524 Systems Biology: Cardiovascular
Spring. 7(6-2) P:NM: (ANT 551 and ANT 553 and BMB 551 and MIC 522 and PHM 563 and PSL 551 and PTH 542) R: Open only to graduate-professional students in College of Osteopathic Medicine. Approval of college.
A multidisciplinary approach to the cardiovascular system emphasizing normal structure and function, and pathologies. Integration of basic science and clinical information.

525 Systems Biology: Respiratory
Spring. 5(4-2) P:NM: (ANT 551 and BMB 521 and MIC 522 and PHM 563 and PSL 501) R: Open only to graduate-professional students in College of Osteopathic Medicine. Approval of college.
A multidisciplinary approach to the respiratory system emphasizing normal structure and function, and pathologies. Integration of basic science and clinical information.

526 Systems Biology: Integumentary
Summer. 2(2-0) P:NM: (ANT 551 and ANT 562 and MIC 522 and PHM 563 and PTH 542) R: Open only to graduate-professional students in College of Osteopathic Medicine. Approval of college.
A multidisciplinary approach to the integumentary system. Emphasis on diagnosis and treatment of integumentary pathologies. Integration of basic science and clinical information.

527 Systems Biology: Female Reproductive
Summer. 5(5-0) P:NM: (ANT 551 and ANT 562 and BMB 521 and MIC 522 and PHM 563 and PSL 501) R: Open only to graduate-professional students in College of Osteopathic Medicine. Approval of college.
A multidisciplinary approach to the female reproductive system emphasizing normal structure and function, and pathologies. Integration of basic science and clinical information in obstetrics and gynecology.

528 Systems Biology: Growth and Development
Summer. 3(3-0) P:NM: (ANT 551 and ANT 562 and BMB 521 and MIC 522 and PHM 563 and PSL 501) R: Open only to graduate-professional students in College of Osteopathic Medicine.
A multidisciplinary approach to growth and development. Emphasis on normal structure and function, and pathologies. Integration of basic science and clinical information.

529 Systems Biology: Endocrinology
Fall. 2(2-0) P:NM: (PSL 501 and ANT 553 and BMB 551) R: Open only to graduate professional students in College of Osteopathic Medicine. Approval of college.
A multidisciplinary approach to endocrinology. Emphasis on normal endocrine function and the principles of diagnosis and treatment of endocrine disorders. Integration of basic science and clinical information.

530 Psychopathology
Fall. 1(1-0) R: Open only to graduate-professional students in Osteopathic Medicine SA: OST 516
Overview of psychopathology, DSM-IV

535 Principles of Gerontology for Medical Practice
Spring. 3(3-0) R: Open only to graduate-professional students in the Colleges of Osteopathic and Human Medicine or approval of department. SA: CMS 522
Lectures, readings, tapes, small group seminars, and home visits related to normal aging epidemiology. Major chronic diseases and other issues of geriatric care.

551 Issues in Minority Health
Fall, Spring, Summer. 3(3-0) R: Open only to graduate and graduate-professional students in the Colleges of Osteopathic Medicine, Human Medicine, and Nursing or approval of college. SA: CMS 515
Patterns of health and illness in minority populations.

590 Special Problems
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 60 credits in all enrollments for this course. R: Open only to graduate-professional students in College of Osteopathic Medicine. Approval of college.
Individual study directed by a faculty member on an experimental, theoretical, or applied problem.

602 Primary Care Ambulatory Clerkship
Fall, Spring, Summer. 1 to 36 credits. A student may earn a maximum of 36 credits in all enrollments for this course. Interdepartmental with Internal Medicine; Osteopathic Surgical Specialties; Pediatrics; Psychiatry; Family and Community Medicine. P:NM: Successful completion of the preclerkship requirements in College of Osteopathic Medicine Units I and II.
A 24-week ambulatory care continuity experience involving 12 weeks in a multidisciplinary environment (family medicine, pediatrics, and internal medicine), 4 weeks in family medicine and 8 weeks in specialty areas (internal medicine, surgery, pediatrics, and obstetrics and gynecology). Didactic sessions are scheduled concurrently.

OSTEOPATHIC SURGICAL SPECIALTIES OSS

Department of Osteopathic Surgical Specialities
College of Osteopathic Medicine

512 Biostatistics and Epidemiology
Summer. 2(2-0) R: Open only to graduate and graduate-professional students in the Colleges of Osteopathic Medicine, Human Medicine, and Nursing or approval of department. SA: CMS 512, OM 512
Medical literature to illustrate statistical reasoning and research design. Emphasis on analysis rather than computation. Prospective or retrospective studies. Sensitivity, specificity, and predictive values. Epidemiologic terminology.

590 Special Problems
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 48 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine. Approval of department. SA: OM 590
Each student works under faculty direction on an experimental, theoretical, or applied problem.

602 Primary Care Ambulatory Clerkship
Fall, Spring, Summer. 1 to 36 credits. A student may earn a maximum of 36 credits in all enrollments for this course. Interdepartmental with Osteopathic Medicine; Internal Medicine; Pediatrics; Psychiatry; Family and Community Medicine. Administered by Department of Osteopathic Medicine. P:NM: Successful completion of the preclerkship requirements in College of Osteopathic Medicine Units I and II.
A 24-week ambulatory care continuity experience involving 12 weeks in a multidisciplinary environment (family medicine, pediatrics, and internal medicine), 4 weeks in family medicine and 8 weeks in specialty areas (internal medicine, surgery, pediatrics, and obstetrics and gynecology). Didactic sessions are scheduled concurrently.

620 Directed Studies
Fall, Spring, Summer. 1 to 30 credits. A student may earn a maximum of 48 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II. SA: OM 620, OM 620
Individual or group work on special problems in medicine.

651 Obstetrics and Gynecology Clerkship
Fall, Spring, Summer. 1 to 9 credits. A student may earn a maximum of 9 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II. SA: OM 651, OM 651
Obstetric patient evaluation and management: motor skills, aptitudes, evaluation of postpartum patient and management of gynecologic problems.

653 Surgery Clerkship
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 12 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II. SA: OM 653, OM 653
Surgical diagnosis, management, and treatment. Structure developed to achieve proficiency in motor skills, aptitudes, comprehension of concepts and principles, patient evaluation, diagnosis, management, therapy.

654 Anesthesiology Clerkship
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II. SA: OM 654, OM 654
Motor skills, concepts and principles, patient evaluation, management and therapy.

656 Orthopedic Clerkship
Fall, Spring, Summer. 1 to 20 credits. A student may earn a maximum of 30 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II. SA: OM 656, OM 656
Program developed to achieve proficiency in motor skills, aptitudes, comprehension of concepts and principles, patient evaluation, diagnosis, management, and therapy.

658 Otorhinolaryngology Clerkship
Fall, Spring, Summer. 1 to 20 credits. A student may earn a maximum of 30 credits in all enrollments for this course. R: Open only to graduate-professional students in the College of Osteopathic Medicine upon completion of Units I and II. SA: OM 658, OM 658
Develop proficiency in motor skills, aptitudes, comprehension of concepts and principles, patient evaluation, diagnosis, management, and therapy.

OFFICE OF THE PROVOST PRO

Office of the Provost

101 Freshman Seminar
Fall, Spring. 0 to 1 credits. A student may earn a maximum of 2 credits in all enrollments for this course. R: Open only to freshmen. Approval of department.
Introduction to the academic life of the University. Special topics proposed by faculty to engage the interests of new students.

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 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. P:NM: (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) P:NM: (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 267 or PHY 184) 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) P:NM: (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) P:NM: (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. P:NM: (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.