

**FOUR-YEAR UNDER GRADUATE
PROGRAMME (FYUGP)**

BSc CHEMISTRY

Programme	B.Sc Chemistry				
Course Title	ORGANIC CHEMISTRY IN DAILY LIFE				
Type of Course	MINOR				
Semester	3				
Academic Level	200-299				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75
Pre-requisites	1. Basic concepts of Organic Chemistry 2. Chemistry and its importance in daily life				
Course Summary	This course ensure students to acquire a profound understanding of Organic Chemistry, emphasizing fundamental reactions, concepts and its implication in daily life.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	To understand the fundamental concepts of reaction mechanisms through the step by step processes involved in chemical reactions	U	C	Instructor-created exams / Assignment
CO2	To recognize the various types of organic reactions and reaction intermediates	Ap	P	Assignment / seminar/quizzes
CO3	To understand how different functional groups confer distinct properties and reactivity, influencing the chemical behaviour of molecules.	U	C	Assignment/Seminar/Internal exam
CO4	To understand the importance of Chemistry in Daily Life.	Ap	P	Group work /Assignment
CO5	To understand the role of Chemistry in human	Ap	P	Group work /Assignment

	happiness index and life expectancy.			
CO6	To empower students to cultivate analytical skills in organic qualitative/quantitative analysis by emphasizing systematic approaches.	Ap	P	Observation of practical skill/Viva voce
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)				

Detailed Syllabus:

Module	Unit	Content	Hrs	Marks
I	Basic concepts of Organic Chemistry		15	30
	1	Homolytic and heterolytic fission with suitable examples. Curly arrow rules. Types of reagents -Electrophiles, Nucleophiles and Free radicals.	1	
	2	Electron Displacement Effects: Inductive effect, definition, Characteristics - +I and -I groups. Applications: Acidity of carboxylic acids-effect of substituents.	2	
	3	Electromeric effect: Definition, Characteristics - +E effect and -E effect. Addition of H ⁺ to ethene and addition of CN ⁻ to acetaldehyde.	2	
	4	Mesomeric effect: Definition, Characteristics - +M and -M groups. Applications: Comparison of electron density in benzene, nitrobenzene, phenol and aniline.	2	
	5	Hyperconjugation effect: Definition, Characteristics. Applications: comparison of stability of But-1-ene and But-2-ene.	2	
	6	Steric effect and its importance in reactivity.	1	
	7	Reaction intermediate: Type, shape and stability of carbocations, carbanions and free radicals.	3	
	8	Types of organic reactions: Addition, Elimination, Substitution, Rearrangement and Redox reactions-Definition and example.	2	
II	Chemistry of Alkyl halides, Alcohols and Phenols		10	22
	9	Alkyl halides- Preparation of alkyl halides from alkanes and alkenes-Wurtz reaction and Fittig's reaction. SN ¹ and SN ² reactions of alkyl halides-Mechanism and stereochemistry.	3	
	10	Alcohols: Preparation from Grignard reagent – Preparation of ethanol from molasses – Wash, rectified spirit, absolute alcohol, denatured spirit, proof spirit and power alcohol (mention only).	2	
	11	Reactions of alcohols-Substitution, dehydration, oxidation and esterification. Haloform reaction - iodoform test -Luca's test-Chemistry of methanol poisoning, harmful effect of ethanol in human body.	3	

