PACKAGING PKG

School of Packaging
College of Agriculture and Natural Resources

101 Principles of Packaging
Fall, Spring, Summer. 3(3-0) SA: PKG 210
Packaging systems, materials and forms and their relationship to the needs and wants of society.

221 Packaging with Glass and Metal
Fall, Spring. 3(3-0) P:M: (CEM 141 or CEM 151 or LBS 171) and (PHY 231 or PHY 231B or PHY 231C or PHY 183 or PHY 183A or PHY 183B or PHY 193H or LBS 271) and (PKG 101 or concurrently) SA: PKG 320, PKG 325
Physical and chemical properties of glass and metals and their applications to packaging.

322 Packaging with Paper and Paperboard
Fall, Spring. 4(3-2) P:M: (PKG 221 or concurrently and PKG 101) and (MTH 124 or MTH 132 or LBS 118 or MTH 152H) and (CEM 143 or CEM 251 or CEM 351) and (STT 200 or STT 201 or STT 315 or STT 351) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging. SA: PKG 325
Physical and chemical properties, manufacture, conversion, and use of wood, paper, paperboard, and related components in packaging. Design, use, and evaluation of packages.

323 Packaging with Plastics
Fall, Spring. 4(3-2) P:M: (PKG 221 or concurrently and PKG 101) and (CEM 143 or CEM 251 or CEM 351) and (STT 200 or STT 201 or STT 315 or STT 351) and (MTH 124 or MTH 132 or LBS 118 or MTH 152H) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging. SA: PKG 320
Physical and chemical properties of plastics and their relationship to selection, design, manufacture, performance, and evaluation of packages.

330 Package Printing
Fall. 3(3-0) P:M: (PKG 221) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging.
Methods of printing packages including copy preparation, design, electronic imaging, aesthetics, camera use, and effects of package materials. Production of printed packages including quality control, economics, and environmental considerations.

370 Packaging and the Environment
Spring. 3(3-0) P:M: Completion of Tier I writing requirement. RB: (CEM 141 or CEM 151 or LBS 164) R: Not open to freshmen or sophomores.
Effects of packaging on environmental quality. Solid waste. Air and water quality. Laws, economics and energy. Resource use and conservation.

410 Distribution Packaging Dynamics
Fall, Spring. 3(3-0) P:M: (PKG 322 and PKG 323) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging. SA: PKG 310
Identification and measurement of hazards in physical distribution. Methods of protection against climate, shock, vibration, and compression.

415 Packaging Decision Systems
Fall, Spring. 3(2-2) P:M: (MTH 116 or LBS 117 or MTH 114 or MTH 124 or MTH 132 or LBS 118 or MTH 152H) RB: (CSE 101 or CSE 131) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging.
Application of computers to analyze and solve problems in the management, specification, production, and testing of packaging systems.

432 Packaging Processes
Fall, Spring. 4(3-2) P:M: (PKG 322 and PKG 323) and (PHY 232 or PHY 232B or PHY 232C or LBS 272 or PHY 184 or PHY 182B or PHY 184A or PHY 184B or PHY 294H) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging.
Integrated study of packaging and production operations, quality control, and organization and control of machines. Interrelationship of products, packaging, machinery layout and efficiency, and quality issues.

440 Robotics and Automotive Packaging
Fall. 3(3-0) P:M: (MTH 124 or MTH 132 or LBS 118 or MTH 152H)
Robotic systems: configurations, components, drive mechanisms, control and feedback, safety. Line inspection, vision systems, guided vehicle and storage retrieval systems, reusable and expendable packaging, container cleaning and identification and economics.

452 Medical Packaging
Fall. 4(3-2) P:M: (PKG 322 or PKG 323)
Special requirements for packaging pharmaceuticals and medical devices. Evaluation of package systems and packaging procedures.

