

- 555. Systems Biology - Respiratory**
Summer. 8 credits. ANT 560, ANT 565, PSL 500A, MPH 521, BCH 502, PHM 521B, PTH 502.
 A multidisciplinary approach to the respiratory system providing functional integration of basic science and clinical information.
- 556. Systems Biology - Urinary**
Fall. 7 credits. ANT 560, ANT 565, PSL 500A, MPH 521, BCH 502, PHM 521B, PTH 502.
 A multidisciplinary approach to the urinary system providing functional integration of basic science and clinical information.
- 557. Systems Biology - Gastrointestinal**
Winter. 13 credits. ANT 560, ANT 565, PSL 500A, MPH 521, BCH 502, PHM 521B, PTH 502.
 A multidisciplinary approach to the gastrointestinal system providing functional integration of basic science and clinical information.
- 558. Systems Biology - Growth and Development**
Fall. 5 credits. ANT 560, ANT 565, PSL 500A, MPH 521, BCH 502, PTH 502.
 A multidisciplinary approach to growth, development, and aging within (but not limited to) the field of pediatrics and gerontology providing functional integration of basic science and clinical information.
- 559. Systems Biology - Reproductive**
Fall. 7 credits. ANT 560, ANT 565; PSL 500A; MPH 521; BCH 502; PTH 502.
 A multidisciplinary approach to the male and female reproductive system providing functional integration of basic science and clinical information (includes obstetrics and gynecology).
- 560. Systems Biology - Musculoskeletal**
Summer. 6 credits. ANT 560, ANT 565; PSL 500A; MPH 521; BCH 502; PHM 521B; PTH 502.
 A multidisciplinary approach to the musculoskeletal system providing functional integration of basic science and clinical information.
- 590. Special Problems**
Fall, Winter, Spring, Summer. 1 to 8 credits. May reenroll for a maximum of 32 credits. Approval of department.
 Each student will work under direction of a faculty member on an experimental, theoretical or applied problem.
- 600. Ambulatory Care**
Fall, Winter, Spring, Summer. 24 credits. Grade P in all courses offered in Terms 1-8 or approval of department.
 A multidisciplinary approach in clinical settings to the ambulatory patient to achieve proficiency in motor skills, aptitudes, comprehension of concepts and principles; patient evaluation, diagnosis, management, and therapy.
- 614. The Osteopathic Examination I**
Winter, Spring. 1(0-4) OST 533 or approval of instructor.
 Emphasizes continuing development of palpatory diagnostic skills, neuromusculoskeletal patient assessment, selection and utilization of appropriate osteopathic manipulative treatment.

- 615. The Osteopathic Examination II**
Spring, Summer. 1(0-4) OST 614 or approval of instructor.
 Introductory clinical course in the application of neuromusculoskeletal assessment, palpatory diagnosis and osteopathic manipulative treatment in ambulatory clinics.
- 616. The Osteopathic Examination III**
Fall, Summer. 1(0-4) OST 615 or approval of instructor.
 Introductory clinical course in the application of neuromusculoskeletal assessment, palpatory diagnosis and osteopathic manipulative treatment in the hospital setting.

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. 4(4-0) PKG 210, PHY 237, CEM 131, CEM 132, CEM 161.
 Common packaging materials including wood, paper, paperboard, plastics, metal foils and sheets, glass, adhesives, cushioning media; their basic properties in relation to performance of package.
- 330. Package Printing**
Winter. 3(3-0) PKG 320 or approval of school.
 Basic printing processes used for packaging materials. Advantages, disadvantages and identification of these printing methods.
- 340. Packaging and the Environment**
Winter. 4(4-0)
 Broad study of the effects of packaging on environmental quality, including solid waste, air and water quality, laws, economics, energy considerations and resources conservation.
- 422. Packaging Systems**
Fall, Winter, Spring. 4(4-0) PKG 320 or approval of school.
 Design, use and evaluation of packages and packaging systems.
- 423. Dynamics of Packaging**
Fall, Winter, Spring. 4(3-3) PKG 422 or approval of school.
 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. May reenroll for a maximum of 9 credits. PKG 422, 2.50 grade-point average and approval of school.
 Development of solutions to specific packaging problems.

