COURSE DESCRIPTIONS

ACADEMIC YEAR 2016-2017

This document contains the most updated course descriptions for the Doctor of Pharmacy program.

PHAR 301 – Pharmaceutical Calculations
Credit: 2 hours
This course covers mathematics encountered in pharmacy practice.

PHAR 302/306 – Anatomy & Physiology
Credit: 4 hours per class
This two-course sequence presents a comprehensive study of the structure and function of all organ systems as well as basic biochemical and biophysical principles of cellular and membrane function. Relevance to clinical states and drug action is also presented in many areas.

PHAR 303 – Patient Counseling & Professional Communications
Credit: 2 hours
This interactive course is designed to guide pharmacy students in the development of effective counseling and communication skills. Emphasis will be placed on development of effective communication to the level of the patients’ understanding and education for the most commonly used drugs. Using videotape technology and role-playing techniques, students will improve their proficiency and competency in effective patient communications and counseling.

PHAR 304 – Biochemistry
Credit: 4 hours
This is a comprehensive course in biochemistry which discusses the metabolism of amino acids, carbohydrates, lipids, and nucleic acids. Principles of enzyme kinetics and regulation, bioenergetics, thermodynamics, and macromolecular structure-function relationships are presented.

PHAR 305 – Pharmacy in the U.S. Healthcare System
Credit: 2 hours
This course will focus on introducing the pharmacy student to the US Healthcare System and its components, healthcare systems of various foreign countries, the profession of pharmacy and the expanding roles of pharmacy and pharmacists in the healthcare system. Various teaching methods will be used including lectures from faculty and guest speakers, interactive activities in class, internet-based assignments, reading assignments, written reports and group project.

PHAR 307 – Pharmacy Marketing & Management
Credit: 3 hours
This course will focus on introducing the pharmacy student to important management and marketing principles relevant to pharmacy practice. How and why these principles are important for the successful management, supervision and marketing of pharmaceutical care services will be examined through classroom lecture, discussion, problem solving activities, reading assignments and current event updates related to this area. This course is in keeping with the University’s Christian mission and philosophy by enabling the student to understand the importance of treating patient and co-worker alike with dignity and respect.

PHAR 308 – Clinical Biochemistry
Credit: 3 hours
This course discusses the principles of quantitative analysis utilized in common clinical laboratory
tests. An introduction to interpretation of abnormal clinical laboratory values is presented. Quantitative aspects of nutrition are presented, and regulatory effects of various hormones are described. Diseases such as arteriosclerosis and diabetes are discussed.

**PHAR 309 – Drug Information**
Credit: 1 hour
This course is designed to introduce the student to sources of drug information and hospital pharmacy functions (e.g. ADR, MUE’s). Practical experience in the Drug Information Center will allow the student the opportunity to practice these skills, evaluate the literature, and communicate this information to other healthcare practitioners.

**PHAR 310 – Immunology**
Credit: 3 hours
This course covers basic immunology and the fundamental principles relating to the immune response in normal and disease states.

**PHAR 312 – Medical Microbiology**
Credit: 4 hours
The basic principles of bacteriology, mycology, parasitology, and virology are presented. The pathogenic properties and diseases of medically important species of bacteria, fungi, protozoa, helminthes, and viruses are described.

**PHAR 314 – Biopharmaceutics**
Credit: 3 hours
The biological and physicochemical factors of the body, drugs, and dosage forms that influence drug availability, disposition, and pharmacological and toxicological responses are presented.

**PHAR 315 – Introduction to Pharmacy Practice I**
Credit: 0.5 hours per class
This series of courses are intended to expose the student pharmacist to a variety of career pathways within the pharmacy profession and to help prepare the student for the experiential component of the Doctor of Pharmacy curriculum. The student pharmacist will be engaged in discussions related to professionalism and pharmacy practice career paths. In addition the student will gain experience in introspection through reflection and will spend time creating an electronic professional portfolio. Student pharmacists will be asked to meet various pre-experiential requirements as a component of this course (e.g., immunizations, portfolio development, HIPAA training and other requirements).

**PHAR 316 – Introduction to Pharmacy Practice II**
Credit: 0.5 hours per class
This series of courses are intended to expose the student pharmacist to a variety of career pathways within the pharmacy profession and to help prepare the student for the experiential component of the Doctor of Pharmacy curriculum. The student pharmacist will be engaged in discussions related to professionalism and pharmacy practice career paths. In addition the student will gain experience in introspection through reflection and will spend time creating an electronic professional portfolio. Student pharmacists will be asked to meet various pre-experiential requirements as a component of this course (e.g., immunizations, portfolio development, HIPAA training and other requirements).
PHAR 331/332 – Introduction to Pharmaceutical Care Skills and Professional Practice
Credit: 1 hour per class
This course is meant to introduce the student to a variety of skills, attitudes and behaviors important to contemporary pharmacy practice. In lab sessions, students will learn health screening skills such as taking blood pressure measurements and measuring blood glucose and cholesterol. By participating in a number of lectures, classroom discussions and a service project, the student will become familiar with professional behavior and ethical decision making as well as the significance of giving back to the community.

PHAR 335 – Community Service I
Credit: 0 hours
CPHS requires a commitment to community service. Each student pharmacist is required to provide 80 hours of community service over the four years of enrollment at CPHS. A minimum of 10 hours must be provided each year. In addition to the benefits to the community, this requirement provides the student an opportunity to learn the needs of the community and to develop as a professional.

PHAR 403 – Financial Management & Pharmacoeconomics
Credit: 2 hours
This course is designed to explore the practical applications of financial management in pharmacy practice. Emphasis is placed on quantitative aspects of effective business management and those techniques for decision making in a pharmaceutical care practice site.