455 Food Packaging
Spring. 3(3-1) P:M: (PKG 322 and PKG 323) R: Open only to sophomores or juniors or seniors or graduate students in the Packaging major.
Food package systems related to specific products and processes. Product composition: problems and packaging solutions, shelf life considerations, and packaging lines.

460 Distribution Packaging and Performance Testing
Spring. 3(2-2) P:M: (PKG 410) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging.
Interrelationships between packaging and distribution systems. Transportation, material handling, warehousing. Logistics and management systems. Performance testing and industry practices. Package container design and testing.

475 Packaging Economics
Fall. 3(3-0) RB: (EC 201 or EC 202)
Economic issues in packaging as they relate to policies of the firm and of government. Relationships between economic policy and societal issues.

480 Packaging Laws and Regulations
Spring. 3(3-0) RB: (PKG 322 or PKG 323) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging.
History and development of packaging laws and regulations. Relationships among law, government regulation and commercial regulation. Effect of current laws and regulations on packaging.

485 Packaging Development (W)
Fall, Spring. 4(4-0) P:M: (PKG 410 and PKG 415 and PKG 432) and completion of Tier I writing requirement. R: Open only to seniors or graduate students in the School of Packaging.
Package development including selection, design and implementation of package systems for protection, distribution, merchandising, use and disposal.

490 Directed Studies in Packaging Problems
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. RB: (PKG 322 and PKG 323) R: Open only to sophomores or juniors or seniors or graduate students in the School of Packaging. Approval of department; application required.
Development of solutions to specific packaging problems. Supervised individual study.

491 Special Topics
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.
Selected topics of current interest.

492 Senior Seminar
Fall, Spring. 1(2-0) R: Open only to seniors in Packaging.
Seminar on current packaging issues, business organization and operations, and accepted practices in a corporate environment.

493 Professional Internship in Packaging
Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. P:M: (PKG 322 and PKG 323) R: A student may earn a maximum of 6 credits in all enrollments for any or all of these courses: ABM 493, AEE 493, ANR 493, ANS 493, CSS 493, EEP 493, FIM 493, FW 493, HRT 493, PKG 493, PLP 493, PRR 493, and RD 493. Approval of school; application required.
Supervised professional experience in the field of packaging offered through corporations and other businesses throughout the U.S.

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.

272 Recreational Boating Systems and the Boating Industry
Fall. 3(3-0)
Boats and boaters, marinas, dealerships, boating agencies and organizations, emerging issues, and management methods. 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. R: 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:M: (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.

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

351 Recreation and Natural Resources Communication (W)
Fall, Spring. 3(2-2) P:M: (PRR 213) and completion of Tier I writing requirement. R: Open only to students in the Department of Park, Recreation and Tourism Resources. Not open to freshmen.
Principles of communication for recreation and natural resource audiences. Application to various forms of interpretive media including verbal, graphic, and written. Field trips required.

370 Administration and Operation of Park and Recreation Systems
Fall. 3(3-0) P:M: (PRR 213 and PRR 215) RB: (PRR 293) R: Not open to freshmen or sophomores.
Administration, operation and policy of park, recreation and tourism organizations. Legal foundations, concepts and responsibilities, ethical decision-making and personnel management.

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

388 Physical Resource Management in Parks, Recreation and Tourism
Fall. 3(2-2) P:M: (PRR 213 and PRR 215) RB: (PRR 293) R: Open only to sophomores or juniors or seniors.
Relationships among natural resources, the environment, recreational use and site design and development. Principles to safeguard, maintain and restore recreation environments.

389 Planning and Evaluation in Parks, Recreation and Tourism
Fall. 3(3-0) P:M: (PRR 215 and PRR 213) RB: (PRR 293) R: Open only to juniors or seniors.
Planning, research and evaluation of recreation and tourism systems. Research methods, resource inventory and classification, use estimation, demand forecasting, marketing, and needs assessment. Formative, process, and summative evaluations using secondary data, surveys, observation, experiments, case studies and focus groups

393 Professional Seminar
Fall, Spring. 1(1-0) P:M: (PRR 293) R: Open only to students in the Department of Park, Recreation and Tourism 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 or 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; Biosystems Engineering. Administered by Department of Fisheries and Wildlife. RB: (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.