- 425. Packaging Process Analysis**
Fall, Winter, Spring. 4(4-0) PKG 422.
 The integrated study of the operation structure and control of the packaging and package-making process. A one-day field trip is required.
- 427. Packaging Materials and Systems Laboratory**
Fall, Winter, Spring. 4(2-4) PKG 320, PKG 422 or approval of school.
 Methods of measuring properties of packaging materials. Design, manufacture and performance testing of complete packages. Techniques for evaluating test results. Value of various test methods.
- 428. Packaging Development**
Fall, Winter, Spring. 4(3-2) PKG 427, CPS 110, Seniors.
 Development of packages to meet present-day requirements of protection and merchandising.
- 429. Packaging Economics**
Winter. 3(3-0) PKG 422, EC 200, AFA 201 or approval of school.
 Examination of economic issues in packaging as they relate to policies of the firm and of government. Relationships between economic policy and social issues.
- 430. Packaging Machinery**
Spring. 4(4-0) PKG 422 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.
- 435. Distribution Packaging**
Fall, Winter, Spring. 3(3-0) EC 200, PKG 422, Juniors or approval of school.
 Interrelationships between packaging and other segments of the distribution system. Market related issues in packaging: materials handling, transportation, and inventory control.
- 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.
- 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.

**Descriptions – Packaging
of
Courses**

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 110 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**

201. Social Recreation and Game Leadership
(HPR 201.) Fall. 3(2-3) Approval of department.

Methods, materials, and practice in conducting party programs, indoor games, and celebrations for large and small groups. Games using special equipment commonly employed in resorts and community centers.

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
(HPR 300.) Spring. 3(2-3)

Orientation and preparation for job. Organization of activities and special programs. Group leadership responsibilities. Development of camp counseling techniques.

313. Recreation and Youth Organization Programs
(HPR 303.) Winter. 4(4-0) Sophomores.

Development and conduct of special recreation events in community and youth organization programs including civic and youth centers, agency operation, adult and senior citizen activities.

344. Leisure and Recreation Resources
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.

351. Environmental Interpretation I: Principles
Fall, Winter. 3(3-0)

Philosophy, needs, types, and uses of information services in private, municipal, county, state and federal park and recreation areas. The role of the park interpreter (naturalist).

362. Introduction to Therapeutic Recreation
(HPR 362.) Fall. 3(3-0) Recreation major or approval of department.

Philosophical and theoretical foundations of therapeutic recreation, overview of populations, type and nature of settings and services and information related to concepts of delivery and resources available.

370. Playground and Day Camp Administration
(HPR 370.) Winter, Spring. 3(3-0) Approval of department.

Organization and administration of playground and day camp programs; equipment and areas, supplies and maintenance; staff selection and training; policies, records and legal responsibilities.

400. Camp Administration
(HPR 400.) Fall. 3(3-0) PRR 310 or approval of department.

Organization and administration of public, semipublic, and private camps; their program requirements and standards. Equipment, camp sites, budgets, and staff.

401. Organization and Administration of Community Recreation
(HPR 401.) Winter, Spring. 3(3-0) PRR 370, PRR 422, HPE 404.

Development of the recreational movement in respect to leisure time. Community recreation programs. State and national acts. Principles and practices in recreational administration.

402. Student Leadership in Recreation
(HPR 402.) Summer. 3 to 6 credits. May reenroll for a maximum of 6 credits.

Student will act as a camp counselor or playground leader under supervision at an approved camp or playground. Reports required of student periodically.

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. The Theory and Philosophy of Recreation
(HPR 422.) Fall, Winter, Spring. 3(3-0)

Philosophy and psychology of play. Types of play program, program building, the play teacher.

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.

442. State and Federal Recreation Resource Policy
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
Fall, Winter. 4(2-4) PRR 304; HRT 211 or HRT 212, or BOT 318 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, Winter. 4(4-0) EC 200, PRR 344 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.

446. Park Area Operations
Winter, 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.