

## Descriptions—Packaging of Courses

**990. Independent Study in Packaging**  
*Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to Ph.D. students in the School of Packaging. Approval of department; application required.*  
Special investigations of unique packaging problems.

**992. Packaging Seminar**  
*Fall. 1(2-0) A student may earn a maximum of 3 credits in all enrollments for this course. R: Open only to graduate students in packaging.*  
Presentations of detailed studies on specialized aspects of packaging.

**999. Doctoral Dissertation Research**  
*Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 50 credits in all enrollments for this course. R: Open only to Doctoral students in packaging.*

## PARK, RECREATION AND TOURISM RESOURCES

PRR

Department of Park, Recreation  
and Tourism Resources  
College of Agriculture and  
Natural Resources

**100. Recreation in Michigan Natural Resources**  
*Spring. 3(3-0)*  
The scope and status of Michigan natural resources used for recreation. Historical and philosophical foundations of management and policy. Analysis of contemporary environmental and recreational policy issues.

**200. Leisure and Society**  
*Fall, Spring, Summer. 3(3-0)*  
Leisure and recreation as part of daily life. Leisure as a social, psychological, political, economic and cultural force in the United States.

**210. Our National Parks and Recreation Lands**  
*Fall, Spring, Summer. 3(3-0)*  
Scope and history of federal recreation lands. Comparisons of national parks to other federal lands. Recreation land management in other nations. Future federal land management options.

**213. Introduction to Parks, Recreation, and Leisure**  
*Fall, Spring, Summer. 3(3-0)*  
The scope and management of recreation services and resources. Historical and philosophical foundations. Influence of recreation behavior on state, national, international, economic, political and social institutions.

**215. Recreation Program Management**  
*Fall, Spring. 4(3-2)*  
Programming and leadership principles for planning, management, and evaluation. Program design and conduct to service different clienteles, using leisure education, program development, and small group processes. Field trips required.

**293. Field Work in Park and Recreation Resources**  
*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. P: PRR 213, PRR 215. R: Open only to students in Park and Recreation Resources. Approval of department.*  
Professional field experience in a park or recreation setting.

**295. Field Study in Park, Recreation and Tourism Resources Delivery Systems**  
*Spring. 2 credits. P: (PRR 213 and PRR 215) R: Open only to sophomores or juniors or seniors. Approval of department; application required.*  
Field course illustrating public, non-profit, and commercial recreation delivery systems. Interrelationships of recreation with natural resources, cultural resources, facilities, and communities. Partnerships and competition among providers. Field trips required.

**300B. Coaching Sports for Athletes with Disabilities**  
*Spring of even years. 2(2-0) Interdepartmental with Kinesiology. Administered by Kinesiology.*  
Rules, strategies, and training. Developing and evaluating player skills. Planning, conducting, and evaluating sport practices. Health and safety concerns.  
SA: PES 300B

**302. Environmental Attitudes and Concepts**  
*Fall. 3(3-0) P: One ISS course or one PSY course or one SOC course. R: Not open to freshmen.*  
History of attitudes and values associated with the environment, wilderness, environmentalism, environmental quality, conservation, and preservation. Perceptions and assessment of modern environmental problems.

**320. Human Behavior in Park and Recreation Settings**  
*Spring. 3(3-0) P: One PSY course or one SOC course.*  
Antecedents, intervening conditions, and outcomes of human behavior in park, recreation, and leisure settings. Interactions between recreation behavior and the natural environment. Problem solving in recreation.

**351. Recreation and Natural Resources Communication (W)**  
*Fall. 3(2-2) P: PRR 213. R: Not open to freshmen. Completion of Tier I writing requirement.*  
Principles of communication for recreation and natural resource audiences. Application to various forms of interpretive media including verbal, graphic, and written. Field trips required.

**362. Recreation for Special Populations**  
*Spring. 3(3-0) P: PRR 213. R: Not open to freshmen.*  
Therapeutic recreation services emphasizing handicapped and geriatric characteristics. Chemical dependency issues. Leisure lifestyle issues. Philosophical foundations and service models. Integration, normalization, inclusion, and empowerment concepts.

**369. Introduction to Zoo and Aquarium Science**  
*Spring. 3(3-0) Interdepartmental with Landscape Architecture; Fisheries and Wildlife; Zoology; and Veterinary Medicine. Administered by Zoology. P: (BS 110 or LBS 144 or LBS 148H)*  
Fundamentals of zoo and aquarium operations including research, interpretation, design, nutrition, captive breeding, conservation, ethics and management.

**370. Administration and Operation of Park and Recreation Systems**  
*Fall. 3(3-0) P: PRR 213, PRR 215. R: Not open to freshmen and sophomores.*  
Policy, administration, and operations of park, recreation and tourism organizations.

**371. Management of Park and Recreation Agencies and Organizations**  
*Spring. 3(3-0) P: PRR 213, PRR 215. R: Not open to freshmen and sophomores.*  
Management concepts and methods. Budgeting, service marketing, and strategic planning in park, recreation and tourism organizations.

