

# BSPS Electives

*(Healthcare Professions and Drug Discovery & Development – 10 credit hours required)*

Course	Title	Prerequisites	Hours
<b>PHR 2510</b>	Introduction to Pharmacy <i>(required for EAP, Combined Degree)</i>		2
<b>PHR 2400.01*</b>	Addicting Drugs: Effects, Neurobiology, and Regulation <i>(GE Themes: Health &amp; Wellbeing)</i>		3
<b>PHR 2410*</b>	Drugstore Science <i>(GE Themes: Health &amp; Wellbeing)</i>		3
<b>PHR 2420*</b>	Drug Culture & Genetics: Revelations from Otzi to Ozzy		3
<b>PHR 2520</b>	Patient Perspectives		2
<b>PHR 3210*</b>	Nature's Medicine Cabinet	3 hrs biology or chem.	2
<b>PHR 3400*</b>	Therapeutic Frontiers		2
<b>PHR 3410</b>	Science Communication & Engagement	Jr. standing	1
<b>PHR 3420</b>	Generation Rx: America's Drug-Taking Culture <i>(GE Foundations: Historical &amp; Cultural Studies)</i>		3
<b>PHR 3430*</b>	Quest for the Cure		3
<b>PHR 3440</b>	Drugs that Changed the World <i>(GE Themes: Health &amp; Wellbeing)</i>		
<b>PHR 3520*</b>	Principles of Therapeutics		2
<b>PHR 3530</b>	Drugs, Human Enhancement, and the Mastery of Nature <i>(GE Foundations: Historical &amp; Cultural Studies)</i>		3
<b>PHR 3540</b>	Health Citizenship: Advocacy and Change-Making <i>(GE Themes: Citizenship for a Diverse and Just World)</i>		3
<b>PHR 3708</b>	Vaccines: A Global History <i>(GE Themes: Health &amp; Wellbeing)</i>		4
<b>PHR 4210H*</b>	Problem-Solving in Biomedical Chemistry	PHR 3200	2
<b>PHR 4330*</b>	Basic Pharmacokinetics	MATH 1151	2
<b>PHR 4420*</b>	Molecular Pharmacology: From DNA to Biopharmaceutical Products	PHR 3200	2
<b>PHR 4430*</b>	GPCR Pharmacology	PHR 3200 (concurrent)	2
<b>PHR 4440*</b>	Pharmacology of Neurologic and Psychiatric Disorders	NEUROSC 3000 or PHR 3200	3
<b>PHR 5270*</b>	Antibiotics and Microbial Natural Products	PHR 4000	3
<b>PHR 5402</b>	Economic Evaluation of Pharmaceutical and Healthcare Interventions	Jr. standing	3
<b>PHR 5410</b>	Understanding and Changing Vaccine Hesitancy Perspectives		3
<b>PHR 5500</b>	History of Pharmacy	Soph. standing	3
<b>PHR 5510*</b>	Basics of Pharmaconutrition		3
<b>PHR 5525</b>	Advocacy in Pharmacy	PHR 2510	1
<b>PHR 5540*</b>	Topics in Clinical Pharmacy Research	PHR 4000	2
<b>PHR 5550</b>	Topics in International Pharmacy	Jr. standing	2
<b>PHR 5560</b>	Success & Leadership in Pharmacy		1.5
<b>PHR 5590</b>	Chemical Dependency and the Healthcare Profession		3
<b>PHR 5700</b>	Introduction to Personalized Therapeutic and Pharmacogenomics	3 hrs biology	3
<b>PHR 5798</b>	International Healthcare Experience in Pharmacy	By application	3

\*counts for EITHER BSPS Elective or Choice Science

\*\*PHR Gen. Ed Theme courses can overlap with BSPS electives or choice sciences up to 6 credit hours

## Course Descriptions

### **PHR 2400.01 – Addicting Drugs: Effect, Introductory Neurobiology and Regulation (3 credit hours)**

- ❖ *GE Themes: Health & Wellbeing*
- ❖ Overview of effects, regulation, and mechanism of action of addicting drugs with an introduction to function of the nervous system and how this function is altered by drugs.

