Course Title/Code: **Principles of Drug Action (MMPH6127)**

Department: Pharmacology and Pharmacy

Objective: To provide a general and broad knowledge about drug distribution and actions in human body and how drugs produce therapeutic effects in the body. In particular, the following aspects will be discussed: (1) the pharmacokinetic properties of drugs [how drugs are absorbed, distributed, excreted and metabolized in human body], (2) the molecular basis of drug actions [what are the dose-response relationships and ligand-receptor interactions], (3) the causes of adverse drug actions, drug interactions and drug allergy [why do abnormal drug responses happen as results of drug interactions, tolerance, dependence and resistance], and (4) the genetic and immunological aspects of drug actions [when to consider personalized medicine and prevent drug allergy or hypersensitivity reactions].

Content: Topic include:

- The fate of drugs in human body
- The theoretical basis of dose-response relationship
- Molecular interactions between drugs and their receptors
- Mechanisms of drug interactions
- The development of drug tolerance, physical dependence and resistance
- Adverse drug reactions
- Pharmacogenetics and pharmacogenomics
- Immunological reactions to drugs

Learning outcomes: On completion of the module, the students are expected to:

- Understand the principle, the qualitative factors (routes of administration, physicochemical properties of drugs, ADEM etc) and the quantitative aspects (bioavailability, volume of distribution, clearance, half-lives etc) of drug pharmacokinetics
- Describe the different classes of drug receptors, the molecular interactions between drugs and their receptors, the terms and principles for different modes of drug-receptor interactions (agonist, antagonist etc)
- Discuss the mechanisms responsible for and approaches to avoid the development of resistance, dependence or tolerance to drugs
- Explain the mechanisms contributing to the adverse effects of drugs, including the preventable adverse drug reaction,

drug interactions cytochrome P450 pathway of drug metabolism and the immunochemical basis for drug allergy.

- Appreciate the influence of non-drug factors (disease states, age, genetics, etc) on drug metabolism actions and adverse reactions.

Prerequisite:	**Students with biomedical, chemical and biochemical background preferred**
Duration:	First semester, 2 hours/week, 24 hours
Coursework / Examination ratio:	In-course assessment (40%) and Examination (60%)
Examination method / duration:	Written examination / 2 hours
Remarks:	Students with biochemical and biomedical background preferred