**393. Professional Seminar**  
*Fall, Spring. 1(1-0) P: PRR 293. R: Open only to majors in Park and Recreation Resources.*  
Linkage of field work and internship. Integration of course work with professional practice.

**410. International Studies in Tourism, Parks and Recreation**  
*Fall, Spring, Summer. 3(3-0) Fall: Latin America, Europe. Spring: Latin America, Europe. Summer: Latin America, Europe, Africa, Australia. A student may earn a maximum of 6 credits in all enrollments for this course. R: Not open to freshmen and sophomores. Approval of department; application required.*  
Influence of tourism, parks and recreation on social, economic and political systems. Management of cultural, historical and natural resources as they relate to tourism, parks and recreation.

**419. Applications of Geographic Information Systems to Natural Resources Management**  
*Spring. 4(2-4) Interdepartmental with Fisheries and Wildlife; Forestry; Geography; Resource Development; and Biosystems Engineering. Administered by Fisheries and Wildlife. P: (GEO 221)*  
The application of geographic information systems, remote sensing, and global positioning systems to integrated planning and management for fish, wildlife, and related resources.

**443. Parks and Recreation Planning and Design Concepts**  
*Spring. 4(2-4) P: PRR 351. R: Not open to freshmen and sophomores.*  
Planning models and design analysis, synthesis, and communication and recreation and tourism subsystem and supply analysis.

**449. Management of Natural Resource Based Recreation**  
*Fall. 3(3-0) R: Not open to freshmen and sophomores.*  
The history of natural resource recreation management in the U.S. Techniques for dispersed and developed recreation management. Security of facilities, visitors, and personnel.

**Park, Recreation and Tourism Resources—Descriptions  
of  
Courses**

- 451. Park Interpretive Services and Visitor Information Systems**  
*Spring of odd years. 3(2-2) R: Not open to freshmen and sophomores.*  
Orientation, management, and education information systems. Influencing visitor behaviors. Goals and functions of interpretation. Types of services. Nature/visitor center programming and facility design and layout. Historical-cultural interpretation. Field trips required.
- 460. Resource and Environmental Economics**  
*Spring. 3(3-0) Interdepartmental with Resource Development; Public Resource Management; and Biosystems Engineering. Administered by Resource Development. P: RD 200; EC 201 or EC 202 or PRM 201 or RD 302.*  
Economics of land and related environmental resources. Production and consumption processes. Resource allocations and scarcity. Market failure and externalities. Market and institutional remedial approaches.
- 464. Natural Resource Economics and Social Science (W)**  
*Fall. 3 credits. Interdepartmental with Forestry; Fisheries and Wildlife; and Resource Development. Administered by Forestry. P: EC 201 or EC 202. R: Not open to freshmen and sophomores. Completion of Tier I writing requirement.*  
Application of economic and social science principles and techniques to production and consumption of natural resources. Benefit-cost analysis. Regional impact analysis. Social impact assessment.
- 466. Natural Resources Planning and Policy**  
*Spring. 3(2-2) Interdepartmental with Forestry; Fisheries and Wildlife; and Resource Development. Administered by Forestry. R: Open only to seniors or graduate students in the Department of Forestry or Department of Fisheries and Wildlife or Department of Park, Recreation and Tourism Resources or Department of Resource Development.*  
Scientific, environmental, social, and institutional factors affecting planning and policy-making. Focus on ecosystem-based planning and policy issues through development of a multiple-use plan. Case studies.
- 467. Programming in Therapeutic Recreation**  
*Fall. 3(3-0) P: PRR 362.*  
Comprehensive and individual program planning methods. Standards of practice, quality assurance, interview techniques, professional ethics, and terminology. Field trips required.
- 468. Therapeutic Recreation Techniques**  
*Spring. 3(3-0) P: PRR 467.*  
Health care documentation. Leisure education. Facilitation techniques. Assistive recreation devices. Principles of pharmacology related to therapeutic recreation. Professional and certification issues.
- 473. Commercial Recreation and Tourism Enterprises**  
*Fall. 3(3-0) P: EC 201, PRR 371. R: Not open to freshmen and sophomores.*  
Management and operation of resort, recreation, and tourism enterprises. Emphasis on small business. Strategic planning, feasibility studies, market assessment, and quality assurance.
- 474. Community and Natural Resource Based Tourism**  
*Spring of even years. 3(3-0) R: Not open to freshmen and sophomores.*  
Developing and sustaining tourism. Environmental, social, and economic considerations. Roles and responsibilities of agencies and organizations. Impact management. Tourism-based community and rural development.
- 475. Evaluation in Parks and Recreation**  
*Fall. 3(2-2) P: STT 200 or STT 201 or PSY 295 or GEO 427. R: Open only to seniors or graduate students.*  
Evaluation concepts, approaches, and methods. Evaluation in management and administrative functions.
- 485. Legal Aspects of Parks, Recreation, and Sport**  
*Fall. 3(3-0) R: Open only to seniors or graduate students.*  
Legal concepts in management and operation of public and private programs, areas and facilities. Tort liability and risk management planning. Rights and behavior constraints of clientele. Legal foundations of authority.
- 489. Seminar in Zoo and Aquarium Science**  
*Fall, Spring. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course. Interdepartmental with Landscape Architecture; Zoology; and Fisheries and Wildlife. Administered by Zoology. R: Approval of department.*  
Scientific writing and oral presentations related to zoo and aquarium studies.
- 490. Independent Study**  
*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: PRR 215, PRR 320. R: Approval of department; application required.*  
Individualized readings and research compatible with students' interests and abilities under the guidance of a faculty member.
- 491. Special Topics in Park and Recreation Resources**  
*Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P: PRR 215; PRR 320. R: Approval of department; application required.*  
Group studies for advanced undergraduate students having special interests in Park and Recreation Resources.
- 493. Professional Internship in Park, Recreation and Tourism Resources**  
*Fall, Spring, Summer. 3 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to juniors or seniors in the Park, Recreation and Tourism Resources major. Approval of department; application required. A student may earn a maximum of 6 credits in the following courses: AEE 493, ANR 493, ANS 493, FW 493, PKG 493, PRM 493, PRR 493, and RD 493.*  
Supervised professional experiences in agencies and businesses related to park, recreation and tourism resources.
- 815. Park and Recreation Program Services**  
*Fall. 3(3-0)*  
Concepts, theories, and philosophies of leisure and recreation. Role and function of delivery systems in communities. Management of the program-planning process and provision of recreation services to diverse groups.
- 829. The Economics of Environmental Resources**  
*Fall. 3(3-0) Interdepartmental with Agricultural Economics; Economics; Forestry; and Resource Development. Administered by Agricultural Economics.*  
Economic principles related to environmental conflicts and public policy alternatives. Applications to water quality, land use, conservation, development, and global environmental issues.
- 840. Recreation and Tourism Economics**  
*Fall. 3(3-0)*  
Economic concepts in public and private sector recreation and tourism decisions. Non-market valuation techniques. Regional economic impact. Demand and supply. Forecasting consumption trends. Financial and benefit cost analysis.
- 841. Park and Recreation Administration and Policy**  
*Fall. 3(3-0)*  
Administration and management of park and recreation services in urban and rural environments. Policy development and evaluation. Planning, financing, staffing, operating and evaluating organizational structures.
- 844. Research Methods in Recreation, Parks, and Tourism**  
*Spring. 3(3-0)*  
Recreation research needs, techniques, assessment and application. Management problems and decision making.
- 848. The Law and Leisure Services**  
*Spring. 3(3-0)*  
Risk control. Legal audits. Human rights mandates. Legal information systems. Contracts and participant forms. Intentional tort and negligence concepts. Personnel legal processes.
- 870. Park, Recreation and Natural Resources Marketing**  
*Fall. 3(3-0) R: Open only to graduate students in the Department of Park, Recreation and Tourism Resources or Department of Resource Development or Department of Forestry or Department of Fisheries and Wildlife.*  
Integration of marketing concepts and methods into agency planning and decision making.
- 874. Leisure, Travel and Tourism**  
*Fall. 3(3-0)*  
Modern concepts of leisure, travel, and tourism. Historical antecedents and current concepts of leisure, travel, and tourism.
- 879. Case Studies in Park and Recreation Resources**  
*Spring. 3(3-0)*  
Integrated approach to policy, planning, and management problems.

