

School of Pharmacy

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KU is a member of the American Association of Colleges of Pharmacy and is accredited by the Accreditation Council for Pharmacy Education, 20 N. Clark St., Suite 2500, Chicago, IL 60602-5109, (312) 664-3575.

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Degrees offered: Pharm.D., M.S., Ph.D.

Since its founding in 1885, the University of Kansas School of Pharmacy has been a leader in pharmacy education. Since 1996, the school has offered only the Doctor of Pharmacy degree as the entry-level practice degree. The curriculum gives the student the knowledge, skills, and ability required of the pharmacy practitioner; it is comprehensive and produces a highly competent general practitioner.

About 60 full-time faculty members teach in the undergraduate professional Doctor of Pharmacy program and in the graduate programs. Three departments (Pharmacology and Toxicology, Medicinal Chemistry, and Pharmaceutical Chemistry) offer Master of Science and Doctor of Philosophy degrees. Pharmacy Practice offers the master's degree. Both the undergraduate and graduate divisions have outstanding national and international reputations based on the excellence and productivity of the faculty. The School of Pharmacy is fully accredited by the Accreditation Council for Pharmacy Education, 20 N. Clark St., Suite 2500, Chicago, IL 60602-5109, (312) 664-3575, the official accrediting body for American pharmacy.

Admission

Admission to the University of Kansas

To qualify for admission to KU, **Kansas resident first-year applicants** must meet one of the following requirements:

- Complete the Kansas Board of Regents' Qualified Admission curriculum with at least a 2.0 grade-point average on a 4.0 scale **or**
- Achieve an ACT score of 21 or above or an SAT score of 980 or above **or**
- Rank in the top one-third of your high school graduating class.

To qualify for admission to KU, **out-of-state first-year applicants** must meet one of the following requirements:

- Complete the Kansas Board of Regents' Qualified Admission curriculum with at least a 2.5 grade-point average on a 4.0 scale **or**
- Achieve an ACT score of 24 or above or an SAT score of 1090 or above with a cumulative 2.0 or higher grade-point average on a 4.0 scale **or**
- Rank in the top one-third of your high school graduating class.

See Undergraduate Admission and Scholarships in the General Information chapter of this catalog.

Prospective students should request applications from the University of Kansas Office of Admissions and Scholarships, KU Visitor Center, 1502 Iowa St., Lawrence, KS 66044-7576, (785) 864-3911, adm@ku.edu. Return completed applications to

that office with necessary transcripts and records. Prospective pharmacy students should declare prepharmacy as the major field of study.

Prepharmacy students are advised by faculty members from the College of Liberal Arts and Sciences while they complete their prepharmacy course work. All prepharmacy students are strongly encouraged to make appointments in the office of the dean of the School of Pharmacy, 2056 Malott Hall, for co-advising services and when they have questions concerning specific course requirements or appropriate electives or any other concerns about their preparation for pharmacy admission.

Admission to the School of Pharmacy

Students should apply to the School of Pharmacy in November for admission the following fall semester. When they apply, they should have completed, or be about to complete, the 68 credit hours of required prepharmacy courses. The required prepharmacy curriculum may be completed at accredited schools other than KU. KU students should submit a Change of School form. Students transferring from other schools should submit an application for undergraduate admission.

Requirements. Applying students should meet the following requirements:

- Complete the required prepharmacy courses and provide the required transcripts as documentation of the course work. One official copy of your transcript should be sent to the Office of Admissions and Scholarships, and one official copy should be sent to the School of Pharmacy.
- Take the Pharmacy College Admissions Test, preferably in October. January test results also are accepted and considered. Have the results of the PCAT sent to KU.
- Complete and return the Applicant Profile Form, available online at www.pharm.ku.edu, to the School of Pharmacy with a \$50 nonrefundable application fee.
- Maintain a grade-point average of 2.5 or higher overall and in the sciences. This is the minimum grade-point average acceptable for admission; the average is generally much higher.
- Arrange for three letters of recommendation, including the school's standard reference forms available at www.pharm.ku.edu, to be sent to the School of Pharmacy by the persons serving as your references.
- An interview is held with selected applicants.

Procedures. The School of Pharmacy admissions committee, consisting of at least two faculty members from each department and representation from the office of the dean, determines admissions. A file consisting of the required documentation is created for each applicant when the application is received. Consideration is given to a student's grade-point average overall and in all science courses in the prepharmacy curriculum. The average grade point of previous entering classes has been 3.0 or higher. Good scholarship is considered a predictor of success in the pharmacy curriculum. However, good communication skills, emotional maturity, leadership ability, professional attitude, and interest in service

Students may be admitted to the School of Pharmacy as juniors. Admission is competitive.

to the community are also important. These additional skills may outweigh very high grades or choice of prepharmacy courses. Applicant PCAT scores also are considered in the admission process. Admission is highly competitive and depends on the number of applications received and the qualifications of the applicants.

The admissions committee begins to consider applications in January each year. The application deadline is February 1, and most decisions are made by May 15. As a condition of matriculation into the KU School of Pharmacy, all admitted students must successfully clear an investigative criminal background check. Successful clearance of the background check is required to enroll in the School of Pharmacy and to participate in patient interactive activities, curricular and extracurricular. Instructions for completing the background check are provided with the letter of acceptance.

Visit Our Web Site

The School of Pharmacy Web site, www.pharm.ku.edu, has current information about the school. Visit the Web site for information about pharmacy programs, resources, student and professional organizations, policies, and procedures, including detailed applicant eligibility, application, and admission information.

Advising

On admission to the school, students are assigned faculty members as their advisers. The adviser serves continuously during the student's tenure in the school. Students are expected to meet with their advisers at least once each semester and are encouraged to meet more often to discuss academic issues and career and professional development.

University Honors Program

The School of Pharmacy encourages all qualified students to participate in the University Honors Program. For further information, see University Honors Program in the College of Liberal Arts and Sciences: General Requirements chapter of this catalog.

Financial Aid

General University

KU's Office of Student Financial Aid, Strong Hall, 1450 Jayhawk Blvd., Room 50, Lawrence, KS 66045-7535, (785) 864-4700, www.financialaid.ku.edu, administers grants, loans, and other need-based financial aid. In recent years, about \$29 million has been processed annually through the office, including about \$2 million annually in short-term loans. Prospective students should contact the Office of Student Financial Aid. Some financial aid programs have application deadlines as early as January 15. The earlier an application is received and the student's file is completed, the better the chance of obtaining financial aid.

For information about scholarships from KU and various outside agencies based on academic merit, diversity, major, and residence, visit the Scholarship Information for KU Students Web site at www.scholarships.ku.edu.

School of Pharmacy

The School of Pharmacy, in cooperation with the Office of Student Financial Aid and the Office of Admissions and Scholarships, offers financial assistance to pharmacy students. Applications are received in the dean's office according to an

announced schedule each year. Awards are based on merit and need. Assistance is available for both entering and continuing students.

Requirements to Practice Pharmacy in Kansas

A license is required to practice pharmacy. State boards of pharmacy grant licenses to students who successfully pass board examinations. In all states, eligibility to take board examinations requires graduation from an accredited school of pharmacy and completion of required experiential training. The Kansas State Board of Pharmacy requires graduates of schools of pharmacy to indicate any current, pending, or previous convictions, fines, violations, or disciplinary action that may affect their eligibility to take the licensing examination. Pharmacists generally may transfer their licenses from a state in which they completed the entire examination to another state, provided the two states had similar practical experience requirements at the time the pharmacist was licensed by examination. Most pharmacists find it useful to maintain a license in the state where they were licensed by examination. By doing so, they can preserve their eligibility to transfer to another state.

