

463. Seminar
Fall. 2(0-4) *Must have job experience to enroll.*

Detailed report on work performed in practical experience or outside packaging projects.

801. Package Design
Fall. 4(3-3)

Advanced work in the development of the graphic and structural design of packages.

834. Special Investigations in Packaging

Fall, Winter, Spring, Summer. *Variable credit.*

899. Research

Fall, Winter, Spring, Summer. *Variable credit. Approval of school.*

Building Construction

B C

200. Dynamics of American Housing
Fall, Winter, Spring, Summer. 3(3-0)

Impact of housing on the economic and social welfare of America. Analysis of the residential building industry and its problems in providing adequate housing.

312. Structural Design

Fall. 4(4-0) 200 or approval of department.

Consideration of structural design systems as used in light construction.

412. Housing Utilities Design
Winter. 4(4-0)

Design of and planning for mechanical and electrical utilities in housing.

413. Residential Construction Systems
Spring. 4(3-2) 312 or approval of department.

Analysis of the primary construction systems employed in the residential building industry, especially the economic and social aspects in meeting the housing goals of the U. S.

415. Building Materials

Spring. 4(4-0) 312 or approval of department.

Properties of building materials pertinent to their application and performance in service.

416. Building Costs

Winter. 4(2-4) *Approval of department.*

Methods of cost estimating. Effects of codes and production practices on costs.

417. Residential Finance

Winter. 4(4-0) *Juniors.*

Analysis of financial programs for the construction, rehabilitation, remodeling and purchase of homes; especially meeting the nation's goals for low to moderate income housing.

418. Special Topics

(F P 418.) Fall, Winter, Spring, Summer. 1 to 3 credits. *Approval of department.*

Selected topics in housing.

420. Construction Management

(F P 314, B C 314.) Spring. 4(2-2) 416 or approval of department.

Systems management techniques for residential building organizations inclusive of organization development, operations, planning, scheduling and control, and administrative systems and procedures.

835. Research in Building Construction

(F P 835.) Fall, Winter, Spring, Summer. *Variable credit. Approval of department.*

899. Research

(F P 899.) Fall, Winter, Spring, Summer. *Variable credit. Approval of department.*

**PARK AND RECREATION
RESOURCES***

PRR

**College of Agriculture and
Natural Resources**

200. Resource Ecology and Man

For course description, see Interdisciplinary Courses.

300. Wilderness Survival

Fall, Spring. 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)

Beliefs and attitudes toward land by primitive man and ancient civilizations. Effects of Muir, Thoreau, and others on man/land relationships. Industrialism and environmental quality. Current environmental controversy. Field trip required.

344. Leisure and Recreation Resources

(R D 344.) Fall. 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

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).

440. Park and Recreation Administration

(R D 440.) Fall. 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

(R D 442.) 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

(R D 444.) Fall. 4(2-4) *Approval of department.*

Planning and design principles of space, scale, and circulation applied to the use of park and

*Established January 1, 1969. Formerly a part of the Department of Resource Development.

recreation areas and facilities. Field trip required.

446. Park Area Operations

(R D 446.) 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.

448. Field Studies in Park Administration

(R D 448.) Fall. 3 credits. *Approval of department.*

Investigation and analysis of outstanding park and recreation programs. Visits to areas under local, state, and federal jurisdiction. Evaluation of administrative practices, area management, and operation policies. Conducted as a traveling class with agency assistance.

449. Recreation Land Management

(R D 440., 350.) Fall, Spring. 3(2-0) *Not open to majors.*

Fundamentals of outdoor recreation resource management. Planning, development, and administration of programs and facilities. Two weekend field trips required.

450. Natural Resource Administration

Fall, Spring. 4(4-0) *Interdepartmental with Fisheries and Wildlife, Forestry, and Resource Development Departments and Natural Resources. Administered by the Forestry Department.*

Concepts and methods of administering wild-land 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. Environmental Interpretation II: Methods and Devices

Spring. 4(3-1) 351.

Methodology and equipment used in information transmission in natural, historic, and scenic areas. Site selection and development criteria for natural resource interpretation.

480. Supervised Study

Fall, Winter, Spring, Summer. 1 to 4 credits. *May re-enroll for a maximum of 10 credits. Approval of department.*

Seminars on current problems. Supervised readings. Individual undergraduate research on selected topics.

484. Senior Proseminar

Winter. 1(1-0) *Senior majors.*

Seminars on current professional problems and literature.

842. Park and Recreation Policy

Fall. 3(3-0) *Interdepartmental with the Resource Development Department.*

Recreation, leisure and work concepts. Determination of needs for recreation facilities. Factors affecting public and private allocation of resources for provision of needed facilities.

846. Urban Recreation Area and Program Analysis

Spring. 4(4-0) *Approval of department.*

Analysis of urban public, private and commercial recreation areas, facilities, and programs. Construction of a typology of urban communities. Course is conducted in selected urban communities in Michigan.

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.

880. Special Problems

Fall, Winter, Spring, Summer. 1 to 6 credits. May re-enroll for a maximum of 10 credits. Approval of department.
Seminars on current problems. Supervised readings. Independent study of selected topics.

899. Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

PATHOLOGY

PTH

College of Human Medicine
College of Osteopathic Medicine
College of Veterinary Medicine

404. General Pathology

Fall. 5(3-6) ANT 420, Junior Medical Technology majors, or approval of department.

407. Clinical Pathology

Winter. 5(3-4) 404 or approval of department.
Theory and technics in hematology, coagulation, blood banking, clinical microscopy and chemical pathology, including urinalysis, blood chemistry and continuous flow analysis.