PHAR 404 – Pharmaceutics I
Credit: 3 hours
This course is designed to provide the student with a basic understanding of medicinal products’ physical and chemical properties of and how these properties influence the design of dosage forms.

PHAR 405 – Nonprescription Drug Therapy
Credit: 3 hours
This course is a study of various nonprescription (OTC) products commonly found in community pharmacy practice. Emphasis is placed on the problem solving process involved in patient assessment, therapeutic intervention, product recommendation(s), triage of serious health care problems to other health care settings, and patient education regarding health promotion and disease management with nonprescription medications.

PHAR 406 – Pharmaceutics II with Lab
Credit: 4 hours
This course enables the student to become proficient in general compounding techniques and a basic knowledge of dosage formulation. A weekly laboratory is designed to enhance the technical capability of students in this area of prognosis.

PHAR 408 – Biology of Disease
Credit: 5 hours
This course is designed to acquaint the student with major diseases, their etiology, pathology, clinical manifestations, diagnosis and prognosis.

PHAR 409 – Introduction to Pharmacy Practice III
Credit: 0.5 hours per class
This series of courses are intended to expose the student pharmacist to a variety of career pathways within the pharmacy profession and to help prepare the student for the experiential component of the
Doctor of Pharmacy curriculum. The student pharmacist will be engaged in discussions related to professionalism and pharmacy practice career paths. In addition the student will gain experience in introspection through reflection and will spend time creating an electronic professional portfolio. Student pharmacists will be asked to meet various pre-experiential requirements as a component of this course (e.g., immunizations, portfolio development, HIPAA training and other requirements).

**PHAR 410 – Pharmacokinetics**
Credit: 2 hours
This course provides the student with an understanding of basic clinically applicable pharmacokinetic formulas and the assumptions that are involved with their use in therapeutic drug monitoring.

**PHAR 412 – Principles of Pharmacology and Medicinal Chemistry**
Credit: 3 hours
First in a series of Pharmacology/Medicinal Chemistry courses, this course introduces the student to the basic principles of structure activity relationships, pharmacogenetics, and biochemical pharmacology with special emphasis placed on physicochemical properties of functional groups, acid-base chemistry, metabolism, receptor theory, and signal transduction.

**PHAR 417 – Pharmacology and Medicinal Chemistry II**
Credit: 4 hours
This course is designed to provide the pharmacy student with a firm foundation in the various pharmacological agents available to effectively manage various autonomic, cardiovascular and renal diseases and conditions. Particular emphasis will be placed on the cellular and physiological systems that are regulated by these agents to bring about the desired therapeutic outcome. For each class of agents the prototypical drug will be emphasized with regard to mechanism of action, chemical characteristics, pharmacokinetic considerations, adverse effects and drug interactions. For the newer agents in each class significant differences from the prototypical agents will be highlighted.

**PHAR 419 – Introduction to Pharmacy Practice IV**
Credit: 0.5 hours per class
This series of courses are intended to expose the student pharmacist to a variety of career pathways within the pharmacy profession and to help prepare the student for the experiential component of the Doctor of Pharmacy curriculum. The student pharmacist will be engaged in discussions related to professionalism and pharmacy practice career paths. In addition the student will gain experience in introspection through reflection and will spend time creating an electronic professional portfolio. Student pharmacists will be asked to meet various pre-experiential requirements as a component of this course (e.g., immunizations, portfolio development, HIPAA training and other requirements).

**PHAR 421 – Pharmacology & Medicinal Chemistry III**
Credit: 4 hours
This course is designed to provide the pharmacy student with a firm foundation in the various therapeutic agents available to effectively manage various paracrine/inflammatory, gastric erosion, endocrine, and central nervous system conditions. Particular emphasis will be placed on the cellular and physiological systems that are regulated by these agents to bring about the desired therapeutic
outcome. For each class of agents the prototypical drug will be emphasized with regard to mechanism of action, chemical characteristics, pharmacokinetic considerations, adverse effects and drug interactions. For the newer agents in each class significant differences from the prototypical agents will be highlighted.

**PHAR 423 – Pharmacology and Medicinal Chemistry IV**
Credit: 3 hours
The use of chemotherapeutic agents for the treatment of infections, cancer and immunosuppression has revolutionized modern medicine and led to significant improvements in the quality of life and lifespan in western populations. This course will address the major therapeutics agents in use today and will cover the mechanisms of action and chemical characteristics that impact clinical usage and the types of infectious agents or cancer cells affected. The focus of the course will be on mechanisms of action and usage of each drug. Consideration will also be given to appropriate drug usage in the light of anti-infective or cancer cell resistance, and the use of multi-drug therapies to counter such resistances.

**PHAR 435 – Community Service II**
Credits: 0 hours
CPHS requires a commitment to community service. Each student pharmacist is required to provide 80 hours of community service over the four year of enrollment at CPHS. A minimum of 10 hours must be provided in each year. In addition to the benefits to the community, this requirement provides the student an opportunity to learn the needs of the community and to develop as a professional.

**PHAR 444/454 – EMT Training I/II**
Credit: 3 hours per class
These courses recognize proficiency achieved in training by a certified instructor for emergency medical technician service. Both courses are required to prepare for EMT certification.

**PHAR 501/503 – Therapeutics I/II**
Credit: 3 hours per class
These courses are designed to illustrate the appropriate clinical application of pharmacodynamics, pathophysiology, and pharmacokinetics to a variety of common acute and chronic disease states. Emphasis is placed on data collection and decision making required for optimal drug therapy.

**PHAR 504 – Special Research in Pharmaceutical Sciences**
Credit: Variable (maximum 3 hours)
The purpose of this elective course is to introduce the student pharmacist to methods of basic science and/or clinical research.