Pharmacists in Kansas must renew their licenses biennially by paying the required fee and providing proof that they have completed the required 30 clock hours of continuing education.

The Kansas Board of Pharmacy requires completion of an appropriate degree from an accredited school of pharmacy plus 1,500 hours of practical experience in pharmacy. At the conclusion of the program, students are certified to the Kansas State Board of Pharmacy as having completed the entire externship requirement (1,500 hours) and are therefore eligible to take the Kansas licensure examination. Students must register as interns with the board as soon as they are accepted by the School of Pharmacy. Students desiring to compile an official record of pharmacy experience obtained on their own initiative may do so by submitting this information to the Kansas State Board of Pharmacy. Practical experience above and beyond the 1,500 required hours may be gained by working as a licensed pharmacy student intern in Kansas, then transferring the hours to another state.

Regulations

Academic Misconduct

Students experiencing difficulties or problems with a particular course or having complaints or grievances about a particular instructor are urged to discuss the problem in a timely fashion with the instructor. If the student feels awkward or uncomfortable doing this, he or she should see the chair of the instructor's department, or if necessary, the dean. The chair or dean brings the matter to the instructor's attention, preserving the student's anonymity, if so requested.

Instructors detecting academic misconduct must act in accordance with the School of Pharmacy and Faculty Senate Rules and Regulations.

Exemptions and Petitions

A student may gain an exemption from introductory prepharmacy courses by successfully completing the Advanced Placement or College Level Examination Program examinations or by other recognized means. Only the exemption is allowed. A total of 208 credit hours of college-level course work is still required for the Pharm.D. degree. Students who have completed high school physics with a grade of B or higher need not take college-level physics. In meritorious cases, the department of-

fering a specific course may waive course prerequisites. Students whose educational goals would be better served by courses other than those prescribed in the normal curriculum may petition the academic standing committee for permission to make appropriate course substitutions.

Terminal-year Courses

A student cannot enroll in the principal terminal-year pharmacy practice experiential rotations unless he or she has a grade-point average in professional courses of at least 2.25 and has completed all didactic course work required for the degree.

Health Insurance and Immunizations

The School of Pharmacy requires students to provide proof of health insurance and professional insurance coverage and immunizations for MMR, hepatitis B, varicella, and tetanus, and a current TB skin test.

Other Regulations

For other regulations of the School of Pharmacy and of the university, see the General Regulations chapter of this catalog.

Doctor of Pharmacy Degree Requirements

Prepharmacy Requirements

The Doctor of Pharmacy degree requires completion of all of the required prepharmacy and professional courses and a total of 208 credit hours with an overall and professional grade-point average of at least 2.25.

The prepharmacy requirements of 68 credit hours include a year each of English, general chemistry, and organic chemistry; calculus, interpersonal communication, biology, microbiology, human anatomy, physiology; and at least 18 hours of general studies in the humanities and social sciences. A course in college physics is required if the student did not complete physics in high school with a grade of B or higher. The college physics credit hours, if required, do not count toward the 208 credit hours required for the degree.

Students are expected to have or to develop basic competence with personal computers, including word processing and database software. These skills are necessary for some class assignments as well as for future work assignments.

The following courses may not be counted:

- Activity courses in physical education or the arts (music, theatre, etc.) do not count toward the degree.
- More than 6 credit hours of foreign language courses may not be counted as part of the humanities and social sciences requirements.
- A maximum of 6 hours in military science may be counted toward degree requirements.
- Courses in other professional schools (e.g., engineering, education) may not be counted toward the degree unless the student can show that such courses are directly relevant to pharmacy. For example, a course in business law taken in the business school would count.

Prepharmacy Curriculum

First Year, Fall Semester (18 hours)	
ENGL 101 Composition	3
CHEM 184 Foundations of Chemistry I	5
BIOL 150 Principles of Molecular and Cellular Biology	4
MATH 115 Calculus I	3
General studies	3
First Year, Spring Semester (17 hours)	
ENGL 102 Critical Reading and Writing	3
CHEM 188 Foundations of Chemistry II	5
BIOL 240 Fundamentals of Human Anatomy	3
General studies	6
Second Year, Fall Semester (16 hours)	
CHEM 624 Organic Chemistry I	3
CHEM 625 Organic Chemistry I Laboratory	2
BIOL 400 Fundamentals of Microbiology	3
BIOL 402 Fundamentals of Microbiology, Laboratory	2
COMS 150 Personal Communication	3
General studies	3
Second Year, Spring Semester (17 hours)	
CHEM 626 Organic Chemistry II	3
CHEM 627 Organic Chemistry II Laboratory	2
BIOL 646 Mammalian Physiology	4
BIOL 647 Mammalian Physiology Laboratory	2
General studies	6

Professional Requirements

The Doctor of Pharmacy degree requires completion of all the required prepharmacy and professional courses and a total of 208 credit hours with an overall grade-point average of 2.25 and a 2.25 grade-point average in professional courses.

The curriculum includes instruction in the three basic sciences: medicinal chemistry, pharmaceutical chemistry, and pharmacology and toxicology. It also includes courses in the various aspects of pharmacy practice, including the health care system, law, and emerging roles for pharmacy practitioners. The curriculum integrates course material among departments. Assignments within the curriculum foster development of independent learning, communication skills, problem solving, and professional motivation. The professional curriculum includes a requirement that each student must complete a minimum of 4 elective credit hours with at least 1 credit hour from each department in the program.

Students enroll in introductory pharmacy practice experiences during the summer following the first and second years. These experiences are located throughout the state of Kansas and vary in the type of professional setting.

Some courses (specifically second-semester third-year) may require travel to the KU Medical Center campus in Kansas City. Students are responsible for their own transportation to Kansas City.

The final year of the curriculum consists of nine four-week experiential practice rotations with faculty preceptors at pharmacy practice sites throughout Kansas. Students must have their own transportation to reach their assigned sites. Housing at these sites is also the student's responsibility.

Professional Program

First Year, Fall Semester (14 hours)	
P&TX 630 Pharmacology I	4
MDCM 601 Medicinal Biochemistry I	4
MDCM 602 Medicinal Biochemistry Laboratory	1
PHAR 500 Early Pharmacy Practice Experience	1
PHCH 517 Pharmacy Calculations	2
PHPR 620 Ethics and Introduction to Law	1
PHAR 507 Dean's Orientation and Introduction to Pharmacy	1

In 2007, KU's School of Pharmacy ranked first in the nation in the percentage of pharmacy faculty who receive research funding from the prestigious National Institutes of Health. KU secured more than \$11 million in NIH funding in 2007, ranking it fourth in total NIH funding.

