

**438. Pharmaceutical Packaging**  
Winter. 3(3-0) PKG 427.

Special requirements for packaging pharmaceuticals and medical devices. Packageforms and procedures that meet these requirements. Labeling, regulatory requirements, and effect of sterilization on packages.

**440. Special Topics**  
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 12 credits if different topics are taken. Juniors or approval of school.

**448. Design of Shipping Containers**  
Spring. 2(1-2) PKG 423.

Students design, build and test a shipping package system for an industrial product. Lectures by industry personnel on specific shipping containers not discussed in other packaging courses.

**450. Packaging Laws and Regulations**  
Spring. 3(3-0) PKG 422 or approval of school.

History and development of packaging laws and regulations. Relationships among law, government regulation and commercial regulation. Effect of current laws and regulations on packaging. Personal liability of the packaging professional.

**455. Food Packaging**  
Fall. 4(3-2) PKG 427 or approval of school.

Food packaging systems and their relationship to specific products, processes, regulations and equipment.

**463. Seminar**  
Fall. 2(0-4) Senior Majors.  
Discussions on current packaging problems.

**801. Packaging Systems**  
Fall. 4(3-3)  
Analysis of various existing packaging systems; problem solving exercises.

**810. Advanced Packaging Materials**  
Spring. 3(2-2) PKG 427 or approval of department.  
Physical and chemical properties of packaging materials. Relationship between properties of materials and performance of packages.

**820. Permeability and Shelf Life**  
Winter. 4(3-3) PKG 422, MTH 113, CPS 115 or approval of school.  
Comprehensive study of the relationship of the storage life of packaged food and agricultural products and the gas, moisture, and vapor permeability of packages in various environments. Computer aided package design.

**822. Seminar**  
Fall. 1(1-0) Approval of department.  
Discussions of recent advances in packaging and reports by graduate students and faculty on research problems. Field trips required.

**834. Special Investigations in Packaging**  
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 8 credits. Approval of school.

**840. Selected Topics**  
Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 12 credits if different topics are taken. Approval of department.

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

**PARK AND RECREATION RESOURCES PRR**

**College of Agriculture and Natural Resources**

**213. Leisure and Recreation Resources**  
(PRR 344.) Fall, 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.

**215. Recreation Programming and Leadership**  
(PRR 201.) Fall, Winter. 3(3-0)

Recreation leadership and programming. Recreation program service settings, design and conduct of programs to serve different clientele groups.

**300. Wilderness Survival**  
Fall, Winter, Spring, Summer. 3(3-0)

Outdoor skills for utilization of plant and animal materials to provide shelter, fire, signals, water and food in the outdoors. Psychology and attitudes conducive to wilderness survival and appreciation. Field trip required.

**301. Wilderness Survival (TV)**  
Fall, Winter, Spring, Summer. 3(3-0)  
Credit may not be earned in both PRR 300 and PRR 301.

A television lecture course dealing with the principles and attitudes necessary to promote survival in a wilderness setting.

**302. Environmental Attitudes and Concepts**  
Fall. 3(3-0)

History of development of attitudes and values about the environment in western civilization. Wilderness, environmentalism, environmental quality, economic development, conservation. Environmental perception and environment-behavior relationships.

**304. Recreation Planning and Design**  
Fall, Spring. 3(3-0) Approval of department.

Basic planning and design concepts applied to recreation areas, facilities, and programs. Planning process, public involvement, population and resource analysis, aesthetic and functional considerations in park design.

**310. Camp Counseling and Administration**  
(HPR 300.) Spring. 3(3-0)

Camp counseling techniques, leadership roles and responsibilities, campcraft skills, programming camp activities, organization and administration of youth camps.

**315. Recreation Program Management**  
(PRR 313.) Winter, Spring. 4(4-0) PRR 215.

Application of recreation programming and leadership principles to program planning, management and evaluation. Development of recreation programs utilizing leisure education format and small group process.

**351. Park Interpretation and Visitor Information Services I: Principles**  
Fall, Winter. 3(3-0)

Communication principles applied to park and recreation resource interpretation and other information services. Principles of audience analysis, brochure and exhibit design, public relations, natural/cultural interpretation, visitor information centers.

**362. Recreation for Special Populations**  
(HPR 362.) Fall, Spring. 3(3-0) PRR 215.

Therapeutic recreation, recreation services for special populations. Physical, social, and psychological disabilities as they relate to leisure services. Field trip required.

**384. Junior Proseminar**  
(PRR 484.) Fall, Spring. 1(1-0) Juniors.

Seminars on current professional problems and literature.

**403. Fieldwork in Park and Recreation**  
Fall, Winter, Spring. 1 to 8 credits. May reenroll for a maximum of 8 credits. Approval of department.

Fieldwork course in which student acts as a leader under supervision in community park and recreation programs.

**422. Leisure Theory and Philosophy**  
(HPR 422.) Fall, Spring. 3(3-0) PRR 213 or approval of department.

Classical and modern leisure theories and philosophies. Personal and societal attitudes toward leisure, work, and recreation. Changing values, leisure and culture, future perspectives.

**440. Park and Recreation Administration**  
Winter, Spring. 4(4-0)

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

**442A. Park and Recreation Resource Policy**  
(PRR 442.) Spring. 3(3-0) PRR 213 or approval of department. May not receive credit for both PRR 442A and PRR 442B.

History and significance of recreation resource policy in the United States. Policy process, case studies of recreation policy development.

**442B. Leisure Services Policy**  
(442.) Spring. 3(3-0) PRR 314 or PRR 362. May not receive credit for both PRR 442A and PRR 442B.

History and significance of recreation policy affecting leisure services and special populations in the U.S. Studies of recreation policy development. Professional certification.

**444. Park and Recreation Area Design**  
Winter. 4(2-4) PRR 304 or 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.

**445. Comprehensive Recreation Planning**  
Fall. 4(4-0) PRR 304 or approval of department.

Comprehensive planning techniques for recreation resources at national, state, and local levels. Supply-demand analysis, forecasting, impact assessment, survey methods and citizen input for recreation system planning.

## Descriptions — Park and Recreation Resources

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### Courses

- 446. Park and Recreation Area Operations**  
Winter, Spring, 3(3-0) Approval of department.  
Operations and maintenance of park and recreation areas and facilities. Preparation and implementation of maintenance plans, standards, scheduling, budget estimating, Selection and operation of maintenance equipment, supplies, and materials.
- 448. Field Studies in Park and Recreation Administration**  
Fall, 3 credits. Approval of department.  
Analysis of park, recreation, and tourism areas and facilities. Visits to local, state, federal, and commercial recreation facilities. Conducted off campus with agency assistance. Field trip required.
- 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 wildland 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. Park Interpretation and Visitor Information Services II: Methods**  
Spring, 4(4-0) PRR 351.  
Methods used in information services for park and recreation areas. Audiovisual programs, exhibit technology, interpretation issues, interpretive planning and program development. Field trip required.
- 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. Therapeutic Recreation Principles (HPR 447.)** Fall, 3(3-0) PRR 362.  
Planning, implementation, and evaluation of therapeutic recreation services. Individual disabilities, review of health care models and related therapies. Field trip required.
- 468. Therapeutic Recreation Techniques (HPR 448.)** 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) EC 201; ACC 230 or approval of department.  
Management methods and problems in commercial recreation enterprises with an emphasis on small business.
- 471. Recreation Products Consumption**  
Winter, 4(4-0) EC 201; ACC 230 or ACC 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.
- 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

- 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.
- 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.