Pharm.D. Curriculum

For Students in the Class of 2022

The South College School of Pharmacy offers a three (3) calendar year Doctor of Pharmacy curriculum. The curriculum is dynamic and will be modified over time in keeping with best educational practices and in response to evaluation by the Accreditation Council for Pharmacy Education.

FIRST PROFESSIONAL YEAR

Course Number	Course Name	4 Digit Code*
	Quarter One	
PSC 6110	Biochemistry	5-0-0-5
PSC 6121	Pathophysiology I	2-0-0-2
PSC 6130	Immunology	3-0-0-3
PPR 6151	Pharmacy Practice I-Introduction to Pharmacy Practice in the Health Care System	3-0-0-3
PPR 6261	Basic Communication Skills for Pharmacy Practice	2-0-0-2
PPR 6271	Forum and Professionalism I	1-0-0-1
		16 hours
	Quarter Two	
PSC 6141	Pharmacy Calculations	3-0-0-3
PSC 6211	Pathophysiology II	2-0-0-2
PSC 6220	Integrated Medicinal Chemistry and Pharmacology I	5-0-0-5
PPR 6230	Pharmacy Practice II-Introduction to Patient Care	3-0-0-3
PPR 6240	Career Paths and Introduction to Practice	1-0-0-1
PPR 6250	Pharmacy Practice III-Public Health and Wellness	3-0-0-3
		17 hours
	Quarter Three	
PSC 6311	Integrated Medicinal Chemistry and Pharmacology II	5-0-0-5
PSC 6321	Pharmaceutics I	3-0-0-3
PSC 6350	Pathophysiology III	2-0-0-2
PSC 6430	Sterile Products	1-2-0-2
PPR 6340	Clinical Laboratory Medicine	2-0-0-2
PPR 6361	Introductory Pharmacy Practice Experience I	0-0-9-3
		17 hours
	Quarter Four	
PSC 6330	Pharmacy Dispensing and Compounding Lab	2-2-0-3
PSC 6410	Integrated Medicinal Chemistry and Pharmacology III	5-0-0-5
PSC 6420	Pharmaceutics II	4-0-0-4
PSC 6440	Basic Biopharmaceutics and Pharmacokinetics	3-0-0-3
PPR 6451	Introductory Pharmacy Practice Experience II	0-0-9-3
		18 hours

SECOND PROFESSIONAL YEAR

Course Number	Course Name	4 Digit Code*
	Quarter One	
PPR 6510	Pharmacy Practice IV-Research Methods and Biostatistics	3-0-0-3
PPR 6550	Drug Information Retrieval and Evaluation	3-0-0-3
PPR 6561	Introductory Pharmacy Practice Experience III	0-0-9-3
PPR 6570	Pharmacotherapy I	4-0-0-4
PPR 6590	Clinical Abilities Lab I	0-4-0-2
PPR 6650	Clinical Pharmacokinetics and Pharmacogenomics	3-0-0-3
		18 hours
	Quarter Two	
PPR 6631	Self-Care I	2-0-0-2
PPR 6640	Pharmacy Practice VI-Pharmacoeconomics and Outcomes Assessment	3-0-0-3
PPR 6670	Pharmacotherapy II	4-0-0-4
PPR 6680	Pharmacotherapy III	4-0-0-4
PPR 6690	Clinical Abilities Lab II	0-4-0-2
PPR/PSC	Elective[#]	2-0-0-2
		17 hours
	Quarter Three	
PPR 6751	Self-Care II	3-0-0-3
PPR 6760	Clinical Seminar I	1-0-0-1
PPR 6770	Pharmacotherapy IV	4-0-0-4
PPR 6780	Pharmacotherapy V	4-0-0-4
PPR 6790	Clinical Abilities Lab III	0-4-0-2
PPR/PSC	Elective[#]	3-0-0-3
		17 hours
	Quarter Four	
PPR 6540	Pharmacy Practice V-Pharmacy Management	3-0-0-3
PPR 6840	Pharmacy Practice VIII-Pharmacy Ethics and Law	3-0-0-3
PPR 6851	Introductory Pharmacy Practice Experience IV-Longitudinal Service Learning and Simulation	0-0-3-1
PPR 6860	Clinical Seminar II	1-0-0-1
PPR 6861	APPE Readiness	1-0-0-1
PPR 6870	Pharmacotherapy VI	4-0-0-4
PPR 6890	Clinical Abilities Lab IV	0-4-0-2
PPR/PSC	Elective[#]	2-0-0-2
		17 hours

SECOND PROFESSIONAL YEAR

Course Number	Course Name	4 Digit Code*

#List of Second Professional Year didactic course electives

PSC 6001	Introduction to Pharmaceutical Analysis	3-0-0-3
PSC 6003	Basic Principles of Toxicology	3-0-0-3
PSC 6004	Drug Discovery, Development, and Regulation	2-0-0-2
PSC 6005	Introduction to Responsible Conduct of Research	2-0-0-2
PSC 6007	Introduction to Neurology	3-0-0-3
PSC 6008	Basics in Pharmaceutical Research	3-0-0-3
PSC 6009	Medical Virology	3-0-0-3
PSC 6010	Critical Evaluation of Molecular Therapeutics	3-0-0-3
PSC 6011	Advanced Compounding of Human and Veterinary Pharmaceutical Products	2-0-0-2
PSC 6012	Independent Study in Pharmaceutical Sciences	2-0-0-2
PSC 6013	Independent Study in Pharmaceutical Sciences	2-0-0-2
PSC 6014	Introduction to Biologics and Biosimilars	3-0-0-3
PSC 6015	Selected Topics in Natural Product Chemistry	2-0-0-2
PSC 6016	Principles of Clinical Research: An Introduction	2-0-0-2
PSC 6201	Introduction to Pharmaceutical Sciences Research	1-0-0-1
PSC 6X02	Independent Research	2-0-0-2
PSC 6X06	Special Projects in Pharmaceutical Sciences Research	1-0-0-1
PPR 6001	Evaluation and Selection of Cardiovascular Drugs	2-0-0-2
PPR 6002	Substance Abuse, Diversion, and Addiction	3-0-0-3
PPR 6003	Case Studies in Public Health Practice	3-0-0-3
PPR 6004	Introduction to Hospice and Palliative Care	2-0-0-2
PPR 6005	Medical Informatics	2-0-0-2
PPR 6006	Geriatrics Pharmacotherapy	2-0-0-2
PPR 6007	Advanced Pain Management and Introduction to Hospice and Palliative Care	3-0-0-3
PPR 6008	Introduction to Psychosocial Pharmacy	2-0-0-2
PPR 6009	Introduction to Psychosocial Pharmacy	3-0-0-3
PPR 6010	Applied Nutrition for Chronic Diseases	2-0-0-2
PPR 6011	Complementary and Alternative Medicine	2-0-0-2
PPR 6012	Introduction to Principles in Patient Safety	2-0-0-2
PPR 6013	Literature Review and Writing Skills	3-0-0-3
PPR 6014	Pediatric Pharmacotherapy	2-0-0-2
PPR 6015	Advanced Cardiovascular Life Support (ACLS)	3-0-0-3
PPR 6016	Introduction to Postgraduate Residency Training	2-0-0-2
PPR 6017	Pediatric Pharmacotherapy	3-0-0-3
PPR 6018	Organizational Leadership	2-0-0-2
PPR 6019	Introduction to Principles in Patient Safety	3-0-0-3
PPR 6020	Disaster Management I – The Pharmaceutical Response to Disasters	2-0-0-2
PPR 6021	Disaster Management II – Social and Administrative Aspects of Disaster Management	2-0-0-2

SECOND PROFESSIONAL YEAR

Course Number	Course Name	4 Digit Code*

#List of Second Professional Year didactic course electives (Continued)

PPR 6022	Independent Study in Pharmacy Practice Research	2-0-0-2
PPR 6023	Independent Study in Pharmacy Practice Research	2-0-0-2
PPR 6024	Applied Therapeutics	2-0-0-2
PPR 6025	Applying Infectious Disease Principles to the Acute Care Patient	2-2-0-3
PPR 6026	Treating Cardiovascular Disease in Acute Care Patients	2-2-0-3
PPR 6027	Advanced Community Pharmacy Topics	2-0-0-2
PPR 6X08	Independent Research in Pharmacy Practice	3-0-0-3
PPR 6X09	Special Projects in Pharmacy Practice Research	1-0-0-1

THIRD PROFESSIONAL YEAR

Course Number	Course Name	4 Digit Code*
	Quarters One through Four	
PPR 69XX	APPE Ambulatory Care (Required)**	0-0-40-4
PPR 69XX	APPE Acute Care (Required)**	0-0-40-4
PPR 69XX	APPE Community (Required)**	0-0-40-4
PPR 69XX	APPE Institutional (Required)**	0-0-40-4
PPR 69XX	APPE electives (5 electives are required)**	0-0-40-4
PPR 6992	Pharmacy Practice X–Curriculum Summative Evaluation (Required) (Quarter Four)	4-0-0-4

Each student is required to complete an Ambulatory Care, Acute Care, Community, and Institutional APPE to be selected from the list below. In addition, each student is required to complete five (5) elective APPEs to be selected from the list below.

