Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NCYD535	Biopharmaceutics and Pharmacokinetics	3	0	0	3

Course Objective
• Knowledge of the process of drug uptake by biological system and their distribution and metabolism. • onset, duration and Intensity of drug action
Learning Outcomes
• To examine the interrelationship of the physical/chemical properties of the drugs and dosage form. • Mechanism of Body response to drugs administered.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Definitions, ADME, concentration time profile, plotting the data, different fluid compartments and blood flow rate compartment models, biological half-life, elimination rate constant. Biopharmaceutics and pharmacokinetics in drug research. Mechanism, physico-chemical, biological and pharmaceutical factors affecting drug absorption through GIT. Techniques for the GIT absorption assessment.	9L	Basics of Pharmacokinetics and ADME studies will be discussed with the help of case studies.
2	Total body clearance, renal clearance, mechanism of clearance, clearance ratio, factors affecting renal clearance, hepatic clearance, volume of distribution and its significance. Factors affecting protein binding, kinetics of protein binding, determination of rate constant and different plots (direct, scatchard and reciprocal), Implication of protein binding on pharmacokinetic parameters	8L	The body clearance of the drug and its protein binding studies will be presented in details
3	Definitions, federal requirements, methods of determination of bioavailability using blood and urinary excretion data. Protocol design for bioavailability assessment. Methods for bioequivalence determination. Pharmacokinetics of drugs following one/ two compartment open models with first	10L	This unit will be discussed bioavailability studies and their importance in drug discovery.

	order elimination kinetics as applied to rapid intravenous injection, Intravenous transfusion and oral administration. Determination of absorption rate constant using Wagner-Nelson, Loo Riegelman methods. Flip-flop models, method of residual. Urinary excretion data and its application in pharmacokinetic characterization of drugs. Pharmacokinetics of multiple dosing		
4	Dosage regimen adjustment in patients with renal and hepatic diseases. Drug dosage in elderly, children and obese patients. Various causes of non-linearity, Michaelis-Menten kinetics, In-vivo estimation of K_m and V_m. Case studies.	7L	The understating of dose and their importance in patients will be presented.
5	Mean Residence Time; Statistical Moment Theory; Application and limitations of physiologic pharmacokinetic models. Chronopharmacokinetics, Drug toxicity and forensic pharmacokinetics, kinetics of maternal-fetal drug transfer, pharmacokinetics v/s pharmacological/ clinical response, metabolic kinetics	8L	The statistical moment theory and their application with clinical response will be discussed in details
TOTAL		**42**	

Text Books:

1) Biopharmaceutics and Pharmacokinetics: An Introduction, Notari, R. E.,CRC Press, 4th Ed. (1986)

Reference Books:

2) Medicinal Chemistry-An Introduction, Gareth Thomas, Wiley,NY, 2nd Ed. (2007).
3) An introduction to Medicinal Chemistry, Graham L. Patrick, Oxford, 4thEd. (2009)
4) Applied Biopharmaceuticsand Pharmacokinetics, Shargel, L., S. Wu-Pong,Mc Graw Hill, 7th Ed. (2016).