**Descriptions—Park, Recreation and Tourism Resources  
of  
Courses**

**890. Independent Study**

Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 7 credits in all enrollments for this course.

Supervised individual study in an area of parks, recreation, leisure, or tourism.

**891. Selected Topics**

Fall, Spring, Summer. 3 to 6 credits. A student may earn a maximum of 8 credits in all enrollments for this course.

Selected topics in park and recreation resources of current interest and importance.

**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. Advanced Environmental and Resource Economics**

Spring of even years. 3(3-0) Interdepartmental with Agricultural Economics; Economics; Forestry; and Resource Development. Administered by Agricultural Economics. P: (AEC 829 and EC 805)

Advanced economic theory of environmental management and policy. Treatment of externalities and market and non-market approaches to environmental improvement. Topics in conservation and sustainable economic growth. Applications to research and policy.

**925. Environmental and Resource Economics Research**

Spring of odd years. 3(3-0) Interdepartmental with Agricultural Economics; Forestry; Resource Development; and Economics. Administered by Agricultural Economics. P: (AEC 829 and EC 805)

Topics such as contingent or non-market valuation, institutional analysis, pollution prevention, environmental quality and location, recreational demand modeling, and environmental risk management. Research process in environmental and resource economics.  
SA: AEC 991H

**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 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.

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.

Hematology. Pathology of hematopoietic, lymphatic, digestive, urinary, respiratory, integumentary, cardiovascular, nervous, reproductive, musculoskeletal, endocrine, ocular, and otic systems.

**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.

**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.

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.

**812. Advanced Clinical Chemistry**

Spring of even 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 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.

**830. Concepts in Molecular Biology**

Spring of odd 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 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 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 years. 1(0-2) P: PTH 851 concurrently.

Histopathologic and ultrastructural study of general morphologic patterns of inflammation cell injury and neoplasm.