

# PHARMACOLOGY AND PHYSIOLOGY (PPY)

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## PPY 1450 - Drugs We Use and Abuse

3 Credits

This course introduces students to the physiology of the human body, i.e., how different systems, such as cardiovascular, respiratory, and nervous systems, work, as well as some basic cell biology. The course additionally covers the basic pharmacology of different drugs used in our society (both legal and illicit), how they are processed by the body's systems, and how the drugs affect the body. This course is intended for non-science majors.

### Restrictions:

Enrollment limited to students in the Biology, Biomedical Engineering, Chemistry or Physics departments.

**Attributes:** Natural Science Req (A&S), UUC:Natural & Applied Science

## PPY 2540 - Human Physiology

4 Credits

An introductory course in the fundamental mechanisms of human physiology. Emphasis is given to basic cell functions and biological control systems, as well as to coordinate body functions.

## PPY 2930 - Special Topics

3 Credits (Repeatable for credit)

## PPY 2980 - Independent Study

1 or 3 Credits (Repeatable for credit)

## PPY 4410 - Molecular Pharmacology

3 Credits

This course will provide the students with a comprehensive introduction to molecular pharmacology. Topics will include fundamentals of receptor biology, binding theory & efficacy, allosteric binding, principals of drug pharmacokinetics and assays/techniques used in modern pharmacology. Each student will participate in a group literature presentation highlighting some aspect of a course topic. Case studies will be used to illustrate these and related topics.

**Prerequisite(s):** (CHEM 3600 with a grade of C- or higher, CHEM 4610 with a grade of C- or higher, or BIOL 3020 with a grade of C- or higher)

## PPY 5110 - Introduction to Pharmacology

1 Credit

PPY-5110 presents an introduction to quantitative pharmacology including pharmacokinetics, drug-receptor theory, medicinal chemistry, and quantitative/statistical approaches to assay development and operations. Prerequisite: Successful completion of the Basic Biomedical Science core curriculum. Exceptions permitted with the permission of instructor. Offered every fall semester.

## PPY 5120 - Systems Physiology and Pharmacology I

2 Credits

PPY-5120 presents an introduction to the pharmacology and physiology of the central and peripheral nervous systems. Prerequisite: Successful completion of the Basic Biomedical Science core curriculum. Exceptions permitted with the permission of instructor. Offered every fall semester.

## PPY 5130 - Systems Physiology and Pharmacology II

3 Credits

PPY-5130 presents an introduction to the pharmacology and physiology of the major systems of the body including the cardiovascular, renal, respiratory, gastrointestinal and endocrine systems, and the principles of energy storage and usage. Prerequisite: Successful completion of the Basic Biomedical Science core curriculum. Exceptions permitted with the permission of instructor. Offered every spring semester.

## PPY 5140 - Fundamentals of Effective Grant Construction

1 Credit

PPY-5140 consists of a mixture of didactic lectures, mentoring sessions, and dedicated writing time (see Appendix 3). Each student is required to write an NIH-style R01 grant application that incorporates concepts in the Pharmacological Sciences such as receptor theory, drug bioactivity, drug discovery, and chemical biology. The course starts with lectures on funding mechanisms and the fundamentals of writing an effective grant proposal. This is followed by class periods designated as dedicated writing time for constructing specific portions of their proposals, during which time a mentoring team is available during this time to answer questions. The mentoring team consists of two PPY faculty members student's dissertation advisor. At the end of the course, the completed grant application is reviewed by a mock study section who determines the student's final grade. Prerequisite: Successful completion of the Basic Biomedical Science core curriculum. Exceptions permitted with the permission of instructor. Offered every spring semester.

## PPY 5410 - Molecular Pharmacology

3 Credits

This course will provide the students with a comprehensive introduction to molecular pharmacology. Topics will include fundamentals of receptor biology, binding theory & efficacy, allosteric binding, principals of drug pharmacokinetics and assays/techniques used in modern pharmacology. Each student will participate in a group literature presentation highlighting some aspect of a course topic. Graduate students will be required to make an individual presentation on a paper provided by the instructors. Case studies will be used to illustrate these and related topics. (Offered in Spring)

### Restrictions:

Enrollment is limited to students with a major in Biochemistry/Molecular Biology or Chemical Biology.

## PPY 5950 - Special Study for Exams

0 Credits (Repeatable for credit)

## PPY 5990 - Thesis Research

0-6 Credits

## PPY 6000 - Pharmacology and Physiological Topics in Human Therapeutics

2 Credits

Selected topics and readings in human therapeutics. Offered occasionally.

## PPY 6010 - Pharmacology and Physiological Topics in Cardiovascular Science

4 Credits

Represents current thinking and concepts of cardiovascular science. Special emphasis is placed on the various control systems in normal and pathophysiological conditions, as well as interactions of drugs and physiological concepts ranging from the molecular level to highly integrative systems. Meets two days a week for one semester. Offered occasionally.

**PPY 6550 - Signal Transduction Mechanisms**

4 Credits

This course covers the mechanisms of action of hormones, neuromodulators and drugs at the cellular, biochemical and molecular levels. The major classes of receptors, signal transduction pathways, and effector systems will be covered in a comprehensive manner. Historical breakthroughs as well as our current understanding of mechanisms will be examined. As an advanced graduate course, the methodology used to elucidate and evaluate these mechanisms will be stressed. Meets two days a week for one semester. Offered occasionally.

**PPY 6660 - Pharmacology and Physiological Topics in the Nervous System**

4 Credits

This course represents current thinking and concepts involving the action of drugs on the nervous system. Special emphasis is placed on the function of neurotransmitters and neuromodulators in normal and pathophysiological conditions as well as the interaction of drugs and physiological concepts ranging from the molecular level to highly integrative systems. Meets two days a week for one semester. Offered occasionally.

**PPY 6800 - Pharm & Phys Science Seminar**

0-1 Credits (Repeatable for credit)

Pharmacology and Physiology Departmental Seminar (0-1 credit per semester). Selected topics in pharmacology and physiology are presented by local, national, and international guest speakers. Seminars are held at least twice monthly and usually more often. Offered in the Fall and Spring Semesters.

**PPY 6900 - Pharmacology and Physiological Science Journal Club**

0-1 Credits (Repeatable for credit)

Selected topics in pharmacology and physiology are discussed from the current literature in these fields. Colloquial journal clubs are held at least twice monthly and usually more often. Offered in the Fall and Spring Semesters.

**PPY 6950 - Special Study for Exams**

0 Credits (Repeatable for credit)

**PPY 6970 - Advanced Research Topics in Pharmacology and Physiology**

1 Credit (Repeatable for credit)

**PPY 6980 - Graduate Independent Study in Pharmacology and Physiology**

0-3 Credits (Repeatable for credit)

**PPY 6990 - Dissertation Research**

0-6 Credits (Repeatable for credit)