* **The 4 Digit Code represents the number of weekly hours of lectures, laboratory, clinical site, and the course credit hours consecutively**

** **A list of APPEs is provided below, the required four APPEs focus on Ambulatory Care, Acute Care, Community, and Institutional**

****List of APPEs**

PPR 6901	APPE Ambulatory Care	0-0-40-4
PPR 6902	APPE Acute Care	0-0-40-4
PPR 6903	APPE Community	0-0-40-4
PPR 6904	APPE Institutional	0-0-40-4
PPR 6905	APPE Advanced Community Pharmacy – Compounding	0-0-40-4
PPR 6906	APPE Behavioral Health	0-0-40-4
PPR 6907	APPE Pediatric Medicine	0-0-40-4
PPR 6908	APPE Trauma/Critical Care Medicine	0-0-40-4
PPR 6909	APPE Oncology Medicine	0-0-40-4
PPR 6910	APPE Infectious Disease Medicine	0-0-40-4
PPR 6911	APPE Long Term Care Pharmacy	0-0-40-4
PPR 6912	APPE Government/Legislative/Board of Pharmacy	0-0-40-4
PPR 6913	APPE Academic Pharmacy Practice	0-0-40-4
PPR 6914	APPE Nuclear Medicine	0-0-40-4
PPR 6915	APPE Nutrition Support	0-0-40-4
PPR 6916	APPE Veterinary Pharmacy	0-0-40-4
PPR 6917	APPE Medication Safety	0-0-40-4
PPR 6918	APPE Drug Information	0-0-40-4
PPR 6919	APPE Pharmaceutical Industry	0-0-40-4

THIRD PROFESSIONAL YEAR

Course Number	Course Name	
****List of APPEs (Continued)**		
PPR 6920	APPE Pharmacy Management	0-0-40-4
PPR 6922	APPE HIV	0-0-40-4
PPR 6923	APPE Medical Anthropology	0-0-40-4
PPR 6924	APPE Public Health	0-0-40-4
PPR 6925	APPE Drug Diversion	0-0-40-4
PPR 6926	APPE Ambulatory Care – Special Topics	0-0-40-4
PPR 6927	APPE Acute Care – Special Topics	0-0-40-4
PPR 6928	APPE Community – Special Topics	0-0-40-4
PPR 6929	APPE Institutional – Special Topics	0-0-40-4
PPR 6930	APPE Geriatric Medicine	0-0-40-4
PPR 6931	APPE Longitudinal – Special Topics	0-0-40-4
PPR 6932	APPE Pharmaceutical Science Research	0-0-40-4
PPR 6933	APPE Alternative and Complementary Medicine	0-0-40-4
PPR 6934	APPE Pharmacokinetics	0-0-40-4
PPR 6935	APPE Transplant	0-0-40-4
PPR 6936	APPE Indian Health Service	0-0-40-4
PPR 6937	APPE Cardiology Medicine	0-0-40-4
PPR 6938	APPE Pulmonary Medicine	0-0-40-4
PPR 6939	APPE Transitional Care	0-0-40-4
PPR 6940	APPE Emergency Medicine	0-0-40-4
PPR 6941	APPE Informatics	0-0-40-4
PPR 6942	APPE Community II	0-0-40-4
PPR 6943	APPE Community III	0-0-40-4
PPR 6944	APPE Institutional II	0-0-40-4
PPR 6945	APPE Hospice/Palliative Care	0-0-40-4
PPR 6946	APPE Infusion/Specialty Pharmacy	0-0-40-4
PPR 6947	APPE Community IV	0-0-40-4
PPR 6948	APPE Ambulatory Care II	0-0-40-4
PPR 6949	APPE Antimicrobial Stewardship	0-0-40-4

School of Pharmacy Required Course Descriptions

Course Descriptions for the First Year Curriculum

PSC 6110 BIOCHEMISTRY 5-0-0-5

This course presents, through lecture and problem-solving activities, basic principles and fundamental concepts of human biochemistry, including the synthesis, metabolism, physicochemical characteristics, function and interactions of amino acids & proteins; nucleotides and nucleic acids; carbohydrates, lipids, and hybrid molecules. The course emphasizes biomolecular structure, metabolic pathways and biochemical signaling processes in normal human health, perturbations of these processes in disease, and as targets for chemical/pharmacological intervention to treat, prevent or diagnosis disease.

PSC 6121 PATHOPHYSIOLOGY I 2-0-0-2

This is the first course in a three-course sequence designed to provide the pharmacy student with a basic understanding of pathophysiologic mechanisms of diseases and normal physiologic compensatory function. This will allow the student to rationally integrate the molecular and functional alterations in cells, tissues, and organ systems associated with disease with the pharmacological targets and basis of drug action introduced in the Integrated Medicinal Chemistry and Pharmacology and Pharmacotherapy course series. This first course will consider the pathophysiology of organ systems including disorders of the cardiovascular system, blood and circulatory system, acid/base/electrolyte balance, and disorders of the urinary and digestive systems.

PSC 6130 IMMUNOLOGY 3-0-0-3

This course presents the fundamentals of immunology. Included in the course is a discussion of the principles and clinical importance of immunology in relation to the structure, growth, disinfection, sterilization and genetics of bacteria, viruses and other microbial infectious, pathogenic organisms. The course also includes a review of antimicrobial/anti-infective agents and mechanisms of emerging resistance.

PSC 6141 PHARMACY CALCULATIONS 3-0-0-3

This course covers the following topics: International System of Units, pharmaceutical measurement, density and specific gravity, interpretation of prescriptions and medication orders, expressions of concentration, calculation of doses and concentrations, measures of potency, electrolyte solutions, reducing and enlarging formulas, and injectable medications including rate-of-flow. This course focuses on performing mathematical calculations useful in compounding extemporaneously prepared pharmaceutical products and provides a strong foundation in basic pharmaceutical calculations useful in practice.

PPR 6151 PHARMACY PRACTICE I -INTRODUCTION TO PHARMACY IN THE HEALTH CARE SYSTEM 3-0-0-3

This course introduces the United States health care system components, with special attention given to Medicare, Medicaid, private insurance, and an introduction to the profession of pharmacy, including the historical perspective, career opportunities, and the future of the practice of pharmacy. The student will be exposed to roles that pharmacists play in health and hospital

systems, medication distribution systems, managing medication use, impact of technology on daily functions of the health care system, and drug shortages.

PSC 6211 PATHOPHYSIOLOGY II 2-0-0-2

This is the second course in a three-course sequence designed to provide the pharmacy student with a basic understanding of pathophysiologic mechanisms of diseases and normal physiologic compensatory function. This will allow the student to rationally integrate the molecular and functional alterations in cells, tissues, and organ systems associated with disease with the pharmacological targets and basis of drug action introduced in the Integrated Medicinal Chemistry and Pharmacology and Pharmacotherapy course series. This second course will consider the pathophysiology of inflammation and healing, immunity, pain, and organ systems including disorders of the respiratory system, nervous system, and sensory organs.

PSC 6220 INTEGRATED MEDICINAL CHEMISTRY & PHARMACOLOGY I 5-0-0-5

This is the first in a three quarter course sequence that introduces and integrates the principles and concepts of medicinal chemistry and pharmacology. This course presents students a basis of understanding of how a drug molecule's chemical and physical properties affect its absorption, distribution, metabolism, and elimination. It also considers the site and mechanisms of action of selected drugs and drug classes, and the characteristic structure-activity relationships influencing drug-target interactions that, in turn, determine their pharmacodynamic effects - including adverse drug effects and interactions. The age/sex/gene-related variations that impact drug action or effectiveness are also discussed in this series.

PPR 6230 PHARMACY PRACTICE II - INTRODUCTION TO PATIENT CARE 3-0-0-3

This course focuses on patient care and applying the patient care process in the practice of pharmacy. Student pharmacists are introduced to the steps of the pharmacist's patient care process and to identifying medication-related problems. Throughout this course, student pharmacists also learn and practice skills necessary to interpret prescriptions and dispense medications.