First Year, Spring Semester (15 hours)

MDCM 603 Medicinal Biochemistry II	3
PHCH 518 Physical-chemical Principles of Solution Dosage Forms	3
P&TX 631 Pharmacology II	4
PHAR 502 Pharmacy Practice II: Health-system Pharmacy Practice Fundamentals	3
PHAR 510 Pharmacy Skills Laboratory I	1
PHAR 515 Immunization Theory and Practice	1
Early elective option	

First Summer (4 hours)

PHAR 550 Introductory Pharmacy Practice Experience—Community	4
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Second Year, Fall Semester (15 hours)

MDCM 625 Medicinal Chemistry I: Neuroeffector Agents	3
P&TX 632 Pharmacology III	4
PHCH 625 Pharmacokinetics	3
PHPR 503 Pharmacy Practice III: Pharmaceutical Care Fundamentals	4
PHAR 515 Pharmacy Skills Laboratory II	1
Early elective option	

Second Year, Spring Semester (17 hours)

MDCM 626 Medicinal Chemistry II: Homeostatic Agents	3
P&TX 640 Toxicology	2
PHPR 646 Pharmacotherapy I	4
PHCH 626 Biopharmaceutics and Drug Delivery	3
PHPR 619 Health Care Systems	3
PHAR 520 Pharmacy Skills Laboratory III	2
Early elective option	

Second Summer (4 hours)

PHAR 560 Introductory Pharmacy Practice Experience—Institutional	4
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Third Year, Fall Semester (18 hours)

MDCM 627 Medicinal Chemistry III: Chemotherapeutic Agents	3
PHPR 647 Pharmacotherapy II	4
PHPR 614 Pharmacy Management	4
P&TX 633 Pharmacology IV	3
PHAR 693 Clinical Pharmacokinetics	2
PHAR 525 Pharmacy Skills Laboratory IV	1
Departmental electives	1

Third Year, Spring Semester (15 hours)

PHPR 648 Pharmacotherapy III	4
PHCH 667 Introduction to Clinical Chemistry	2
PHPR 621 Pharmacy Law	2
PHPR 630 Drug Information/Biostatistics and Medical Literature Evaluation	4
PHPR 670 Physical Assessment	1
PHAR 530 Pharmacy Skills Laboratory V	1
Departmental electives	3

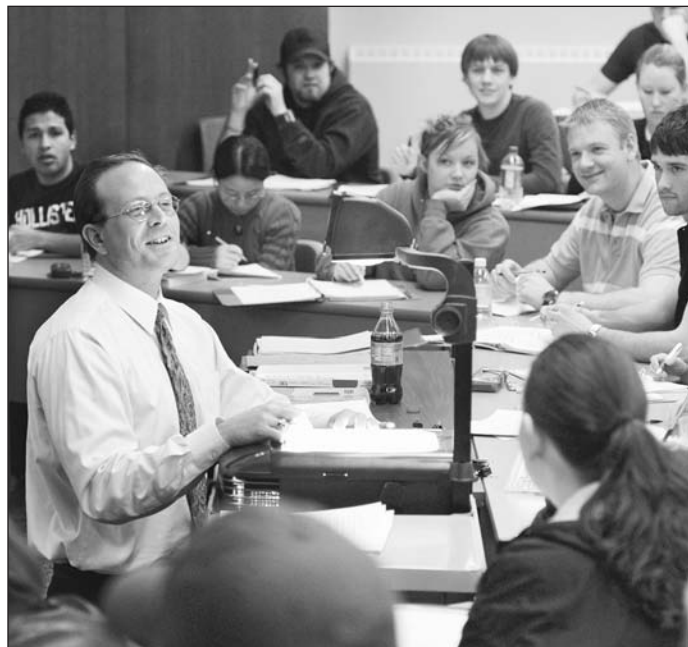
Fourth Year. The fourth year is composed of 36 credit hours of experiential pharmacy practice rotations (nine 4-week assignments). The required experiential rotations include drug information, ambulatory care, hospital externship, rounding hospital externship, and community externship. The remaining four clerkships/externships are assigned from pharmacy practice clerkship courses. Assignments are made on the basis of the student's preference, and site availability. The five 4-week rotations of the fall semester begin in July and conclude at the end of November. The four 4-week spring semester rotations begin in January and conclude in April. See the Pharmacy Practice (PHPR) courses with Clerkship titles for a complete listing.

Pharmacy Courses

■ Medicinal Chemistry Courses

MDCM 601 Medicinal Biochemistry I (4). A study of the biochemical principles of macromolecular structure and function, molecular communication, and the metabolism of nutrients and xenobiotics as applied to problems of medicinal and pharmacological significance. Prerequisite: Concurrent enrollment in MDCM 602 Lab. LEC

MDCM 602 Medicinal Biochemistry Laboratory (1). Laboratory exercises illustrating the application of chemical principles to biochemical processes of medicinal,



pharmacological, and clinical significance. Prerequisite: Concurrent enrollment in MDCM 601. LAB

MDCM 603 Medicinal Biochemistry II (3). A study of the biochemical principles of macromolecular structure and function, biosynthesis, molecular communication, and the metabolism of nutrients and xenobiotics as applied to problems of medicinal and pharmacological significance. Prerequisite: CHEM 626 and MDCM 601. LEC

MDCM 605 Phytomedicinal Agents (1). Information will be provided on botanical sources; herbs in clinical practice (physiology, pharmacology, chemistry, types of preparations, contraindications, side effects and findings of clinical research); medical conditions; foods as medicine; safety and toxicity; herb-drug interactions; herb quality; legal and professional issues relevant to the use of botanical products. Course graded on a satisfactory/fail basis. LEC

MDCM 606 Phytomedicinal Agents II (1). This course will cover indigenous wisdom, ethnobotany, natural products chemistry and biotechnology to detail discoveries that are producing safe and effective medicines. The student will get familiarized with pharmacologically active compounds that were discovered from animals (frogs, leeches, insects, snakes); plants (terrestrial and marine); microorganisms (fungi and bacteria) as well as marine organisms. Course graded on a satisfactory/fail basis. Prerequisite: MDCM 626 or instructor permission. LEC

MDCM 625 Medicinal Chemistry I: Neuroeffector Agents (3). A study, from the molecular viewpoint, of the organic substances used as medicinal agents, including consideration of their origins, chemical properties, structure-activity relationships, metabolism and mechanisms of action; this course emphasizes drugs affecting the central nervous system. Prerequisite: CHEM 626 and MDCM 621. LEC

MDCM 626 Medicinal Chemistry II: Homeostatic Agents (3). A continuation of MDCM 625 with emphasis on autonomic and cardiovascular agents and peripherally-acting hormones. Prerequisite: MDCM 625. LEC

MDCM 627 Medicinal Chemistry III: Chemotherapeutic Agents (3). A continuation of MDCM 625 and MDCM 626 with special emphasis on vitamins and anticancer, antiviral, antibacterial, and antifungal agents. Prerequisite: MDCM 625. LEC

MDCM 675 Introduction to Drug Design and Development (2-3). A discussion of the principles of contemporary drug design with specific examples chosen from the original literature. Prodrugs: bioisosteres; modulation of drug absorption, distribution, metabolism, and excretion; molecular dissection; rigid analogs; pharmacophores; etc., will be treated. Prerequisite: MDCM 627. LEC

MDCM 690 Undergraduate Research (1-5). Research in medicinal chemistry. Students will be assigned to a laboratory research problem. Prerequisite: Consent of instructor. IND

The KU School of Pharmacy, established in 1885, was the third state university school of pharmacy in the U.S. and is the only pharmacy school in Kansas.