### **PHR 2410 – Drugstore Science (3 credit hours)**

- ❖ *GE Themes: Health & Wellbeing*
- ❖ Distance-learning course (100% online)
- ❖ This course introduces the science behind common drugstore products, including over-the-counter (OTC) medications and drug-cosmetics, including how these products work, potential non-drug alternatives, and various drug-related issues involving their use. Note: Content of this course is not intended to be considered as professional medical advice or to replace advice from a healthcare provider.

### **PHR 2420 – Drug Culture and Genetics: Revelations from Otzi to Ozzy (3 credit hours)**

- ❖ Humans have been experimenting with chemicals for therapeutic use and taking mind-altering substances for thousands of years. In this course we investigate the genetic evidence of past human drug use, the genetic revelations and techniques involved in therapeutic drug use addiction behavior today, and the role of genetics in the future of therapeutics.

### **PHR 2510 – Introduction to Pharmacy (2 credit hours)**

- ❖ A survey of the profession of pharmacy, dealing with its history, educational requirements, organization, regulation, and contemporary developments.

### **PHR 2511H – Introduction to Pharmacy Honors (3 credit hours)**

- ❖ A survey of the profession of pharmacy including its history, scope of practice, educational pathways, ethical foundations, regulation, contemporary issues, career opportunities, and prospects for the future; as well as topics related to medication use and drug discovery/development.

### **PHR 2520 – Patient Perspectives (2 credit hours)**

- ❖ This course will provide students with the unique opportunity to learn directly from patient speakers (and caregivers if available) about the impact disease states and therapy have on them. In addition to listening to these first-hand accounts, students will be able to thoughtfully engage and meaningfully reflect each week to develop their understanding and empathy for the patient experience.

**PHR 2530/2350E – Introduction to Pharmaceutical Sciences Research (2 credit hours)**

- ❖ This elective is designed to differentiate investigation-focused pharmaceutical research compared to skills-focused laboratory course work and introduce students to exciting topics of active research in the field in a highly approachable way.
- ❖ **Elective for Healthcare Professions Pathway ONLY (required for DDD)**

**PHR 3191 – Experiential Learning in Pharmaceutical Sciences (1 credit hour)**

- ❖ Allows students to reflect on their hands-on pharmacy or health care-related internships, jobs, or other experiences through course lectures and assignments. Students will work closely with their supervisors and instructors to explore the skills they have gained and to receive constructive feedback.

**PHR 3210 – Nature’s Medicine Cabinet (2 credit hours)**

- ❖ This course covers basic information on natural products that have exerted an effect on human health to be utilized as a foundation in solving simulated practical cases.

**PHR 3400 – Therapeutic Frontiers (2 credit hours)**

- ❖ Investigation of newly emerging (and at times) controversial strategies for treating disease, including biologics, cell replacement therapy, and vaccines among others. This course also explores the science behind important therapeutic factors such as the placebo effect, the microbiome, and pharmacogenomics.

**PHR 3410 – Science Communication and Engagement (1 credit hour)**

- ❖ With the Generation Rx Laboratory at the Center of Science and Industry (COSI), students will practice science communication as they create and lead live, hands-on experiments teaching basic drug science.
- ❖ *Course is graded S/U*

**PHR 3420 – Generation Rx: America’s Drug-Taking Culture (3 credit hours)**

- ❖ *GE Foundations: Historical & Cultural Studies*
- ❖ Distance-Learning course (100% online)
- ❖ This course analyzes America’s drug-taking culture by examining its past, present, and future. Students will identify factors that fuel it, discuss its influence on a patient’s medication experience, and evaluate its role in a current public health crisis. The course will conclude with discussing ideas that promote a culture of health.

**PHR 3430 – Quest for the Cure (3 credit hours)**

- ❖ In this course we discuss the ongoing quest for a cure for cancer, including recent investigations in how cancer is treated, prevented, and detected. Like in many quests, cancer has proven an evasive and adaptable villain and our heroic cancer patients, advocates, researchers, and healthcare providers face additional obstacles in the form of cancer health disparities.