**PHAR 505/507 – Introductory Pharmacy Practice Experiences (IPPEs)**
Credit: 1 hour per class
These two, month-long practice experiences are designed to expose the student pharmacist to the practice of pharmaceutical care in the community and hospital settings. These practice experiences introduce the student pharmacist to the operational, clinical and administrative roles of the pharmacist; however, there is a greater emphasis on the drug distribution functions of the pharmacist in these settings. These experiences are usually scheduled during the summers following the first and second professional years.
PHAR 508 – Top 300 Drug Review
Credit: 1 hour
This examination is designed to evaluate the students' mastery of basic facts concerning the Top 300 most commonly prescribed drug products. Prerequisites: PHAR 505 and 507.

PHAR 508A – New Drug Discovery and Development
Credit: 1 hour
This course will teach student pharmacists how to apply the principles of pharmacology to drug discovery and development. Specifically, pharmacological concepts will be applied directly to the detection and quantification of drug effect. Concepts such as affinity, efficacy and allosteric modulation will be described in the definition of new drugs for receptors, ion channels and enzymes. Drug development also will be discussed through the application of pharmacokinetics. In addition, the infrastructure of drug discovery and development organizations will be discussed to give students a working knowledge of the working environment for possible career choices.

PHAR 509 – Therapeutic Drug Monitoring
Credit: 4 hours
This course provides the knowledge and skills necessary to apply pharmacokinetic principles in the clinical arena. Emphasis is placed on therapeutic monitoring and individualization of drug therapy. Prerequisites: PHAR 301, 314 and 410.

PHAR 509B – Simulated Pharmacotherapy Case Studies
Credit: 1.5 hours
This elective is designed for student pharmacists with an interest in expanding their ability to apply the principles of pharmacotherapy in a simulated pharmacy workflow environment. The purpose of the course is to prepare student pharmacists for the challenges encountered in pharmacy practice and equip them to identify, critically analyze, and resolve medication issues. Advanced concepts related to pharmacotherapy, critical thinking, and patient evaluation will be emphasized.

PHAR 510 – Cardiology
Credit: 1 hour
This elective is designed for students with an interest in cardiology. The purpose of the course is to enhance students understanding of cardiovascular pathophysiology and pharmacotherapy. Advanced concepts related to cardiovascular pharmacotherapy therapy will be emphasized.

PHAR 510P – Pharmaceutical Care for Patients with Diabetes*
Credit: 1 hour (P/F)
This course includes a 15 hour on-line self-study (maximum time allotted) and 8 hour live training which will be offered over the last 5 weeks of the semester. The self-study modules are a review of the medical management (pharmacologic and non-pharmacologic) for diabetes and include case studies and activities that must be completed prior to attending the live training. The live training portion is designed to be application of the self-study modules. Participants will be assessed on ability to take blood pressure measurements, perform monofilament foot exams, provide insulin injection, and perform a fingerstick blood glucose using a blood glucose monitor. Case-based learning is also utilized throughout the live portion to apply knowledge of guidelines and therapeutic management (pharmacologic and non-pharmacologic). Participants must also complete an on-line
final exam in order to receive a certificate of completion. Students wishing to pursue opportunities in
the community or ambulatory care setting would be well-positioned with a certificate in diabetes on
the CV; however, issues addressed in this program are not as intense as the information provided in
the Diabetes Elective offered through Campbell.

*Includes an approximate additional cost of $135.

**PHAR 511 – Jurisprudence**
Credit: 3 hours
Discussions and analysis of federal and state law, regulations, standards of practice, case law and
ethics related to pharmacy practice and drug development and distribution. Focus is upon analyzing,
understanding and applying these issues through case studies and hypotheticals. Considerable
emphasis on professionalism and the historical events that have shaped today's professional
pharmacy practice, as well as the drug development and distribution system.

**PHAR 512P – Multicultural Health Practices/Health Disparities**
Credit: 1 hour
This course will provide the student with a further understanding of racial and ethnic disparities in the
quality of care received by minority Americans. Topics that will be covered include cultural
competence, health literacy and health disparities.

**PHAR 514 – Advanced Topics in Cardiovascular Pharmacology**
Credit: 1 hour
The mechanisms by which pharmacological agents modify the contractility of cardiac and smooth
muscle will be discussed in this elective course. A special emphasis will be placed on how alteration
of calcium ion concentration affects contraction.

**PHAR 515P – Introduction to Pharmacy Practice V**
Credit: 0.5 hours per class
This series of courses are intended to expose the student pharmacist to a variety of career pathways
within the pharmacy profession and to help prepare the student for the experiential component of the
Doctor of Pharmacy curriculum. The student pharmacist will be engaged in discussions related to
professionalism and pharmacy practice career paths. In addition the student will gain experience in
introspection through reflection and will spend time creating an electronic professional portfolio.
Student pharmacists will be asked to meet various pre-experiential requirements as a component of
this course (e.g., immunizations, portfolio development, HIPAA training and other requirements).

**PHAR 516P – Introduction to Pharmacy Practice VI**
Credit: 0.5 hours per class
This series of courses are intended to expose the student pharmacist to a variety of career pathways
within the pharmacy profession and to help prepare the student for the experiential component of the
Doctor of Pharmacy curriculum. The student pharmacist will be engaged in discussions related to
professionalism and pharmacy practice career paths. In addition the student will gain experience in
introspection through reflection and will spend time creating an electronic professional portfolio.
Student pharmacists will be asked to meet various pre-experiential requirements as a component of
this course (e.g., immunizations, portfolio development, HIPAA training and other requirements).

