



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3163617

Subject Name : Medicinal Chemistry-II & Medicinal Natural Products

Type of Course: Chemical Technology

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

Rationale: The main objective of this subject is to study nomenclature, SAR, MOA, metabolism and synthesis of drugs and to know about the Medicinal Natural Products & Phytochemistry..

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE Viva(V)	PA (I)	
3	0	2	4	70	30	30	20	150

L-Lectures; T-Tutorial/Teacher Guided Student Activity; P-Practical; C-Credit; ESE-End Semester Examination; PA-Progressive Assessment

Content:

Sr. No.	Content	Total Hrs.
1	Study of nomenclature, classification, SAR, MOA, and synthesis of Cardio-vascular drugs, diuretics, anti-hyperlipidemics, anti-osteoporotic drugs	14
2	Study of nomenclature, classification and MOA of anticancer drugs, antiviral drugs- anti-HIV drugs	4
3	Drugs affecting CNS: Study of nomenclature, classification, SAR and synthesis of CNS drugs- General anesthetics, anti-seizure drugs, anti-anxiety drugs, antipsychotic drugs, anti-parkinsonism drugs.	9
4	Drugs affecting ANS: Study of nomenclature, classification, SAR and synthesis of (a).ANS drugs- adrenergic drugs and adrenergic blockers; Cholinergic drugs and Cholinergic blockers	9
5	Medicinal Natural Products: Scope of the subject, Source of the drug of natural origin, Classification of drug, factors involved in the production of drugs.	4
6	Phytochemistry: Chemical constituents in the production of plants (carbohydrates, lipids, alkaloids, protein enzyme, glycosides, steroids, tannins, terpenoids, flavonoids, plant pigments. Detailed study of extraction and isolation of one representative from each of the above mentioned chemical class (10 drugs) . Recent advances in Phytopharmaceuticals.	8

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)



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Reference Books:

1. Text book of Medicinal Chemistry Volume –I & II by V. Alagarsamy
2. Text book of Medicinal Chemistry by Ashutoshkar
3. Strategies for Organic Drug Synthesis & Design, & Daniel Led nicer, John Willey & Sons Inc. New York., 2nd Ed, 1998.
4. Burger's Medicinal Chemistry & Drug Discovery: Vol. 1 to 6, A. Burger & M.E.Wolff, John Wiley & Sons – New Jersey,6th Ed, 2003
5. Foye's Principles of Medicinal Chemistry, W.O. Foye, Lippincott Williams & Wilkins- Philadelphia, Oxford, 6th Ed, 2008.
6. Organic Chemistry of Drug Synthesis: Vol.1 to 6, Daniel Lednicer, John Wiley & Sons Inc
7. Text book of Medicinal & Pharmaceutical Chemistry, Charles Owens
8. Natural Products: chemistry and biological significance J. Mann, R.S. Davidson, et. Al
9. Introduction to Flavanoids, B,A. Bohm
10. Insecticides of Natural Origin, Sukh Dev

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
1	To describe the nomenclature, SAR, MOA, metabolism of CNS, ANS and other drug substances and the scope and classification of medicinal natural products.	33
2	To illustrate the synthesis of CNS, ANS and other drug substances and the extraction/isolation of Phytoconstituents.	24
3	To demonstrate the extraction/isolation/synthesis of drug substances.	13
4	To analyse the factors involved in the synthesis/isolation of drug substances	13
5	To explain the chemical constituents of the drug substances	10
6	To evaluate the methods of synthesis/extraction/isolation of drug substances	7

List of experiments:

1. Preparation of 4-nitro benzoic acid
2. Preparation of ethyl-4-nitro benzoate
3. Preparation of ethyl-4 –amino benzoate
4. Preparation of Phenytoin
5. Oxidation of Benzoin to Benzil.
6. Synthesis of Sulphanilamide
7. Isolation of Casein from milk
8. Isolation & evaluation of starch from potato
9. Isolation of Calcium citrate from lemon
10. Study of bromination

Major Equipment:

1. Mechanical stirrer & heating mantle
2. UV chamber
3. Vacuum pump
4. Dryer

List of Open Source Software/learning website:

- 1) Literature available in any laboratory manual of Pharmaceutical Industries.
- 2) Literature available on internet
- 3) Medical dictionaries
- 4) Delnet
- 5) Pharmacopoeia