

# PHARMACOLOGY AND TOXICOLOGY (PHAR)

## **PHAR 100 Introductory Pharmacology Units: 3.00**

Topics covered include central nervous system stimulants and depressants, narcotics, alcohol, cardiovascular agents, contraceptives, environmental toxicants, mechanism of drug action and disposition, antibiotics, drugs used in sports, over-the-counter drugs, food additives, and vitamins.

NOTE Also offered online. Consult the Bachelor of Health Sciences program office. Learning Hours may vary.

**Requirements:** One-Way Exclusion PHAR 230/3.0; PHAR 270/3.0; PHAR 340/3.0; PHAR 370/3.0; PHAR 450/3.0

**Offering Faculty:** Faculty of Health Sciences

### **Course Learning Outcomes:**

1. Apply learned knowledge of the essential elements of a phase 3 clinical trial to design a hypothetical clinical trial for a new drug to treat a specific disease or condition. (PLO 4, 8; Assessment 1)
2. Describe the mechanism of action and physiological effects of classes of drugs to be able to summarize the reason(s) for their use and abuse in society. (PLO 4, 6; Assessments 2-5)
3. Discuss the pharmacological principles of drug abuse to advocate for healthy and appropriate drug use. (PLO 4, 6; Assessment 2)
4. Effectively discuss and apply relevant pharmacological principles within a group to successfully complete collaborative assignments. (PLO 4; Assessments 1, 2)

## **PHAR 230 Pharmacology for the Health Sciences Units: 3.00**

Lecture series on the following topics: principles of drug action, autonomic pharmacology, cardiovascular-renal pharmacology, neuropsychopharmacology, chemotherapy, drugs acting on the endocrine system, over-the-counter drugs, and therapeutic applications.

**Learning Hours:** 122 (36 Lecture, 8 Group Learning, 78 Private Study)

**Requirements:** Corequisite (PHGY 215 and PHGY 216) or KNPE 225 or PHGY 210/6.0 or PHGY 214/6.0. Exclusion PHAR 270/3.0; PHAR 340; PHAR 370.

**Offering Faculty:** Faculty of Health Sciences

## **PHAR 340 Principles of General Pharmacology I Units: 3.00**

Topics include: fundamental principles of drug action, autonomic nervous system pharmacology, and toxicology.

**Learning Hours:** 120 (27 Lecture, 24 Tutorial, 69 Private Study)

**Requirements:** PREREQUISITE (PHGY 215 and PHGY 216) or BIOL 339 or PHGY 210 or PHGY 214 EXCLUSION No more than 3.0 units from PHAR 230; PHAR 270; PHAR 340; PHAR 370.

**Offering Faculty:** Faculty of Health Sciences

## **PHAR 370 Fundamentals of Pharmacology and Therapeutics Units: 3.00**

An interdisciplinary course that introduces the basic principles and clinical applications of pharmacology. This 12-week course covers six topics. Students will work through the topics online, using a combination of online modules, readings, and short video clips. Students will participate in a variety of assessments throughout the course.

LEARNING HOURS may vary: 120(480;72P)

Also offered online.

**Requirements:** Corequisite One of (PHGY 215/3.0 and PHGY 216/3.0) or KNPE 225/3.0. Exclusion PHAR 230/3.0; PHAR 270/3.0; PHAR 340/3.0 One-Way Exclusion PHAR 450/3.0

**Offering Faculty:** Faculty of Health Sciences

### **Course Learning Outcomes:**

1. Apply the principles of drug therapy to solve basic pharmacokinetics problems
2. Describe how drugs affect the body and how the body affects drugs to predict beneficial and adverse drug effects
3. Discuss the use of therapeutics in a variety of physiology systems and processes to propose basic therapeutic plans for common diseases and ailments
4. Explain how drugs target and combat infections and cancers to evaluate the pros and cons of available treatment options and to advocate for appropriate use to decrease the emergence of resistance
5. Source and critically analyse phase 3 clinical trials to recognize a well-designed, valid study for a new drug

**PHAR 380 Toxicological Inquiry Units: 3.00**

Students in this course will learn about the human toxicology associated with both pharmaceutical and environmental exposures. General principles and mechanisms of toxicity will be introduced in order to describe how different pharmaceuticals and environmental compounds can lead to adverse effects in humans. Students will apply module content to current toxicological topics through exploration of popular media and the scientific literature. Development of a research proposal contributes to a large proportion of course work and assessment.

NOTE Also offered online. Consult Bachelor of Health Sciences program office.

**Learning Hours:** 120 (60 Online Activity, 60 Private Study)

**Requirements:** Prerequisite Level 2 or above and (BCHM 102/3.0 or BCHM 218/3.0 or BCHM 270/3.0 or BCHM 316/3.0 or BIOL 334/3.0).