**PHAR 518 – General Toxicology**
Credit: 3 hours
This course is designed to give the student a broad appreciation of the field of Toxicology. The
student is guided through the mechanisms by which toxicants enter the body and the biotransformation processes that result in the disease-producing entities. The various cellular mechanisms of toxicity and the major target organs affected by toxins will be treated in some detail. Didactic material may be augmented with both in vivo and in vitro experimental laboratories for assessing toxicity. Aspects of environmental, forensic, clinical toxicology, and risk assessment will also be addressed in this course.

**PHAR 519 – Physical Assessment**
Credit: 2 hours
This course introduces the student pharmacist to the basic principles and techniques of history taking and physical examination. Students in this course will have an opportunity to develop the skills necessary to adequately follow the patient using physical assessment parameters and to monitor drug therapy when appropriate. The student will also have an opportunity to use and demonstrate the skills learned in this class during his or her Advanced Pharmacy Practice Experience rotations.

**PHAR 521 – Substance Abuse Education**
Credit: 1 hour
This course will focus on the acute and maintenance treatment options for patients suffering from substance abuse and dependence. Students will develop the skills necessary to recommend pharmacotherapeutic treatment plans based on their review of guidelines and literature in this area. Classroom sessions will be utilized to discuss assigned readings as well as to work on cases.

**PHAR 522P – Practical Compounding Techniques: Sterile Products**
Credit: 1 hour
This course offers instruction on additional compounding and processing techniques and exercises that include practical applications and thought processes for preparing a sterile dosage form.

**PHAR 523 – Special Research Projects in Pharmacy Practice**
Credit: Variable (1—3 hours) (P/F)
Independent research projects performed under the direction of individual faculty mentor from the Department of Pharmacy Practice. This course will enable the student pharmacist to apply the scientific inquiry process and to utilize critical thinking, problem-solving, verbal, as well as written communication skills while conducting a practice-based research project. Alternatively, this course may be used for other research-related scholarly pursuits such as the production of a manuscript following primary literature investigation and review of a specific area of scientific inquiry that is timely, rigorous and contributes to the medical, pharmacy practice and/or pharmacy social & administrative scientific literature. The student pharmacist will gain experience in:

- Literature search/evaluation;
- Protocol design and IRB requirements;
- Data acquisition and management;
- Data analysis;
- Project management and report requirements; and/or scientific writing

**PHAR 524 – Toxicology Problems**
Credit: 1 or 2 Hours
Students will be challenged to analyze and discuss case studies of problems typically encountered
in evaluating drug toxicity. The development of critical thinking skills, problem-solving capabilities, and decision-making approaches will be emphasized over specific memorization of facts.

**PHAR 525 – Ethics in Pharmacy Practice**  
Credit: 2 hours  
As healthcare professionals, pharmacists encounter a variety of problems, which may compromise quality care and patient rights. This course is designed to enable pharmacy students to approach moral dilemmas objectively with a thorough understanding of professional moral responsibility. Students will learn skills in moral reasoning necessary to promote the dignity of clients they serve.

**PHAR 526 – Scientific Basis of Drug Selection**  
Credit: 2 hours  
This course develops skills needed to critically evaluate current research literature to assess the therapeutic potential of a new and improved modification of an existing drug. The course focuses on calcium channel blockers and beta adrenergic antagonists and agonists as examples of drug classes requiring such assessment.

**PHAR 528 – Experimental Design & Biostatistics**  
Credit: 4 hours  
This course involves the application of statistical methods in health sciences. The course is intended to provide the student with basic knowledge of descriptive statistics, probability theory, hypothesis testing, and other selected statistical methods useful in the design and evaluation of clinical research investigation.

**PHAR 529 – Hematology & Oncology**  
Credit: 1 hour  
This course will allow students to develop a better understanding of the treatment of hematology and oncology patients. The course will start with a general review and then focus on many of the disease states that will not be covered in the therapeutics course such as leukemia, lymphoma, myeloma, blood and marrow transplant. Students will learn how to take a diagnosis and develop a treatment plan including chemotherapy regimens and their supportive care issues that go along with the treatment.

**PHAR 530 – Biotechnology in Pharmacy**  
Credit: 3 hours  
This course is intended to expose students to the basic principles and practical applications of molecular biological techniques to pharmaceutical product development. Experimental, analytical, and production technologies will be discussed along with ethical implications, if appropriate.

**PHAR 531 – Strategic Management in Healthcare**  
Credit: 1 hour  
This course will introduce the concepts of strategic planning in business and provide examples in the different pharmacy and healthcare settings. Strategic management is a process of evaluation followed by decision making to increase the value of the organization. This requires an approach to strategic decision making which considers the environment in which the organization finds itself, the organization's own internal capabilities, setting specific performance objectives to achieve the strategy and executing appropriate action plans. The course emphasizes that strategy involves innovation and creativity, both creating and adapting to change. At the end of this course, the student should be able to understand the key influences on the development of an organization's
strategy, analyze those influences, propose appropriate strategic behavior for an organization and
demonstrate an understanding of how strategic change can occur within an organization.

**PHAR 533 – Introduction to Pharmacy Consulting**
Credit: 1 hour
This elective course is designed to introduce students to the practice of consultant pharmacy.
Pharmacists are required by the Federal government to monitor the drug therapy of every patient in
nursing homes. This drug regimen review must be performed on a monthly basis and is an effective
method for monitoring the drug therapy received by patients. Studies indicate that clinical
pharmacists can improve the quality of patient care in nursing homes. Students will be exposed to
the elements of this specialized practice. Prerequisite: PHAR 503.

**PHAR 534 – Herbal Remedies**
Credit: 1 hour
This course discusses herbal remedies recently being used as alternative solutions to treat and
prevent different diseases.

**PHAR 535 – HIV/AIDS**
Credit: 1 hour
This course will discuss the potential future effects of the AIDS epidemic on pharmacy practitioners.
The nature of the disease and secondary infections, available treatment modalities, and preventative
measures that involve pharmacists will be described and discussed.

