562. Clinical Nurse Specialist Practicum III
Winter. 5(2-9) N E 581, approval of college.

563. Clinical Nurse Specialist Practicum IV
Spring. 5(2-9) N E 582, approval of college.
Primary care management of clients with multiple health problems. Focus on loss theory. Longitudinal study of a family.

590. Special Problems
Fall, Winter, Spring. 1 to 8 credits.
May reenroll for a maximum of 48 credits. Approval of instructor.
Individual or group work on special problems in medicine.

620. Directed Studies
Fall, Winter, Spring. 2 to 24 credits. May reenroll for a maximum of 48 credits. Admission to a college of medicine or approval of department. Individual or group work on special problems in medicine.

651. Obstetrics—Gynecology Clerkship
Fall, Winter, Spring, Summer. 8 credits. Grade P in all courses offered in terms 1 through 8. Clinical exposure in obstetrics and gynecology. Program developed to achieve efficiency in obstetrical patient evaluation, management, motor skills, aptitudes, evaluation of postpartum patient; management of gynecologic problems.

653. Surgery Clerkship
Fall, Winter, Spring, Summer. 8 credits. Grade P in all courses offered in terms 1 through 8. Clinical exposure in area of surgical diagnosis, management, treatment. Program structure developed to achieve proficiency in motor skills, aptitudes; comprehension of concepts and principles; patient evaluation, diagnosis, management, and therapy.

656. Orthopedics Clerkship
Fall, Winter, Spring, Summer. 6 to 8 credits. May reenroll for a maximum of 12 credits. Grade P in all courses offered in terms 1 through 8. Clinical exposure in area of orthopedics. Program structure developed to achieve proficiency in motor skills, aptitudes; comprehension of concepts and principles; patient evaluation, diagnosis, management, and therapy.

565. Medical Ethics
Winter. 3(2-0) Interdepartmental with and administered by the College of Human Medicine. Analysis and evaluation of the ethical elements of medical decision making. Topics include: patient rights, physician responsibilities, euthanasia, informed consent, paternality, confidentiality, biomedical research, and allocation of scarce resources.

520. Normal Endocrine Structure and Function
Spring. 3 credits. BCH 502.
An integrated basic science course presenting a series of lectures and laboratories related to the normal structure and function of the endocrine organs. Prerequisite for studying endocrine diseases in systems biology.

530. Comprehensive Patient Evaluation I
Fall. 2 to 6 credits. Admission to a college of medicine. ANT 565 or concurrently. Interdepartmental course in physical examination skills. Stresses comprehensive, osteopathic evaluation of the patient.

531. Comprehensive Patient Evaluation II
Winter. 2 to 6 credits. OST 530, ANT 565.
Continuation of OST 530.

532. Comprehensive Patient Evaluation III
Spring. 4 credits. OST 531.
Interdepartmental course in physical examination skills. Stresses application of comprehensive, osteopathic evaluation of the patient. Introduction to office procedures and physical diagnosis.

552. Systems Biology—Integumentary
A multidisciplinary approach to the integumentary system providing a functional integration of basic science and clinical information.

553. Systems Biology—Nervous System
Fall. 10 credits. ANT 563, PSL 500A, PTH 502, BCH 503, PFM 521, PFM 524.
A multidisciplinary approach to the nervous system providing a functional integration of basic science and clinical information.

554. Systems Biology—Cardiovascular
A multidisciplinary approach to the cardiovascular system providing a functional integration of basic science and clinical information.
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555. Systems Biology - Respiratory
   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, PAM 520, PTH 502.
   A multidisciplinary approach to the urinary system providing functional integration of basic science and clinical information.

557. Systems Biology - Gastrointestinal
   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
   A multidisciplinary approach to the musculoskeletal system providing functional integration of basic science and clinical information.

561. 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 508, Interdepartmental with and administered by the Department of Psychiatry.
   Subspecialties exist in psychiatry in clinical settings with child patients and their families.

614. The Osteopathic Examination I
   Winter, Spring. 1(4-4) OST 533 or approval of instructor.

615. The Osteopathic Examination I
   Spring. 1(4-4) OST 614 or approval of instructor.
   Introductory clinical course in the application of neuro- and musculoskeletal assessment, palpatory diagnosis and osteopathic manipulative treatment in ambulatory clinics.

616. The Osteopathic Examination III
   Fall, Summer, 1(4-4) OST 615 or approval of instructor.
   Introductory clinical course in the application of neuro- and musculoskeletal assessment, palpatory diagnosis and osteopathic manipulative treatment in the hospital setting.

PACKAGING

College of Agriculture and Natural Resources

210. Principles of Packaging
   Fall, Winter, Spring. Summer. 3(0-0)
   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 231 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(0-0) 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 of materials, manufacture, conversion 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 resources, and environmental ethics.

423. Dynamics of Packaging
   Fall, Winter, Spring. 4(3-2) PKG 423 or approval of department.
   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.
   Development of solutions to specific packaging problems.

425. Packaging Process Analysis
   Fall, Winter, Spring. 4(3-2) PPK 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) PPK 427, CPS 115, Seniors.
   Development of packages to meet present-day requirements of protection and merchandising.

429. Packaging Economics
   Winter. 3(3-0) PPK 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) PPK 422 or approval of school.
   Examination of automated packaging lines and auxiliary materials handling equipment, including consideration of design, specification and operation of machinery for the package-making and package-filling operations.

435. Distribution Packaging
   Fall, Winter, Spring. 3(3-0) EC 202, PPK 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.

436. Pharmaceutical Packaging
   Winter. 3(3-0) PPK 427.
   Special requirements for packaging pharmaceuticals and medical devices. Package forms 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.

445. Design of Shipping Containers
   Spring. 2(1-2) PPK 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) PPK 422 or approval of school.

455. Food Packaging
   Fall. 4(3-2) PPK 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.