

BSPS Choice Sciences

(Healthcare Professions – 18 hours | Drug Discovery & Development – 14 hours)

Course	Title	Prerequisites	Hours
MICRBIO 4000 4000.01 or 4000.02	Microbiology <i>(required for EAP, Combined Degree)</i>	BIO 1113.xx	4
ANATOMY 2300 or 3300	Human Anatomy Advanced Human Anatomy	BIO 1113.xx	4 5
EEOB 2510	Human Anatomy	3 hrs. Biology	3
EEOB 2511	Human Anatomy	3 hrs. Biology	4
BIO 1114.xx	Biological Sciences: Form, Function, Diversity & Ecology	BIO 1113.xx	4
CHEM 2550	Organic Chemistry II Lab	CHEM 2520 (or conc.)	2
CHEM 2210	Analytical Chemistry I: Quantitative Analysis	CHEM 1220	5
CHEM 3510	Inorganic Chemistry	CHEM 2520	3
CHEM 5440	Introduction to Computational Chemistry	CHEM 2520	3
MATH 1152	Calculus II	MATH 1151 (C- or higher)	5
HTHRHS 2500	Medical Terminology for the Health Professions <i>(Does not count for DDD Pathway Choice Sciences)</i>		3
HUMNTR 2410	Science of Human Nutrition		4
HUMNTR 2310	Fundamentals of Nutrition	BIO 1113 & CHEM 1220	3
MICRBIO 5122	Immunology	MICRBIO 4000	3
MOLGEN 4500	General Genetics	BIO 1113	3
MOLGEN 4606	Molecular Genetics	BIO 1113 or CHEM1210	4
PSYCH 3331	Abnormal Psychology	PSYCH 1100	3
PSYCH 3340	Introduction to Life Span Development Psychology	PSYCH 1100	3
PHYSICS 1200 or PHYSICS 1250	Mechanics, Kinematics, Fluids, Waves Mechanics, Work & Energy, Thermal Physics	MATH 1148, placement M MATH 1151 (or conc.)	5
PHYSICS 1201 or PHYSICS 1251	E&M, Optics, Modern Physics E&M, Waves, Optics, Modern Physics	PHYSICS 1200 PHYSICS 1250/MATH 1151	5 5
PHR 2400.01*	Addicting Drugs		3
PHR 2410*	Drugstore Science <i>(GE Themes: Health & Wellbeing)</i>		3
PHR 2420*	Drug Culture & Genetics: Revelations from Otzi to Ozzy		3
PHR 3210*	Nature's Medicine Cabinet	3 hrs. Biology or Chemistry	2
PHR 3400*	Therapeutic Frontiers		2
PHR 3430*	Quest for the Cure		3

PHR 3520*	Principles of Therapeutics		2
PHR 4210H*	Problem-Solving in Biomedical Chemistry	PHR 3200	2
PHR 4330*	Basic Pharmacokinetics	MATH 1151	2
PHR 4420*	Molecular Pharmacology: From DNA to Biopharmaceutical Products	PHR 3200 (or conc.)	2
PHR 4430*	GPCR Pharmacology	PHR 3200 (or conc.)	2
PHR 4440*	Pharmacology of Neurologic and Psychiatric Disorders	NEUROSC 3000 or PHR 3200	3
PHR 5510*	Basics of Pharmaconutrition		3
PHR 5520*	Advanced Pharmaconutrition	PHR 5510	2
PHR 5540*	Topics in Clinical Pharmacy Research	PHR 4000	2
PHR 5700*	Intro to Personalized Therapeutic and Pharmacogenomics		3

*Counts for EITHER pharmacy elective or choice science

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

Course Descriptions

MICROBIO 4000.01/02 – Basic and Practical Microbiology (4 credit hours)

- ❖ Provides an understanding of microorganisms and their interaction with the human experience.
- ❖ Required for Combined Degree, EAP

ANATOMY 2300 – Human Anatomy (4 credit hours)

- ❖ Regional study of the basic structure and terminology associated with the human body supplemented with computer-assisted instruction. Laboratory includes demonstrations on prosected human cadavers.
- ❖ **Note: EEOB 2510, EEOB 2511 and ANATOMY 3300 are also acceptable**

BIOLOGY 1114 – Biological Sciences: Form, Function, Diversity, and Ecology (4 credit hours)

- ❖ Exploration of biology and biological principles; evolution and speciation, diversity in structure, function, behavior, and ecology among prokaryotes and eukaryotes. A broad introduction to biology comprises both Biology 1113 and 1114.