Pharmacy Courses (MDCM, PHCH, P&TX)

MDCM 691 Research Techniques in Medicinal Chemistry (1). A lecture course designed to acquaint beginning research students with basic laboratory techniques, principles of laboratory safety, use of instrumental methods for structure elucidation, and the writing of scientific reports. Prerequisite: Consent of instructor. LEC

MDCM 692 Problems in Medicinal Chemistry (1-5). This course encompasses original work on a laboratory problem of limited scope, honors reading assignments from medicinal chemistry literature, or in-depth discussions of assigned topics. Prerequisite: Consent of instructor. IND

■ Pharmaceutical Chemistry Courses

PHCH 510 Emerging Trends in Pharmaceutical Chemistry I (1). This elective class will explore emerging areas of research currently impacting the pharmaceutical industry. Potential topics include; biologicals as therapeutics, drug targeting, prodrugs, nanotechnology, biological barriers, gene therapy, transporters, vaccines, intracellular drug trafficking, controlled release drug delivery, cancer therapy, analytical biotechnology and many others. The class will be team taught by PHCH faculty and guest speakers. Graded on a satisfactory/unsatisfactory basis. Prerequisite: Must be accepted to the Pharmacy Program. LEC

PHCH 511 Emerging Trends in Pharmaceutical Chemistry II (1). This elective class will explore emerging areas of research currently impacting the pharmaceutical industry. Potential topics include; biologicals as therapeutics, drug targeting, prodrugs, nanotechnology, biological barriers, gene therapy, transporters, vaccines, intracellular drug trafficking, controlled release drug delivery, cancer therapy, analytical biotechnology and many others. The class will be team taught by PHCH faculty and guest speakers. Prerequisite: Must be accepted to the Pharmacy Program. LEC

PHCH 512 Roadmap to Drug Development (1). This class will explore both the costs and time lines required for the approval of both new as well as generic drug products from identification of drug targets to FDA approval, and Phase 4 studies. Included will be a short history of the establishment of the FDA and its evolving role. The contributions of Frances Kelsey, the FDA scientist who fought the approval of thalidomide in the U.S.A. and thus saved many from the trauma of birth defects caused by the drug will be discussed. The class will be team taught by pharmaceutical chemistry faculty and guest speakers. Graded on a satisfactory/fail basis. Prerequisite: Completion of PHCH 626 or instructor permission. LEC

PHCH 517 Pharmacy Calculations (2). An introduction to the mathematics involved in filling prescriptions and in manufacturing pharmaceuticals. Includes an introduction to standard prescription notation and familiarization with pharmaceutical weights and measures. LEC

PHCH 518 Physical-chemical Principles of Solution Dosage Forms (3). Physical properties of pharmaceutical solutions and their physiological compatibility will be discussed (intermolecular interactions, energetics, colligative properties, isotonicity, pH, buffers and drug solubility). Kinetics and mechanisms of drug degradation in solution will also be introduced. Prerequisite: PHCH 517. LEC

PHCH 605 Vaccines (1). Vaccines are currently the most powerful therapeutic approach available for infectious disease and promise to become of increasing importance for a wide variety of other pathologies including cancer. This course discusses the immunological basis of vaccinology, types of vaccines currently available and in development and the process by which vaccines are made from the basic research stage through their pharmaceutical development and marketing. Ethical aspects of vaccine use will also be considered. Course graded on a satisfactory/fail basis. LEC

PHCH 625 Pharmacokinetics (3). A discussion of the basic concepts, and some clinical applications, of pharmacokinetics, clearance concepts, extravascular dosing, and the use of pharmacokinetics in dosage regimen design and adjustment. Prerequisite: PHCH 517 and PHCH 518. LEC

PHCH 626 Biopharmaceutics and Drug Delivery (3). A study of biological barriers to drug delivery, conventional dosage forms, and new and future drug delivery strategies. Prerequisite: PHCH 517, PHCH 518, and PHCH 625. LEC

PHCH 667 Introduction to Clinical Chemistry (2). A lecture-discussion course concerned with identification of the contents of physiological fluids, changes in physiological fluid content induced by disease and drugs, and therapeutic drug monitoring; case study discussions and presentations are coordinated with the integrated laboratory. Prerequisite: Fifth-year standing and concomitant enrollment in integrated laboratory. LEC

PHCH 686 Special Topics in Pharmaceutics (1-2). A study of selected topics of current interest which are pertinent to the area of pharmacy. This course is normally reserved as a didactic one that is offered occasionally when there is a special subject to be taught for one semester only. Prerequisite: Consent of instructor. IND

PHCH 690 Undergraduate Research in Pharmaceutical Chemistry (1-5). Student will be assigned a suitable research project in the area of pharmaceutical analysis or pharmaceutics. Prerequisite: Consent of instructor. IND

PHCH 694 Problems in Pharmaceutical Chemistry (1-5). A student will be assigned a suitable research project in an area of pharmaceutical analysis or pharmaceutics. This course is offered regularly by the Department of Pharmaceutical Chemistry to meet the special needs of selected students, usually for one of the following two situations: (1) This course may be taken when a student has a special interest in a problem or area of limited scope and desires to pursue that study in depth under supervision of a member of the faculty. (2) This course is sometimes used as a remedial class to provide a mechanism of intensive review and study in an area of weakness. Prerequisite: Consent of instructor. IND

■ Pharmacology and Toxicology Courses

P&TX 630 Pharmacology I (4). The pharmacology series covers the mechanisms by which drugs interact with living organisms. An integrative emphasis will be placed on understanding the molecular basis of drug action with respect to modifying the pathophysiology of specific disease states. Topics in P&TX 630 include, general principles of cell biology, molecular biology, pharmacogenomics, immunology and principles of drug metabolism and disposition. Prerequisite: Biol 646 or equivalent. LEC

P&TX 631 Pharmacology II (4). The pharmacology series covers the mechanisms by which drugs interact with living organisms. An integrative emphasis will be placed on understanding the molecular basis of drug action with respect to modifying the pathophysiology of specific disease states. Topics in P&TX 631 include, hematology, cancer biology and therapeutics, immunopharmacology, infectious diseases and respiratory disease. Prerequisite: P&TX 630 and Biol 400 or equivalent. LEC

P&TX 632 Pharmacology III (4). The pharmacology series covers the mechanisms by which drugs interact with living organisms. An integrative emphasis will be placed on understanding the molecular basis of drug action with respect to modifying the pathophysiology of specific disease states. Topics in P&TX 632 include, cardiovascular diseases, diuretics, autonomic pharmacology and drugs regulating central nervous system function. Prerequisite: P&TX 630 and P&TX 631. LEC

P&TX 633 Pharmacology IV (3). The pharmacology series covers the mechanisms by which drugs interact with living organisms. An integrative emphasis will be placed on understanding the molecular basis of drug action with respect to modifying the pathophysiology of specific disease states. Topics in P&TX 633 include endocrine disorders, diabetes and obesity, and gastrointestinal pharmacology. Prerequisite: P&TX 630, P&TX 631 and P&TX 632. LEC

P&TX 640 Toxicology (2). General principles of toxicology, treatment, and management of accidental poisoning, and current topics of interest. Prerequisite: P&TX 630, P&TX 631, and P&TX 632. LEC

P&TX 641 Antibiotics: Benefits and Risks (1). Students will read about and discuss the latest research on new antibiotic targets, therapeutic potential, disease prevention, and the emergence of antibiotic resistance. LEC

P&TX 642 Obesity, Diabetes, and Metabolic Syndrome: Current Concepts (1). Students in this class will read about and discuss some of the latest research on the basic pathophysiology of these disorders and potential links between them. Efforts to test novel drug interventions will then be discussed and related to the new insights into the disease mechanisms. Prerequisite: P&TX 630. LEC

P&TX 643 Current Concepts of Neurodegenerative Disease (1). Neurodegenerative diseases, such as Alzheimer's and Parkinson's diseases, are associated with older age and/or enhanced oxidative stress. The possible causes for the development and progression of these diseases with relation to current research in the field will be discussed. Additionally, a summary of available and suggested future treatments will be given. Prerequisite: P&TX 630. LEC

P&TX 645 Neurobiological Basis of Addiction: Physiological, Biochemical, Pharmacological, and Treatment Concepts (1). Several addictions will be discussed including addictions to alcohol, cocaine, methamphetamine, gambling, and others as time permits. The physiology, biochemistry, pharmacology and available treatments for these addictions will be reviewed. The role of pharmacotherapies will be discussed, particularly as they relate to the molecular basis of addiction. Behavioral and psychological approaches also will be examined. Prerequisite: Completion of P&TX 632 or special permission from faculty. LEC

P&TX 694 Undergraduate Laboratory: Research in Pharmacology and Toxicology (1-5). Original research on a laboratory problem of limited scope. This course cannot count toward pharmacology and toxicology requirements in the School of Pharmacy. Prerequisite: Consent of instructor. IND

P&TX 698 Library Problems in Pharmacology and Toxicology (1-5). Original library review of a limited special topic in pharmacology and toxicology. The student will write a review in his or her report. This course may count toward pharmacology and toxicology requirements in the School of Pharmacy. Prerequisite: P&TX 635 and consent of instructor. IND

Consult the Schedule of Classes for current KU course offerings, www.registrar.ku.edu.

