



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3133601

Semester – III

Subject Name: INTRODUCTION TO MEDICINAL CHEMISTRY, BIOCHEMISTRY & PHYSIOLOGY

Type of course: Chemical Technology

Prerequisite: The students should have a basic knowledge of Organic Chemistry.

Rationale: The main objective of this subject is to offer an overview over the fundamentals of Human Physiology, Medicinal Chemistry & Biochemistry. The study also provides an overview of Pharmaceutical industries, synthesis & pharmacology of drugs and metabolism.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	ESE (V)	PA (I)		
4	0	0	4	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs
1	Introduction to Human Physiology: Introduction to human body:, Organization of human body, Different system of human body, cell & cell organelles, composition and functions of blood, Cardiac cycle, Digestive system, Urinary system, Respiratory system	7
2	Overview of Pharmaceutical Industry: Indian Pharmaceutical Industry, Introduction to pharmacopoeias, Introduction to GMP, its importance & general application in pharmaceutical industry concept of GMP.	3
3	Introduction to Medicinal & Pharmaceutical Chemistry: Definitions of Medicinal Chemistry, Pharmaceutical Chemistry, Drug, Pharmacology, Structure activity Relationship, Mode of Action. Methods of classification of drugs based on structure & biological activity, Concept of acidity & basicity of drugs & pKa values. Introduction of absorption & distribution of drugs based on physicochemical properties, introduction to bio pharmaceuticals	3
4	Anti – infective drugs: study of the chemistry of the following classes of drugs: nomenclature, classification, SAR, MOA, synthesis of : - Anti-infective agents: antiseptic & disinfectant, antibacterial –Sulfonamides, Quinoline Antiparasitic agents, Antiamoebic, Anthelminthic, Antimycobacterial agents, Antifungal agents, Diagnostic agents. Non –	20



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	Steroidal Anti – Inflammatory drugs (NSAIDs).	
5	Introduction to Biochemistry: Metabolism of carbohydrates: Photosynthesis, glycolysis, pentose phosphate cycle, TCA cycle. Metabolism of lipids, Metabolism of proteins & amino acids, urea cycle. DNA & RNA, Protein biosynthesis.	11
6	Drug metabolism: Metabolism Chemistry, Route of administration, metabolism pathways	2

Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	20	10	10	5	5

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Strategies for Organic Drug Synthesis & Design, & Daniel Led nicer, John Willey & Sons Inc. New York. 2nd Ed, 1998
2. Burger's Medicinal Chemistry & Drug Discovery: Vol. 1 to 6, A. Burger & M.E. Wolff, John Wiley & Sons – New Jersey, 6th Ed, 2003
3. Foye's Principles of Medicinal Chemistry, W.O. Foye, Lippincott Williams & Wilkins-Philadelphia, Oxford, 6th Ed, 2008.
4. Text book of Medicinal & Pharmaceutical Chemistry, Charles Owens Wilson Lippincott Williams & Wilkins – Philadelphia. 1962
5. Medicinal Chemistry Volume 1 &2 by Alagarsamy
6. Medicinal Chemistry by Ashutoshkar.
7. Anatomy Physiology, Toutora, Johns Wiley & Sons, NY, 10th Ed.,2003
8. Pharmacology, Satoskar – Bhandarkar, Popular Prakshan, Mumbai, 2003
9. Principles of Biochemistry, Lehninger, Freeman & Company, 5th Ed, 2008
10. Biochemistry, J.M.Berg, J.L.Tymoczko & L. Stryer, W H Freeman, 5th Ed, 2002
11. Biochemistry by U. Satyanarayana, Elsevier, 4th Edition, 2013

Course Outcomes:

Sr.	CO statement	Marks % weightage
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No.		
CO-1	To know the basic knowledge of physiology of human body organ system	29
CO-2	To explain the overview and importance of pharmaceutical Industry & GMP regulations	29
CO-3	To apply the knowledge of Medicinal Chemistry, Pharmaceutical Chemistry & Biochemistry	14
CO-4	To illustrate the knowledge of Anti – infective, Anti-malarial, Non – Steroidal Anti – Inflammatory drugs (NSAIDs).drugs structure activity relationship and mechanism of action	14
CO-5	To describe the metabolic path ways of carbohydrates, proteins & lipids.	7
CO-6	To summarize chemistry & metabolism and routes of drug administration of drugs	7

List of Experiments: --

Major Equipment: --

List of Open Source Software/learning website:

- 1) Literature available on internet
- 2) Medical dictionaries
- 3) Delnet
- 4) Literature available under R&D in Pharma industry.
- 5) Pharma Journals/ e-journals