PPR 6240 CAREER PATHS & INTRODUCTION TO PRACTICE 1-0-0-1

This introductory course teaches student pharmacists basic pharmacy practice concepts and skills associated with community and institutional practices. Examples of topics included in this course are AHA BLS certification, APhA immunization certification, HIPAA certification, Bloodborne pathogens certification, introduction to drug information and professionalism. Journaling and self-reflection are introduced in this course.

PPR 6250 PHARMACY PRACTICE III - PUBLIC HEALTH & WELLNESS 3-0-0-3

This course provides students with an overview of the core topics in public health and wellness, including epidemiology, environmental health, social and behavioral sciences, health disparities and health policy. This course also provides focused attention on the significance of the pharmacist in public health. Pharmacy students are introduced to behavioral theories and the application to culturally competent public health program design. Through the use of case studies, group discussion, and active learning exercises, the student will be able to identify and examine

public health issues and populations at risk, and the pharmacist's role in providing public health services.

PPR 6261 BASIC COMMUNICATION SKILLS FOR PHARMACY PRACTICE 2-0-0-2

This course is designed to introduce student pharmacists to basic communication skills needed for pharmacy practice by combining theory, practice, and application. The course will focus on patient-centered communication and interprofessional communication, both verbal and nonverbal, as well as specific skills such as active listening, empathy, assertiveness, and conflict resolution. Students will participate in activities throughout the course that will reinforce course content (e.g. patient interviewing and counseling). Skills learned in this course will be reinforced throughout the entire Pharm.D. curriculum.

PPR 6271 FORUM & PROFESSIONALISM I 1-0-0-1

This course is designed for the first year student to address issues related to professional conduct, ethics, career-long learning, self-awareness, diversity and cultural sensitivity, leadership, and innovation. This course prepares students for their role as pharmacists and future healthcare providers.

PSC 6311 INTEGRATED MEDICINAL CHEMISTRY & PHARMACOLOGY II 5-0-0-5

This is the second in a three quarter course sequence that integrates the principles and concepts of medicinal chemistry and pharmacology for selected drugs and drug classes. This course provides basic knowledge and builds on students' understanding of the important chemical and physical properties of a drug molecule that influence its absorption, distribution, metabolism and elimination. The course focuses on understanding the structure-activity relationships and drug-target interactions that constitute the pharmacological mechanism of action leading to the desired pharmacodynamic effects. The course series also provides the basis of understanding for adverse drug effects and interactions. The age/sex/gene-related variations that impact drug action or effectiveness are also discussed in this series.

PSC 6321 PHARMACEUTICS I 3-0-0-3

This course focuses on learning physical pharmacy concepts and developing skills on integrating physical, chemical and biological principles underlying the design and development, preparation, compounding, packaging and manufacture of therapeutically effective, pharmaceutical dosage forms. This course further emphasizes the influence of physico-chemical properties of drugs and excipients to optimize drug bioavailability and drug delivery characteristics from dosage forms. Topics covered will include key areas of pharmaceutics which influence the process of drug development, preformulation and formulation strategies, drug solubility and dissolution, solutions and ionic equilibria, pH and buffer systems, isotonicity, osmotic and thermodynamic properties of pharmaceutical systems, drug stability, drug diffusion and solid dosage form characteristics. Relevant pharmaceutical ingredients and contemporary industrial manufacturing methods will also be discussed in this course.

PSC 6330 PHARMACY DISPENSING & COMPOUNDING LAB 2-2-0-3

This laboratory course will focus on application of physicochemical properties of drugs and excipients, including appropriate pharmaceutical calculations, relevant to extemporaneous preparation and compounding of conventional and specialized non-sterile drug preparations, typically encountered by practicing pharmacists in compounding pharmacy settings. Students will compound, package, and appropriately label their individually prepared drug products: solutions, gels, suspensions, emulsions, ointments, creams, pastes, lotions, suppositories, troches, lollipops, capsules, and effervescent powders. Flavoring, coloring, and taste-masking strategies to achieve patient compliance will also be incorporated during compounding techniques.

PSC 6350 PATHOPHYSIOLOGY III 2-0-0-2

This is the third course in a three-course sequence designed to provide the pharmacy student with a basic understanding of pathophysiologic mechanisms of diseases and normal physiologic compensatory function. This will allow the student to rationally integrate the molecular and functional alterations in cells, tissues, and organ systems associated with disease with the pharmacological targets and basis of drug action introduced in the Integrated Medicinal Chemistry and Pharmacology and Pharmacotherapy course series. This third course will consider the pathophysiology of diseases and systems including neoplasms and cancer, infection, disorders of the musculoskeletal, endocrine, and reproductive systems.

PPR 6340 CLINICAL LABORATORY MEDICINE 2-0-0-2

This course introduces students to clinical laboratory diagnostic tests. The basic theory, selection, and interpretation of procedures most commonly used in a primary care setting and case presentations are studied. Students study techniques used to obtain, preserve, and handle laboratory specimens as well as use clinical laboratory results to screen, diagnose, evaluate, and monitor patients. Students gain familiarity with Occupational Safety & Health Administration (OSHA) requirements and Clinical Laboratory Improvement Amendments (CLIA) and their implications for laboratory medicine.

PPR 6361 INTRODUCTORY PHARMACY PRACTICE EXPERIENCE I 0-0-9-3

This sequence of courses gives student pharmacists, in their first and second years of the curriculum, experiences in independent community pharmacy, chain community pharmacy, and institutional pharmacy allowing them to achieve educational outcomes in the areas of patient care and pharmacy practice. The students will spend 8 contact hours, one day a week, at the assigned location for 10 consecutive weeks. This sequence will occur during the 3rd, 4th, and 5th quarters. The location will change each quarter, allowing the student exposure to three diverse pharmacy practice environments. Student pharmacists will learn the basic distributive, dispensing, and administrative processes in the assigned practice setting gaining initial experience interacting with patients, preceptors, technicians and other pharmacy personnel. Students will document their experiences, activities and outcomes achievement.

PSC 6410 INTEGRATED MEDICINAL CHEMISTRY & PHARMACOLOGY III 5-0-0-5

This is the last of a three quarter course sequence that integrates the principles and concepts of medicinal chemistry and pharmacology for selected drugs and drug classes. This course provides

basic knowledge and builds on students' understanding of the important chemical and physical properties of a drug molecule that influence its absorption, distribution, metabolism and elimination. The course focuses on understanding the structure-activity relationships and drug-target interactions that constitute the pharmacological mechanism of action leading to the desired pharmacodynamic effects. The course series also provides the basis of understanding for adverse drug effects and interactions. The age/sex/gene-related variations that impact drug action or effectiveness are also discussed in this series. Basic principles of toxicology are also presented in this final course.

PSC 6420 PHARMACEUTICS II 4-0-0-4

This course integrates physical, chemical and biological principles underlying the design, preparation and manufacture of pharmaceutical dosage forms and drug delivery systems. Topics covered include liquid dosage forms, disperse systems and semisolids, transdermal drug delivery systems, parenteral dosage forms, pulmonary and nasal drug delivery systems, pharmaceutical inserts, novel drug delivery systems, and products of biotechnology.

PSC 6430 STERILE PRODUCTS 1-2-0-2

This laboratory course builds upon the Pharmacy Dispensing and Compounding Lab with a focus on sterile products from the time of receipt of an order for a sterile product through the preparation and dispensing of the finished product. Pharmacy calculations, chemical interactions and stability of the finished product are reviewed. Students learn requirements for a sterile product preparation area, including equipment in the area, and aseptic techniques for compounding piggyback medications, large volume parenterals, parenteral nutrition and sterile irrigation solutions. Review of special procedures and equipment for hazardous product preparation, including chemotherapy, will be included. Students will learn the importance of in-line filters, specialized infusion tubing and protecting certain products from environmental exposure. Technologies such as the central line, PIC lines, infusion ports, and peripheral catheters used in administering sterile products, and OSHA standards for healthcare workers and patients, are addressed.

PSC 6440 BASIC BIOPHARMACEUTICS & PHARMACOKINETICS 3-0-0-3

This course provides a conceptual and quantitative background in pharmacokinetic theory and applications needed to pursue advanced studies in clinical pharmacokinetics. The impact of drug data such as physicochemical characteristics, dosage forms, and routes of administration as well as the impact of patient factors such as gastrointestinal, hepatic, and renal function on drug disposition are examined and modeled. Pharmacokinetic, pharmacodynamic, and pharmacogenetic factors and parameters are introduced and calculated as they relate to drug absorption, distribution, metabolism, and elimination.