As a part of their course work, about 180 pharmacy students volunteer each semester in Kansas hospitals, nursing homes, health care organizations, and other agencies.

■ Pharmacy Courses

PHAR 500 Early Pharmacy Practice Experience (1). PHAR 500 is a didactic course designed to introduce the student pharmacist to the concepts of Introductory Pharmacy Practice Experiential Education, fulfill pre-requisites needed prior to IPPE site placement and to prepare the student for participation in the Introductory Pharmacy Practice Experiences. The course will address topics such as professionalism, confidentiality, patient interaction, medical and drug histories, blood borne pathogens and CPR. Students must be accepted to the school of pharmacy to be eligible to enroll. FLD

PHAR 502 Pharmacy Practice II: Health-system Pharmacy Practice Fundamentals (3). Introduction to the prescription dispensing process within health-system pharmacies (hospital, nursing home, home health, HMO) with an emphasis on distribution systems, parenteral, and sterile products. Incorporates lectures, case studies, pharmacy visits, and laboratory experience. Prerequisite: PHPR 501. LEC

PHAR 505 Immunization Theory and Practice (1). This course will provide students with the training and resources/materials necessary to: a) identify at-risk patient populations needing immunizations, b) work with other health-care professionals to establish and promote a successful pharmacy-based immunization service, c) act as either vaccine advocate or immunizer when appropriate, and d) promote public health by helping the patients they serve avoid vaccine-preventable communicable diseases. LEC

PHAR 507 Dean's Orientation and Introduction to Pharmacy (1). An introduction to the profession of pharmacy addressing issues such as 1) academic expectations, 2) professional expectations, 3) ethics, 4) various career pathways, and 5) medical communication. Students must be accepted to the school of pharmacy to be eligible to enroll. LEC

PHAR 510 Pharmacy Skills Laboratory I (1). Exercises that reinforce the concepts taught in pharmacy practice, pharmaceutical chemistry, medicinal chemistry, and pharmacology courses. Includes exercises in compounding, dispensing and patient counseling. LAB

PHAR 515 Pharmacy Skills Laboratory II (1). Exercises that reinforce the concepts taught in pharmacy practice, pharmaceutical chemistry, medicinal chemistry, and pharmacology courses. Includes exercises in compounding, dispensing, and patient counseling. LAB

PHAR 520 Pharmacy Skills Laboratory III (2). Exercises that reinforce the concepts taught in pharmacy practice, pharmaceutical chemistry, medicinal chemistry, and pharmacology courses. Includes exercises in compounding, dispensing, and patient counseling. LAB

PHAR 525 Pharmacy Skills Laboratory IV (1). Exercises that reinforce the concepts taught in pharmacy practice, pharmaceutical chemistry, medicinal chemistry, and pharmacology courses. Includes exercises in compounding, dispensing, and patient counseling. LAB

PHAR 530 Pharmacy Skills Laboratory V (1). Exercises that reinforce the concepts taught in pharmacy practice, pharmaceutical chemistry, medicinal chemistry, and pharmacology courses. Includes exercises in compounding, dispensing, and patient counseling. LAB

PHAR 550 Introductory Pharmacy Practice Experience—Community (4). A required four credit hour experiential course involving 160 hours of on-site experiential education. The course is designed to provide the student pharmacist with exposure to the practice of pharmacy in either an independent community or chain pharmacy in either a rural or urban setting within the state of Kansas. Prerequisite: Completion of PHAR 500 or instructor consent. FLD

PHAR 560 Introductory Pharmacy Practice Experience—Institutional (4). A required four credit hour experiential course years involving 160 hours of on-site experiential education. The course is designed to provide the student pharmacist with exposure to the practice of pharmacy in an institutional health-system (hospital) environment in either a rural or urban setting within the state of Kansas. Prerequisite: Completion of PHAR 502 or instructor consent. FLD

PHAR 619 Health Care Systems (3). An introduction to the health care system of the United States. On completion of the course the student will better understand the impact on pharmacy of changes in financing and technology. Enrollment limited to pharmacy majors. LEC

PHAR 690 Physical and Chemical Assessment (3). In Physical assessment, students will learn how to utilize the available instruments to take blood pressures, temperatures, doing eye/ear exams, palpate/auscultate internal organs, and the most common skin conditions seen by a pharmacist. Chemical assessment will involve the students learning how drugs and disease change physiological fluid content, identification methods, and therapeutic monitoring through case study discussion and presentations. Prerequisite: Admission into the Non-traditional Pharm.D. program. LEC

PHAR 693 Clinical Pharmacokinetics (2). This course presents discussions on physiological and disease state variables in pharmacokinetics for selected drugs

and drug classes, and instructs students in the use of physiological and disease state pharmacokinetic information to develop individualized therapeutic regimens. Prerequisite: PHCH 625 and PHCH 626. LEC

PHAR 694 Clinical Pharmacokinetics (3). This course presents discussions and clinical examples on physiological and disease state variables in pharmacokinetics for selected drugs and drug classes, and instructs students in the use of physiological and disease state pharmacokinetic information to develop or individualized therapeutic regimens. Delivery of this course will involve some aspects of distance learning. Prerequisite: Admission into the Non-traditional Pharm.D. program. LEC

■ Pharmacy Practice Courses

PHPR 503 Pharmacy Practice III: Pharmaceutical Care Fundamentals (4). The principles of pharmaceutical care will be presented with an emphasis on identifying drug-related problems plus development and monitoring of a care plan. Drug interactions will be presented with an emphasis on evaluating the risk of the interaction in a particular patient. Patient counseling and communication techniques will be covered. Approximately half the class time will be spent covering non-prescription drugs and herbals. Prerequisite: PHPR 501 and PHAR 502. LEC

PHPR 510 Medical Terminology Elective (1). This course provides the fundamentals for developing a medical vocabulary. The student will develop the ability to understand, define and utilize medical terminology and abbreviations used in patient care. LEC

PHPR 511 Service-learning Elective (1). Students will work at a health-related community center and participate in structured learning exercises. The objectives are to: 1) enable students to learn appropriate strategies to communicate and provide services to people with varying languages, cultures, social, and economic backgrounds, disabilities, illnesses, or impairments, 2) increase social interaction and citizenship, 3) heighten social awareness and understanding of ethical issues, and 4) acknowledge social responsibility and realize personal values. FLD

PHPR 512 Careers in Pharmacy Elective (1). This elective course will help students explore the various career paths in pharmacy. Potential topics include, among others, hospital, retail, industry, and academic opportunities in pharmacy. The course will be taught by PHPR faculty and guest presenters. Prerequisite: Must be accepted to the Pharmacy Program. LEC

PHPR 513 Chemical Dependency Elective (1). This elective course will enhance the pharmacy student's knowledge and understanding of the current theories behind the addiction process, frequently abused drugs and/or chemicals and the treatment and recovery process. Prerequisite: Must be accepted to the Pharmacy Program. LEC

