



M.Sc. Chemistry
M.Sc. Chemistry Semester-II

Course Code	PS02CCHE52	Title of the Course	Organic Chemistry-II
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	<ol style="list-style-type: none">1. To learn alkene synthesis reactions, hydroboration chemistry, name reactions, and their mechanism.2. To learn transition metal catalyst based C-C, C-N coupling reactions and their mechanism3. To understand the role of chemical reagents in the oxidation, reduction, and transformation of various organic functional groups.
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Course Content		
Unit	Description	Weightage* (%)
1.	Organic Name Reactions-I and their applications: Robinson ring annulation, Wittig reaction and its modifications; Peterson olefination, Shapiro reaction, Bamford Steven's reaction, Julia olefination	25%
2.	Organic Name Reactions-II and their applications: Stork Enamine reaction, Buchwald-Hartwig amination, Suzuki coupling, Sonogashira coupling, Brown's hydroboration reactions, Vilsmeier-Haack reaction, Darzen condensation.	25%
3.	Oxidation and Reduction Reagents in Organic Synthesis: Oxidation Reagents: CrO ₃ , MnO ₂ , SeO ₂ , Pb(OAc) ₄ , HIO ₄ , DMSO, HgO, K ₃ Fe(CN) ₆ , DDQ, Dess-Martin periodinane, Peracid; Reduction Reagents: Al(O- ^t Bu) ₃ , Al(O- ⁱ Pr) ₃ , Na/NH ₃ , Zn/HCl, N ₂ H ₄ /OH, NaBH ₄ , LiAlH ₄ , complex metal hydrides, TBTH.	25%
4.	Some Miscellaneous Reagents in Organic Synthesis: Trimethylsilylhalide, LDA, Wilkinson catalyst, alkyl lithium, Grignard reagent, Gilman reagent, PTC, NBS, DCC.	25%
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Teaching-Learning Methodology	To meet the effective teaching and the learning requirements, teaching-learning methodology comprises classroom teaching, use of e-resources, library books, IT tools, encouraging students to participate in seminars/workshops, presentation by students, assigning work based upon subject requirements, etc.
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Propose synthesis for steroidal skeletal structures and selective α -acylation and alkylation on carbonyl compounds
2.	Design olefin synthesis using variety of name reactions including Wittig reaction and modifications; Peterson olefination, Shapiro reaction, Bamford Steven's Reaction, Julia olefination
3.	Get oneself familiarize with useful chemical transformations with regio- and chemo-selectivity using Hydroboration reaction to convert olefins to variety of useful derivatives
4.	Appreciate the role of organometallic chemistry in organic synthesis by studying Suzuki coupling, Buchwald-Hartwig amination and Sonogashira coupling reaction
5.	Understand the chemistry involved in oxidation-reduction reactions by employing numerous reagents to appreciate chemo-selectivity of the reagents
6.	Suggest use of miscellaneous reagents in organic synthesis including Wilkinson catalyst, Grignard reagent and Gilman reagent, PTC, DCC, Peracids, NBS etc.

Suggested References:	
Sr. No.	References





1.	Principles of Organic Synthesis: R.O.C Norman & J. M. Coxon (ELBS).
2.	Mechanism in Organic Chemistry: Peter Sykes (Orient Longman).
3.	Modern Methods of Organic Synthesis: W. Carruthers (Cambridge).
4.	Organic Reaction Mechanism: V. K. Ahluwalia and R. K. Parashar (Narosa).
5.	Organic Chemistry: Clayden, Greeves and Warren(Oxford)
6.	Organic Reactions and Their Mechanism: P. S. Kalsi (New Age International Publishers).

On-line resources to be used if available as reference material

On-line Resources