Chem 2550 – Organic Chemistry Laboratory II (2 credit hours)

- ❖ Introduction to spectroscopic characterization, scientific writing, computational chemistry, and the laboratory techniques of organic chemistry, including synthesis, isolation, purification, and identification of organic compounds.

CHEM 2210 – Analytical Chemistry I: Quantitative Analysis (5 credit hours)

- ❖ Quantitative chemical analysis for chemistry majors; quantitative analysis of the elemental and molecular composition of complex systems.

CHEM 3510 Inorganic Chemistry (3 credit hours)

- ❖ Introduction to the principles of inorganic structure and bonding, including molecular symmetry, atomic structure, ionic bonding, coordination complexes, magnetic properties, thermodynamics and reactivity, bioinorganic chemistry, and nanoparticles.

CHEM 5440 – Intro to Computational Chemistry (3 credit hours)

- ❖ Introduction to fundamental concepts in computational chemistry, including molecular modeling, molecular dynamics, and semi-empirical and ab initio calculations.

Math 1152 – Calculus II (5 credit hours)

- ❖ Integral calculus, sequences and series, parametric curves, polar coordinates, (optional: vectors).

HTRHSC 2500 – Medical Terminology for the Health Professions (3 credit hours)

- ❖ Terminology and abbreviations pertaining to anatomy, physiology, pathology, diagnostic processes/procedures and medical/surgical interventions by body system.
- ❖ ***Does not count for DDD Pathway Choice Science.***

HUMNTR 2210 – Science of Human Nutrition (3 credit hours)

- ❖ Basic principles of biological science, emphasizing the interaction between nutrients and physiological (including cellular) processes.

HUMNTR 2310 – Fundamentals of Nutrition (3 credit hours)

- ❖ Nutrient and energy needs of the human biological system throughout the life cycle including energy balance with consideration of socio-psychological factors.

MICROBIO 5122 – Immunology (2 credit hours)

- ❖ Cellular and molecular properties of the immune system.

MOLGEN 4500 – General Genetics (3 credit hours)

- ❖ The principles of genetics, including molecular genetics, transmission genetics of prokaryotes and eukaryotes, developmental and non-chromosomal genetics, recombinant DNA and genomics, and the genetics and evolution of populations.

MOLGEN 4606 – Molecular Genetics (4 credit hours)

- ❖ A comprehensive genetics course for majors covering transmission and molecular genetics; DNA replication, repair and mutation; transcription and translation; analysis and manipulation of genes at the molecular level.

PSYCH 3331 – Abnormal Psychology (3 credit hours)

- ❖ Examination of current theories and empirical findings regarding the major forms of psychopathology and treatment.

PSYCH 3340 – Intro to Life Span Development Psychology (3 credit hours)

- ❖ Consideration of theories and research on psychological development across the lifespan; includes consideration of social policies that influence developmental outcomes.

PHYSICS 1200 – Mechanics, Kinematics, Fluids, Waves (5 credit hours)

- ❖ Algebra-based introduction to classical physics: Newtons laws, fluids, waves.
- ❖ **Note: PHYSICS 1250 is also acceptable**

PHYSICS 1201 – E&M, Optics, Modern Physics (5 credit hours)

- ❖ Algebra-based introduction to electricity and magnetism, simple optics, overview of modern physics including special relativity and quantum mechanics.
- ❖ **Note: PHYSICS 1251 is also acceptable**

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

- ❖ 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)

- ❖ 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 2530/ 2530E – Introduction to Pharmaceutical Sciences Research (2 credit hours)

- This elective is designed to differentiate investigation-focused pharmaceutical research compared to skills-focused laboratory coursework and introduce students to exciting topics of active research in the field in a highly approachable way.
- **Does not count for DDD Pathway Choice Science.**

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 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 3520 – Principles of Therapeutics (2 credit hours)

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

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 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 5520 - Advanced Pharmacognosy (2 credit hours)

- ❖ Provides concepts needed by pharmacists necessary to include nutrition into their daily assessment of patients and integrate their findings into the therapeutic plan.

PHR 5540 – Topics in Clinical 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 5700/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.