PHPR 600 Nuclear Pharmacy Practice (2). This introductory course in nuclear pharmacy practice provides a basic understanding of radiation, radiation dosimetry, radiopharmaceuticals, and clinical application of radiopharmaceuticals in diagnosis and treatment. The course includes both didactic material as well as laboratory experience. LEC

PHPR 612 Pharmacoeconomics and Outcomes (3). In Pharmacoeconomics and Outcomes students will study health care economics from both a macro and micro basis with a primary focus on pharmacy economic issues as applied to our health care practices as well as health outcomes research. This course will incorporate lecture, readings, case exercises, and guided discussions to accomplish these goals and will utilize distance learning techniques. Prerequisite: Admission to the non-traditional Pharm. D. program. LEC

PHPR 614 Pharmacy Management (4). A course designed to provide knowledge and skills to effect efficient and effective pharmacy management. This will include foundations in financial management, inventory control, purchasing, cost-effective drug utilization, quality management, pharmacoeconomics, and human resource management. LEC

PHPR 619 Health Care Systems (3). This course is an introduction to the organization, financing, and delivery of health care services with a focus on the U.S. health care system. Course content addresses the following questions: how do we evaluate the health care sector, where is health care provided, how is health care financed, what are the characteristics of health care providers (individuals and institutions), what influences the performance of the health care sector, and what lies in the future for health care delivery. The purpose of the course is to prepare pharmacy students for non-clinical aspects of their practice sites. Enrollment limited to pharmacy majors. LEC

PHPR 620 Ethics and Introduction to Law (1). This course provides an introduction to the fundamentals of law and ethics as they apply to the practice of pharmacy. Course sessions will focus on ethical expectations of the profession, principles and issues in medical and pharmacy ethics, and laws that govern medication dispensing. LEC

The University of Kansas was the first university to be designated a National Center for Drug Design.

Pharmacy Courses (PHPR)

PHPR 621 Pharmacy Law (2). A course developed to increase students' knowledge and understanding of laws that regulate the pharmacy profession. Prerequisite: Fifth year standing. LEC

PHPR 622 Drug Information and Biostatistics (3). This course will provide the student with a working knowledge of drug information retrieval skills and medical literature evaluation skills with an application to pharmacy practice. Prerequisite: Admission to the non-traditional Pharm. D. program. LEC

PHPR 625 Pharmacotherapy I (3). This course focuses on the pharmacotherapy and the role of the pharmacist in disease state management of diseases and conditions including Hormone Replacement, Osteoporosis, Rheumatoid and Osteoarthritis, Lipid disorders, and Diabetes. Emphasis will be placed on the integration of pathophysiology, pharmacology, and therapeutics to devise appropriate pharmaceutical care plans. Appropriate pharmaceutical care plans will include rationale for drug use, appropriate drug selection and dosing regimens, expected outcomes of drug therapy, key monitoring parameters for efficacy and toxicity, clinically important drug-drug or drug-disease interactions, counseling, and compliance issues. The class format will include online assignments, interactive Internet-based lectures, and case studies. Prerequisite: Admission to the non-traditional Pharm. D. program. LEC

PHPR 626 Pharmacotherapy II (3). This course focuses on the pharmacotherapy and the role of the pharmacist in disease state management of diseases and conditions including Cancer and Infectious Diseases. Emphasis will be placed on the integration of pathophysiology, pharmacology, and therapeutics to devise appropriate pharmaceutical care plans. Appropriate pharmaceutical care plans will include rationale for drug use, appropriate drug selection and dosing regimens, expected outcomes of drug therapy, key monitoring parameters for efficacy and toxicity, clinically important drug-drug or drug-disease interactions, counseling, and compliance issues. The class format will include online reading assignments, online study guides, online assignments, interactive Internet-based lectures and case studies. Prerequisite: Admission to the non-traditional Pharm. D. program. LEC

PHPR 627 Pharmacotherapy III (3). This course focuses on the pharmacotherapy and the role of the pharmacist in disease state management of Hypertension, Ischemic Heart Disease, Myocardial Infarct, Heart Failure, Stroke, Anticoagulation, Upper GI Disorders, Asthma and COPD, and Renal Disease. Emphasis will be placed on the integration of pathophysiology, pharmacology, and therapeutics to devise appropriate pharmacy care plans. These plans will include rationale for drug use, selection and dosing regimens, expected outcomes of drug therapy, key monitoring parameters, clinically important drug-drug or drug-disease interactions, counseling, and compliance issues. The class format includes online reading assignments, study guides, and assignments, interactive Internet-based lectures and case studies. Prerequisite: Admission to the non-traditional Pharm. D. program. LEC

PHPR 628 Pharmacotherapy IV (3). This course focuses on the pharmacotherapy and the role of the pharmacist in disease state management of Variations in Drug Metabolism and Interactions, Hepatitis, Anti-retroviral Therapy, Skin and Soft Tissue Infections, Bone and Joint Infections, Alzheimer's Disease, Parkinson's Disease, Seizure Disorders, and Depression. Emphasis will be placed on the integration of pathophysiology, pharmacology, and therapeutics to devise appropriate pharmacy care plans. These plans will include rationale for drug use, selection and dosing regimens, expected outcomes of drug therapy, key monitoring parameters, clinically important drug-drug or drug-disease interactions, counseling, and compliance issues. The class format includes online reading assignments, study guides, and assignments, interactive Internet-based lectures and case studies. Prerequisite: Admission to the non-traditional Pharm.D. program. LEC

PHPR 630 Drug Information/Biostatistics and Medical Literature Evaluation (4). An introduction to the principles of drug information analysis, storage, and retrieval as well as biostatistics as applied to understanding and interpreting biomedical literature. Advantages and disadvantages of several commercial and manual drug information systems will be considered. The course includes practical experiences in drug information services. The biostatistical emphasis of the course will be on the application of statistical tests commonly used and the interpretation of their results. Prerequisite: Fifth year standing. LEC

PHPR 631 General Clinical Clerkship (4). Students will gain knowledge into appropriate drug therapy in patients, providing drug information to health care providers and patients, apply the laws pertaining to drug usage and acquisitions, monitor patients for drug-drug, drug-lab, and drug-food interactions, report adverse side effects, and make therapeutic suggestions to the physician. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 632 Compounding Clerkship (4). Students participating in this rotation will gain experience in reviewing or designing appropriate care plans for extemporaneously compounded medications. In addition students will gain valuable experience preparing the compounded pharmaceutical product. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 633 Ambulatory Community Practice Clerkship (4). Students participating in this rotation will gain experience providing advanced pharmacy care for patients in an ambulatory setting. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 634 Surgical ICU Clerkship (4). Students participating in this rotation will gain experience providing advanced pharmacy care for patients in the Surgical Intensive Care Unit. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 635 Problems in Pharmacy Practice (1-5). A course designed for the study of special topics in pharmacy practice. A research paper will be required. Prerequisite: Consent of instructor. IND



PHPR 636 Law/Ethics (3). A course developed to increase students' knowledge and understanding of laws that regulate the pharmacy profession and to expand awareness of and sensitivity of the ethical issues that occur in pharmacy practice. Prerequisite: Fifth year standing. LEC

PHPR 637 NTPD Rounding Clerkship I (4). Students interview and assess patients, review laboratory data, and develop health problem lists and prospective pharmaceutical care plans in an approved NTPD site. Students must select and have approved, 8 weeks in advance, a site that provides daily access to patients for 3 consecutive days. Prerequisite: Acceptance in the NTPD program and completion of the didactic portion of the NTPD program. FLD

