
Winter. 4(4-0) 312.

Design of and planning for mechanical and electrical utilities in housing.

**415. Building Materials**  
Spring. 4(4-0) 312 or approval of department.

Properties of building materials pertinent to their application and performance in service.

**416. Building Costs**  
Winter. 4(2-4) Approval of department.

Methods of cost estimating. Effects of codes and production practices on costs.

**418. Special Topics**  
(F P 418.) Fall, Winter, Spring, Summer. 1 to 3 credits. Approval of department.  
Selected topics in housing.

**835. Research in Building Construction**  
(F P 835.) Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**899. Research**  
(F P 899.) Fall, Winter, Spring, Summer. Variable credit. Approval of department.

## PARK AND RECREATION RESOURCES\* PRR

### College of Agriculture and Natural Resources

**200. Resource Ecology and Man**  
For course description, see Interdisciplinary Courses.

**344. Leisure and Recreation Resources**  
(R D 344.) Spring. 3(3-0)

Leisure in relation to park and recreation resources. History and philosophy, significance in modern society, and impact on urban and natural resource developments.

**440. Park and Recreation Administration**  
(R D 440.) Fall. 4(4-0)

Park and recreation organization, administration and policy at municipal, county, and regional level. Field trip required.

**442. State and Federal Recreation Resource Policy**  
(R D 442.) Winter. 3(3-0)

Origin, development and significance of public policy in recreation resource development in the United States with emphasis at state and federal levels. Field trip required.

**444. Park and Recreation Area Design**  
(R D 444.) Fall. 4(2-4) Approval of department.

Planning and design principles of space, scale, and circulation applied to the use of park and recreation areas and facilities. Field trip required.

**446. Park Area Operations**  
(R D 446.) Spring. 3(3-0) Approval of department.

Problems in operations and maintenance of park and recreation areas and facilities. Personnel practices, budgeting, and maintenance schedules. Selection and adaptability of maintenance equipment. Field trip required.

**448. Field Studies in Park Administration**  
(R D 448.) 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**  
(R D 440., 350.) Fall, Spring. 3(2-0)  
Not open to majors.

Fundamentals of outdoor recreation resource management. Planning, development, and administration of programs and facilities. Two weekend field trips required.

**450. Natural Resource Administration**  
Fall, Winter. 4(4-0) Interdepartmental with the Fisheries and Wildlife, Forestry, and Resource Development Departments and administered by the Forestry Department.  
Concepts and methods of economics and administration and application of techniques to management of wildlands.

\*Established January 1, 1969. Formerly a part of the Department of Resource Development.

**480. Supervised Study**  
*Fall, Winter, Spring, Summer. 1 to 4 credits. May re-enroll 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.

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

**880. Special Problems**  
*Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 10 credits. Approval of department.*  
 Seminars on current problems. Supervised readings. Independent study of selected topics.

**899. Research**  
*Fall, Winter, Spring, Summer. Variable credit. Approval of department.*

**PATHOLOGY PTH**  
**College of Human Medicine**  
**College of Veterinary Medicine**

**404. General Pathology**  
*Fall. 5(3-6) ANT 421; Junior Medical Technology majors, or approval of department.*

**407. Clinical Pathology**  
*Winter. 5(3-4) 404 or approval of department.*  
 Theory and technics in histopathology, hematology, blood banking, clinical microscopy and chemical pathology, including urinalysis, blood chemistry and histochemistry.

**408. Clinical Pathology**  
*Spring. 5(3-4) 404 or approval of department.*  
 Continuation of 407.

**501. Pathology of Infancy and Childhood**  
*Winter. 5(5-0) Year V Human Medicine Students.*  
 An analysis of disease processes in the immature human between birth and puberty.

**550. Pathology I**  
*Fall, Spring. 7(3-9) Human Medicine or Veterinary Medicine students, or approval of department.*  
 Principles of pathology, including causes of disease, disturbances of cell growth and metabolism, necrosis, circulatory changes, inflammation, repair and neoplasms; pathology of the hematopoietic, cardio-vascular and urinary systems; integration of principles of clinical pathology.

**560. Pathology II**  
*Winter, Summer. 7(3-9) 550.*  
 Continuation of 550, with coverage of the digestive, respiratory, genital, nervous, skeletal, muscular, and integumentary systems.

**610. Veterinary Clinical Pathology Laboratory**  
*Fall, Spring. 3(0-9) 560.*  
 Laboratory procedures in the diagnosis of disease; examination of body tissues and/or fluids from the living or dead animal; postmortem techniques.

**615. Diseases of Poultry**  
*Winter, Summer. 4(4-0) Eighth-term Veterinary Medicine students.*  
 Etiology, signs, lesions, differential diagnosis and control of infectious and noninfectious diseases of birds, with emphasis on domestic poultry.

