

- 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, PHY 237, PHY 238 or approval of school.

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 321 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, CEM 143, CEM 161 or approval of school.

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, CEM 143, CEM 161 or approval of school.

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(3-2) PKG 331, PKG 332, PHY 239 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 331, PKG 332, 2.50 grade-point average, approval of school.

Development of solutions to specific packaging problems.

425. Packaging Process Analysis

Fall, Winter, Spring. 4(3-2) PKG 331, PKG 332.

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 423, PKG 425, Seniors.

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

429. Packaging Economics

Winter. 3(3-0) PKG 331, PKG 332, 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. Elements of Packaging Machinery

Spring. 4(4-0) PKG 331, PKG 332 or approval of school.

Design, selection, specification and operation of components of packaging machinery. Industrial parts and processes. Basic machine mechanisms. Application of pneumatics, hydraulics and electricity. Field trip required.

433. Packaging Performance Testing

Fall, Winter. 3(2-3) PKG 423.

Performance testing of package systems for fragility, impact, vibration, compression, and material performance in accordance with industry practices. Package container design. Measurement and simulation of distribution environment for handling, shipping, and storage of package systems.

435. Distribution Packaging

Fall, Winter, Spring. 3(3-0) EC 202, PKG 331, PKG 332, 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. 4(3-2) PKG 331, PKG 332.

Special requirements for packaging pharmaceuticals and medical devices. Evaluations of package systems and packaging procedures that meet these requirements.

440. Special Topics (MTC)

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 331, PKG 332 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 331, PKG 332 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.

465. Automation in Packaging

Winter. 4(3-2) PKG 331, PKG 332.

Automated material handling systems: configurations, components, sensors, vision systems. Robotic safety. Material handling, line inspection, automated guided vehicle systems, automated storage retrieval systems. Economic justification. Field trips required.

467. Packaging Decision Systems

Fall, Winter, Spring. 3(2-2) PKG 331, PKG 332, CPS 115, EC 202.

Structure and use of decision systems for management, specification, production and testing. Use of microcomputers to support decisions.

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 331, PKG 332 or approval of school.

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 331, PKG 332, 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.

823. Advanced Packaging Dynamics

Spring. 3(2-2) PKG 423 or approval of school.

Shock simulation, random vibration, power spectral density, modeling of non-linear systems. Fourier decomposition. Modal analysis. Multiple degree of freedom systems. Damping and cushioning properties. Instrumentation in dynamic testing.

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

200. Leisure and Society

Fall, Winter, Spring. 3(3-0)

Leisure and recreation as part of daily life. Leisure as a social, psychological and economic force in American culture.