

Course Code	Course Name	Credits
26CH005	MEDICINAL CHEMISTRY	04

Course Objectives

- Understand the fundamentals of drugs, including classification, nomenclature, drug design, delivery systems, and stability.
- Gain knowledge of heterocyclic drugs, common diseases, and their treatment using therapeutic agents.
- Apply principles of organic reactions and bioregulatory drugs in the synthesis and therapeutic use of pharmaceuticals.

Learning Outcomes

On completion of this course the students will be able to

- Definition, Classification of the drugs with examples and structures.
- Explain the Drugs used for various infectious diseases caused by pathogens.
- Describe the structure activity relation of some important class of drugs.
- Explain mechanism of action of the drugs.
- Describe synthesis of medicinally important drug.
- Describe various approaches and designing of drug molecules.

Unit-1 – Introduction to Chemistry of Drugs (12 Hrs.)

Drugs – definition; sources; study of drugs; classification (biological, chemical, commercial and utility); nomenclature of drugs; biotransformation; drug design; factors affecting stability of drugs; encapsulation; drug delivery systems; sustained release of drugs.

Unit 2 – Drugs Containing Heterocycles (12 Hrs.)

Structures and therapeutic uses of drugs containing pyridine (nikethamide, isoniazid, mepyramine, niacin); thiazole (niridazole, thiabendazole, sulfathiazole); imidazole (azomycin, metronidazole, clotrimazole); indole (serotonin, reserpine, ergotamine, indomethacin); quinoline (chinofon, chloroquine, primaquine).

Unit 3 - Common Diseases and their Treatment (12 Hrs.)

Insect-borne diseases – treatment using drugs; air-borne diseases – treatment; water-borne diseases – treatment; digestive disorders – treatment; diseases of respiratory system – treatment; diseases of nervous system – treatment; other common diseases – treatment.

Unit 4 – Name Reactions in Drug Synthesis (12 Hrs.)

Mechanism and uses of Beckmann rearrangement; Fries rearrangement; Schmidt reaction; MPV reduction; Clemmensen reduction; Birch reduction; Darzens reaction; Reimer–Tiemann reaction; Mannich reaction; Michael reaction.

Unit 5 - Bioregulatory Drugs (12 Hrs.)

Cardiovascular drugs; cardiac glycosides; antiarrhythmic drugs; antihypertensive agents; antianginal agents; diabetes and hypoglycaemic drugs; types of diabetes (diabetes insipidus and diabetes mellitus); control of diabetes; insulin; hypoglycaemic agents; anticonvulsants; cancer and antineoplastic drugs; causes; antimetabolites.

Reference Books:

1. S.K.Srivastava , A Complete TextBook of Medical Pharmacology, Volume I, 2012 2nd Edition, Avichal Publishing Company, Kolkatta.
2. S.K.Srivastava, A Complete TextBook of Medical Pharmacology, Volume II, 2012 2nd Edition, Avichal Publishing Company, Kolkatta.
3. Deb A C, Fundamentals of Biochemistry, 1994 New Central Book Agency, Calcutta.
4. M.Satake and Y.Mido Chemistry for Health Science 2003 Discovery Publishing House, New Delhi.
5. A.Kar , Medicinal Chemistry,1993 Wiley Easterns Limited, New Delhi.
6. J.Clayden,N. Greeves and S.Warren, Organic Chemistry, 2nd Edition, 2012 Oxford University Press, New York.
7. Gosh J, TextBook of Pharmaceutical Chemistry, 3rd Edition,1997 S. Chand & Chand Publications, New Delhi.
8. M. George M and L. Joseph, TextBook of Pharmaceutical Chemistry, 2009 Viva Books, New Delhi.

Websites and eLearning Sources:

1. <https://nptel.ac.in/courses/104106106>
2. <https://youtu.be/K501Izt7GRU?si=aX6iPW73yJfzL6e>
3. <https://www.omicsonline.org/open-access/a-short-note-on-airborne-and-waterborne-diseases-130302.html>

COs and Bloom's Taxonomy Mapping – 26CH005

Course Outcomes	On completing U.G. program the students will be able to	BTL
CO1	Recognize, Understanding and explain the drugs used for various infectious diseases caused by pathogens	K1, K2
CO2	Recognize, Understanding and explain the drugs used for various infectious diseases caused by pathogens	K3
CO3	Applying the structure activity relation of some important class of drugs and its application	K4
CO4	Analyze and explain the mechanism of action of medicinally important drugs	K5
CO5	Evaluate the synthesis of drugs and its uses	K6

BTL K1 and K2 – remembering and understanding, K3- Applying, K4 – Analyse, K5- Evaluate and K6- Create

Relationship Matrix – 26CH005

Course Outcomes	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)						Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	3	2	1	1	1	2	3	3	2	2	2	1	1.91
CO2	2	3	3	2	2	2	2	3	2	2	2	1	2.08
CO3	2	3	2	2	2	1	2	3	2	3	2	1	2.08
CO4	3	3	3	2	2	2	3	3	2	3	2	1	2.41
CO5	3	3	3	2	2	3	3	3	3	3	3	3	2.83
Total													2.26

Mean Score: 3- High, 2- Medium/Moderate, 1-Low

