# Lecture Plan

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| **Name of the college: Government College of Arts, Science & Commerce, Sanquelim, Goa** | | |
| **Name of Faculty: Dr. Dipesh Sakharam Harmalkar** | **Subject: Organic Chemistry I** | |
| **Paper code: CHC-202** | **Program/Course: S.Y.BSc.** | **Division:** |
| **Academic year: 2025 - 2026** | **Semester: IV** | **Total Lectures: 30** |
| **Credits: 3** | | |

**Course Objectives:**

- To understand the preparation and reactions of carboxylic acids and amines.
- To apply knowledge of UV Visible spectroscopy in calculating absorption values.
- To understand stereochemistry of organic compounds.

**Expected Course Outcome:**

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

CO-1 To understand the fundamentals of structures, chirality, and functional group properties of carboxylic acids and amines.

CO-2 To explain with mechanisms the synthetic methods of preparations of various amines, carboxylic acids and chiral compounds.

CO-3 To apply knowledge of UV-Visible spectroscopy in calculating absorption values and monitoring various reactions of carboxylic acids and amines.

CO-4 To evaluate and analyse different name reactions, stereochemical aspects in order to prepare structurally diverse compounds.

**Learning Outcome:**

At the end of the course students will be able:

1. To describe the structural features, chirality concepts, and functional group characteristics of carboxylic acids and amines.
2. Illustrate and explain the mechanisms and synthetic routes involved in the preparation of amines, carboxylic acids, and chiral molecules.
3. Apply UV–Visible spectroscopic principles to calculate absorption parameters and monitor chemical transformations of carboxylic acids and amines.
4. Evaluate and analyse various name reactions and stereochemical principles to design and prepare structurally diverse organic compounds.

| Month | Lectures From | Lectures To | No. of lectures allotted | Topic, Subtopic to be covered | Exercise/Assignment | ICT Tools | Reference books |
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| December | 01-12-2025 | 23-12-2025 | 06 | **1. Carboxylic acids and its derivatives:** IUPAC nomenclature of aliphatic and aromatic carboxylic acids; Functional group identification. Acidic and alkaline hydrolysis of esters; Oxidation of toluene to benzoic acid. Toluene to benzoic acid. Hydrolysis of cyanides, Grignard synthesis of carboxylic acids. Reactions: Hell Volhard Zelinsky Reaction. Carboxylic acid derivatives (aliphatic): (up to 5 carbons) | | Smart board, Power point presentation, Google classroom. | [1-3] |
| January | 02-01-2026 | 12-01-2026 | 03 | **1. Carboxylic acids and its derivatives:** Preparation: Acid chlorides, Anhydrides, Esters and Amides from acids and their interconversions, Reactions: Comparative study of the nucleophilicity towards acyl derivatives. Hydrolysis of acid chlorides, acid amide to carboxylic acids. | | Smart board, Power point presentation, Google classroom, Google quiz | [1-3] |
| January | 13-01-2026 | 31-01-2026 | 04 | **2. Amines and Diazonium Salts:** Amines (aliphatic and aromatic) (upto 5 carbons) IUPAC nomenclature, Preparation: from alkyl halides, Gabriel's phthalimide synthesis, Hofmann bromamide reaction (with mechanism). Reduction of cyanides, reduction of nitroarenes. | ISA I: Assignment | | [1-3] |
| February | 01-02-2026 | 17-02-2026 | 06 | **2. Amines and Diazonium Salts:** Reactions: Elimination reactions Hofmann vs. Saytzeff elimination, Carbylamine test, Hinsberg test, with $HNO_2$, Schotten – Baumann reaction. Electrophilic substitution of aniline: nitration, bromination, sulphonation. | ISA II: Written test | Smart board, Power point presentation, Google classroom, Google quiz | [1-3] |

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| | | | | Diazonium salts: Preparation from aromatic amines, conversion to benzene, phenol, chlorobenzene, bromobenzene. Preparation of azo dye of aniline with *β*-naphthol. | | | |
| | 18-02-2026 | 28-02-2026 | 02 | **4. Introduction to Stereochemistry:** Concept of isomerism. Types of isomerism. Stereoisomerism, conformational isomerism. Conformations with respect to ethane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. | | Smart board, Power point presentation, Google classroom | [1-3] |
| March | 01-03-2026 | 31-03-2026 | 10 | **4. Introduction to Stereochemistry:** Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds. Threo and erythro; D and L; cis – trans nomenclature; Cahn Ingold Prelog Rules: R/ S (for upto 2 chiral carbon atoms) and E / Z Nomenclature (for upto two C=C systems). | ISA III: Quiz | Smart board, Power point presentation, Google classroom | [1-3] |

**References:**


[1] Morrison, R.T. & Boyd, R.N. Organic Chemistry, Pearson, 2010.
[2] Bahl, A. & Bahl, B.S. Advanced Organic Chemistry, S. Chand, 2010.
[3] Singh, J. & Yadav, L. Undergraduate Organic Chemistry, Vol 1, 6th edition, 2004


| * Assessment Rubrics | |
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| **Component** | **Max Marks** |
| ISA | 15 |
| Semester End Exam | 60 |

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| Practical | 25 |
| Total | 100 |