PPR 6451 INTRODUCTORY PHARMACY PRACTICE EXPERIENCE II 0-0-9-3

This sequence of courses gives student pharmacists, in their first and second years of the curriculum, experiences in independent community pharmacy, chain community pharmacy, and institutional pharmacy allowing them to achieve educational outcomes in the areas of patient care and pharmacy practice. The students will spend 8 contact hours, one day a week, at the assigned location for 10 consecutive weeks. This sequence will occur during the 3rd, 4th, and 5th quarters. The location will change each quarter, allowing the student exposure to three diverse pharmacy practice environments. Student pharmacists will learn the basic distributive, dispensing, and

administrative processes in the assigned practice setting gaining initial experience interacting with patients, preceptors, technicians and other pharmacy personnel. Students will document their experiences, activities and outcomes achievement.

Course Descriptions for the Second Year Curriculum

PPR 6510 PHARMACY PRACTICE IV - RESEARCH METHODS AND BIOSTATISTICS 3-0-0-3

The aim of this course is to familiarize students with the pros and cons (including potential problems and pitfalls) that different research methodologies present, and to indicate ways in which these are addressed. The students will formulate a focused research question and improve their critical evaluation skills. The course provides students with the knowledge and skills needed to read, interpret, and evaluate quantitative findings found in evidence-based pharmacy and medical literature. It emphasizes recognizing and applying the correct quantitative methods to assist in evaluating observed data and professional practice decision-making.

PPR 6540 PHARMACY PRACTICE V - PHARMACY MANAGEMENT 3-0-0-3

The purpose of this course is to introduce the basic principles of management as they apply in pharmacy practice settings in an ever-changing health care environment. These principles include financial analysis, strategic planning, leadership, organizational design, quality control, supervision, personal motivation and management. The course addresses those who will be entrepreneurs, own or lease a pharmacy, practice in a hospital or community pharmacy, or want to develop and establish a new pharmacy.

PPR 6550 DRUG INFORMATION RETRIEVAL & EVALUATION 3-0-0-3

This course serves as an introduction to the principles of drug information and literature retrieval and evaluation. Students learn how to answer drug information questions, differentiate types of medical and scientific literature, search and retrieve information, write a drug monograph, report an adverse drug reaction, prepare a presentation to a Pharmacy and Therapeutics Committee, present an article via journal club presentation, and effectively communicate drug information.

PPR 6561 INTRODUCTORY PHARMACY PRACTICE EXPERIENCE III 0-0-9-3

This sequence of courses gives student pharmacists, in their first and second years of the curriculum, experiences in independent community pharmacy, chain community pharmacy, and institutional pharmacy allowing them to achieve educational outcomes in the areas of patient care and pharmacy practice. The students will spend 8 contact hours, one day a week, at the assigned location for 10 consecutive weeks. This sequence will occur during the 3rd, 4th, and 5th quarters. The location will change each quarter, allowing the student exposure to three diverse pharmacy practice environments. Student pharmacists will learn the basic distributive, dispensing, and administrative processes in the assigned practice setting gaining initial experience interacting with patients, preceptors, technicians and other pharmacy personnel. Students will document their experiences, activities and outcomes achievement.

PPR 6570 PHARMACOTHERAPY I 4-0-0-4

Pharmacotherapy I is the first course in a six-course Pharmacotherapy series. The series of courses occur during the second professional year of the PharmD program. The courses in the Pharmacotherapy course series are designed to develop the student's knowledge of pharmacotherapy and to develop the ability to apply pharmacotherapy concepts and principles to different disease states. The course sequence reinforces pathophysiology and pharmacology and emphasizes clinical symptomatology; diagnostic testing and diagnosis; therapeutic agents and evidence based medicine supporting agents use; applicable clinical practice guidelines; and therapeutic drug monitoring for each disorder/condition.

PPR 6590 CLINICAL ABILITIES LAB I 0-4-0-2

Clinical Abilities Lab I is the first course in the Clinical Abilities Lab series. The series of courses occur during the second professional year of the PharmD curriculum. This lab-based course provides students with hands-on experiences and practice to achieve proficiency in the abilities, through integration of knowledge, skills, behaviors, and values, that are essential for a pharmacy practitioner to provide patient care using the pharmacists' patient care process. The Clinical Abilities Lab also provides students opportunities to practice and develop trustworthiness when performing entrustable professional activities (EPAs). Students will apply and integrate knowledge from the Pharmacotherapy course sequence to patient cases. Throughout the Clinical Abilities Lab series, students will practice communication with patients and other health care providers, educating patients and caregivers on medications and self-monitoring devices, patient interviewing skills, physical assessment, performing prescription drug utilization reviews, and prescription verification. Knowledge of commonly prescribed medications, drug information, biostatistics, pharmacy law, and pharmacy calculations are reinforced.

PPR 6631 SELF-CARE I 2-0-0-2

This is the first of a two-part course series that evaluates the use of nonprescription drug therapies and complementary and alternative medicines in the use of self-care. Throughout the course series, students will learn to evaluate a patient's appropriateness for self-care, and if appropriate, recommend a treatment plan. This course also covers the use of home diagnostic and monitoring devices used in preventive healthcare or in the treatment of common self-care conditions.

PPR 6640 PHARMACY PRACTIVE VI - PHARMACOECONOMICS & OUTCOMES ASSESSMENT 3-0-0-3

Pharmacoeconomic approaches are increasingly being found in medical and health outcomes research and used as a tool for health care decision making process. This course introduces the basic concepts, terminology, and methods associated with pharmacoeconomic studies. Students understand and review the principles of pharmacoeconomics and discuss their application to the evaluation of medication use and treatment outcomes, how these tools are used in practice and factors that limit their use or interpretation. Students learn the role of study perspective in the selection of cost/consequence parameters and the impact on study design and interpretation of results. The course reviews and compares the commonly used generic and disease-specific measures of health-related quality of life measures. The students examine the definitions for and methods of establishing the validity and reliability of a health-related quality of life measure. Application and reinforcement of pharmacoeconomics will continue throughout the pharmacotherapy series.

PPR 6650 CLINICAL PHARMACOKINETICS AND PHARMACOGENOMICS 3-0-0-3

This course enables students to critically apply knowledge from basic pharmaceutical sciences, mathematical modeling, and pharmacotherapy courses at a higher level of sophistication in order to optimize drug therapy for individual patients and diverse populations. The focus of this course is on initiating and adjusting individualized drug dosage regimens for selected medications based on targeted and measured drug plasma levels, patient's demographics, organ function, concomitant medications and disease states, and overall patient's response to drug therapy. Altered drug disposition in special patient populations such as pediatrics, geriatrics, obesity, and those with renal or hepatic dysfunction is also addressed.

PPR 6670 PHARMACOTHERAPY II 4-0-0-4

Pharmacotherapy II is the second course in a six-course Pharmacotherapy series. The series of courses occur during the second professional year of the PharmD program. The courses in the Pharmacotherapy course series are designed to develop the student's knowledge of pharmacotherapy and to develop the ability to apply pharmacotherapy concepts and principles to different disease states. The course sequence reinforces pathophysiology and pharmacology and emphasizes clinical symptomatology; diagnostic testing and diagnosis; therapeutic agents and evidence based medicine supporting agents use; applicable clinical practice guidelines; and therapeutic drug monitoring for each disorder/condition.

PPR 6680 PHARMACOTHERAPY III 4-0-0-4

Pharmacotherapy III is the third course in a six-course Pharmacotherapy series. The series of courses occur during the second professional year of the PharmD program. The courses in the Pharmacotherapy course series are designed to develop the student's knowledge of pharmacotherapy and to develop the ability to apply pharmacotherapy concepts and principles to different disease states. The course sequence reinforces pathophysiology and pharmacology and emphasizes clinical symptomatology; diagnostic testing and diagnosis; therapeutic agents and evidence based medicine supporting agents use; applicable clinical practice guidelines; and therapeutic drug monitoring for each disorder/condition.

PPR 6690 CLINICAL ABILITIES LAB II 0-4-0-2

Clinical Abilities Lab II is the second course in the Clinical Abilities Lab series. The series of courses occur during the second professional year of the PharmD curriculum. This lab-based course provides students with hands-on experiences and practice to achieve proficiency in the abilities, through integration of knowledge, skills, behaviors, and values, that are essential for a pharmacy practitioner to provide patient care using the pharmacists' patient care process. The Clinical Abilities Lab also provides students opportunities to practice and develop trustworthiness when performing entrustable professional activities (EPAs). Students will apply and integrate knowledge from the Pharmacotherapy course sequence to patient cases. Throughout the Clinical Abilities Lab series, students will practice communication with patients and other health care providers, educating patients and caregivers on medications and self-monitoring devices, patient interviewing skills, physical assessment, performing prescription drug utilization reviews, and prescription verification. Knowledge of commonly prescribed medications, drug information, biostatistics, pharmacy law, and pharmacy calculations are reinforced.