448 Foundations of Natural Resource Based Recreation Management
Spring. 3(3-0) P:M: (PRR 210 or PRR 302) RB: (ZOL 355) or Basic Ecology R: Open only to juniors or seniors or graduate students.
History and current status of natural resource-based recreation. Integration of natural resource management, security, interpretation, and outdoor programming. Visitor and resource management tools and models.

449 Natural Resource Based Recreation Management Applications
Spring. 3(3-0) P:M: (PRR 448) RB: (PRR 388) and Ecology background. R: Open only to juniors or seniors or graduate students.
Application of management principles to trail, camping and dispersed recreation activities and settings. Security of visitors, resources and support facilities. Case studies and integrated problem solving.

451 Park Interpretive Services and Visitor Information Systems
Spring. 3(2-2) R: Not open to freshmen or 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 Natural Resource Economics
Spring. 3(3-0) Interdepartmental with Resource Development; Environmental Economics and Policy; Biosystems Engineering. Administered by Department of Resource Development. P:M: (EC 201) and (RD 302 or EEP 255)
Economic framework for analyzing natural resource management decisions. Spatial and inter-temporal allocation of renewable and nonrenewable resources. Special emphasis on institutions, externalities, and public interests in resource management.

464 Natural Resource Economics and Social Science (W)
Fall. 3(2-2) Interdepartmental with Forestry; Fisheries and Wildlife; Resource Development. Administered by Department of Forestry. P:M: (EC 201 or EC 202) and completion of Tier I writing requirement. R: Not open to freshmen or sophomores.
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; Resource Development. Administered by Department of 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.

473 Commercial Recreation and Tourism Businesses and Organizations
Fall. 3(3-0) RB: (PRR 370) R: Open only to juniors or seniors or graduate students.
Start-up and management of commercial recreation and tourism businesses with an emphasis on small businesses. Roles and responsibilities of industry associations. Establishment and operation of tourism marketing organizations.

474 The Tourism System
Fall. 3(3-0) RB: (PRR 370 and PRR 371) R: Open only to juniors or seniors or graduate students.
Major sectors and emerging types of tourism. Industry and market trends. Tourism and community development. Evaluating and managing the impact of tourism.

485 Legal Aspects of Community-Based Recreation
Fall. 3(3-0) P:M: (PRR 213 and PRR 215) R: Open only to juniors or seniors.
Application of legal concepts to management and operation of programs, services, and facilities of private nonprofit and public entities. Legal strategies. Human rights and behaviors. Management of risk liability.

487 Community-Based Recreation Facility Management
Spring. 3(2-2) RB: (PRR 388 and PRR 485) R: Open only to seniors or graduate students.
Analysis of the operation and maintenance of facilities and equipment used in the delivery of recreation programs and services. Management of human interaction within communities. Field trips required.

488 Community-Based Recreation Programming
Spring. 3(2-2) RB: (PRR 215 and PRR 370 and PRR 371 and PRR 388 and PRR 485) R: Open only to juniors or seniors or graduate students.
Recreation programs and services in rural and urban settings. Nonprofit, public and private agencies. Delivery systems and research procedures. Effective community-based recreation in relation to human services.

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 Zoology; Fisheries and Wildlife. Administered by Department of 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. 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. 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. P:M: (PRR 393 and PRR 293) R: Open only seniors in the Department of Park, Recreation and Tourism Resources. Approval of department; application required. A student may earn a maximum of 6 credits in all enrollments for any or all of these courses:: ABM 493, AEE 493, ANR 493, ANS 493, CSS 493, EEP 493, FIM 493, FW 493, HRT 493, PKG 493, PLP 493, PRR 493, and RD 493.
Supervised professional experiences in agencies and businesses related to park, recreation and tourism resources.

