555. Systems Biology - Respiratory

Summer. 8 credits. ANT 560, ANT 565, PSL 500A, MPH 521, BCH 502, PHM 521, 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 521, 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 520, 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 and development within the field of pediatrics providing functional integration of biological, behavioral and clinical sciences.

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 521; 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.

610. Subspecialty Clerkship: Child Psychiatry

Fall, Winter, Spring, Summer. 4 to 16 credits. PSC 608. Interdepartmental with and administered by the Department of Psychiatry.

Subspecialty experiences in psychiatry in clinical settings with child patients and their families.

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.

321. Technical Principles for Packaging

Fall, Winter, Spring. 4(3-2) PKG 210, CEM 143, PHY 237 or approval of department.

Relationships between package systems and distribution environments. Testing, evaluating and predicting package performance under various environmental influences.

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.

331. Plastic and Glass Packaging

Fall, Winter, Spring. 4(3-2) PKG 321 or approval of department.

Physical and chemical properties of plastics and glass and their relationship to selection, design, manufacture, performance and evaluation of container systems.

332. Paper and Metal Packaging

Fall, Winter, Spring. 4(3-2) PKG 321 or approval of department.

Physical and chemical properties, manufacture, conversion and use of wood, paper, paperboard, metals, metal foils and related components. Design, use and evaluation of packages made from these materials.

340. Packaging and the Environment

Winter. 3(3-0)

Broad study of the effects of packaging on environmental quality including solid waste management, air and water quality, laws, economics, energy considerations, resource conservation and environmental ethics.

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(3-2) PKG 422.

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

428. Packaging Development

Fall, Winter, Spring. 4(3-2) PKG 427, CPS 115, Seniors.

Development of packages to meet present-day requirements of protection and merchandising.

429. Packaging Economics

Winter. 3(3-0) PKG 422, EC 202, ACC 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 202, 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.

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

210. Our National Parks
Fall, Spring. 3(3-0) Not open to majors.
Heritage, management, and future of U.S. National Parks. Conflicts inherent in preservation of natural and historic resources for public enjoyment.

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.

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(3-2) 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.

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.