GUJARAT TECHNOLOGICAL UNIVERSITY

CHEMICAL TECHNOLOGY (36)
MEDICINAL CHEMISTRY-I
SUBJECT CODE: 2163601
B.E. 6th SEMESTER

Type of course: Chemical Technology

Prerequisite: Studied department electives of previous semesters. Basic knowledge of Organic Chemistry is required.

Rationale: The main objective of this subject is to study the nomenclature, classification, synthesis, SAR, MOA of different classes of drug substances.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
4	0	3	7	70	20	10	20	10	20	150

Content:

Sr. No.	Topic	Teaching Hours	Module Weightage (%)
01	Drugs affecting ANS & CNS: Study of the chemistry of the following classes of drugs including nomenclature, classification, SAR, Synthesis: (a)ANS drugs: Drugs affecting neurotransmission-cholinergic, adrenergics (b)CNS drugs: Serotonergics and their antagonists CNS drugs General Anesthetics, hypnotics, anti-seizure drugs, Antipsychotic and anti-anxiety agents, analgesics, anti-parkinson drugs.	35	58
02	Antihistamines, Diuretics, NSAIDs, Anticancer drugs, Antivirals: Antihistaminic including anti-ulcer drugs, emetics, antiemetics, Anti-osteoporotic drugs, antivirals, anticancer agents Cardiovascular drugs Diuretics, anticoagulants, thrombolytics and antithrombotics, cardiac agents, antihypertensive, antihyperlipidemics, NSAIDs	25	42

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
60	**11**	**10**	**10**	**9**	**00**

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

Reference Books:

1. Strategies for Organic Drug Synthesis & Design, & Daniel Led nicer, John Willey & Sons Inc. New York. 2nd Ed, 1998.
2. Organic Chemistry of Drug Synthesis: Vol.1 to 6, Daniel Lednicer, John Wiley & Sons Inc.
3. Burger's Medicinal Chemistry & Drug Discovery: Vol. 1 to 6, A. Burger & M.E.Wolff, John Wiley & Sons – New Jersey,6th Ed, 2003
4. Foye's Principles of Medicinal Chemistry, W.O. Foye, Lippincott Williams & Wilkins-Philadelphia, Oxford, 6th Ed, 2008.
5. Text book of Medicinal & Pharmaceutical Chemistry, Charles Owens Wilson Lippincott Williams & Wilkins – Philadelphia. 1962
6. Organic Synthesis – The Disconnection Approach, Warren S., John Wiley & Sons – Chichester.,1st Ed., 2005
7. Pharmaceutical Substances: Synthesis, Patents, Applications (N-Z), A. Kleemann, Georg Thieme Verlag,Stuttgart.4th Ed, 2001
8. Textbook of Medicinal & pharmaceuticals Chemistry, Wilson & Griswold ., Williams & Wilkins,1st Ed, 2004
9. Principles of Biochemistry, Lehninger, Freeman & Company, 5th Ed, 2008
10. Biochemistry, J.M.Berg, J.L.Tymoczko & L. Stryer, 5th Ed, 2002

Course Outcome:

1. To know the classification, nomenclature, synthesis, SAR, MOA of ANS drugs, CNS drugs, antihistamines, Diuretics, Anti cancer drug, Anti virals etc.
2. To carry out synthesis of API molecules.
3. To be able to apply this knowledge in the API manufacturing & Pharmaceutical Formulation industries
4. To build a bridge between theoretical and practical concept used in industry

List of Experiments:

1. Preparation of compounds in common use in pharmaceutical industry-simple transformation using newer reagents (1- exercise)
2. Preparations of drug intermediates. (6 exercises)
3. Concise writing of procedures and presentation for selected reaction from the latest literature (3 examples)

Design based Problems (DP)/Open Ended Problem:

Students are free to select any area of science and technology based on chemical technology applications to define Projects.

Some suggested projects are listed below:

1. Literature survey on synthesis of new anti cancer drugs
2. Carry out synthesis of drugs and intermediates
3. Product profile and its manufacturing process of antihistamines, antiparkinsons drugs etc
4. PPT on ANS & CNS drugs

List of Open Source Software/learning website:

1. Literature available under R&D of Pharmaceutical Industries
2. Literature available on internet
3. Medical dictionaries
4. Pharma journals/ e-journals

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.