PHPR 638 NTPD Clerkship II (4). Students interview and assess patients, review laboratory data, and develop health care problem lists and prospective pharmaceutical care plans in an approved NTPD site. Students must select and have sites approved 8 weeks in advance of the clerkship. Prerequisite: Acceptance in the NTPD program and completion of the didactic portion of the NTPD program. FLD

PHPR 639 NTPD Clerkship III (4). Students interview and assess patients, review laboratory data, and develop health problem lists and prospective pharmaceutical care plans in an approved NTPD site. Students must select and have sites approved 8 weeks in advance of the clerkship. Prerequisite: Acceptance in the NTPD program and completion of the didactic portion of the NTPD program. FLD

PHPR 640 NTPD Clerkship IV (4). Students interview and assess patients, review laboratory data, and develop health problem lists and prospective pharmaceutical care plans in an approved NTPD site. Students must select and have sites approved 8 weeks in advance of the clerkship. Prerequisite: Acceptance in the NTPD program and completion of the didactic portion of the NTPD program. FLD

PHPR 641 NTPD Clerkship V (4). Students interview and assess patients, review laboratory data, and develop health problem lists and prospective pharmaceutical care plans in an approved NTPD site. Students must select and have sites approved 8 weeks in advance of the clerkship. Prerequisite: Acceptance in the NTPD program and completion of the didactic portion of the NTPD program. FLD

PHPR 642 Medical ICU Clerkship (4). Students participating in this rotation will gain experience providing advanced pharmacy care for patients in the Medical Intensive Care Unit. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 643 Nutrition Support Advanced Clerkship (4). An advanced clerkship in nutrition support with emphasis upon parenteral and enteral nutrition. The student will round with a nutrition support team, take medication histories, review patients' nutritional status, monitor drug and nutrition therapy, provide drug information, make drug and nutrition therapy recommendations, and will counsel patients on the appropriate use of their medications and nutritional supplementation. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 646 Pharmacotherapy I (4). A course dealing with the clinical applications of drug knowledge to patient care. Disease and drug knowledge will be applied to the design and monitoring of therapeutic treatment plans for patients. Incorporates three credit hours of lecture and one credit hour of case studies and off-campus professional experience. Prerequisite: Successful completion of Pharmacy Practice II (PHAR 502). LEC

PHPR 647 Pharmacotherapy II (4). A course dealing with the clinical applications of drug knowledge to patient care. Disease and drug knowledge will be applied to the design and monitoring of therapeutic treatment plans for patients. Incorporates three credit hours of lecture and one credit hour of case studies and off-campus professional experience. This course is graded A,B,C,F. Prerequisite: Fifth year standing and successful completion of Pharmacotherapy I, PHPR 646. LEC

PHPR 648 Pharmacotherapy III (4). A course dealing with the clinical applications of drug knowledge to patient care. Disease and drug knowledge will be applied to the design and monitoring of therapeutic treatment plans for patients. Incorporates three credit hours of lecture and one credit hour of case studies and off-campus professional experience. This course is graded A,B,C,F. Prerequisite: Fifth year standing and successful completion of Pharmacotherapy II, PHPR 647 with a C or above. LEC

PHPR 649 Drug Information (3). An introduction to the principles of drug information analysis, storage, and retrieval. Advantages and disadvantages of several commercial and manual systems will be considered. The course includes practical experiences in drug information services. Prerequisite: Fifth year standing. LEC

PHPR 650 Family Practice Advanced Clerkship (4). An advanced clerkship that provides the student experience in caring for hospitalized patients as part of a team of Family Medicine physicians, medical students, and other health care practitioners. Emphasis is placed on a multi-disciplinary approach to the overall care (medical, social, etc.) of the patient. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 651 Biostatistics (3). An introduction to the principles of statistics as they apply to the understanding and interpretation of the biomedical literature. The emphasis of this course is on the application of statistical tests commonly employed in biomedical research and the interpretation of their results. Prerequisite: Fifth year standing. LEC

PHPR 652 Drug Information Advanced Clerkship (4). An advanced clerkship providing the student actual experience in taking and answering drug information questions utilizing computer data base searching, preparing, and providing information to health care professionals. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 653 Home Health Care Advanced Clerkship (4). An advanced clerkship in Home Health Care pharmacy services. The student will participate with the health care team, take medication histories, monitor drug therapy, provide drug information, provide kinetic consults, make drug therapy recommendations, and will perform patient medication education. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 654 Neonatal Advanced Clerkship (4). An advanced clerkship in neonatology. The student will round with the medical team, taking medication histories, monitoring therapy, providing drug information, providing kinetic consults, and performing discharge counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 655 Pediatric Hematology, Oncology Advanced Clerkship (4). An advanced clerkship in pediatric hematology, oncology. The student will round with the medical team, taking medication histories, monitoring therapy, providing drug information, providing kinetic consults, and performing discharge counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 656 Internal Medicine Advanced Clerkship (4). An advanced clerkship in internal medicine. The student will round with an internal medicine team, provide drug information, perform kinetic consults, monitor therapy, take medication histories, and provide discharge counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 657 Poison Control Center Advanced Clerkship (4). An advanced clerkship in an acute care poison control center. The student will participate with the health care team, take medication/substance histories, monitor suggested actions, provide drug information and poison information, make drug therapy recommendations, and will perform patient poison information education. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 658 Infectious Disease Advanced Clerkship (4). An advanced clerkship in infectious disease. The student will round with the infectious disease service, provide drug information, perform kinetic consults, monitor therapy, take medication histories, and provide discharge medication counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 659 Medication Safety/Reconciliation (4). Students participating in this rotation will gain experience in medication supply management. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 660 Cardiology Advanced Clerkship (4). An advanced clerkship in cardiology. The student will round with the cardiology service, provide drug information, perform kinetic consults, monitor therapy, take medication histories, and provide discharge medication counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 661 General Pediatrics Advanced Clerkship (4). An advanced clerkship in pediatrics. The student will round with the health care team, take medication histories, monitor drug therapy, provide drug information, provide kinetic consults, make drug therapy recommendations, will counsel patients on glucose monitor-

ing equipment and will perform patient medication education. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 662 Research Laboratory Rotation (4). Students participating in this rotation will gain experience in a research laboratory environment. Prerequisite: Successful completion of the Pharm.D. didactic course. FLD

PHPR 663 Critical Care Advanced Clerkship (4). An advanced clerkship in critical care/intensive care/emergency care. The student will round with the health care team, take medication histories, monitor drug therapy, provide drug information, provide kinetic consults, make drug therapy recommendations, and will perform patient medication education. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 664 Geriatrics Advanced Clerkship (4). An advanced clerkship emphasizing pharmacotherapy in geriatric patients. The student will round with the geriatric service seeing patients both in the acute case setting and in long term care facilities. The student will provide drug information, perform kinetic consults, monitor therapy for appropriate outcomes, take medication histories, and provide medication consultation. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 665 Advanced Specialized Clerkship I (4). An advanced clerkship in a specialized clinical practice area. The student will round with the physician team, provide drug information, perform kinetic consults, monitor therapy, take medication histories, and provide discharge medication counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 667 Advanced Specialized Clerkship II (4). An advanced clerkship in a specialized clinical practice area. The student will round with the physician team, provide drug information, perform kinetic consults, monitor therapy, take medication histories, and provide discharge medication counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 668 OB-GYN Advanced Clerkship (4). An advanced clerkship dealing with drug therapy for obstetrics and gynecology patients. The student will round with the OB-GYN service, will take medication histories, provide drug information, perform kinetic consults, monitor drug therapy for appropriate outcomes, and provide medication consultation. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 669 Oncology Advanced Clerkship (4). An advanced clerkship in oncology. The student will round with the health care team, take medication histories, monitor drug therapy, provide drug information, provide kinetic consults, make drug therapy recommendations, and will perform patient medication education. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 670 Physical Assessment (1). An introduction to the principles of physical assessment used to monitor drug effectiveness, side effects, adverse drug reactions, and drug-related complications. Prerequisite: Fifth year standing. LEC