PHARMACOLOGY AND TOXICOLOGY PHM

Department of Pharmacology and Toxicology
College of Veterinary Medicine

350 Introductory Human Pharmacology
Spring. 3(3-0) P:M: (PSL 250) or (PSL 431 and PSL 432) R: Not open to freshmen.
General principles of pharmacology. Central and autonomic nervous systems. Cardiovascular and renal drugs. Chemotherapy. Anti-infective drugs and endocrine agents.

450 Introduction to Chemical Toxicology
Spring. 3(3-0) P:M: (BS 110 or LBS 144) and (BS 111 or LBS 145) and (CEM 251) R: Not open to freshmen or sophomores.
Mammalian toxicology. Disposition of chemicals in the body, detoxication, elimination, and mechanisms of toxicity in major organ systems. Selected toxic agents.

480 Special Problems
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Approval of department.
Individual work on selected research problems.

PHILOSOPHY PHL

Department of Philosophy
College of Arts and Letters

130 Logic and Reasoning
Fall, Spring. 3(3-0) Not open to students with credit in PHL 330.
Deductive and inductive reasoning. Topics such as rational argumentation, fallacies, definition, meaning, truth and evidence. Techniques for critical reading and thinking.

200 Introduction to Philosophy
Fall, Spring. 3(3-0)
Theories of knowledge, values, and reality. Topics such as objectivity, relativism and cultural diversity, moral responsibility, aesthetic values, the self, existence of God, free will, minds and machines.

210 Ancient Greek Philosophy
Fall. 3(3-0)
Philosophical problems of existence, knowledge, and action as addressed in selected readings from the Presocratics, Plato, Aristotle, and Hellenistic philosophers.

211 Modern Philosophy
Spring. 3(3-0) RB: (PHL 210)
Philosophy from the Renaissance through the nineteenth century, including Descartes, Spinoza, Locke, Hume, Kant, Hegel, Kierkegaard and Nietzsche.

320 Existentialism
Fall. 3(3-0) RB: One PHL course.
Husserl, Jaspers, Kierkegaard, Marcel, Nietzsche, Sartre, and de Beauvoir. Topics such as hope, anxiety, bad faith, subjectivity, freedom, social being, phenomenological method.

330 Formal Reasoning I
Fall, Spring. 4(4-0)
Formal methods in deductive reasoning. Logic of connectives and quantifiers, including identity, functions, and descriptions.

331 Formal Reasoning II
Spring. 4(4-0) P:M: (PHL 330)
Axiomatic method. Informal axiomatizations of set theory and probability theory. Metatheory of elementary logic.

340 Ethics
Fall, Spring. 3(3-0) RB: One PHL course.
Inquiry through the writings of some important theorists, their critics and their contemporary followers. Aristotle, Hume, Kant, Mill, Sidgwick.

344 Ethical Issues in Health Care
Fall, Spring. 4(4-0) R: Not open to freshmen or sophomores.
Termination of treatment, truth-telling, informed consent, human experimentation, reproductive issues, allocation of scarce resources, justice and the health care system.

345 Business Ethics
Fall. 4(4-0) R: Not open to freshmen or sophomores.
Ethical dimensions of the relationships between a business and employees, consumers, other businesses, society, government, and the law.

347 Aesthetics
Fall. 3(3-0) RB: One course in art or literature or music or philosophy.
Theories of aesthetic value and the nature of art. Works of such aestheticians as Plato, Hume, Kant, Hegel, Tolstoy, Santayana, Wittgenstein, Isenberg, Langer, Murdoch.

350 Introduction to Social and Political Philosophy
Fall. 3(3-0) RB: One PHL course.
History of social and political philosophy; problems such as obligation, power, oppression, freedom, equality, and community.

354 Philosophy of Law
Fall, Spring. 3(3-0) RB: One PHL course or two PLS courses.
Legal concepts such as punishment, responsibility, rights and duties, and judicial decisions. Legal theories such as natural law, positivism and realism.