**PHAR 536 – Hypertension I**
Credit: 2 hours
This course is an in-depth discussion and literature evaluation of agents used to treat hypertension.

**PHAR 537 – Practical Applications in Infectious Diseases Pharmacotherapy**
Credit: 2 hours
This course is designed to allow the student with a strong interest in infectious diseases to further
develop skills necessary to make rational choices with regard to antimicrobial pharmacotherapy.
These skills will be developed primarily through analysis of patient cases. Students will be presented
with case problems and assigned readings for each topic at least one week prior to discussion of
patient cases. Advanced concepts related to antimicrobial therapy will be emphasized. Prerequisite:
PHAR 501 & 503.

**PHAR 538 – Hypertension II**
Credit: 1 hour
This course is a further discussion of agents used to treat hypertension. Prerequisite: PHAR 536.

**PHAR 539 – Care of the Diabetic Patient**
Credit: 2 hours
This series of classes will deal with specific issues which complicate the day-to-day and long-term
management of diabetes. Topics covered will include diabetes survival skills, diabetes in special
population groups, diseases which complicate diabetes treatment, and complications of diabetes.

**PHAR 542 – Molecular Modeling**
Credit: 2 hours
This informal course trains students in the use of high performance computing systems to solve
problems in biological modeling. Lecture topics include a review of high performance computing in
molecular modeling, electron density calculations and 3D protein representation docking of
molecules. We will use Silicon Graphics 2 and Cray T90 systems. Material is presented both in lectures and supervised lab sessions, during which students do interactive programming. The course is designed for students who are interested in viewing and taking a virtual walk through a complex molecule.

**PHAR 543 – Anticoagulation Management**
Credit: 1 hour
This course offers a more detailed (depth and breadth) analysis of venous embolic disease (deep-vein thrombosis and pulmonary embolism) focusing upon the scope of the problem within the healthcare system—appropriate identification of patients at risk, and appropriate efforts to prevent and treat these diseases when necessary. Additionally, there will be a focus upon nationally recognized efforts (The Joint Commission National Patient Safety Goals, The Joint Commission Core Measures for Venous Thromboembolic Disease) to provide efficacy and safety to patients we serve. This course should ready pharmacy students/future pharmacists to position themselves appropriately into the therapeutic management of anticoagulants/antithrombotics in both the hospital and community pharmacy settings.

**PHAR 544 – Introduction to Clinical Research Design & Literature Evaluation**
Credit: 2 hours
This course builds upon the basic drug information and statistics skills learned previously. Evaluating the drug and medical literature to determine appropriateness of study design, quality of the data, statistical test selection and application, study limitations, and implications of the study results are some of the areas that will be discussed.

**PHAR 545/547 – Therapeutics III/IV**
Credit: 3 hours per class
These courses are designed to illustrate the appropriate clinical application of pharmacodynamics, pathophysiology, and pharmacokinetics to a variety of common acute and chronic disease states. Emphasis will be placed on data collection, analysis, and decision-making required to optimize drug therapy. Prerequisites: PHAR 501/503 strongly suggested.

**PHAR 546 - Anticoagulation Management II**
Credit: 1 hour
There is today an overwhelming amount of new information regarding the comparative efficacies of newly developed anticoagulants and antithrombotic drug therapies and their optimal use in life-threatening thromboembolic disease states, specifically those in Acute Coronary Syndrome patients. This consumes over 100 Billion healthcare dollars annually. This course will focus on these emerging uses, evidence, and issues. Focused, succinct review of the critical studies defining the role of these new drug therapies will be the focus of this class and ready the P4 student to be knowledgeable of these important landmark trials defining appropriate drug therapy selection in the setting of cardiology. This elective will benefit those who intend to do cardiology rotations in their P4 year or have cardiology focused practices or post-graduate experiences with cardiology as a focus.

**PHAR 548 - Advanced Nonprescription Drug Therapy**
Credit: 3 hours
This is a self-study course which integrates and strengthens the basic knowledge of non-prescription drug therapy learned in Pharm. 405 by application in on-line self-study modules, development of a strategic business plan, and a one day live program. Emphasis is placed on the problem solving
process involved in patient assessment, therapeutic intervention, product recommendation(s), triage of serious health care problems to health care settings, and patient education regarding health promotion and disease management with nonprescription medications.

**PHAR 550 - Alternative Medicine**
Credits: 3 hours
The most commonly available herbs and natural products will be covered concerning their therapeutic effect and the dosage forms. In addition overview of the Eastern therapies will be presented.

**PHAR 551 – Legal Topics**
Credit: 1 hour
This course is designed to provide an overview of contemporary topics in pharmacy and healthcare law in seminar format. Class discussion will include the application of ethics and values to factual situations involving the use of drugs in healthcare.

**PHAR 552 – Medication Therapy Management (MTM)**
Credit: 3 hours
This course is designed to provide the student-pharmacist with an understanding of the various platforms and prescription drug plans that provide payment to pharmacists for medication therapy management (MTM) services. Early in the course students will learn the core elements of MTM, patient interview skills and how to navigate and document MTM services via software systems including Mirixa and Outcomes Pharmaceutical Care. Students will conduct patient interviews, MTM assessments and documentation using the SOAP (subjective/objective findings, assessment, recommendations) format. Patient cases will be discussed during class to address appropriateness of therapy and emphasize treatment guidelines, practice standards and various pharmacotherapy principles. Participants in this course will develop a working knowledge of current MTM opportunities for pharmacists and learn the process by which to provide MTM services. This course is ideal for students interested in expanded services in community pharmacy practice. However the knowledge and skills gained from this course can be applied to any patient care setting.