408. Clinical Pathology

Spring. 5(3-4) 404 or approval of department.
Continuation of 407.

501. Pathology of Infancy and Childhood

Winter. 5(5-0) Year V Human Medicine Students.
An analysis of disease processes in the immature human between birth and puberty.

550. Veterinary Pathology I

Spring. 6(3-6) Admission to the professional veterinary program, or approval of department.
Principles of pathology, including causes of disease, disturbances of cell growth and metabolism, necrosis, circulatory changes, inflammation and neoplasms; introduction to clinical hematology.

560. Pathology II

Winter, Summer. 7(4-8) 550.
Continuation of 550, with coverage of the hematopoietic, cardiovascular, urinary, digestive, respiratory and reproductive systems; integration of principles of clinical pathology.

610. Veterinary Clinical Pathology

Fall, Spring. 3(2-3) 560.
Laboratory procedures in the diagnosis and prognosis of animal disease; examination of body tissues, fluids and excreta.

615. Diseases of Poultry

Winter, Summer. 4(4-0) Eighth-term Veterinary Medicine students.
Etiology, signs, lesions, differential diagnosis and control of infectious and noninfectious diseases of birds, with emphasis on domestic poultry.

620. Human Pathology I

Fall. 5(4-2) Medical school Sophomores or approval of department.
Recognition and classification of gross and microscopic structural changes in disease, analysis of functional consequences, and correlation with clinical manifestations.

621. Human Pathology II

Winter. 5(4-2) 620.
Continuation of 620.

622. Principles of Laboratory Medicine

Spring. 5(4-2) 621.
Study of diseases, the diagnosis and management of which rely on laboratory methods; hemologic, endocrine, metabolic, and infectious diseases are included.

800. Problems in Pathology

Fall, Winter, Spring, Summer. Variable credit. Approval of department.
Elective work for students in veterinary medicine interested in pathology as a speciality, or in the special pathology of diseases of a particular class or species, and for graduate minors and majors interested in pathological techniques or in non-thesis research.

801. Pathology Seminar

Fall, Winter, Spring, Summer. 1(1-0)
May re-enroll for a maximum of 3 credits for M.S. candidates and 6 credits for Ph.D. candidates. Approval of department.
Seminar required of all majors in Pathology.

802. Advanced Histopathology

Fall. 5(6-0) Approval of department.
A relatively advanced and comprehensive study in the histopathologic aspects of systemic and special pathology; independent study in the field of pathogenesis and microscopic pathology.

803. Advanced Histopathology

Winter. 5(6-0) 802 and approval of department.
Continuation of 802.

804. Histopathologic Techniques

Fall. 3(1-6) Approval of department.
Theory and practice in preparation of tissues for examination with the light microscope; special stains and histochemical procedures included.

805. Pathology Proseminar

Fall. 2(2-0) Approval of department.
Philosophy and methods of research; theses and other research reports; literature review; illustration of research data; practical assignments.

810. Post-Mortem Diagnosis

Winter, Summer. 3(0-9) May re-enroll for a maximum of 6 credits. Approval of department. Required of majors.
Instruction and practice in diagnosis of animal diseases by means of necropsy and other laboratory techniques. Emphasis will be placed upon correlation and interpretation of gross and microscopic lesions and the results of other tests.

811. Advanced Clinical Pathology

Winter. 3(1-6) Approval of department.
Application of standard and newer techniques and instrumentations in hematology, biochemistry, parasitology, etc., to the diagnosis of disease.

812. Hematology

Winter. 5(3-4) 408 or 610 or approval of department.
Pathology of diseases of blood and an analysis of diagnostic laboratory procedures.

820. Oncology

Spring. 3(6-0) Approval of department.
A study of benign and malignant neoplasms with emphasis on gross and microscopic characteristics and diagnosis.

826. Laboratory Animal Pathology

Spring. 4(3-3) Graduate status and approval of department. Interdepartmental with and administered by Laboratory Animal Resources.
Macro and microscopic studies on the diseases of laboratory animals with special emphasis on naturally-occurring diseases which might interfere with the interpretation of experimental results.

899. Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

910. Biology of Disease

Fall. 3(2-3) Approval of department. Primarily for students in the biological sciences.
Basic morphologic changes in disease with emphasis on the related physiologic pathology. Laboratory includes relevant problems in post-mortem diagnosis.

980. Histopathologic Diagnosis

Fall, Winter, Spring, Summer. 3(0-9)
May re-enroll for a maximum of 6 credits. 803, 820.
Trimming, histopathologic examination, description, diagnosis and reporting of specimens from biopsy and necropsy.

990. Advanced Correlative Pathology

Fall, Winter, Spring, Summer. 5(0-15)
May re-enroll for a maximum of 15 credits. Approval of department.
Experience in morphologic and clinical pathology and correlation of these with the clinical aspects of disease.

999. Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

PHARMACOLOGY PHM

College of Human Medicine
College of Osteopathic Medicine
College of Veterinary Medicine

350. Introductory Human Pharmacology

Spring. 3(3-0) PSL 332 or concurrently; or approval of department.
Survey of pharmacology including general principles, central nervous system drugs, autonomic nervous system drugs, cardiovascular and renal drugs, endocrine drugs, anti-infectives, poisoning therapy, and other basic related topics.

430. Drug Abuse

Fall. 3(3-0) Juniors and approval of department. Biology and chemistry recommended.
Actions, mechanism of action, toxicity and uses of drugs of abuse. Sociological and psychological aspects of drug abuse and the legal aspects of the sale and distribution of drugs are considered.