**800. Problems in Pathology**  
*Fall, Winter, Spring, Summer. Variable credit. Approval of department.*  
 Elective work for students in veterinary medicine interested in pathology as a speciality, or in the special pathology of diseases of a particular class or species, and for graduate minors and majors interested in pathological techniques or in non-thesis research.

**801. Pathology Seminar**  
*Fall, Winter, Spring, Summer. 1(1-0) May re-enroll for a maximum of 3 credits for M.S. candidates and 6 credits for Ph.D. candidates. Approval of department.*  
 Seminar required of all majors in Pathology.

**802. Advanced Histopathology**  
*Fall. 5(0-15) 560 and approval of department.*  
 A relatively advanced and comprehensive study in the histopathologic aspects of systemic and special pathology; independent study in the field of pathogenesis and microscopic pathology.

**803. Advanced Histopathology**  
*Winter. 5(0-15) 802 and approval of department.*  
 Continuation of 802.

**804. Histopathologic Techniques**  
*Fall. 3(1-6) Approval of department.*  
 Theory and practice in preparation of tissues for examination with the light microscope; special stains and histochemical procedures included.

**805. Pathology Proseminar**  
*Fall. 2(2-0) Approval of department.*  
 Philosophy and methods of research; theses and other research reports; literature review; illustration of research data; practical assignments.

**810. Post-Mortem Diagnosis**  
*Winter, Summer. 3(0-9) May re-enroll for a maximum of 6 credits. Approval of department. Required of majors.*  
 Instruction and practice in diagnosis of animal diseases by means of necropsy and other laboratory techniques. Emphasis will be placed upon correlation and interpretation of gross and microscopic lesions and the results of other tests.

**811. Advanced Clinical Pathology**  
*Winter. 3(1-6) Approval of department.*  
 Application of standard and newer techniques and instrumentations in hematology, biochemistry, parasitology, etc., to the diagnosis of disease.

**812. Hematology**  
*Winter. 5(3-4) 408 or 610 or approval of department.*  
 Pathology of diseases of blood and an analysis of diagnostic laboratory procedures.

**820. Oncology**  
*Spring. 3(0-9) 560 and approval of department.*  
 A study of benign and malignant neoplasms with emphasis on gross and microscopic characteristics and diagnosis.

**821. Pathology of Nutritional and Metabolic Diseases**  
*Spring of odd-numbered years. 3(1-6) Approval of department.*  
 The pathogenesis and macroscopic and microscopic lesions of nutritional deficiencies and imbalance and of other disturbances of metabolism.

**899. Research**  
*Fall, Winter, Spring, Summer. Variable credit. Approval of department.*

**910. Biology of Disease**  
*Fall. 3(2-3) Approval of department. Primarily for students in the biological sciences.*  
 Basic morphologic changes in disease with emphasis on the related physiologic pathology. Laboratory includes relevant problems in post-mortem diagnosis.

**980. Histopathologic Diagnosis**  
*Fall, Winter, Spring, Summer. 3(0-9) May re-enroll for a maximum of 6 credits. 803, 820.*  
 Trimming, histopathologic examination, description, diagnosis and reporting of specimens from biopsy and necropsy.

**990. Advanced Correlative Pathology**  
*Fall, Winter, Spring, Summer. 5(0-15) May re-enroll for a maximum of 15 credits. Approval of department.*  
 Experience in morphologic and clinical pathology and correlation of these with the clinical aspects of disease.

**999. Research**  
*Fall, Winter, Spring, Summer. Variable credit. Approval of department.*

**PHARMACOLOGY PHM**  
**College of Human Medicine**  
**College of Veterinary Medicine**

**480. Special Problems**  
*Fall, Winter, Spring, Summer. Variable credit. May re-enroll for a maximum of 5 credits. Approval of department.*

**510. Principles of Pharmacology**  
*Fall, Spring. 9(6-8) Fifth-term Veterinary Medicine students or approval of department.*  
 Principles of pharmacodynamics and essentials of prescription writing.

**511. Applied Pharmacology**  
*Winter, Summer. 4(4-0) 510.*  
 Chemotherapy and toxicology.

**810. Synaptic Transmission**  
*Winter. 4(4-0) Approval of department.*  
 Chemical and electrical aspects of the transmission of nervous impulses at synaptic and neuroeffector junctions and the influences of drugs upon these processes.

**811. Organ System Pharmacology**  
*Winter of even-numbered years. 4(3-3) 510 and approval of department.*  
 Current concepts and recent advances in the areas of cardiovascular, renal and syncytial smooth muscle pharmacology.