

# Pharmaceutical Sciences (PSCI)

---

**PSCI 194. Individual Study. 1-5 Credits.**

**PSCI 196. Field Experience. 1-15 Credits.**

**PSCI 199. Special Topics. 1-5 Credits.**

**PSCI 291. Seminar. 1-3 Credits.**

**PSCI 292. Global Practicum: Study Abroad. 1-15 Credits.**

Pre-Arranged study at accredited foreign institutions (study abroad), domestic institutions (National Student Exchange) or on approved study abroad programs. Pre-requisite: Sophomore standing and prior approval by International Student and Study Abroad Services and major department. Graded 'P' or 'F' (Undergraduate), or 'S' or 'U' (Graduate).

**PSCI 294. Individual Study. 1-5 Credits.**

**PSCI 299. Special Topics. 1-5 Credits.**

**PSCI 300. Pharmaceutical Organic Chemistry. 5 Credits.**

This course provides pre-professional pharmacy students enrolled in the Doctor of Pharmacy Early Admissions Pathway with a comprehensive overview of organic chemistry and related topics relevant to the professional pharmacy curriculum such as structure-activity relationships, drug design, and common pharmaceutical polymers. Prereq: CHEM 121, CHEM 121L, CHEM 122, CHEM 122L. Restricted to students who have conditional acceptance in the NDSU Doctor of Pharmacy program.

**PSCI 301. Biochemistry and Molecular Biology for Pharmacists. 5 Credits.**

The primary goal in this course is to ensure that students begin to understand how biological processes occur at the molecular level. Students will also study the structure and function of the molecules of living cells, with an emphasis on proteins in the context of antibiotic and other drug interactions. The course will include an introduction to biomolecules, an examination of the generation and use of metabolic energy, biosynthesis, metabolic regulation, and an introduction of the storage, transmission, and expression of genetic information. Prereq: CHEM 342 or PSCI 300. Restricted to students who have conditional acceptance in the NDSU Doctor of Pharmacy program.

**PSCI 367. Pharmaceutical Calculations. 1 Credit.**

Qualitative and quantitative principles encompassing calculations performed by pharmacists in traditional and specialized practice settings. Scope includes computations related to prescriptions and medication orders. Restricted to students in the professional Pharmacy program.

**PSCI 368. Pharmaceutics I. 3 Credits.**

Quantitative and theoretical principles of science applied to the design, preparation, evaluation, use, and therapeutic limitations of various pharmaceutical dosage forms. Biological and physiochemical principles that govern the absorption, distribution, metabolism, and excretion of drug dosage forms in humans. Prereq: Admission to professional program.

**PSCI 369. Pharmaceutics II. 2 Credits.**

Quantitative and theoretical principles of science applied to the design, preparation, evaluation, use, and therapeutic limitations of various pharmaceutical dosage forms. Biological and physiochemical principles that govern the absorption of drug dosage forms. Prereq: Admission to professional program.

**PSCI 379. Global Seminar. 1-6 Credits.**

NDSU instructed experience or field study in a foreign country. Conducted in English for residence credit. Pre-requisite: Prior approval by International Student and Study Abroad Services and major department. May be repeated. Standard Grading.

**PSCI 391. Seminar. 1-3 Credits.**

**PSCI 392. Global Practicum: Study Abroad. 1-15 Credits.**

Pre-Arranged study at accredited foreign institutions (study abroad), domestic institutions (National Student Exchange) or on approved study abroad programs. Pre-requisite: Sophomore standing and prior approval by International Student and Study Abroad Services and major department. Graded 'P' or 'F' (Undergraduate), or 'S' or 'U' (Graduate).

