



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Science

M.Sc. (Chemistry) Programme

Subject Code & Name: - MS01CCHE01 & Organic Chemistry - I

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	I
Course Code	MS01CCHE01
Course Title	Organic Chemistry - I
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 concepts of chirality, topicity, prostereoisomerism, stereoselective, and stereospecific reactions.
2. To understand the role of reactive intermediates in molecular rearrangements.
3. To learn addition, elimination, aromatic substitution reactions, and mechanism.

Prerequisites (if any)

Learning Outcomes

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

1. Detect chirality in molecular structure using symmetry
2. Recognize the relationship between enantiomeric and diastereomeric structures
3. Employ various name reactions for their useful applications
4. Learn the differences between elimination, addition Reactions and substitution reactions
5. Identify the stereochemical consequences during chemical reactions



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Detailed Contents		
UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	Reagents (Oxidizing and Reducing) in Organic Synthesis: Oxidation Reagents: CrO_3 , MnO_2 , SeO_2 , $\text{Pb}(\text{OAc})_4$, HIO_4 , DMSO, HgO , $\text{K}_3\text{Fe}(\text{CN})_6$, DDQ, Dess-Martin periodinane, Peracid; Reduction Reagents: $\text{Al}(\text{O}^t\text{Bu})_3$, $\text{Al}(\text{O}^i\text{Pr})_3$, Na/NH_3 , Zn/HCl , $\text{N}_2\text{H}_4/\text{OH}^-$, NaBH_4 , LiAlH_4 , complex metal hydrides, TBTH.	15
II	Stereochemistry: Concept of Chirality, Chirality and Symmetry, Sawhorse, Newman and Fischer Projections, Interconversion of Projection formula, Elements of Chirality including Chiral centre, Chiral axis, Chiral plane and Helicity, CIP Nomenclature, Molecules with more than one Chiral centre, Total number of Stereoisomer in such molecules, Enantiomeric and Diastereomeric Relationship. Concept of stereoselective and stereospecific reactions, Optical Purity.	15
III	Elimination and Addition Reactions: Elimination Reactions: Mechanisms and Orientation, E1 , E1cb , E2 spectrum, Effects of Changes in Substrate, Base, Leaving Group and Medium on Reactivity, Hoffman and Saytzeff eliminations, Bredt's Rule, Pyrolytic Eliminations-Cope and Chugaev eliminations. Addition reactions: Mechanisms, Orientation and Reactivity, Markonikoff and anti-Markonikoff additions, Reactions including Hydro-Halo, Hydro-Hydroxy, Hydro-Alkoxy, Dihydro, Dihydroxy, dihalo, ozonolysis, Woodward-Prevost Hydroxylation.	15





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IV	Aliphatic nucleophilic substitution reactions: The SN^1 , SN^2 , and SN^i , S_N^1CB reactions, their mechanisms and stereochemistry, leaving group effect and reaction medium, ambident nucleophile, Neighboring group participation (anchimeric assistance), Aliphatic electrophilic substitution reactions: SE^1 , SE^2 and SE^i reactions, their mechanism and stereochemistry.	15
Text Book(s)		
1. Organic Reactions, Stereochemistry and Mechanism: P.S. Kalsi (New Age.) 2. Organic Reaction Mechanism: V.K. Ahluwalia and R.K. Parashar (Narosa)		
Reference Books		
1. Organic Chemistry: Clayden, Greeves and Warren (Oxford) 2. Advanced Organic Chemistry: Jerry March (Wiley) 3. Organic Chemistry vol. 2 Stereochemistry and the chemistry natural products, 5 th edition by I.L. Finlay, Pearson Publication		
Web Resources		
www.nptel.ac.in www.swayam.gov.in www.epgp.inflibnet.ac.in (e-PG pathshala) 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.)

