

GUJARAT TECHNOLOGICAL UNIVERSITY

BACHELOR OF PHARMACY

SEMESTER: VIII

Subject Name: **Pharmaceutical Chemistry-X (Medicinal Chemistry)**

Subject Code: **280003**

[THEORY]

Sr. No.	Course Content	Total Hrs
	Introduction, history, classification, nomenclature, mechanism of action, adverse effects, therapeutic uses, structure activity relationship (SAR) and synthetic procedures of selected drugs and recent developments of following categories to be covered.	
1.	Drugs acting on Cardiovascular System:	
a.	Cardiotonic Agents <ul style="list-style-type: none"> SAR: Cardiac glycosides Synthesis: Dobutamine 	04
b.	Antihypertensive Agents <ul style="list-style-type: none"> SAR: ACE Inhibitors, Dihydropyridnes Synthesis: Nifedipine, Amlodipine, Atenolol, Metoprolol, Carvediol, Captopril, Hydralazine. 	08
c.	Antiarrhythmic Agents <ul style="list-style-type: none"> Synthesis: Lignocaine, Flecainide. 	04
d.	Antianginal Agents <ul style="list-style-type: none"> Synthesis: Glyceryl trinitrate, Isosorbide dinitrate 	02
e.	Antihyperlipidemic agents: <ul style="list-style-type: none"> SAR: HMG CoA Reductase inhibitors Synthesis of Clofibrate 	03
f.	Coagulants and Anticoagulants <ul style="list-style-type: none"> Synthesis of warfarin 	02
g.	Antiplatelet Agents	01
h.	Thrombolytic Agents	01
i.	Plasma expanders	01

2.	Diuretics:		
	<ul style="list-style-type: none"> SAR: Thiazide diuretics, 5-Sulfamoyl benzoic acid derivatives. Synthesis: Hydrochlorthiazide, Acetazolamide, Furosemide, Dihydroflumethiazide, Ethacrinic acid 		04
3.	Antiobesity Drugs		01
4.	Drug Design and Development:		
	a.	QSAR (i) Hansch Linear Free Energy Relationship (LFER) model (ii) Free Wilson Mathematical Model	04
	b.	De novo Drug Design (i) Molecular modeling (ii) Computer Aided Drug Design	04
	c.	Methods of Lead Discovery <ul style="list-style-type: none"> Optimization of Lead 	03
	d.	Brief introduction to Combinatorial Chemistry and Parallel Synthesis	03

[PRACTICALS]

A.	Synthesis and purification of following organic compounds: <ol style="list-style-type: none"> 1. Anthranilic acid from Phthalic anhydride 2. Dihydroxytryptycene from Anthracene and p-Benzoquinone 3. Fluorescein from Resorcinol and Phthalic anhydride and Purification by Column Chromatography. 4. 3-Phenylpropionic acid from Diethyl malonate 5. Microwave assisted synthesis of any Three Compounds. 6. Sulphanilamide from Acetanilide 7. Hippuric acid from Glycine
B.	Reaction monitoring and characterization of synthesized compounds with the help of TLC, UV and IR spectroscopy.
C.	Demonstration of QSAR Models (Any Three Exercise): <ol style="list-style-type: none"> 1. Literature survey of any QSAR Model and calculation of various physicochemical parameters 2. Perform multiple regression analysis in MS Excel. 3. Generation of Best Equation.

Text Books:

1. J. N. Delagado and W. A. R. Remers, 11th ed, Wilson and Giswolds Textbook of organic medicinal and pharmaceutical chemistry, J. Lippincott Co. Philadelphia.
2. W. C. Foye, Principles of medicinal chemistry, Lea and Febiger, Philadelphia.

Reference Books:

1. H. E. Wolff, edn, Burgers Medicinal chemistry, John Wiley and sons, New York Oxford University Press, Oxfords.
2. Daniel Lednicer, Strategies for organic drug synthesis and design, John Wiley and Sons USA
3. G. L. Patrick. An Introduction to Medicinal Chemistry, 4th Edition, Oxford University Press.
4. Vogel's Text books practical organic chemistry, ELBS/Longman, London.
5. Arthur Vogel, Elementary Practical Organic Chemistry, Part-I and II, Second edition, CBS Publisher.