



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Pharmacy College
Semester-1(B.Pharm.)

Subject: Pharmaceutical Organic Chemistry-I (BPHBP11302)

Type of course: Major

Prerequisite: NA

Rationale: Organic chemistry plays an important part in our daily life because food, clothes, paper, ink, rubber, soap, perfumes, medicines etc. are indispensable to us for proper living. Organic compounds are important constituents of many products e.g., paint, food, plastic, explosive, medicine, petrochemical, pesticide etc.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
CI	T	P		Theory Marks		Practical Marks	CA	
				ESE	MSE	VP	ALA	
3	1	4	6	75	25	35	15	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Continuous Assessment:

(For each activity maximum-minimum range is 5 to 10 marks)

Sr. No	Active Learning Activities	Marks
1.	Identify and write : Faculty will provide compound name (total 10 compounds) and students have to identify and write their IUPAC name and upload to the Moodle.	05
2.	Assignment: Faculty will provide the name of compound and students have to write its structure and uses and upload on moodle.	05
3.	Identification Tests: Faculty will provide the name of compound and student will write their class of compound and qualitative test of it and upload on moodle.	05
Total		15



Course Content:

Sr. No	Course content	Hrs	% Weightage
1	Classification, nomenclature and isomerism: Classification of Organic Compounds Common and IUPAC systems of nomenclature of organic compounds (up to 10 Carbons open chain and carbocyclic compounds) Structural isomerisms in organic compounds	07	13
2	Alkanes*, Alkenes* and Conjugated dienes*: SP hybridization in alkanes, Halogenation of alkanes, uses of paraffins, Stabilities of alkenes, SP hybridization in alkenes, E1 and E2 reactions – kinetics, order of reactivity of alkyl halides, rearrangement of carbocations, Saytzeffs orientation and evidences. E1 verses E2 reactions, Factors affecting E1 and E2 reactions. Ozonolysis, electrophilic addition reactions of alkenes, Markownikoff's orientation, free radical addition reactions of alkenes, Anti Markownikoff's orientation. Stability of conjugated dienes, Diel-Alder, electrophilic addition, free radical addition reactions of conjugated dienes, allylic rearrangement	10	23
3	Alkyl halides*: SN1 and SN2 reactions - kinetics, order of reactivity of alkyl halides, stereochemistry and rearrangement of carbocations SN1 versus SN2 reactions, Factors affecting SN1 and SN2 reactions. Structure and uses of ethyl chloride, Chloroform, trichloroethylene, tetrachloroethylene, dichloromethane, tetra chloromethane and iodoform. Alcohols*:- Qualitative tests, Structure and uses of Ethyl alcohol, Methyl alcohol, chlorobutanol, Cetosteryl alcohol, Benzyl alcohol, Glycerol, Propylene glycol.	10	23
4	Carbonyl compounds* (Aldehydes and ketones): Nucleophilic addition, Electrometric effect, aldol condensation, Crossed Aldolcondensation, Cannizzaro reaction, Crossed Cannizzaro reaction, Benzoin condensation, Perkin condensation, qualitative tests, Structure and uses of Formaldehyde, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanillin, Cinnamaldehyde	10	23

5	<p>Carboxylic acids*: Acidity of carboxylic acids, effect of substituents on acidity, inductive effect and qualitative tests for carboxylic acids, amide and ester Structure and Uses of Acetic acid, Lactic acid, Tartaric acid, Citric acid, Succinic acid. Oxalic acid, Salicylic acid, Benzoic acid, Benzyl benzoate, Dimethyl phthalate, Methyl salicylate and Acetyl salicylic acid</p> <p>Aliphatic amines* - Basicity, effect of substituent on Basicity. Qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine</p>	08	18
<p><u>Note:</u> General methods of preparation and reactions of compounds superscripted with asterisk (*) to be explained</p>			

Suggested Specification table with Marks (Theory):75

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	30%	40%	20%	05%	05%	

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.

Course Outcome:

After learning the course the students should be able to:	
CO1	Describe the classification of organic compounds and nomenclature.
CO2	Classify isomerism and explain structural isomerism
CO3	Explain hybridization in alkenes, alkenes and stabilities of alkenes, conjugated dienes.
CO4	Explain the mechanism, orientation of elimination, Electrophilic, free radical and Nucleophilic addition reaction.
CO5	Discuss the mechanism, kinetics, stereochemistry and factors affecting SN1 & SN2 reaction.



List of Practical

(Minimum-10 practical):

Sr. No	Descriptions	Unit No	Hrs
1.	Preliminary test: Color, odour, aliphatic/aromatic compounds, saturation and unsaturation etc.	1	4
2.	Detection of elements like Nitrogen, Sulphur and Halogen by Lassaigne's test	1	4
3.	Solubility test	2	4
4.	Functional group test like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anilides	2	4
5.	Melting point/Boiling point of organic compounds	2	4
6.	Identification of the unknown compound from the literature using melting point/ boiling point.	3	4
7.	Preparation of the derivatives and confirmation of the unknown compound by melting point/ boiling point.	3	4
8.	Minimum 5 unknown organic compounds to be analysed systematically.	3	4
9.	Preparation of suitable solid derivatives from organic compounds	3	4
10.	Construction of molecular models	3	4
		Total	40

Instructional Method:

- The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- From the content 10% topics are suggested for flipped mode instruction.
- Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory
- The internal evaluation will be done on the basis of Active Learning Assignment
- Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

1. Organic Chemistry by Morrison and Boyd
2. Organic Chemistry by I.L. Finar , Volume-I
3. Textbook of Organic Chemistry by B.S. Bahl & Arun Bahl.
4. Organic Chemistry by P.L.Soni
5. Practical Organic Chemistry by Mann and Saunders.
6. Vogel's text book of Practical Organic Chemistry
7. Advanced Practical organic chemistry by N.K.Vishnoi.
8. Introduction to Organic Laboratory techniques by Pavia, Lampman and Kriz.
9. Reaction and reaction mechanism by Ahluwaliah/Chatwal.