PHPR 671 Nuclear Pharmacy Advanced Clerkship (4). Students participating in this rotation will gain practical experience in compounding and dispensing radiopharmaceutical products in a clinical setting. Additionally, students will be involved in maintaining quality assurance and regulatory compliance. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 672 Managed Care Clerkship (4). The student will spend time in a managed care setting and will analyze the appropriateness of health care dollars spent based on appropriate drug used, dosage, cost of the drug, outcome of the patient, and other factors. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 673 Formulary Management/DUE (4). The student will learn how to manage a formulary system within a hospital and will include preparation of drug evaluations for P&T meetings. The student will also collect data from patient charts to prepare DUE for P&T or hospital administration. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 674 Ambulatory Care Advanced Clerkship I (4). Students participating in this rotation will gain practical experience in monitoring drug therapy for chronic disease states. Emphasis will be placed on the effectiveness of drug therapy, toxicity, drug interactions, compliance, and patient counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 675 Operating Room Clerkship (4). The student will spend time with the operating room pharmacist learning how to prepare anesthesia medical trays, anesthesia preparations, IV bags for surgery, narcotic tracking and ordering, and pain management procedures. The student will also learn about the scrubbing up procedures before entering surgical suites. The students will have an opportunity to interact with an anesthesiologist to learn about induction agents. Prerequisite: Successful completion of the Pharm.D. didactic courses. LEC

PHPR 676 Clinical Clerkship (4). A clinical pharmacy clerkship involving didactic seminar and clinical instruction in patient drug therapy using facilities of hospi-

Some courses may require travel to KU Medical Center in Kansas City. Students are responsible for their own transportation.

The 2008 Fiske Guide to Colleges calls KU's School of Pharmacy a standout.

Pharmacy Courses (PHPR)

tals and clinics. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 677 Ambulatory Care Advanced Clerkship II (4). Students participating in this rotation will gain additional experience in monitoring drug therapy for chronic disease states. Emphasis will be placed on the effectiveness of drug therapy, toxicity, drug interactions, compliance, and patient counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses and Ambulatory Care I. FLD

PHPR 678 Pharmaceutical Industry Clerkship (4). Students participating in this rotation will be exposed to a variety of areas within the pharmaceutical industry. These areas may include research and development, marketing, clinical research, drug information, and/or quality assurance. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 679 Pharmacy Association Clerkship (4). Students participating in this rotation will be involved in the management of state or national professional pharmacy associations. This rotation may involve legislative, educational, professional, and financial issues. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 680 Advanced Specialized Externship I (4). An advanced full-time experiential pharmacy practice rotation that provides the student with practice experience (externship) in non-traditional practice settings such as managed care administration, governmental agencies, prisons, Indian Health service, pharmacy organizations, pharmaceutical industry, veterinary medicine, etc. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 681 Pulmonary/Critical Care Advanced Clerkship (4). Students participating in this rotation will gain knowledge and practical skills in managing the medications of patients with pulmonary disease in the critical care setting. Emphasis will be placed on monitoring the effectiveness of drug therapy, toxicity, drug interactions and pharmacokinetics. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 682 Public Health Service Clerkship (4). Students participating in this rotation will have exposure to various government agencies that are a part of the Public Health Service. This may include the FDA, Indian Health Service, or the Federal Bureau of Prisons. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 683 Hematology Advanced Clerkship (4). Students participating in this rotation will gain knowledge and practical skills in managing the medications of patients with hematological disorders. The student will round with the health care team, take medication histories, monitor drug therapy, provide drug information, provide kinetic consults, make drug therapy recommendations, and perform patient medication education. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 684 Neurology Advanced Clerkship (4). Students participating in this rotation will gain knowledge and practical skills in managing the medications of patients with neurological disorders. The student will round with the health care team, take medication histories, monitor drug therapy, provide drug information, provide kinetic consults, make drug therapy recommendations and perform patient medication education. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 685 Hospital Pharmacy Administration (4). Students participating in this rotation will be exposed to a wide variety of areas within hospital pharmacy administration. These areas may include financial management, inventory control, purchasing, cost-effective drug utilization, quality assurance, committee involvement, and personnel issues. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 686 Hospital Externship I (4). A full-time externship of four to six weeks duration in an institutional setting. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 687 Hospital Externship II (4). A continuation of PHPR 686. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 688 Long-term Care Advanced Clerkship (4). Students participating in this rotation will gain knowledge and practical skills in managing the medications of patients in the long-term care setting. This experience will focus on dosing, side effects, and skills needed to monitor drug therapy in the geriatric population. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 689 Pediatric Critical Care Advanced Clerkship (4). Students participating in this rotation will gain knowledge and practical skills in managing the pediatric patient in the critical care setting. The student will round with the health care team, take medication histories, monitor drug therapy, provide drug information, provide kinetic consults, make drug therapy recommendations and perform patient medication education. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 690 Clinical Drug Research (4). Students participating in this rotation will gain experience in the clinical drug research process. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 691 Diabetes Advanced Clerkship (4). Students participating in this rotation will gain knowledge and practical skills in managing the medications of the diabetic patient. The student will take medication histories, monitor drug therapy, provide drug information, and perform patient medication education. They will also learn to use and evaluate various methods of glucose testing. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 692 Veterinary Medicine Clerkship (4). Students will participate in daily rounds of hospitalized animals providing drug information, interview owners of animals being seen in clinic, observe surgical and radiology procedures, learn the federal requirements of drug use in food stock animals, and zoo acquisitions. Students will be required to sign a liability release form when taking this rotation. Prerequisite: Successful completion of Pharm.D. didactic courses. FLD

PHPR 693 Psychopharmacy Advanced Clerkship (4). An advanced clerkship in a specialized clinical practice area. The student will round with the physician team, provide drug information, perform kinetic consults, monitor therapy, take medication histories, and provide discharge medication counseling. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 694 Drug Utilization Review Clerkship (4). Students will learn how to perform a retrospective study using both large and small data bases to obtain information to therapeutic questions. The student will also learn how to apply the appropriate statistics to the data, interpretation of the information, and writing up the study into a publishable format. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 695 Investigational Drugs Clerkship (4). Students will learn how to monitor, report, control, and distribute investigation drugs in clinical drug trials. The student will also learn how to interact with the drug company sponsoring, the physicians prescribing, and the patients who are included in these trials. The students will also be involved with the Human Subjects Committee paperwork associated with enrolling patients into the trials. Prerequisite: Successful completion of the Pharm.D. Didactic courses. FLD

PHPR 696 Community Externship I (4). A full-time externship of four to six weeks in duration in a community practice setting. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 697 Community Externship II (4). A continuation of PHPR 696. Prerequisite: Successful completion of the Pharm.D. didactic courses. FLD

PHPR 699 Seminar (1). This course provides the student the opportunity to develop and present a formal seminar on a drug therapy management subject using appropriate audiovisual aids and to defend their presentation of material. LEC

Pharmacists are employed by the pharmaceutical industry, government agencies, armed services, public health services, the Peace Corps, hospitals, scientific publications, drug wholesalers, and as community pharmacists.