



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि. नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Science

M.Sc. (Chemistry) Programme

Subject Code & Name: - MS02CCHE01 & Organic Chemistry - II

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				Internal		External	
L	T	P	Total	TH	PWE	TH	PWE
4	-	-	4	50	-	50	-

Programme Name	M.Sc. Chemistry
Semester	II
Course Code	MS02CCHE01
Course Title	Organic Chemistry - II
Course Content Type (Th./Pr.)	Theory
Course Credit	4
Sessions+ Lab. Per Week	4
Total Teaching/Lab. Hours	60 Hours
* 2 Laboratory = 1 Session	

Learning Objectives

1. To understand the applications of different reagents for various organic transformation.
2. To become knowledgeable about hydroboration chemistry, alkene synthesis reactions, and various name reactions and their mechanisms.
3. To understand the mechanism of C-C and C-N coupling reactions.

Prerequisites (if any)

Learning Outcomes

On the Completion of this course, students will able to:

1. Utilising a range of name reactions, such as the Wittig reaction and variations, design olefin synthesis: Shapiro reaction, Bamford Stevens reaction, Peterson olefination, and Julia olefination.



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2. Learn how to convert olefins into a range of useful derivatives using the hydroboration reaction, a useful chemical transformation with regio- and chemo-selectivity.
3. Learn about various coupling reaction to gain an understanding of the function of organometallic chemistry in organic synthesis.
4. Promote the use of many reagents in organic synthesis, such as PTC, DCC, peracids, NBS, Grignard and Gilman reagents, Wilkinson catalyst, etc.

Detailed Contents

UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	Reagents in Organic Synthesis: Trimethylsilylhalide, LDA, Wilkinson catalyst, alkyl lithium, Grignard reagent, Gilman reagent, PTC, NBS, DCC.	15
II	Reactive Intermediates in Molecular Rearrangements: Molecular Rearrangement involving Carbocation: Wagner-Meerwein, Pinacol-Pinacolone, Demjanov and Beckmann Rearrangement. Molecular Rearrangement involving Carbanion: Favorskii, Benzil-Benzilic Acid, Stevens and Sommelet-Hauser Rearrangement. Molecular Rearrangement involving Non-Classical Carbocation: Neighboring group participation by $\pi(\text{pi})$ and $\sigma(\text{sigma})$ bonds. Molecular Rearrangement involving Free radical: Rieme-Tiemann, Fries Rearrangement. Molecular Rearrangement involving Nitrene: Curtius, Schmidt, Lossen and Hoffmann Rearrangement. Molecular Rearrangement involving Carbene: Wolf Rearrangement [Emphasizing on Various Techniques for Determination of Mechanism]	15
III	Olefination Organic Reactions: Robinson ring annulation, Wittig reaction and its modifications; Peterson olefination, Shapiro reaction, Bamford Steven's reaction, Julia olefination.	15



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IV	Coupling/Multicomponent reactions and their applications: C-C/C-N coupling reactions: Cannizzaro reaction, Stobbe condensation, Knoevenagel reaction, Stork Enamine reaction, Claisen condensation, Dieckmann reaction, Reformatsky reaction, Michael reaction, Buchwald-Hartwig amination, Ritter reaction. Multicomponent reactions: Ugi reaction, Biginelli reaction, Passerini reaction.	15
Text Book(s)		
1. Organic reaction mechanisms (4 th -edition), V.K.Ahluwalia and Rakeshkumar Parashar (Narosa)		
Reference Books		
1. Organic Reactions and Their Mechanism: P. S. Kalsi (New Age International Publishers). 2. Organic Chemistry: Clayden, Greeves and Warren(Oxford). 3. Modern Methods of Organic Synthesis: W. Carruthers (Cambridge). 4. Mechanism in Organic Chemistry: Peter Sykes (Orient Longman).		
Web Resources		
1. www.nptel.ac.in 2. www.swayam.gov.in 3. www.epgp.inflibnet.ac.in (e-PG pathshala) 4. www.ndl.iitkgp.ac.in (National Digital Library)		
Required Software(s) (if any)		
Practical(s) (if any)		

L:: Lecture, T:: Tutorial , P::Practical

PWE:: Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)