PPR 6751 SELF-CARE II 3-0-0-3

This is the second of a two-part course series that evaluates the use of nonprescription drug therapies and complementary and alternative medicines in the use of self-care. Throughout the course series, students will learn to evaluate a patient's appropriateness for self-care, and if appropriate, recommend a treatment plan. This course also covers the use of home diagnostic and monitoring devices used in preventive healthcare or in the treatment of common self-care conditions.

PPR 6760 CLINICAL SEMINAR I 1-0-0-1

This course is the first of a two part series, and provides the formal instruction component of the series. In this class, students receive instruction on the preparation of formal clinically-oriented presentations, including drug information responses, patient questions in the community environment and case presentations. These activities are devised to prepare students to formulate and present formalized patient data to other healthcare professionals as well as patients.

PPR 6770 PHARMACOTHERAPY IV 4-0-0-4

Pharmacotherapy IV is the fourth course in a six-course Pharmacotherapy series. The series of courses occur during the second professional year of the PharmD program. The courses in the Pharmacotherapy course series are designed to develop the student's knowledge of pharmacotherapy and to develop the ability to apply pharmacotherapy concepts and principles to different disease states. The course sequence reinforces pathophysiology and pharmacology and emphasizes clinical symptomatology; diagnostic testing and diagnosis; therapeutic agents and evidence based medicine supporting agents use; applicable clinical practice guidelines; and therapeutic drug monitoring for each disorder/condition.

PPR 6780 PHARMACOTHERAPY V 4-0-0-4

Pharmacotherapy V is the fifth course in a six-course Pharmacotherapy series. The series of courses occur during the second professional year of the PharmD program. The courses in the Pharmacotherapy course series are designed to develop the student's knowledge of pharmacotherapy and to develop the ability to apply pharmacotherapy concepts and principles to different disease states. The course sequence reinforces pathophysiology and pharmacology and emphasizes clinical symptomatology; diagnostic testing and diagnosis; therapeutic agents and evidence based medicine supporting agents use; applicable clinical practice guidelines; and therapeutic drug monitoring for each disorder/condition.

PPR 6790 CLINICAL ABILITIES LAB III 0-4-0-2

Clinical Abilities Lab III is the third course in the Clinical Abilities Lab series. The series of courses occur during the second professional year of the PharmD curriculum. This lab-based course provides students with hands-on experiences and practice to achieve proficiency in the abilities, through integration of knowledge, skills, behaviors, and values, that are essential for a pharmacy practitioner to provide patient care using the pharmacists' patient care process. The Clinical Abilities Lab also provides students opportunities to practice and develop trustworthiness when performing entrustable professional activities (EPAs). Students will apply and integrate knowledge from the Pharmacotherapy course sequence to patient cases. Throughout the Clinical Abilities Lab series, students will practice communication with patients and other health care providers, educating patients and caregivers on medications and self-monitoring devices, patient interviewing skills, physical assessment, performing prescription drug utilization reviews, and

prescription verification. Knowledge of commonly prescribed medications, drug information, biostatistics, pharmacy law, and pharmacy calculations are reinforced.

PPR 6840 PHARMACY PRACTICE VIII - PHARMACY ETHICS & LAW 3-0-0-3

This course consists of a study of federal and state pharmacy, drug, and related laws. Through self-study, lecture, and case studies, students learn the substance of these laws and application to pharmacy practice. Discussion of societal and health care system issues, such as abortion and the right to die, demonstrates the broader societal role of the pharmacist. In light of continuing expansion of the pharmacist's role in the delivery of healthcare services, attention is given to ethical and legal issues surrounding direct patient care services, including an examination of professional liability (civil, criminal, and disciplinary). While the importance of the above issues has grown significantly in very recent years, these issues have not displaced the need to study the expansive body of traditional pharmacy and drug law.

PPR 6851 INTRODUCTORY PHARMACY PRACTICE EXPERIENCE IV: LONGITUDINAL SERVICE LEARNING AND SIMULATION 0-0-3-1

Service learning provides the student pharmacist opportunities to learn personal and professional skills while providing the community with needed services. This course is a longitudinal course in which the student pharmacist will be introduced to in the second quarter of the Doctor of Pharmacy curriculum. This course will reinforce learning from the classroom and problem-based simulations with community based needs in the patient-care environment. This course will involve learning extended beyond the classroom and will culminate at the end of the didactic curriculum.

PPR 6860 CLINICAL SEMINAR II 1-0-0-1

This course is the second of a two part series, and provides the formal instruction component of the series. In this class, students receive instruction on the preparation of formal clinically-oriented presentations, including drug information responses, patient questions in the community environment and case presentations. These activities are devised to prepare students to formulate and present formalized patient data to other healthcare professionals as well as patients.

PPR 6861 APPE READINESS 1-0-0-1

This course is designed to help prepare students for advanced pharmacy practice experiences (APPEs) by supporting student development of professional attitudes and behaviors that are expected of pharmacists. Topics covered within this course include, but are not limited to professionalism, ethic, career development, and advocacy.

PPR 6870 PHARMACOTHERAPY VI 4-0-0-4

Pharmacotherapy VI is the sixth course in a six-course Pharmacotherapy series. The series of courses occur during the second professional year of the PharmD program. The courses in the Pharmacotherapy course series are designed to develop the student's knowledge of pharmacotherapy and to develop the ability to apply pharmacotherapy concepts and principles to different disease states. The course sequence reinforces pathophysiology and pharmacology and emphasizes clinical symptomatology; diagnostic testing and diagnosis; therapeutic agents and evidence based medicine supporting agents use; applicable clinical practice guidelines; and therapeutic drug monitoring for each disorder/condition.

PPR 6890 CLINICAL ABILITIES LAB IV 0-4-0-2

Clinical Abilities Lab IV is the fourth course in the Clinical Abilities Lab series. The series of courses occur during the second professional year of the PharmD curriculum. This lab-based course provides students with hands-on experiences and practice to achieve proficiency in the abilities, through integration of knowledge, skills, behaviors, and values, that are essential for a pharmacy practitioner to provide patient care using the pharmacists' patient care process. The Clinical Abilities Lab also provides students opportunities to practice and develop trustworthiness when performing entrustable professional activities (EPAs). Students will apply and integrate knowledge from the Pharmacotherapy course sequence to patient cases. Throughout the Clinical Abilities Lab series, students will practice communication with patients and other health care providers, educating patients and caregivers on medications and self-monitoring devices, patient interviewing skills, physical assessment, performing prescription drug utilization reviews, and prescription verification. Knowledge of commonly prescribed medications, drug information, biostatistics, pharmacy law, and pharmacy calculations are reinforced.

Course Descriptions for the Third Year Curriculum

PPR 6901-6949 ADVANCED PHARMACY PRACTICE EXPERIENCE 0-0-40-4

The overall purpose of the advanced pharmacy practice experience (APPE) is for the student pharmacist to develop, practice, and gain confidence in clinical decision-making skills for managing pharmacotherapy in a variety of patient populations. APPE courses generally involve direct patient care utilizing the Pharmacist Patient Care Process (PPCP). Students are evaluated via Entrustable Professional Activities (EPAs) to gain professional skills in various pharmacy practice experiences. Student evaluations are mapped to the corresponding EPA value gauging their readiness for practice. The student also develops inter-professional relationships within the various practices. The PPCP and EPAs are explained at the beginning of each student evaluation for clarity.

PPR 6992 PHARMACY PRACTICE X - CURRICULUM SUMMATIVE EVALUATION 4-0-0-4

During the advanced pharmacy practice experiences, students continue their development by participating in several activities such as interprofessional education and collaboration activities, job application workshop, and discuss post-graduate professional and financial decisions. Students also reflect on curriculum components by reviewing and assessing performance in several topics. Activities in this course prepare students to become practitioners.

School of Pharmacy Elective Course Descriptions

PSC 6001 INTRODUCTION TO PHARMACEUTICAL ANALYSIS 3-0-0-3

Through didactic instruction and laboratory experience, this practical course introduces the pharmacy student to analysis of critical quality and performance characteristics of pharmaceutical dosage forms. Students will learn, perform and interpret selected standard, compendial, chemical and physical tests of drug products and intermediates such as hardness, friability, disintegration, dissolution, content uniformity, dosage form potency, suspension stability/homogeneity, and moisture content (KF). The principles of cGMP in pharmaceutical testing will be presented, as well as the importance of product specifications. Practical considerations for API and product stability testing, including the concept of stability indicating methods, will be discussed.

