

Master of Science in Pharmacology (Drug Design and Development)

Pharmacology is a modern science and deals with mechanisms of drug action, drug design and development, pharmacokinetics, toxicity among others. Pharmacology is related to other life science such as biochemistry, physiology, pathology, pharmacy and therapeutics among others.

Pharmacology is one of the sciences that are geared to provide solutions to problems of human health. The degree program on Pharmacology will be carried out in the Department of Biochemistry while the Chemistry departments, Institute for Computer Science and Statistics will provide expertise in relevant research methods. Collaboration with research institutions and pharmaceutical companies in Kenya (or outside) will be established to enhance practical training in biomedical research.

COURSE OBJECTIVES

1. To provide students with advanced knowledge in drug design and testing.
2. To provide students with advanced knowledge in possible targets for therapy in human pathogens.
3. To provide students with knowledge treatment of lifestyle and neurological diseases.
4. To provide students with knowledge in ethical issues in biomedical testing.
5. To expose students to recent advances in essential areas of pharmacology and ability to critic research articles.

COURSE JUSTIFICATION

Human health is important for the socio-economic status of country and thus improvement human health is of high priority in Kenya and in the world. Kenya and other developing countries have a big burden of tropical diseases and emerging/remerging diseases. There is also an increase in lifestyle diseases like cancer, hypertension, cardiovascular diseases, diabetes and nutritional disorders. Most of the tropical parasitic diseases have been neglected as far as drug development as concerned. The limited drugs are hindered by high costs, toxicity and increasing drug resistance of the parasites. The management of disease depends on better drugs thus the need to drug development is of high priority.

This pharmacology course will specialize in drug design and development. The course will also highlight great resource in traditional knowledge present in Kenya and other African countries. This program is relevant to the medical needs of Kenya and the world

CAREER OPPORTUNITIES

It is anticipated that students graduating from this program will have attained the necessary knowledge and skills to drug design and development and get job opportunities in research institutions and pharmaceuticals industry.

Regulations and syllabus for the Degree of Master of Science in Pharmacology (Drug Design and Development)

1.0 Admission Requirements

- 1.1 The common regulations for all masters degrees in the University shall apply.
- 1.2 The general regulations for all masters' degrees in the Faculty of Science shall apply.
- 1.3 The following shall be eligible for registration for the Master of Science degree in Pharmacology (Drug Design and Development);
 - 1.3.1 A holder of at least a Second Class Honours (Upper Division) degree having studied Biochemistry as a major or regular subject. The candidate must have an average of credit (B) in Biochemistry courses.
 - 1.3.2 A holder of a Second Class Honours (Lower Division) Degree in Biochemistry combined with another relevant subject but with a credit B in Biochemistry course may, under exceptional circumstances, be considered provided he/she produces evidence of having worked for at least three years in Biochemistry or a closely related field with at least one publication in a refereed journal.
 - 1.3.3 A holder of Bachelor of Veterinary Medicine, or Bachelor of Medicine and Bachelor of Surgery, or Bachelor of Pharmacy, with an average of credit (B) in Biochemistry courses.
 - 1.3.4 A holder of a degree accepted as equivalent to one of the degrees mentioned in 1.3.1 to 1.3.4 above from another University recognized by Senate.

2.0 Duration and Pattern of the Course

- 2.1 The duration of the Master of Science Pharmacology (Drug Design and Development) shall be at least two academic years (18 months) from the date of registration.
- 2.2 The program shall follow course work, examination and thesis.
- 2.3 In the first year students shall take twelve units which shall be assessed by course-work and examination. Each unit shall comprise lectures which shall include tutorials and discussions. In addition, students will be required to attend/present Departmental seminars.

- 2.4 In the second year students will undertake research, seminar presentation (at least **two** seminars on their research work) and thesis writing.
- 2.5 The students will present a research proposal to the departmental postgraduate board before formal registration by Board of Postgraduate studies
- 2.6 Upon successful registration, the student shall commence on the research and present quarterly reports to Board of Postgraduate studies during the course of the study.
- 2.7 That the regulations for thesis/dissertation/project outlined in section 4.0. shall apply.

COURSE DISTRIBUTION

First Year – First Semester

1. SBH 3100 Research Methodology
2. SBH 3102 Bioinformatics
3. SCH 3104 Synthetic organic chemistry
4. SBH 3121 Principles of drug efficacy testing
5. SBH 3123 Principles of pharmacology and toxicology
6. SBH 3201 Fundamentals of molecular biology

First Year – Second Semester

1. SBH 3115 Drug targets in human pathogens
2. SBH 3119 Enhanced bioavailability and drug delivery systems
3. SBH 3122 Herbal medicine and phytochemistry
4. SBH 3124 Drug targets in lifestyle and neurological diseases
5. SBH 3125 Special topics in drug design and development
6. SBH 3214 Molecular modeling and chemoinformatics