**PHAR 552P – Medication Therapy Management (MTM) II**
Credit: 2 hours
This course is designed to provide the student-pharmacist with an in depth knowledge of medication therapy management (MTM) services. This course is designed to foster professionalism through inter-professional teamwork. Through patient interaction, student pharmacists will increase their working pharmacotherapy knowledge and will apply core principles and guidelines to direct patient care. Student pharmacists will provide MTM services to patients in a clinic or community pharmacy setting.

**PHAR 553 – Introduction to Veterinary Pharmacy**
Credit: 1 hour
This course is designed to introduce students to the major differences between veterinary and human diseases, therapeutics, and pharmacy practice. Students participating in this class will be better prepared for veterinary prescription processing, customer questions, and OTC recommendations and precautions in the retail setting.

**PHAR 554 – Geriatric Assessment**
Credit: 3 hours
This course is designed to allow the student to gain familiarity with select instruments used to assess a variety of conditions which commonly occur in the geriatric population. The course will utilize a combination of didactic lectures, case problems, and actual field use of the techniques and instruments reviewed in class. Most class meetings will have an application component to enable the student to further develop the multi-dimensional knowledge and skill-set necessary to comprehensively evaluate and monitor treatment in the older adult.

**PHAR 554P – Geriatric Pharmacotherapy II**
Credit: 1 hour
This course is designed to introduce student pharmacists to the concepts of geriatric care and build upon knowledge from pharmacotherapy lectures with a focus on older adult patients. The course will review physiologic changes and altered presentation of the elderly patient, geriatric syndromes and pharmacotherapy in the older adult. The course will utilize didactic lectures, case-based discussion and will conclude with an application-based exercise utilizing actual patients. Topics covered include psychiatric diseases, neurologic issues, consultant pharmacy, palliative care and SOAP documentation in the medical record.

**PHAR 556 – Pain Management Issues**
Credit: 1 hour
This course will provide information on pain management. Topics that will be covered include the pathophysiology of pain, pain assessment, pain management guidelines and their application to patient care, therapeutics of pain management using systemic agents, use of alternative and intervention pain management techniques, methods of analgesic administration, and pain management in special populations. Practice-specific application of pain management principals will be discussed.

**PHAR 557 – Issues in Critical Care**
Credit: 1 hour
This course is designed to introduce critical care principles. This course will illustrate the appropriate clinical application of pathophysiology, pharmacokinetics and pharmacodynamics in the critical care population.

**PHAR 558 – Essentials of Toxicology**
Credit: 2 hours
This course is designed to give the student a broad appreciation of the field of Toxicology. The student is guided through the mechanisms by which toxicants enter the body and the biotransformation processes that result in the disease producing entities. The various cellular mechanisms of toxicity and the major target organs affected by toxins will be treated in some detail. Didactic material may be augmented with both in vivo and in vitro experimental laboratories for assessing toxicity. Aspects of environmental, forensic, clinical toxicology, and risk assessment will also be addressed in this course.

**PHAR 559 - Obstetrics, Gynecology & Women’s Health (OB-GYN & WH)**
Credit: variable 1 - 2 hours
The student-driven obstetrics, gynecology, and women’s health elective will help prepare student pharmacists enrolled in the College of Pharmacy & Health Sciences to practice evidence-based care involving a variety of women’s health issues including, but not limited to, preconception care, contraception, drugs in pregnancy and lactation, menopause pharmacotherapy, osteoporosis, and
labor and delivery. As a team, students will be assigned a specific topic and will lead a class discussion based on the assigned readings/topic(s). Areas to be covered in the discussion include incidence of disease state (if applicable), pathophysiology, evidence-based guidelines, pharmacotherapy, and any recent or emerging evidence involving the assigned topic. In addition, the students shall identify any community or patient resources of value regarding the assigned topic.

**PHAR 560 – Practical Applications in Pediatric Pharmacotherapy**
Credit: 1 hour
This course will enhance the pharmacy student’s skills in pediatric pharmacotherapy by promoting the student’s understanding of the unique characteristics of the pediatric population and pediatric disease states. This course promotes the mission of Campbell University by equipping students with superior skills in Pediatrics which will allow them to practice pharmacy with the highest integrity and service to their patients. The goals are to promote the pharmacy students understanding of the pediatric population with an emphasis on pediatric disease states. This course will focus on medications, fluids, electrolytes and nutrition to manage neonates and pediatric patients.

**PHAR 561 – Pharmacoeconomics**
Credit: 3 hours
This course will provide basic information about the principles of pharmacoeconomics, which has been defined as the description and analysis of costs of drug therapy to society.

**PHAR 562 - Community Pharmacy Management**
Credits: 1 hour
This course provides specific instruction in policies and procedures required to own and manage a community retail pharmacy.

**PHAR 563 – Managed Care**
Credit: 2 hours
This elective course presents an in-depth discussion of integrated healthcare systems with analysis of methods to provide high-quality/low-cost healthcare to large patient populations.

**PHAR 564 – Community Service III**
Credits: 0 hours
CPHS requires a commitment to community service. Each student pharmacist is required to provide 80 hours of community service over the four years of enrollment at CPHS. A minimum of 10 hours must be provided in each year. In addition to the benefits to the community, this requirement provides the student an opportunity to learn the needs of the community and to develop as a professional.

**PHAR 565 – Epidemiology**
Credit: 2 hours
This elective course will provide an introduction to the principles of epidemiology. The course will emphasize basic analytic techniques to investigate and prevent infectious disease outbreaks and hospital infections. Prerequisites: PHAR 310 and 312.