PSC 6003 BASIC PRINCIPLES OF TOXICOLOGY 3-0-0-3

This course introduces the student to the basic principles of toxicology, including the absorption and disposition of toxicants, mechanisms of toxicity, and non-specific toxicity such as carcinogenesis, gene and developmental toxicity; as well as characteristic target-organ toxicity. The course presents the hallmark toxic responses and mechanisms of action of specific classes of toxicants, including drugs, pesticides, and environmental and industrial agents; with discussion of standards of treatment and support of the poisoned patient. Concepts and insights into fields of applied toxicology (forensic, clinical, and occupational) will be introduced and discussed.

PSC 6004 DRUG DISCOVERY, DEVELOPMENT AND REGULATION 2-0-0-2

This elective course provides the student a detailed overview of, and insights into how, a drug is discovered and the number and types of nonclinical and clinical studies that are conducted before it can be approved for human use. It also considers the role of regulatory bodies in providing oversight of drug safety and efficacy, as well as illustrates the relationships between and integration of all of these scientific, strategic and regulatory processes.

PSC 6005 INTRODUCTION TO THE RESPONSIBLE CONDUCT OF RESEARCH 2-0-0-2

This course will provide an introduction to the key aspects of conducting responsible research in the current environment and under governmental policies. In particular, we will discuss the role of a principal investigator in overseeing and conducting research in order to avoid situations that would result in legal findings of misconduct. Six major sections will be covered, which include: protection of human subjects, responsible use of animals in research, data management practices, authorship and publications, conflict of interest, and collaboration and mentorship in research.

PSC 6007 INTRODUCTION TO NEUROLOGY 3-0-0-3

This course consists of an in-depth study of neuroanatomy and physiology, neurological development, psychosocial aspects of neurological disability/diseases, and treatment principles: Topics that will provide the foundation of understanding neurology and pharmacotherapy of neurological disorders. Discussions will focus on common acute and chronic neurological disabilities and case studies, as well as recent medical/pharmacological advances in the prevention and treatment of neurological problems.

PSC 6008 BASICS IN PHARMACEUTICAL RESEARCH 3-0-0-3

This course provides an overview and basic exposure to pharmaceutical research and related outcomes. The student will gain an understanding of the basic and clinical research that goes into developing a drug from initial discovery through pre-clinical and clinical studies, FDA approval and onto the market. This will be followed by the student selecting a drug to research in order to present a summary of how that particular drug went through the drug approval process. The basics of research design will be presented and discussed as the cornerstone to productive pharmaceutical research. The student will spend time in the laboratory to enhance their understanding of techniques/methods used in pharmaceutical research. This course will also prepare the student to critically analyze research articles and be able to present the key aspects of research methodology, results, statistical analyses, and conclusions that are part of research publications. Other topics that will be covered include the importance of ethical conduct in research, the rise of biological agents in pharmacy, as well as funding and career opportunities for

pharmacists interested in pharmaceutical research. This course will be of interest to those interested in understanding or pursuing basic science or clinical research as well as those who will be involved in clinical trials.

PSC 6009 MEDICAL VIROLOGY 3-0-0-3

This course will combine the molecular and clinical aspects of virology, thus providing a balanced approach to Medical Virology. This course provides an understanding of viral structure and pathogenesis. While it is focused almost entirely on viruses that infect humans and cause serious disease, it will also discuss virus-like agents (prions, viroids, etc.). In addition to traditional topics, this course will explain trends in Virology, including: virus-based gene therapy; modern advances in vaccinology; "oncolytic" viruses to treat cancers; emerging viruses and potential bioterrorism agents.

PSC 6010 CRITICAL EVALUATION OF MOLECULAR THERAPEUTICS 3-0-0-3

Critical Evaluation of Molecular Therapeutics is an adaptive elective course designed to facilitate the students' professional development into competent pharmacists and acquisition of lifelong learning skills. Using a student-centered and team-based learning approaches, the delivery of course content relies heavily on case-based learning and critical evaluation and presentation of patient cases and primary literature using journal clubs. This course consists of patient case discussions, in-class team activities, critical evaluation of primary literature (pre-clinical and translational studies, and clinical trials), and journal clubs. Emphasis is placed on discussing molecular aspects of disease pathogenesis, appropriateness of therapeutic approaches, evaluation of current guidelines and literature, and identifying novel therapeutic strategies. The course is conducted at an Advanced Pharmacy Practice Experience (APPE, P3 year) level with performance-based adjustments to the content and weekly schedule. Thus, by creating an active learning environment that challenges students and promotes cooperation as a team, students improve their critical thinking, clinical reasoning, critical evaluation, and communication skills.

PSC 6011 ADVANCED COMPOUNDING OF HUMAN AND VETERINARY PHARMACEUTICAL PRODUCTS 2-0-0-2

This course integrates concepts of dosage form design with the science and art of compounding medications. An emphasis on appropriate uses of excipients will enable students to better understand formulative aspects of medications that they will dispense. This can potentially make the students better pharmacists as they counsel to patients and other health care professionals.

PSC 6012 INDEPENDENT STUDY IN PHARMACEUTICAL SCIENCES 2-0-0-2

Independent Study in Pharmaceutical Sciences is a specialized course of study providing individual instruction to students in the Concentration in Pharmaceutical Sciences and Pharmacy Research program, that specifically address a didactic need in the student's area of research, not otherwise offered as an elective by the School of Pharmacy.

Prerequisites: Good standing in the Concentration in Pharmaceutical Sciences and Pharmacy Research. Completion and approval of: PSC 6012 and PSC 6013 Independent Study in Pharmaceutical Sciences Consent and Authorization Form.

PSC 6013 INDEPENDENT STUDY IN PHARMACEUTICAL SCIENCES 2-0-0-2

Independent Study in Pharmaceutical Sciences is a specialized course of study providing individual instruction to students in the Concentration in Pharmaceutical Sciences and Pharmacy

Research program, that specifically address a didactic need in the student's area of research, not otherwise offered as an elective by the School of Pharmacy.
Prerequisites: Good standing in the Concentration in Pharmaceutical Sciences and Pharmacy Research. Completion and approval of: PSC 6012 and PSC 6013 Independent Study in Pharmaceutical Sciences Consent and Authorization Form.

PSC 6014 INTRODUCTION TO BIOLOGICS AND BIOSIMILARS 3-0-0-3
This course is designed to introduce the student to the scientific principles that guide the development and manufacture of biological therapeutics (biologics) and their corresponding biosimilar analogs. Furthermore, the student will be exposed to (1) the regulatory requirements that must be met before a biologic is approved, (2) the regulatory requirements before a biosimilar is approved, (3) the differences between a biologic and a biosimilar as well as, (4) the issues associated with the use of biologics and biosimilars in a clinical setting. In addition, concepts regarding the substitution of a corresponding biosimilar for the Innovator's biologic, the interchangeability of the biosimilar, and the ethical use of biosimilars will be presented.

PSC 6015 SELECTED TOPICS IN NATURAL PRODUCT CHEMISTRY 2-0-0-2
Natural products chemistry is the chemistry of metabolite products from natural resources such as plants, animals and microorganisms. Students will be introduced to current theory and research in the field of natural product chemistry. This course is designed to introduce a number of selected classes of bioactive novel compounds isolated from natural resources. In the meanwhile, the students will also be exposed briefly to (1) the general isolation methods used to isolate natural products, (2) spectral methods used to identify new compounds, and (3) examples of structural modifications of lead compounds in new drug development. It is expected that the students will also work in small groups or participate in cooperative group learning sessions to discuss on the importance of natural product chemistry and structure elucidation methods. Specifically, this course covers: (1) basic techniques of natural product extraction and isolation; (2) alkaloids; (3) terpenoids; (4) flavonoids; (5) bioactive peptides and proteins; and (6) bioactive nucleosides and nucleotides.

PSC 6016 PRINCIPLES OF CLINICAL RESEARCH: AN INTRODUCTION 2-0-0-2
This course will provide students enrolled in healthcare professions and in particular those enrolled in the pre-pharmacy and pharmacy programs, an overview of the complex process and procedures required to evaluate the safety, toxicity, and efficacy of a drug in human subjects and patients. This course will walk students through animal testing requirements, design of clinical studies, protocol development, institutional review board approval, establishment of data safety monitoring boards, subject and patient enrollment, study conduct and monitoring, and regulatory requirements for the evaluation and registration of human pharmaceutical products.