**PSCI 394. Individual Study. 1-5 Credits.**

**PSCI 399. Special Topics. 1-5 Credits.**

**PSCI 410. Pharmaceutical Biotechnology. 2 Credits.**

Current and future biotechnologies in drug discovery, design, and production. Diagnostic technologies for individualized patient therapies. Prereq: admission to PharmD program. {Also offered for graduate credit - see PSCI 610.}

**PSCI 411. Principles of Pharmacokinetics and Pharmacodynamics. 3 Credits.**

This course is designed for professional Pharm D students/Graduate Students to learn and understand the basic principles of Pharmacokinetics/Pharmacodynamics, and then apply them to the patient care setting and scientific research, covering from basic chemical, biochemical, pharmacological principles applied to the study of therapeutic agents, to the pharmacologic properties of drugs that affect their ADME and therapeutic effects. Prereq: Admission to PharmD program. {Also offered for graduate credit - see PSCI 611.}

**PSCI 412. Chemotherapeutic/Infectious Disease Pharmacodynamics. 3 Credits.**

Pharmacologic and therapeutic properties of chemotherapeutic agents and anti-infective drugs. Prereq: PSCI 411. {Also offered for graduate credit - see PSCI 612.}.

**PSCI 413. Endocrine/Respiratory/GI Pharmacodynamics. 3 Credits.**

The pharmacological properties and therapeutic uses of therapeutic agents for the treatment of disorders of the endocrine and GI systems, autonomic nervous system, and anti-inflammation agents, will be covered in this course. Prereq: PHRM 340, PHRM 341, PSCI 411 all with a grade of C or higher. {Also offered for graduate credit - see PSCI 613.}.

**PSCI 414. Cardiovascular Pharmacodynamics. 3 Credits.**

Pharmacologic properties of drugs used in the treatment of cardiovascular disorders. Prereq: PHRM 340 and PSCI 411 both with a grade of C or higher. {Also offered for graduate credit - see PSCI 614.}.

**PSCI 415. Neuropsychiatry Pharmacodynamics. 3 Credits.**

Pharmacological properties of therapeutic agents used in the treatment of central nervous system disorders. Prereq: PHRM 341 and PSCI 411 both with a grade of C or higher. {Also offered for graduate credit - see PSCI 615.}.

**PSCI 417. Pharmacogenomics. 2 Credits.**

This course provides students with a broad perspective on the emergence of pharmacogenomics as a new field and the potential role of pharmacogenomics in future clinical therapeutics and drug design. Prereq: Admission to PharmD/graduate PSCI program. {Also offered for graduate credit - see PSCI 617.}.

**PSCI 470. Pharmacokinetics. 3 Credits.**

Concepts and mathematical techniques for describing the time course of drugs in biological systems. Prereq: PSCI 411 with a grade of C or higher. {Also offered for graduate credit - see PSCI 670.}.

**PSCI 491. Seminar. 1-5 Credits.**

**PSCI 492. Global Practicum: Study Abroad. 1-15 Credits.**

Pre-Arranged study at accredited foreign institutions (study abroad), domestic institutions (National Student Exchange) or on approved study abroad programs. Pre-requisite: Sophomore standing and prior approval by International Student and Study Abroad Services and major department. Graded 'P' or 'F' (Undergraduate), or 'S' or 'U' (Graduate).

**PSCI 494. Individual Study. 1-5 Credits.**

**PSCI 496. Field Experience. 1-15 Credits.**

**PSCI 499. Special Topics. 1-5 Credits.**

**PSCI 545. Clinical Toxicology. 2 Credits.**

Toxic potential of various poisonous substances including mechanism of toxicity, toxic doses, clinical presentation, clinical and laboratory monitoring and their specific treatment. Prereq: PSCI 411.

**PSCI 590. Graduate Seminar. 1-3 Credits.**

**PSCI 593. Individual Study/Tutorial. 1-5 Credits.**

**PSCI 610. Pharmaceutical Biotechnology. 2 Credits.**

Current and future biotechnologies in drug discovery, design, and production. Diagnostic technologies for individualized patient therapies. Prereq: Accepted into PSCI Graduate Program and/or department consent. {Also offered for undergraduate credit - see PSCI 410.}.

**PSCI 611. Principles of Pharmacokinetics and Pharmacodynamics. 3 Credits.**

This course is designed for professional Pharm D students/Graduate Students to learn and understand the basic principles of Pharmacokinetics/Pharmacodynamics, and then apply them to the patient care setting and scientific research, covering from basic chemical, biochemical, pharmacological principles applied to the study of therapeutic agents, to the pharmacologic properties of drugs that affect their ADME and therapeutic effects. Prereq: Admission into PSCI Graduate Program and/or department consent. {Also offered for undergraduate credit - see PSCI 411.}.

