Birla Institute of Technology & Science, Pilani
Hyderabad Campus

SECOND SEMESTER 2020-2021

Course Handout Part II

Date: 16-01-2021

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : CHEM F335
Course Title : Organic Chemistry and Drug Design
Instructor-in-Charge : **K V G Chandra Sekhar**
Instructor : Khetmalis Yogesh Mahadu

Scope and Objective of the Course: To familiarize the students with basic aspects of drug discovery and more importantly, the applications of organic chemistry in drug design, important drug targets, marketed drugs, synthesis of drugs; the overall objective is to have a reflective teaching and learning environment

Textbooks:

1. An Introduction to Medicinal Chemistry by Graham L. Patrick, Oxford University Press, 5th edition.

Reference books

1. Medicinal Chemistry by Ashutosh Kar, New Age International Publishers, 7th edition
2. The Organic Chemistry of Drug Design and Drug Action by Richard B Silverman, Academic press, 2nd edition.
3. Principles of Medicinal Chemistry by William O Foye, Lea and Febiger, Phil., 6th edition.

Learning Outcomes: The learner should be able to accomplish the following:

1. Able to identify and list at least five biological targets for drugs
2. From the above targets, be able to analyze and choose suitable targets for a disease with rationale
3. For the above targets be able to identify ten important available drugs, with the corresponding Structure-Activity Relationship (SAR)
4. At the end, be able to rationally design and propose simple synthesis of a drug for a given disease.

Course Plan:

Lec. No.	Learning objectives	Topics to be Covered	Chapter in the Text Book
1-13	Drugs and Drug targets	Introduction, drug targets, intermolecular bonding forces, classification of drugs, naming of drugs and medicines, structures and functions of protein, enzymes, receptors, and nucleic acids, receptors and signal transduction; miscellaneous drug targets	T: 1-10; Lecture notes
14-17	Pharmacokinetics	Molecular interaction with receptors and enzymes; absorption, distribution, metabolism, and elimination of drugs, concept of prodrugs	T:11

18-23	Drug discovery, design, and development	Finding a lead; choosing a disease, target, and bioassay; finding leads from natural drugs, synthetic compounds libraries, existing drugs; optimizing target interactions; SAR; drug development: preclinical and clinical trials; patenting and regulatory affairs	T: 12-15
24-28	Antimicrobial agents	Introduction, classification, synthesis, and design of Sulfonamides; penicillins; cephalosporins; β-lactam antibiotics; quinolones and fluroquinolones; aminoglycosides	T:19, lecture notes
29-33	Antiviral agents	Broad spectrum antiviral agents: introduction; synthesis, and design against DNA viruses; RNA viruses/HIV; protease inhibitors,	T:20
34-38	Anticancer agents	Cancer; drugs acting on nucleic acids; antimetabolites; hormone-based therapies; inhibitors of signaling pathways	T: 21

Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of Component
Mid-semester Test	90 min	30	06/03; 900 -1030 AM	Open book
Class tests*	15 min. each	20	Continuous	Open book
Presentation	10 min.	10	In April first week	Open book
Comprehensive Examination	120 min.	40	17/05 FN	Open book

* 5 class tests will be conducted and best 4 will be considered. Make up is not permissible for class tests.

Note: *Active and regular participation in the online class discussions is expected from each student.*

Chamber Consultation Hour: Monday, 10 – 11 AM

Notices: All the notices pertaining to this course will be displayed on **CMS only**.

Make-up Policy: Will be granted only for genuine reasons decided by the instructor.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Final grading will be done on the basis of the overall performance of a student in each of the components as listed under evaluation scheme. For **mid-semester grading**, progress made by a student up to that point of time would be evaluated.

INSTRUCTOR-IN-CHARGE

KVG Chandra Sekhar