PSC 6201 INTRODUCTION TO PHARMACEUTICAL SCIENCES RESEARCH 1-0-0-1
This course is required for students who are interested in considering applying for admission to the Concentration in Pharmaceutical Sciences Research. Students will be introduced to the broad range of research that occurs in the pharmaceutical sciences including areas of medicinal chemistry and drug design, pharmaceutical technologies, drug product development, molecular pharmacology, DMPK, and toxicology. Pharmaceutical Sciences faculty will provide an overview

of their research interests and related potential lines of investigation within the capabilities of the School of Pharmacy that may be of interest to student researchers.
Prerequisites: First quarter, Doctor of Pharmacy GPA of 3.0 or better with no first quarter course grades less than B, and permission of the Chair, Department of Pharmaceutical Sciences.

PSC 6X02 INDEPENDENT RESEARCH 2-0-0-2
This research elective course provides professional pharmacy students with experiential opportunities in laboratory research in the pharmaceutical sciences. Through the student's self-directed initiative and expertise of a faculty mentor, the student will advance the student's knowledge, research acumen and technical skill set in a defined area of pharmaceutical sciences research.

PSC 6X06 SPECIAL PROJECTS IN PHARMACEUTICAL SCIENCES RESEARCH 1-0-0-1
The course provides the pharmacy student an opportunity for direct participation in various aspects of pharmaceutical sciences research under the supervision of Pharmaceutical Sciences faculty. Student activities may range from focused, topical review of scientific literature, to hands-on experience with a variety of laboratory techniques and instrumentation.

PPR 6001 EVALUATION AND SELECTION OF CARDIOVASCULAR DRUGS 2-0-0-2
This is a self-study course involving writing approximately a 10-page paper that either evaluates the role of a new cardiovascular drug in therapy or explores the effect of drugs on the heart. The topics should be focused, and go beyond the material offered in the prerequisite. It is the intent of this course to develop critical thinking skills in evaluating the cardiovascular effects of drugs, utilizing recent primary literature. The student will demonstrate in-depth knowledge of pathophysiology, pharmacology, therapeutics and, when applicable, pharmacoeconomics. The final paper will be well-referenced, thorough and accurate in its description of the cardiovascular drug and/or topic selected.

PPR 6002 SUBSTANCE ABUSE, DIVERSON AND ADDICTION 3-0-0-3
This course provides the student with essential pharmacological, medical, and legal knowledge to impact patient care regarding prescription and non-prescription drugs of abuse and misuse. This course prepares the student with knowledge and skills to conduct conversations with patients, families and other healthcare professionals regarding the abuse, misuse and addiction of medications and other substances. The students also learn prevention and diversion strategies aimed at reducing medication abuse and misuse.

PPR 6003 CASE STUDIES IN PUBLIC HEALTH PRACTICE 3-0-0-3
This course provides students with an opportunity to apply knowledge and skills relevant to public health practice, such as, social determinants, outbreak investigation, policy analysis, regulatory decision-making, ethics, program development, program evaluation, screening programs, working with stakeholders, social marketing, health risk communication, and emergency preparedness. The core disciplinary competencies in public health are covered in detail in these cases. Discussing these cases will provide students with an approach for developing competency in communication, diversity and culture, leadership, professionalism, program planning, and systems thinking.

PPR 6004 INTRODUCTION TO HOSPICE AND PALLIATIVE CARE 2-0-0-2
This course introduces students to hospice and palliative care. Students learn how medication therapy changes as a patient's condition, goals of care, and prognosis change. Students are introduced to management of both common diagnoses and symptoms in hospice and palliative care patients. Small ethical discussions involving appropriate therapy at the end of life occur. The course gives students the opportunity to practice looking up drug information questions and giving verbal pharmacotherapy recommendations.

PPR 6005 MEDICAL INFORMATICS 2-0-0-2
This course provides an introduction to medical informatics and use of related technologies in the provision of healthcare with a focus on electronic health records, computerized order entry with medical logic modules, evidence based medicine and clinical practice guidelines , pharmacy systems and E-prescribing, health information exchange, telehealth, medical mobile technology, and consumer health informatics.

PPR 6006 GERIATRICS PHARMACOTHERAPY 2-0-0-2
This course is designed to introduce the student to the physiologic, pharmacologic and sociologic aspects of aging and to allow the student to gain a rudimentary appreciation and understanding of drug therapy issues to consider in the elderly. The course will focus on: 1) physiological and practical aspects of medication use in the elderly, 2) the pharmacist's role in geriatric care, and 3) the management of disease states and syndromes most commonly encountered in the elderly. The use of a case study format in class along with didactic presentations will allow the student to gain experience in designing and monitoring drug regimens for the geriatric patient.

PPR 6007 ADVANCED PAIN MANAGEMENT AND INTRODUCTION TO HOSPICE AND PALLIATIVE CARE 3-0-0-3
This course builds on the foundational knowledge about pain management taught in PPR 6710. Students will go over cases and concepts about pain management in more depth than covered in PPR 6710. This course also introduces students to hospice and palliative care. Students learn how medication therapy changes as a patient's condition, goals of care, and prognosis change. Students are introduced to management of both common diagnoses and symptoms in hospice and palliative care patients. Small ethical discussions involving appropriate therapy at the end of life occur. The course gives students the opportunity to practice looking up drug information questions and giving verbal pharmacotherapy recommendations.

PPR 6008 INTRODUCTION TO PSYCHOSOCIAL PHARMACY 2-0-0-2
This course is designed to introduce the student to the behavioral and social aspects of patient care. With the advent of the collaborative model of health care, it is imperative that today's pharmacist is equipped to provide optimum patient care within a psychosocial framework. This course provides an introduction to multiple aspects of the psychosocial approach to health care, including interprofessional communication in drug therapy management, the patient's role in treatment decisions, psychosocial determinants of medication adherence, ethical issues of pharmaceutical care, and developments in behavioral medicine.

PPR 6009 INTRODUCTION TO PSYCHOSOCIAL PHARMACY 3-0-0-3
This course is designed to introduce the student to the behavioral and social aspects of patient care. With the advent of a more patient-centered collaborative model of health care, it is imperative that

today's pharmacist is equipped to provide optimum patient care within a psychosocial framework. This course provides an introduction to multiple aspects of the psychosocial approach to health care, including the patient's role in treatment decisions, psychosocial determinants of medication adherence, self-awareness of the pharmacist, and ethical issues of pharmaceutical care.

PPR 6010 APPLIED NUTRITION FOR CHRONIC DISEASES 2-0-0-2

In this course, students will learn about the importance of nutritional management for common disease states. Students will be introduced to basic concepts regarding nutrition and the GI system. Students will be exposed to the metabolism of macronutrients, vitamins, minerals, and dietary supplements. Students will gain experience on how to counsel patients on specific dietary measures for various disease states. Utilizing weekly food diaries, students will gain an understanding of the challenges patients undergo while modifying their dietary habits. Nutritional management for the following disease states will be covered: cardiovascular disease, diabetes, gastrointestinal disorders, hepatic and renal disease, and obesity.

PPR 6011 COMPLEMENTARY AND ALTERNATIVE MEDICINE 2-0-0-2

With the increased focus on patient-centered care, it is imperative that our pharmacy students are introduced to additional concepts and applications of complementary and alternative medicine. Patients often look beyond the treatment modalities of Western medicine when seeking improved health and quality of life. This course will allow the student to become aware of the multiple methods of treatment that patients my implement in their care. The course builds upon the courses Self-Care and Non-Prescription Therapies and Complementary and Natural Medicine. The course focuses upon dietary supplements, complementary and natural medicines, and homeopathic remedies commonly used in patient care, the relationship of complementary and natural medicines, including alternative medicines, to traditional medicine and concomitant use with traditional medicine is examined.

PPR 6012 INTRODUCTION TO PRINCIPLES IN PATIENT SAFETY 2-0-0-2

This course is designed to introduce the student to the issues surrounding patient safety, medication errors and the design of systems to prevent medical errors from occurring. With the publication of the landmark report, "*To Err is Human: Building a Safer Health System"* in 1999, the landscape of patient care has evolved to include the study of errors and how they occur. This course provides an introduction to understanding the history and evolution of patient and medication safety, the principles of human factors and how they affect errors within the healthcare system, defining medication errors and adverse drug events; and the principles, techniques, and technology for reducing errors and their effects on patients. Emphasis will be placed on quality improvement, risk, patient outcomes and culture in our healthcare system.

PPR 6013 LITERATURE REVIEW AND WRITING SKILLS 3-0-0-3

This course is designed to enable students to assess and contribute to scientific literature. Through the duration of this course, students will work in assigned groups to identify a research question, search and evaluate the literature, and compose a systematic review. Students will have the opportunity to give and receive constructive feedback in order to help facilitate self-development, group dynamics, and social skills.