**PHR 3440 – Drugs that Changed the World (3 credit hours)**

- ❖ Medications have profoundly affected the human experience. The discovery and use of medications such as antibiotics, contraceptives, and vaccines have reshaped our society in the last century. While many of these medications have had a generally positive impact on human populations, they are not free of controversy. This course will explore their complex history, science, and societal impact.

**PHR 3520 – Principles of Therapeutics (2 credit hours)**

- ❖ Designed to provide knowledge about medication therapies and treatment guidelines for common illnesses affecting patients.

**PHR 3530 – Drugs, Human Enhancement, and the Mastery of Nature (3 credit hours)**

- ❖ *GE Foundations: Historical & Cultural Studies*
- ❖ How should we navigate questions of identity in the world of cognitive and mood enhancing drugs? Where do we draw the line on 'smart drugs' for intellectual endeavors or the use of performance enhancing drugs in athletic pursuits? More broadly, we will debate whether and how as a society we might enact particular restraints on our pursuit of human enhancements.

**PHR 3540 – Health Citizenship: Advocacy and Change-making (3 credit hours)**

- ❖ *GE Themes: Citizenship for a Diverse and Just World*
- ❖ The goal of the Health Citizenship: Advocacy and Change-making elective is to build a foundation of knowledge of historical and current state and federal issues that impact healthcare and cultivate skills to become effective changemakers to improve the healthcare system. Students will participate in distance learning and discussion activities to evaluate opportunities for improvement for healthcare. By the end of the elective, students will have developed enhanced knowledge, communication and relationship skills to leverage their role to advance patient care.

**PHR 3708 – Vaccines: A Global History (4 credit hours)**

- ❖ *GE Themes: Health & Wellbeing*
- ❖ This course examines the history and biology of vaccines. We explore the discovery and development of vaccines, along with the political and cultural controversies that have surrounded them for centuries. Team-taught course with faculty member in History.

**PHR 4193 – Independent Study in Pharmaceutical Sciences (Credit hours vary)**

- ❖ Laboratory and library work designed to give the qualified student an opportunity to complete an original investigation or pursue an interest in a special problem.

**PHR 4210H – Problem Solving in Biomedical Chemistry (2 credit hours)**

- ❖ A course designed to use problem-based learning to promote understanding of biomedical concepts. Case studies will be assigned, allowing students to apply biochemical principles and communicate with their colleagues in the course.

**PHR 4330 – Basic Pharmacokinetics (2 credit hours)**

- ❖ An elementary course designed to introduce the student to the topic of pharmacokinetics. The application of biopharmaceutics and pharmacokinetic principles as they relate to drug absorption, distribution and elimination will be discussed.

**PHR 4420 – Molecular Pharmacology: From DNA to Biopharmaceutical Products (2 credit hours)**

- ❖ Introduces students to pharmacological research and drug discovery through readings, discussions, and presentations.

**PHR 4430 – GPCR Pharmacology (2 credit hours)**

- ❖ Focuses on the pharmacology of G-protein-coupled receptors (GPCRs). GPCRs constitute a large and diverse family of proteins whose importance is underscored by the fact that at least one third of the currently marketed drugs target these proteins.

**PHR 4440 – Pharmacology of Neurologic and Psychiatric Disorders (3 credit hours)**

- ❖ This course is designed for pharmaceutical science majors, neuroscience majors, or non-majors with a basic knowledge of biology. This course will serve as an introduction to principles of pharmacological therapy of neurologic and psychiatric diseases.

