



FORMAN CHRISTIAN COLLEGE
(A Chartered University), Lahore
DEPARTMENT OF CHEMISTRY

Instructor Information:

Dr. Muhammad Abbas

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Office no.: S-312

Office hours: MWF: 10:00-15:00

Course Content:

Types and physicochemical properties of drugs and pharmacologically active products, structure and activity relationship, drug design, metal ions and information carriers, chemistry, and mode of action of some common drugs.

Learning Outcomes:

1. Upon the completion of the course, a student is expected to get knowledge of:
Learn the types, physicochemical properties of drugs, and pharmaceutically important scaffolds in various drug molecules.
2. Learn the chemical structure and drug development process, and the stereochemistry of drug molecules.
3. Learn active molecules and biological target interaction and structure-activity relationship (SAR) analysis.
4. Learn about metal ions and their complexes of medicinal importance.
5. Learn about the mode of different common drugs.

Reading Materials:

1. Foye's Principles of Medicinal Chemistry, 6th edition
2. Essentials of Pharmaceutical Chemistry from 4th edition
3. An introduction to Medicinal Chemistry, 5th edition.

Evaluation policy:

1. Quizzes	20%
2. Assignment	10%
3. Presentation/Discussion	10%
4. Midterm Examination	20%
5. Final Examination	35%
6. Class participation	05%

Note:

- A student must be regular and punctual. 90% attendance is essential to qualify to sit for the final examination.
- Zero will be awarded to a student who will be found to be guilty in the examination.
- There will be no makeup examination.

SEMESTER BREAKUP:

WEEK	Topics
1	Introduction to drugs? Drug targets, Cell structure Introduction to drug targets at the molecular level
2-3	Intermolecular bonding forces Electrostatic or ionic bonds, Hydrogen bonds, Van der Waals interactions, Dipole-dipole and ion-dipole interactions, Repulsive interactions, The role of water, and hydrophobic interactions. Pharmacokinetic issues and medicines
4-5	Lipinski's rule of five , Classification of drugs, Naming of drugs and medicines, The primary, secondary, tertiary, and quaternary structures of proteins
6-7	Translation and post-translational modifications, Proteomics, Protein function: Structural proteins, Transport proteins, Enzymes, and receptors
8	Mid and Presentations
9-10	Substrate binding at an active site, the catalytic role of enzymes, Binding interactions, Acid/base catalysis, Nucleophilic groups, Cofactors, Antibodies as drugs and as drug carriers (ADCs) with the latest examples
11-12	Role of the receptor: Neurotransmitters and hormones, Receptor types and subtypes, Receptor activation, how does the binding site change shape? Ion channel receptors, General principles, Structure, Gating, Ligand-gated and voltage-gated ion channels, G-protein-coupled receptors
13-14	Pharmacodynamics and pharmacokinetics: Enzymes as drug targets: Inhibitors acting at the active site of an enzyme with the latest examples of COVID-19 Inhibitors Reversible and Irreversible inhibitors. Receptors as drug targets: The design of agonists, antagonists.