**PHAR 566 – Introduction to Nuclear Pharmacy**
Credit: 1 hour
This course provides basic instruction in principles and techniques applicable to the preparation and dispensing of radioactive pharmaceuticals.
PHAR 567 – Reimbursement for Pharmaceutical Care Services
Credit: 1 Hour
Different strategies utilized in the provisions of pharmaceutical care will be discussed. Students will learn how to document patient encounters and how to complete the proper forms necessary for billing and submitting claims. Students will have the opportunity to hear success stories from practicing pharmacists who have implemented pharmaceutical care services and have received reimbursement for their efforts.

PHAR 569 – Healthy Choices
Credit: 1 Hour
This course will discuss and encourage aspects of establishing a healthy lifestyle for participants.

PHAR 570/571 – Asthma Management I/II
Credit: 1 hour per class
The purpose of this course is to develop the knowledge and skills of student pharmacists so they can provide a high level of comprehensive pharmaceutical care to patients with asthma. This course is a two part series offering one credit hour per class. Part one is during the first five week phase for third year students and part two is offered during the second five week phase in the spring of the third year.

PHAR 575 – Essential Spanish for Pharmacists
Credit: 2 hours
This course introduces students to basic and practical information that they can use when providing pharmacy services to Spanish speaking patients. The course covers common situations, such as greeting, patient data collection, prescription dispensing information and administration instructions. Students are not required to be fluent in Spanish.

PHAR 576 – Pharmacy Christian Missions
Credit: 1 hour
The course explores the various issues related to pharmacy/medical missions including how the provision of medical and pharmaceutical care can serve as opportunities for the presentation of the Christian Gospel. The activities concerning the planning, preparation, and execution of short term mission trips will be discussed.

PHAR 577/578 – Lipid Management I/II
Credit: 1 hour per class
The Lipid Management Elective and Certificate Program will prepare pharmacy students to diagnose, treat, and monitor the therapy of patients with lipid disorders.

PHAR 581 – Medication Errors: Causes, Prevention, Current Issues
Credit: 1 hour
This course is intended to provide the student with an introduction to the problem of medication errors in healthcare. Activities will include discussions of significant medication error research, factors which can contribute to errors, drug categories and abbreviations associated with error risks, error detecting methods, case analysis of errors, and error prevention methods, including the roles of both the patient and technology. Students will also use the Internet to become familiar with various organizations and list services related to patient safety and to identify and discuss pertinent issues and current events related to this area.
PHAR 582 – Botanical Medical Seminar
Credit: 1 hour
This course is an investigation of the use of herbal preparations in the rational application in pharmacy. The course is intended to provide the student with a basic knowledge of botanical and herbal preparations. This information will be given in a seminar style where students will be required to read and prepare to discuss articles on these agents. This course is co-listed as PHSC 582.

PHAR 583 – Advanced Pharmacy Marketing & Management
Credit: 3 hours
Designed for students interested in pursuing or enrolled in the dual PharmD/ MBA Program. Topics covered will expand upon the basic principles taught in PHAR 307 and offers a recitation and an individual project. Emphasis is placed on the decision-making from a financial management perspective. This course may replace PHAR 307.

PHAR 585 – Drug-Induced Diseases
Credit: 2 hours
The Drug Induced Disease Class is designed to study the adverse effects of certain drugs on each of the body systems. This two-hour elective will explore a different drug-induced disease each week including cardiac, pulmonary, endocrine, etc.

PHAR 587 – Advanced Financial Management and Pharmacoeconomics for Pharmacists
Credit: 3 hours
Healthcare is dramatically changed and an understanding of financial management is critical in the decision making process. This course expands on the basic principles taught in PHAR 403 and offers a recitation and an individual project. Emphasis is placed on the decision-making from a financial management perspective. This course may replace PHAR 403.

PHAR 589 – Advanced Patient Counseling
Credit: 1 hour
This course will provide the students with additional knowledge and skills to be effective patient educators, which will improve the quality of therapeutic interventions provided to patients. A secondary goal for this course will be to increase student interest in the Annual APhA-ASP National Patient Counseling Competition and to enhance Campbell University's performance at the national competition.

PHAR 590 – Smoking Cessation
Credit: 1 hour
This course will prepare participants to facilitate the process of smoking cessation. Topics that will be covered include: consequences of tobacco abuse, pharmacotherapy of nicotine replacement, assessing readiness for smoking cessation, guiding patients through the quit process, and ways to incorporate smoking cessation counseling into pharmacy practice.

PHAR 591 – Cosmeceuticals
Credit: 1 hour
Cosmeceutical is a pharmaceutical product that provides cosmetic benefits. Like Cosmetics, cosmeceuticals are topically applied, but they contain ingredients that influence biological function of the skin. Cosmeceuticals improve appearance by delivering nutrients necessary for healthy skin. This course will provide an overview of the benefits and toxicology of the active ingredients used in cosmeceuticals.
PHAR 592 – Advanced Cellular & Molecular Pharmacology
Credit: 3 hours
This course involves a detailed treatment of the various receptor/signal transduction systems found in mammalian systems from the perspective of developing them as therapeutic targets. Aspects of ion channel pharmacology, cyclic AMP and inositol phosphate signaling in pathological conditions will be discussed. The pharmacological control of tyrosine kinase signaling pathways and cell cycle regulation in the therapy of neoplastic disease will be addressed as well. The regulation of gene expression by inhibition of transcription or gene knockout/replacement strategies will also be discussed. The coursework for the class will entail lectures and systematic evaluation of the primary literature in the topics being covered. Prerequisite: PHAR 412 or PHSC 512.

PHAR 593 – Leadership Development
Credit: 2 hours
The purpose of this course is to identify and strengthen leadership skills. It uses a development approach focusing on how individuals become effective leaders by addressing the human element of enterprise within significant business situations. Students will strengthen their individual capabilities to advance their organizations strategically by rethinking their approaches to management, leadership, and leadership development. This course enables students to understand how to build and foster relationships as well as emphasizes the importance of those relationships in their professional and personal lives.