	12	Phenols: Preparation from chlorobenzene. Comparison of acidity of phenol, p-nitrophenol and p-methoxyphenol.	1	
	13	Preparation and uses of phenolphthalein.	1	
III	Chemistry of Carbonyl compounds and Amines		10	23
	14	Aldehydes & Ketones: Preparation from alcohols. Comparison of reactivity of aldehydes and ketones.	1	
	15	Nucleophilic addition reactions in aldehydes and ketone. Addition of HCN and bisulphite. Clemmensen reduction and Wolff Kishner reduction.	2	
	16	Carboxylic Acids: Preparation from Grignard reagent- Decarboxylation-Kolbeelectrolysis.	2	
	17	Amines: Preparation from nitro compounds-Hofmann's bromamide reaction, Hofmann's carbylamines reaction. Basicity: Comparison of basicity of ammonia, methylamine and aniline.	3	
	18	Diazonium salts: Preparation and synthetic application of benzene diazonium chloride. Preparation and uses of methyl orange.	2	
IV	Chemistry in Daily Life		10	23
	19	Petrochemicals: Name, carbon range and uses of fractions of petroleum distillation. Octane number, Cetane number, Flash point. LPG and CNG: Composition and uses.	2	
	20	Pharmaceuticals: Drug - Chemical name, generic name and trade names with examples. Antipyretics, analgesics, antibiotics, antacids, antiseptics (definition and examples, structure not expected).	2	
	21	Dyes: Definition- Requirements of a dye. Theories of colour and chemical constitution. Structure and applications of martius yellow, indigo and alizarin.	3	
	22	Food: Food additives: Food preservatives, artificial sweeteners and antioxidants (definition and examples, structures not required) Commonly used permitted and non-permitted food colours (structures not required).	3	
V	Organic Chemistry Practicals		30	
	23	General Reactions of Organic Compounds	4	
	24	Study of the reactions of functional groups from the following list. 1. Phenols –(phenol) 2. Amines-(aniline) 3. Aldehydes and Ketones-(benzaldehyde, benzophenone). 4. Carboxylic acids (benzoic acid, cinnamic acid). 5. Carbohydrates (glucose). 6. Amides (benzamide, urea)	20	
	25	Organic Preparations.	6	

References

1. Morrison, R. T. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Bhal and Bhal, Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.
3. I. L. Finar, *Organic Chemistry*, Vol. I, 5th Edn., Pearson Education, New Delhi, 2013.
4. M. K. Jain, S. C. Sharma, *Modern Organic Chemistry*, 3rd Edn., Vishal Publishing Company Co., 2010.
5. K. S. Tewari, N. K. Vishnoi, S. N. Mehrotra, *A Textbook of Organic Chemistry*, 2nd Edn., Vikas Publishing House, New Delhi, 2004.
6. Jayashree Ghosh. A textbook of Pharmaceutical Chemistry, 3rd Edn. S Chand and Company Ltd. New Delhi, 1999
7. B. Srilakshmi. Food Science 5th Edn. New Age publishers, New Delhi, 2010.
8. K. Singh. Chemistry in Daily Life. Prentice Hall of India, New Delhi
9. B. S. Furniss, A. J. Hannaford, P. W. G. Smith, A. R. Tatchell, *Vogel's Textbook of Practical Organic Chemistry*, 5th Edn., Pearson Education, Noida, 2014.
10. F. G. Mann, B. C. Saunders, *Practical Organic Chemistry*, 4th Edn., Pearson Education, Noida, 2011.

Mapping of COs with PSOs and POs :

	PSO 1	PSO 2	PSO 3	PSO4	PS O5	PSO 6	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO 1	2	-	2	-	1	-	2			1	2	1	
CO 2	2		2	-	-	1	2			2	1	1	
CO 3	2	-	2	-	-	2	2			2	1		
CO 4	2	-	2		2	2	2			2	1		
CO 5	2		-	-	2	-	2			2	1		
CO 6	2	-	2		-	2	2		1		2		1

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Discussion / Seminar
- Midterm Exam
- Practical exam (20%)

Mapping of COs to Assessment Rubrics :

	Internal Exam	Assignment	Seminar/Group Discussion	Quizzes/viva	Observation Of practical Skill	End Semester Examinations
CO 1	✓	✓				✓
CO 2	✓	✓		✓		✓
CO 3		✓	✓			✓
CO 4		✓	✓			✓
CO 5		✓	✓			✓
CO 6				✓	✓	✓