Practical Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim, Goa		
Name of Faculty: Dr. Dipesh Sakharam Harmalkar	**Subject: Advanced Organic Chemistry I**	
Paper code: CHC 304	**Program: T.Y.BSc.**	**Division:**
Academic year: 2025 - 2026	**Semester: VI**	**Total Practical/Labs: 12 (30 h)**
Credits: 1		

Course Objectives:

- To apply theoretical concepts to experiments.
- To acquire hands on training in organic preparation.
- To acquire hands on training in organic qualitative analysis.

Expected Course Outcome:

At the end of the course students will be able to:

CO1. Explain the fundamental chemistry, structure, and reactivity of simple heterocyclic compounds and selected natural products.

CO2. Interpret NMR spectra and elucidate the structure of organic compounds using chemical shift, splitting patterns, and coupling constants.

CO3. Write detailed mechanisms for important name reactions and rearrangements, and apply mechanistic principles to predict reaction outcomes.

CO4. Analyze and identify unknown organic compounds through separation techniques and NMR spectroscopy, integrating theoretical knowledge with laboratory skills.

Student Learning Outcome:

At the end of the course students will be able to:

LO1: Students will be able to describe the structure, classification, aromaticity, and basic reactions of simple heterocyclic compounds and summarize the chemistry of selected natural products such as alkaloids and terpenoids.

LO2: Students will be able to interpret ^{1}H and ^{13}C NMR spectra by identifying chemical shifts, multiplicity, integration, and coupling constants to determine the molecular structure of organic compounds.

LO3: Students will be able to illustrate step-by-step mechanisms of key name reactions and rearrangements and predict products based on electron flow, intermediates, and reaction conditions.
LO4: Students will be able to perform separation of organic mixtures using laboratory techniques (extraction, crystallization, chromatography) and identify functional groups/structures through NMR analysis and theoretical interpretation.

Month	Practical/Labs Scheduled Date	No. of Practical /Labs planned	List of Experiments	Reference books
December	10-12-2025	1 (Batch III)	Binary mixture separation	[1-4]
January	07-01-2026	1 (Batch III)	Binary mixture separation	[1-4]
	14-01-2026	1 (Batch III)	Binary mixture separation	[1-4]
	21-01-2026	1 (Batch III)	Binary mixture separation	[1-4]
	28-01-2026	1 (Batch III)	Binary mixture separation	[1-4]
February	04-02-2026	1 (Batch III)	Binary mixture separation	[1-4]
	11-02-2026	1 (Batch III)	Binary mixture separation	[1-4]
	18-02-2026	1 (Batch III)	Binary mixture separation	[1-4]

	25-02-2026	1 (Batch III)	Binary mixture separation	[1-4]
March	04-03-2026	1 (Batch III)	Binary mixture separation	[1-4]
	11-03-2026	1 (Batch III)	Binary mixture separation	[1-4]
	18-03-2026	1 (Batch III)	Binary mixture separation	[1-4]
	25-03-2026	1 (Batch III)	Interpretation of ^{1}H and ^{13}C NMR Spectra	[1-4]

References:

1. Furniss, B. S., Hannaford, A. J., Smith P. W. G. and Tatchell, A. R., Vogel's Textbook of Practical Organic Chemistry, 5th ed., Pearson Education Ltd. Ltd., London, UK, 2011.
2. Pasto, D., Johnson C. and Miller, M., Experiments and Techniques in Organic Chemistry, 1st ed., Prentice Hall, New Jersey, USA, 1992.
3. Fieser, L. F. and Williamson, K. L., Organic Experiments, 7th ed., D. C. Heath and Company, Massachusetts, USA, 1992
4. Bansal, R. K., Laboratory Manual of Organic Chemistry, 5th ed., New Age International Publishers, New Delhi, India 2009.

*** Assessment Rubrics**	
Component	**Max Marks**
ISA	15
Semester End Exam	60
Practical	25
Total	100