TEACHING PLAN: CH-204

SCHOOL: SOBAS		ACADEMIC SESSION: 2023-2024	FOR STUDENTS' BATCH: IV SEMESTER
1	Course code	CH-204	
2	Course Title	ORGANIC CHEMISTRY	
3	Credits		
4	Learning Hours	Contact Hours: 54 Practical Teaching: 27 Project, Tutorial and Assessment: 09 Total hours: 90	
5	Course Objective	The purpose of this course is to provide: 1. Broad and balance knowledge in chemistry in addition to understanding of key chemical concepts, principles and theories. 2. To develop students' ability and skill to acquire expertise over solving both theoretical and applied chemistry problems. 3. To provide knowledge and skill to the students' thus enabling them to undertake further studies in chemistry in related areas or multidisciplinary areas that can be helpful for self-employment/entrepreneurship.	
6	Course Outcomes	1. Able To describe absorptions of various functional groups and applications of IR spectroscopy. To know the application of IR spectroscopy in structure elucidation. 2. To synthesize and know reactions of amines. 3. To discuss synthetic application of diazonium salts and other nitro compounds. 4. Get knowledge about the preparation of aliphatic, aromatic aldehydes and ketones and various important name reactions of aldehydes and ketones.	
7	Outline syllabus:		

7.01	Paper Code	Unit	Introduction	Reference number	Teaching methods
7.02	CH-204 UNIT-I IR ABSORPTION SPECTROSCOPY	(a)	Hookes law	Brian Smith	Lecture, Blackboard, PPT, Discussion
		(b)	Selection rules and internsity	Brian Smith	Lecture, Blackboard, PPT, Discussion
		(c)	Application of IR spectroscopy	Brian Smith	Lecture, Blackboard, PPT, Discussion
7.03	CH-204 UNIT-II AMINES	(a)	Nomenclature and Structure	Finar Solomon	Lecture, Blackboard, PPT, Discussion
		(b)	Structures and basicity	Solomon Finar	Lecture, Blackboard, PPT, Discussion

		(c)	Reactions	Solomon Fianr	Lecture, Blackboard, PPT, Discussion
7.04	**CH-204 UNIT-III DIAZONIUM SALTS**	(a)	Mechanism of Diazozitation	Solomon Fianr	Lecture, Blackboard, PPT, Discussion
		(b)	Preparation of Nitro compounds	Solomon Fianr	Lecture, Blackboard, PPT, Discussion
		(c)	Reactions	Solomon Fianr	Lecture, Blackboard, PPT, Discussion
7.05	**CH-204 UNIT-IV ALDEHYDES AND KETONES**	(a)	Nomenclature and Structure	Solomon Fianr	Lecture, Blackboard, PPT, Discussion
		(b)	Preparation	Solomon Fianr	Lecture, Blackboard, PPT, Discussion
		(c)	Reactions	Solomon Fianr	Lecture, Blackboard, PPT, Discussion

8	**Course Evaluation**	
8.10	**CA: 20%**	
8.1	**Attendance**	5%
8.12	**Homework**	-
8.13	**Quizzes**	4 Quizzes, 5%
8.14	**Projects**	1 Project, 5%
8.15	**Presentation**	1 Presentation, 5%
8.16	**Any other**	--
8.2	**MTE(IA)**	20%
8.3	**End-term examination: 60%**	
9	**Text Books & References**	
9.1	**Text books**	Organic Chemistry: I. L. Finar
9.2	**References**	Organic Chemistry: Graham Solomon Infrared Spectral Interpretations: A Systematic Approach: Brian Smith Organic Chemistry: Finar
9.3	**Video References**	https://www.youtube.com/watch?v=We0Iih_1FQ4 https://www.youtube.com/watch?v=7iA3quM6yaY https://www.youtube.com/watch?v=sJ2-3pe_-2Y https://www.youtube.com/watch?v=W79R6VRfZGM https://www.youtube.com/watch?v=a2FgqSPGLSg https://www.youtube.com/watch?v=RjccXQZa6Jc https://www.youtube.com/watch?v=egboO2CLtds https://www.youtube.com/watch?v=2uzNMdc2zlw

Mapping of Outcomes v. Topics

Outcome no. → Syllabus topic↓	1	2	3	4
.Unit I (a)	Y			
. Unit I (b)	Y			
Unit I (c)	Y			
.Unit II (a)		Y		
. Unit II(b)		Y		
. Unit II(c)		Y		
Unit III (a)			Y	
Unit III(b)			Y	
. Unit III(c)			Y	
.Unit IV (a)				Y
Unit IV(b)				Y
Unit IV(c)				Y

QUESTION BANK

Subjective type

UNIT I

1. What are the molecular vibration energy levels?
2. Discuss Hooke's Law.
3. What are selection rules for IR spectroscopy?
4. How the different functional groups differ in IR absorptions?
5. Discuss the applications of IR spectra for determining the molecular structure.
6. What is fingerprint region?

UNIT II

1. What are the physical properties of amines?
2. How to separate the 1˚, 2˚ and 3˚ amines?
3. How the basicity of amines is affected by the structures of them?
4. Discuss the general synthesis procedures of amines?
5. How the tertiary amines are prepared?
6. Discuss the Gabriel Phthalamide synthesis.
7. Discuss the mechanism of Hofmann Bromide reaction.
8. Discuss the mechanism of electrophilic addition in aryl amines.

UNIT III

1. What are the diazonium salts?
2. How diazonium salts are prepared?
3. Discuss the mechanism of diazozitation?
4. Discuss the replacement reaction of diazo groups with –OH,-H and –CN group.
5. How nitro alkanes are prepared?
6. Discuss the reduction reaction of diazonium compounds.
7. Discuss the mechanism of substitution reactions in nitro arenes.

UNIT IV

1. Discuss the bonding and hybridization of Carbonyl group.
2. How aldehydes are synthesized?
3. Discuss the preparation methods for ketones?
4. How Aldehydes or Ketones are distinguished?
5. Discuss the physical properties of aldehydes and ketones?
6. Discuss the advantages of oxidation of alcohols with PCC and Pyridinium dichromate.
7. Write a note on Benzoin condensation.
8. Compare the relative reactivities of aldehydes and ketones.
9. Write a short note on Cannizaro reaction.
10. How to prepare carboxylic acids from aldehydes?

PROJECTS (To be given to group of students)
