ARSD College, University of Delhi

Model Course Handout/Lesson Plan

Course Name : B.Sc. Honours						
Semester	**Course Code**	**Course Title**	**Lecture (L)**	**Tutorial (T)**	**Practical (P)**	**Credit (C)**
IV	Chemistry –SEC-9	Pharmaceutical Chemistry	2			2
Teacher/Instructor(s)		Dr. Nimalini Moirangthem				
Session		2021-22				

Course Objective:

The objective of this paper is to develop basic understanding of drugs discovery, design, development and their side effects. The course will cover synthesis of major drug classes including-analgesics, antipyretics, anti- inflammatory agents, antibacterial and antifungal agents, antiviral agents, central nervous system agents and drugs for HIV--AIDS. An overview of fermentation process and production of certain dietary supplements and certain common antibiotics will be discussed.

Course Learning Outcomes:

By the end of this course, students will be able to:

• Gain insight into retro-synthesis approach in relation to drug design and drug discovery.

• Learn synthetic pathways of major drug classes.

• Understand the fermentation process and production of ethanol, citric acids, antibiotics and some classes of vitamins.

Lesson Plan:

Unit No.	Learning Objective	Lecture No.	Topics to be covered
1.	Introduction: (Lectures: 7)	1	Introduction Drug discovery, design and development
		2	Sources of drugs: biological, marine, minerals and plant tissue culture,

		3	physio-chemical aspects (optical, geometric and bioisosterism) of drug molecules and biological action,
		4	drug receptor interaction,
		5	basic retro-synthetic approach for development of drug.
		6	Cause of side effect of drugs like ibuprofen, cetirizine, thalidomide.
		7	Difference between drug and poison.
2.	Drugs and Pharmaceuticals: (Lectures: 15)	8	Study of pharmaceutical aids like talc,
		9	diatomite, kaolin
		10	gelatin and natural colours
		11	Synthesis of the representative drugs of the following classes: analgesics agents,
		12	antipyretic agents,
		13	antiinflammatory agents (Aspirin);
		14	antibacterial and antifungal agents
		15	(Sulphonamides; Sulphanethoxazol,
		16	Sulphacetamide, Trimethoprim);
		17	antiviral agents (Acyclovir),
		18	central nervous system agents (Phenobarbital,
		19	Diazepam),
		20	Cardiovascular (Glyceryl trinitrate),
		21	antilaprosy (Dapsone),
		22	HIV-AIDS related drugs (AZT- Zidovudine)
3.	Fermentation: (Lectures: 8)	23	Fermentation Aerobic and anaerobic fermentation. Production of (i) Ethyl alcohol
		24	citric acid
		25	(ii) Antibiotics; Penicillin,
		26	Cephalosporin, Chloromycetin and
		27	Streptomycin, (iii) Lysine, Glutamic acid
		28	Streptomycin, (iii) Lysine, Glutamic acid
		29	Vitamin B2,
		30	Vitamin B12, Vitamin C.

Evaluation Scheme:

No.	Component	Duration	Marks
1.	Internal Assessment		12
	• Quiz		
	• Class Test		
	• Attendance		
	• Assignment		
2.	End Semester Examination	2.5 hr	38

Details of the Course

Unit	Contents	Contact Hours
1	Introduction Drug discovery, design and development: Sources of drugs: biological, marine, minerals and plant tissue culture, physio-chemical aspects (optical, geometric and bioisosterism) of drug molecules and biological action, drug receptor interaction, basic retro-synthetic approach for development of drug. Cause of side effect of drugs like ibuprofen, cetirizine, thalidomide. Difference between drug and poison.	7
2	Study of pharmaceutical aids like talc, diatomite, kaolin, bentomite, gelatin and natural colours Synthesis of the representative drugs of the following classes: analgesics agents, antipyretic agents, antiinflammatory agents (Aspirin); antibacterial and antifungal agents (Sulphonamides; Sulphanethoxazol, Sulphacetamide, Trimethoprim); antiviral agents (Acyclovir), central nervous system agents (Phenobarbital, Diazepam),Cardiovascular (Glyceryl trinitrate), antilaprosy (Dapsone), HIV-AIDS related drugs (AZT- Zidovudine).	15
3	Fermentation Aerobic and anaerobic fermentation. Production of (i) Ethyl alcohol and citric acid, (ii) Antibiotics; Penicillin, Cephalosporin, Chloromycetin and Streptomycin, (iii) Lysine, Glutamic acid, Vitamin B2, Vitamin B12 and Vitamin C.	8
	Total	**30**

Suggested Books:

Sl. No.	Name of Authors/Books/Publishers	Year of Publication/Reprint
1	Patrick, G. Introduction to Medicinal Chemistry, Oxford University Press.	2017
2	Singh H.; Kapoor V.K. Medicinal and Pharmaceutical Chemistry, Vallabh Prakashan.	1996
3	Foye, W.O.; Lemke, T. L.; William, D.A,Principles of Medicinal Chemistry, B.I. Waverly Pvt. Ltd.	1995
4	V.K. Kapoor.; Organic Pharmaceutical Chemistry, Vallabh Prakashan.	2020
5	Chandan S.; Bishwanath C.; Suchandra C.; Kaushik B.; Lectures on Pharmaceutical Chemistry and Pesticide Chemistry, TECHNO WORLD.	2020

Mode of Evaluation:	Internal Assessment / End Semester Exam