**Offering Faculty:** Faculty of Health Sciences

**Course Learning Outcomes:**

1. Describe principles and mechanisms of toxicity in order to explain the range of possible effects following exposure to chemicals.
2. Consolidate academic literature and module content in order to develop a research question and hypothesis for an experiment involving a potentially toxic chemical.
3. Compare and contrast popular media representations of toxicity with relevant scientific literature in order to critically evaluate how toxicology is perceived by the public.

**PHAR 416 Xenobiotic Disposition and Toxicity Units: 3.00**

An advanced study of chemical disposition and toxicity. Topics include toxicokinetics, biotransformation, metabolite-mediated toxicity, free radicals, the mechanism of action of toxicants, effects of toxicants on organ systems and a detailed examination of selected toxic agents. NOTE BCHM, BIOL, BMCO, ELSC, and ETOX students should contact the Department for permission to enrol in this course.

**Learning Hours:** 120 (36 Lecture, 84 Private Study)

**Requirements:** Prerequisite Level 4 or above and registration in a LISC/BCHM Major or Specialization, ELSC Specialization, or BHSc program, and a CGPA of 2.5 or higher and (PHAR 370/3.0 or BCHM 310/9.0 or BCHM 316/3.0).

**Offering Faculty:** Faculty of Health Sciences

**Course Learning Outcomes:**

1. Describe principles and mechanisms of toxicity.
2. Explain the effects of exposure to chemicals in different situations.
3. Compare and contrast mechanisms of toxicity in different target tissues.
4. Consolidate knowledge to be able to critically analyze the attributes and shortcomings of peer reviewed manuscripts in the discipline of toxicology.
5. Present key points related to specific topics in toxicology.

**PHAR 450 Principles of General Pharmacology II Units: 3.00**

Topics include: neuropsychopharmacology, cardiovascular pharmacology, agents acting on the endocrine system, and chemotherapy.

NOTE This course involves team based learning sessions and a drug literature evaluation assignment.

**Requirements:** Prerequisite (PHAR 230 or PHAR 270 or PHAR 370 with a min grade of B) or PHAR 340.

**Offering Faculty:** Faculty of Health Sciences

**PHAR 480 Drug Discovery and Development Units: 3.00**

This survey course covers the life-cycle of pharmaceutical products including discovery, development, and the transition to a generic or over-the-counter medication. Specific themes include target identification, design and synthesis, efficacy determination, optimization, preclinical safety assessment, clinical trials, and the differences between biologics and small chemical entities. Social and economic pressures exerted upon the pharmaceutical industry are also explored.

**Requirements:** Minimum 4th year (Level 4) standing and one of (PHAR 230/3.0; PHAR 370/3.0; PHAR 340/3.0). LISC MAJ SSP students require a GPA of 2.5. Note this course cannot be used as credit towards the LISC DDHT SSP Plan Exclusion DDHT 459/3.0; DDHT 460/3.0

**Offering Faculty:** Faculty of Health Sciences

**Course Learning Outcomes:**

1. Critically analyze the social and economic implications of legislative decisions pertaining to the pharmaceutical industry to argue a particular side of these decisions.
2. Develop solutions to drug discovery/development problems to discuss either orally or in writing solutions to these problems.
3. Develop an understanding of the biologic, social, and economic constraints that influence drug discovery and drug development.
4. Develop and refine professional interpersonal communication skills.

**PHAR 499 Research Project in Pharmacology and Toxicology Units: 12.00**

An examination of the development and present state of knowledge in selected research areas of pharmacology and toxicology. Research project involves experimental design, data collection and analysis, written report and oral presentation. Students will be required to attend seminars and tutorials on topics related to research.

**NOTE** Acceptance by a supervisor required prior to registration.

**NOTE** Students whose research requires the care and/or handling of animals must also complete the Introductory Animal Care Course and if required the appropriate Animal Use workshops through the Office of the University Veterinarian.

**Learning Hours:** 480 (288 Laboratory, 24 Group Learning, 24 Individual Instruction, 144 Private Study)

**Requirements:** Prerequisite Level 4 and registration in a LISC or ELSC Specialization Plan and a cumulative GPA of 2.50 or higher. Exclusion Maximum 12.0 units from: ANAT 499/12.0; ANAT 599/6.0; BCHM 421/6.0; BCHM 422/6.0; BCHM 594/3.0; BCHM 595/6.0; BCHM 596/12.0; CANC 499/12.0; DISC 591/3.0; DISC 592/3.0; DISC 593/3.0; DISC 594/3.0; DISC 598/6.0; DISC 599/6.0; EPID 499/12.0; EPID 595/6.0; HSCI 591/3.0; HSCI 592/3.0; HSCI 593/3.0; HSCI 594/3.0; HSCI 595/3.0; HSCI 598/6.0; HSCI 599/6.0; LISC 499/12.0\*; LISC 594/3.0; LISC 595/6.0; LISC 596/12.0; LISC 598/9.0; MICR 499/12.0; NSCI 499/12.0; PATH 499/12.0; PATH 595/6.0; PHAR 499/12.0; PHGY 499/12.0; REPD 499/12.0.

**Offering Faculty:** Faculty of Health Sciences