**PHR 4997 – BSPS Honors Project (Credit hours Vary)**

- ❖ Designed to provide undergraduate students with practical experience in the pharmaceutical sciences through research, outreach and engagement, internships and other activities.
- ❖ *Course is graded S/U*
- ❖ *Prerequisite: Honors standing and enrollment in BSPS Program*

**PHR 4998 – General Undergraduate Research (Credit hours Vary)**

- ❖ Course credit earned by conducting research while enrolled as an undergraduate student.
- ❖ *Course is graded S/U*

**PHR 4999 – Undergraduate Research Thesis (Credit hours Vary)**

- ❖ Culmination of undergraduate research in the form of written thesis

**PHR 5402 – Economic Evaluation of Pharmaceutical and Health Care Interventions (3 Credit hours)**

- ❖ Distance-learning course (100% online)
- ❖ Introduction to economic evaluation of pharmaceutical and other health care interventions and services, including evaluating costs and health outcomes, using results to inform resource allocation, interpretation and evaluation of economic evaluations in the literature, and decision analysis in health care.

**PHR 5410 - Understanding and Changing Vaccine Hesitancy Perspectives (3 Credit Hours)**

- ❖ Vaccines are among the most significant achievements in modern medicine, providing a safe and highly effective means to prevent disease. However, an increasing number of individuals are refusing vaccination. In this course, we analyze contributing factors to the anti-vaccine movement, discuss the psychology behind vaccine hesitancy, and evaluate the implications of under vaccination.

**PHR 5500 - History of Pharmacy (3 Credit Hours)**

- ❖ Distance-Enhanced
- ❖ Evolution and development of the profession of pharmacy from antiquity to the present, with emphasis on its Anglo-American development since the 18th century.
- ❖ *Prerequisite: Soph standing in BSPS, or enrollment in PharmD program. Not open to students with credit for 5130.*

**PHR 5510 – Basics of Pharmaconutrition (3 credit hours)**

- ❖ Covers basic information on the effects of dietary factors on pharmaconutrition to be utilized as a foundation in solving patient-related cases in pharmacy practice.

**PHR 5525 - Advocacy in Pharmacy (2 Credit Hours)**

- ❖ Informs and engages students in legislation, the role of advocacy in Pharmacy, current healthcare issues, and how students and organizations can make a difference in the future of Pharmacy practice. Completion of Pharmacy 2510: Introduction to Pharmacy recommended for undergraduates.

**PHR 5540 – Introduction to Clinical and Translational Pharmacy Research (2 credit hours)**

- ❖ Introduction to conducting research in clinical pharmacy including research design issues and ethical considerations. Faculty conducting research in various populations will discuss their research, followed by class discussion.
- ❖ *Course is graded S/U*

**PHR 5550 - Topics in International Pharmacy (2 Credit Hours)**

- ❖ Seminar on global pharmaceutical issues and international practices of pharmacy.
- ❖ *This course is graded S/U.*

**PHR 5560 - Success & Leadership in Pharmacy (1.5 Credit Hours)**

- ❖ Explore the meaning of success and leadership, attributes of successful leaders and what can be done to be a successful leader.
- ❖ *This course is graded S/U.*

**PHR 5580 - Professional Ethics (1.5 Credit Hours)**

- ❖ The conceptual basis and content of pharmaceutical ethics; significance of codified ethics, interprofessionally considered; individual and group analysis of ethical issues; methods of encouraging compliance.

**PHR 5590 - Chemical Dependency and the Healthcare Professional (3 Credit Hours)**

- ❖ This lecture- and discussion-based course provides instruction, debate and exploration relating to the impact of chemical dependency on healthcare professionals, including the concepts of addiction, individuals at risk, intervention, withdrawal, emotions, recovery networks, regulatory actions and returning to practice.

**PHR/CBG 5700 – Introduction to Personalized Therapeutic and Pharmacogenomics (3 credit hours)**

- ❖ Exploration of the trend to therapy tailored to the individual patient rather than "one drug fits all;" inter-individual differences in drug responses, with emphasis on genetic and genomic factors; ethical, regulatory, and economic issues that impact drug therapies. Credit for introductory biology course recommended prior to enrollment.

**PHR 5798 - International Healthcare Experience in Pharmacy (3 Credit Hours)**

- ❖ Preparation for traveling abroad to a destination country. Students will be introduced to the culture, history, and healthcare practice in the destination country. Evaluation will be based on participation in individual class sessions and fulfillment of assignments.
- ❖ *Admitted by application. This course is graded S/U.*