PPR 6014 PEDIATRIC PHARMACOTHERAPY 2-0-0-2

This course is designed to introduce the student to the physiologic, pharmacologic, and sociologic aspects of pediatric patients and to allow the student to gain a basic understanding of drug therapy issues unique to the pediatric population. The course will focus on physiological and practical aspects of medication use in pediatrics, the management of disease states most commonly encountered in pediatric patients, and the pharmacist's role in pediatric care.

PPR 6015 ADVANCED CARDIOVASCULAR LIFE SUPPORT (ACLS) 3-0-0-3

This comprehensive interprofessional course is designed to enable students to learn and develop the cognitive and psychomotor skills and abilities necessary for resuscitation of the adult. Team approach and strategies for managing the cardiopulmonary arrested high fidelity simulated patient are included. The student will practice techniques to assess cardiac dysrhythmias and follow through with appropriate therapeutic interventions such as drug and electrical therapy, airway control, ventilation, and supplemental oxygen. Requirements for AHA-ACLS certification are fulfilled. This course is offered to students enrolled at Health Profession Programs at South College (SC) and, with the approval of course instructors, may be offered to other health profession students or healthcare providers outside SC.

PPR 6016 INTRODUCTION TO POSTGRADUATE RESIDENCY TRAINING 2-0-0-2

This course provides an introduction to postgraduate residency training and serves to increase student knowledge and interest in postgraduate residency training. Throughout the course, students will learn about residency programs and develop the skills necessary for application to postgraduate residency training programs.

PPR 6017 PEDIATRIC PHARMACOTHERAPY 3-0-0-3

This course is designed to introduce the student to the physiologic, pharmacologic, and sociologic aspects of pediatric patients and to allow the student to gain a basic understanding of drug therapy issues unique to the pediatric population. The course will focus on physiological and practical aspects of medication use in pediatrics, the management of disease states most commonly encountered in pediatric patients, and the pharmacist's role in pediatric care.

PPR 6018 ORGANIZATIONAL LEADERSHIP 2-0-0-2

This two credit hour course is designed to equip student pharmacists with practical knowledge of organizational leadership strategies. Although all students are welcome to register for the course, the course will be particularly useful to students with leadership responsibilities in professional organizations. Organizational Leadership will afford opportunities for students to organize and execute meetings and special events, demonstrate proficiency with parliamentary procedure, maintain bookkeeping records, motivate and engage stakeholders, and perform other activities relevant to organizational leadership.

PPR 6019 INTRODUCTION TO PRINCIPLES IN PATIENT SAFETY 3-0-0-3

This course is designed to introduce the student to the issues surrounding patient safety, medication errors and the design of systems to prevent medical errors from occurring. With the publication of the landmark report, "*To Err is Human: Building a Safer Health System"* in 1999, the landscape of patient care has evolved to include the study of errors and how they occur. This course provides an introduction to understanding the history and evolution of patient and medication safety, the

principles of human factors and how they affect errors within the healthcare system, defining medication errors and adverse drug events; and the principles, techniques, and technology for reducing errors and their effects on patients. Emphasis will be placed on quality improvement, risk, patient outcomes and culture in our healthcare system.

PPR 6020 DISASTER MANAGEMENT I – THE PHARMACEUTICAL RESPONSE TO DISASTERS 2-0-0-2

This course is designed to equip student pharmacists with practical knowledge of medical and pharmaceutical management strategies employed in terrorism response. Students will have the opportunity to achieve certification in Basic Disaster Life Support (BDLS®) and various courses sponsored by the Federal Emergency Management Agency (FEMA) Emergency Management Institute. Students will also gain a comprehensive understanding of the medical and pharmaceutical implications of chemical, biologic, radiologic, nuclear, explosive (CBRNE) events.

PPR 6021 DISASTER MANAGEMENT II – SOCIAL AND ADMINISTRATIVE ASPECTS OF DISASTER MANAGEMENT 2-0-0-2

This course is designed to acquaint student pharmacists with the social and administrative aspects of disaster management. Students will have the opportunity to achieve certification in various Federal Emergency Management Agency (FEMA) Emergency Management Institute courses. Students will also gain a comprehensive understanding of administrative issues pertaining to disaster management.

PPR 6022 INDEPENDENT STUDY IN PHARMACY PRACTICE RESEARCH 2-0-0-2

Independent Study in Pharmacy Practice Research is a specialized course of study providing individual instruction to students in the Concentration in Pharmaceutical Sciences & Pharmacy Research program that specifically addresses potential knowledge gaps in student's training in areas of the pharmaceutical sciences needed to support student research that may not be addressed by other available courses.

Prerequisites: Good standing in the Concentration in Pharmaceutical Sciences and Pharmacy Research. Completion and approval of: PPR 6022 and PPR 6023 Independent Study in Pharmacy Practice Research Consent and Authorization Form.

PPR 6023 INDEPENDENT STUDY IN PHARMACY PRACTICE RESEARCH 2-0-0-2

Independent Study in Pharmacy Practice Research is a specialized course of study providing individual instruction to students in the Concentration in Pharmaceutical Sciences & Pharmacy Research program that specifically addresses potential knowledge gaps in student's training in areas of the pharmaceutical sciences needed to support student research that may not be addressed by other available courses.

Prerequisites: Good standing in the Concentration in Pharmaceutical Sciences and Pharmacy Research. Completion and approval of: PPR 6022 and PPR 6023 Independent Study in Pharmacy Practice Research Consent and Authorization Form.

PPR 6024 APPLIED THERAPEUTICS 2-0-0-2

This elective course provides the student pharmacist the opportunity to bridge the gap from introductory pharmacy practice experiences (IPPEs) to advanced pharmacy practice experiences (APPEs) by applying the knowledge, skills, and abilities obtained from the didactic, experiential, and interprofessional curricula. This elective course promotes APPE readiness. Participating

students will directly interact with patients at a practice site, applying therapeutic knowledge to evaluate and solve problems relating to a variety of disease states.

PPR 6025 APPLYING INFECTIOUS DISEASE PRINCIPLES TO THE ACUTE CARE PATIENT 2-2-0-3

This course will allow the student to apply the principles of antimicrobial therapy, antibiotic stewardship, and drug information skills previously taught in the Doctor of Pharmacy curriculum. The student will complete an in-depth study of the properties of anti-infective agents, including antibiotics, antivirals, and antifungals; and apply this information to patient scenarios that will allow the student to practice guideline and literature-based treatment of complex infections in the acute care patient. Principles of antimicrobial stewardship will be reinforced so that the student will be able to determine appropriate empiric therapy of commonly seen infectious disease syndromes in the acute care patient. This course will also emphasize evidence-based medicine including interpretation of guidelines and primary literature to help determine the best anti-infective course for an acute care patient.

PPR 6026 TREATING CARDIOVASCULAR DISEASE IN ACUTE CARE PATIENTS 2-2-0-3

The student will complete an in-depth study of the pathophysiology and treatment of commonly encountered cardiovascular disease states; properties of medications used to treat cardiovascular diseases; and apply this information to patient scenarios that will allow the student to practice guideline and literature-based treatment in the acute care patient. This course will also emphasize evidence-based medicine including interpretation of guidelines and primary literature to help determine the best pharmacotherapy plan for an acute care patient.

PPR 6027 ADVANCED COMMUNITY PHARMACY TOPICS 2-0-0-2

Advanced Community Pharmacy Topics is an elective course designed to introduce students to other areas of service within community pharmacy. Upon the completion of this course, pharmacy students will earn a point-of-care testing certificate. This course includes pre-reading from current literature and governmental agencies and culminates with a skills assessment. Students will learn how to perform four types of specimen collection (oral swab, nasal swab, throat swab, and finger stick); the legal and management issues associated with point-of-care testing and follow-up care; and using infectious disease models, will learn to assess patients, evaluate vital signs and physical findings to determine if POC testing is appropriate. Students will also learn more about collaborative pharmacy practice agreements with community pharmacy settings, diabetes education, and advanced medication management therapy services.

PPR 6X08 INDEPENDENT RESEARCH IN PHARMACY PRACTICE 3-0-0-3

This research elective course provides professional pharmacy students with opportunities in social, administrative, and clinical research in the Pharmacy Practice Department. Through the students' self-directed initiative and expertise of a faculty mentor, the student will advance their knowledge, research acumen and technical skill set in a defined area of the social, administrative, and clinical research.

PPR 6X09 SPECIAL PROJECTS IN PHARMACY PRACTICE RESEARCH 1-0-0-1

The course provides the pharmacy student an opportunity for direct participation in various aspects of Pharmacy Practice research under the supervision of Pharmacy Practice faculty.

Defined student activities may range from focused, topical review and summation of scientific literature, to practical experience using a variety research study methods and techniques.