**PSCI 612. Chemotherapeutic/Infectious Disease Pharmacodynamics. 3 Credits.**

This is a basic pharmacology course. The chemical structure, medicinal and pharmacological properties of therapeutic agents used in the treatment of cancerous and infectious diseases will be covered in this course. Aspects of microbiology, molecular and cell biology, physiology, immunology and pharmacology related to understanding the therapeutic use of these agents will be discussed. Prereq: accepted into PSCI Graduate Program and/or department consent. {Also offered for undergraduate credit - see PSCI 412.}.

**PSCI 613. Endocrine/Respiratory/GI Pharmacodynamics. 3 Credits.**

The pharmacological properties and therapeutic uses of therapeutic agents for the treatment of disorders of the endocrine and GI systems, autonomic nervous system, and anti-inflammation agents, will be covered in this course. Prereq: Admission into PSCI Graduate Program and/or department consent. {Also offered for undergraduate credit - see PSCI 413.}.

**PSCI 614. Cardiovascular Pharmacodynamics. 3 Credits.**

Pharmacologic properties of drugs used in the treatment of cardiovascular disorders. Prereq: accepted into PSCI Graduate Program and/or department consent. {Also offered for undergraduate credit - see PSCI 414.}.

**PSCI 615. Neuropsychiatry Pharmacodynamics. 3 Credits.**

Pharmacological properties of therapeutic agents used in the treatment of central nervous system disorders. Prereq: accepted into PSCI Graduate Program and/or department consent. {Also offered for undergraduate credit - see PSCI 415.}.

**PSCI 617. Pharmacogenomics. 2 Credits.**

This course provides students with a broad perspective on the emergence of pharmacogenomics as a new field and the potential role of pharmacogenomics in future clinical therapeutics and drug design. Prereq: Admission into Pharmaceutical Sciences graduate program and/or consent from the Department of Pharmaceutical Sciences. {Also offered for undergraduate credit - see PSCI 417.}.

**PSCI 670. Pharmacokinetics. 3 Credits.**

Concepts and mathematical techniques for describing the time course of drugs in biological systems. Also includes Toxicology. Prereq: Admission to PSCI Graduate program and/or department consent. {Also offered for undergraduate credit - see PSCI 470.}.

**PSCI 690. Graduate Seminar. 1-3 Credits.****PSCI 696. Special Topics. 1-5 Credits.****PSCI 701. Quantative Drug Design. 2 Credits.**

Modeling of drug disposition and receptor binding with focus on rational development of new drugs and elucidation of action mechanisms.

**PSCI 703. Drug Metabolism. 2 Credits.**

Drug biotransformations and their effects on drug properties such as duration of action, potency, toxicity, and specificity. Prereq: BIOC 702.

**PSCI 746. Neuropharmacology. 3 Credits.**

Study of action mechanisms of drugs affecting the central and peripheral nervous systems.

**PSCI 747. Cardiovascular Pharmacology. 3 Credits.**

Study of action mechanisms of drugs affecting the circulatory systems, including their pathology.

**PSCI 762. Advanced Biopharmaceutics. 2 Credits.**

Stability and kinetic factors involved in absorption, distribution, metabolism, and excretion of drug products.

**PSCI 765. Cancer Cell Biology. 2 Credits.**

This course covers the principles of modern cancer cell biology, including topics on oncogenes, tumor suppressor genes, growth factors, signal transduction, cell cycle, apoptosis, angiogenesis, and mechanism of tumor metastasis.

**PSCI 790. Graduate Seminar. 1-3 Credits.****PSCI 791. Temporary/Trial Topics. 1-5 Credits.****PSCI 793. Individual Study/Tutorial. 1-5 Credits.****PSCI 795. Field Experience. 1-15 Credits.****PSCI 796. Special Topics. 1-5 Credits.****PSCI 798. Master's Thesis. 1-10 Credits.****PSCI 892. Graduate Teaching Experience. 1-6 Credits.****PSCI 899. Doctoral Dissertation. 1-15 Credits.**