PHAR 594 – Pharmacogenetics
Credit: 2 hour
The basic principles of pharmacogenetics/pharmacogenomics and their relationship to current drug development are discussed. The course is divided into two sections based on the development of this field; Classical pharmacogenetics and clinical pharmacogenetics. The overall goal of this course is integrate a general understanding of the field of pharmacogenetics with current research focused on novel drug discovery. This course is cross listed as PHSC 564 and CLNR 528.

PHAR 595 – Bioterrorism & Mass Public Health Threats
Credit: 3 hours
This course provides an overview of current issues related to bioterrorism and the mass threats to public health. Details of specific risks of threat entities and their treatment will be taught. An emphasis is placed on response planning and preparation.

PHAR 599 – Neurology
Credit: 1 hour
This course will provide the student with a further understanding of neurological disease states and how to manage them including neurological pathophysiology and understanding of neurological exam. Topics that will be covered include neurotransmitters and the drugs that affect them, neuromuscular disorders, neuro oncology, infections of the brain and nervous system, neuropsychiatry, drug abuse and addiction, sleep disorders, genetic neurological disorders, and pediatric and obstetric neurology. Disease state specific medication therapies will be discussed with a focus on guidelines and evidence based medicine.

PHAR 6XX – Advanced Pharmacy Practice Experiences
Credit: 4 hours per rotation
These rotations are designed to provide the students with an environment where they can integrate
the academic knowledge gained during pre-clinical years with professional experience to develop clinical expertise in the promotion of rational and efficacious drug therapy. Each individually numbered rotation of four weeks (160 hours) duration is weighted as four semester hours. The selection, sequence and scheduling of these senior rotations will vary according to an individual student’s needs, interests and site availability. Campbell University has affiliation agreements for a diverse offering of electives ranging from additional experiences in general community and hospital practices to sub-specialties in hospital (administration, intensive care, cardiology, neurology, and emergency medicine), to clinics and long-term care (ambulatory care, surgical centers, skilled and assisted living communities) to community practice (compounding, medication therapy management services, and community management).

**PHAR 604 – Advanced Community: Advanced Pharmacy Practice Experience**

Credit: 4 hours

The purpose of this experience is to provide future pharmacists with an understanding of how the practice of pharmacy is conducted in the community setting and to further develop their professional attitudes, judgment, and skills needed to function in this practice setting. The setting for this type of APPE is select community pharmacy environments (chain and independent) in which pharmaceutical care services are provided in addition to traditional dispensing and counseling services.

**PHAR 605 – Ambulatory Care: Advanced Pharmacy Practice Experience**

Credit: 4 hours

The purpose of this experience is to introduce the student to clinical pharmacy practice in a patient-care setting through the management of common disease states. The setting for this type of APPE provides the opportunity for patient-care activities in medical practice sites such as physician offices and community health centers.

**PHAR 606 – Geriatrics: Advanced Pharmacy Practice Experience**

Credit: 4 hours

The purpose of this experience is to introduce the student to the philosophies and practice of geriatric medicine through clinically-oriented activities. The setting for this type of APPE provides the opportunity for patient-care with geriatric patients in assisted living, skilled nursing facility or other practice setting that has a large percentage of patients age 65 or older or patients physiologically similar to geriatric individuals.

**PHAR 607 – Internal Medicine I: Advanced Pharmacy Practice Experience**

Credit: 4 hours

The purpose of this experience is to expose the student to clinical pharmacy practice in the inpatient setting through clinically-oriented services and patient-specific activities. The setting for this type of APPE allows the student to work with an interdisciplinary team in the hospital setting handling patient care from an acute care perspective.

**PHAR 608– Internal Medicine II: Advanced Pharmacy Practice Experience**

Credit: 4 hours

The purpose of this experience is to build on the exposure students obtain during PH607 for pharmacy practice in the inpatient setting through clinically-oriented services and patient-specific activities. The setting for this type of APPE allows the student to work with an interdisciplinary team in the hospital setting handling patient care from an acute care perspective.
PHAR 609 – Drug Information: Advanced Pharmacy Practice Experience
Credit: 4 hours
The purpose of this experience is to better prepare future pharmacists to meet their role as a reliable and integral source of drug information through training in drug literature retrieval, evaluation & application. The setting for this type of APPE is within Drug Information Centers or in conjunction with Drug Information Services at various locations such as universities, hospitals, & pharmaceutical companies.

PHAR 610 – Advanced Hospital: Advanced Pharmacy Practice Experience
Credit: 4 hours
The purpose of this experience is to expand upon the knowledge and skill-set obtained during the Introductory to Hospital Pharmacy Practice Experience (PH507) and to facilitate the student-pharmacist’s exposure to current hospital pharmacy practice. The setting for this type of APPE allows the student-pharmacist to enhance operational/distributive skills as a component of integrated, interdisciplinary patient care within the wider hospital/health system setting.

PHAR 690 – Community Service IV
Credit: 0 hours
CPHS requires a commitment to community service. Each student pharmacist is required to provide 80 hours of community service over the four years of enrollment at CPHS. A minimum of 10 hours must be provided in each year. In addition to the benefits to the community, this requirement provides the student an opportunity to learn the needs of the community and to develop as a professional.

PHAR 699 – Professional Presentation Seminar
Credit: 1 hour
This course requires a student pharmacist to prepare and present a seminar on a timely and relevant therapeutic topic utilizing the latest available electronic technology. This course encourages the student to critically evaluate literature and fosters an environment committed to life-long learning. Effective communication with healthcare professionals is a primary role for the pharmacy professional.

PHAR 705 – Health Care Administration Research Project
Credit: Variable (maximum 3 hours)
This advanced independent study project incorporates aspects of pharmacy practice and business. Instructor permission is required.