C. U. SHAH UNIVERSITY, WADHWAN CITY.

Faculty of: **Sciences and Life Sciences**
Course: **Bachelor of Science (Chemistry)**
Semester**: I**
Subject Code**: CHM202-1C**
Subject Name: **Organic and Analytical Chemistry-I**

Sr. No	Category	Subject Code	Subject Name	Teaching hours/ Week			Credit hours	Credit Points	Evaluation Scheme/ Semester								
									Theory				Tutorial / Practical				Total
									Continuous and Comprehensive Evaluation		End Semester Exams		Internal Assessment		End Semester Exams		
				Th	Tu	Pr			Marks	Marks	Marks	Duration	Marks	Duration	Marks	Duration	
2	MAJOR	CHM202-1C	Organic and Analytical Chemistry-I	3	-	2	5	4	10 10 05	Assignment Quiz Attendance	50	2	25	1	-	-	100

AIM :

- Aware students of the history of organic chemistry and its scope.
- Acquaint the basic concept of Analytical Chemistry as a subject.
- Basic concepts related to Organic and Analytical chemistry.
- Learn laboratory skills for handling glassware and chemicals for safety purposes.

COURSE CONTENTS

Course Outline for Theory

UNIT	COURSE CONTENT	TEACHING HOURS
I	**Qualitative and Quantitative Analysis of Organic Compound** Detection of Carbon and Hydrogen Detection of Nitrogen, Sulphur and Halogens (Lassaigne's Test) Detection of Phosphorous Estimation of Carbon and Hydrogen with examples (Liebig's combustion method) Estimation of Nitrogen by Kjeldalh's method with limitation and examples Estimation of Nitrogen Dumas's method with examples Estimation of Halogen, Phosphorous, and Sulphur by Carius method with examples	**15**
II	**Synthesis and Uses of Some Important Organic Compounds** • Sulphanilamide • PAS(Para Amino Salicylic Acid) • Adrenaline • 8-hydroxy quinoline • Indigo • Methyl Orange • Vanillin **Stereochemistry** History and introductions of stereochemistry, Classification with examples **Molecular Projections**: Fischer Projections, Characteristics and Limitations,	**15**

	Sawhorse Projections, Newman Projections, Interconversions of Fischer-Sawhorse-Newman Projections. **Geometrical Isomerism**: cis–trans and, syn-anti isomerism E/Z notations with C.I.P rules. **Optical Isomerism**: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Distereoisomers, mesostructures, Racemic mixture and resolution. Relative and absolute configuration, Comparison between D, L and R, S Nomenclature	
III	**Basic Analytical Chemistry** Introduction, Qualitative and Quantitative analysis, Instrumental and Chemical Methods of Analysis, Selection of Methods, limitations of Analytical Methods Classification of Errors, Accuracy, and Precision, Absolute and Relative Error, Minimization of Error, Statistical Terms: Mean, Median, Standard Deviation, Reliability of Results (Q-test), Comparison of Results: Student's t-test and F-test, confidence limit (interval), Numerical based on above topics. **Modes of Concentration** Preparation of Standard Solutions: Equivalent weight of acid and base, Equivalent weight of acid salt, Equivalent weight of an ion, Molarity with numerical, Normality with numerical, Molality with numerical, Strength of solutions: %Concentration w/v, Weight Fraction, Volume Fraction, Examples	**15**

Course Outline for Practical

SR. NO	COURSE CONTENT
1	**Demonstrative Practicals** Calibration and use of apparatus/common glassware (Measuring Cylinder and flasks), Preparations of Standard solutions
2	**Qualitative Analysis of Organic Compound** Organic compounds containing the following groups: Carboxylic Acid, Phenol, Amine, Aldehyde, Hydrocarbon, Ketone, carbohydrate, Nitro, halo, Amide, Anilide.
	Total Hours = 30

TEACHING METHODOLOGY:

- Conventional method (classroom blackboard teaching)
- ICT Techniques
- Teaching through the classroom, laboratory work
- variety of learning styles and tools (PowerPoint presentations, audio-visual resources, e-resources, seminars, workshops, models)
- Teaching through laboratory work

LEARNING OUTCOME:

- Expand the basic knowledge of organic chemistry
- To understand methods of analysis of important elements.
- To learn the basics of synthesis of organic compounds
- To acquire knowledge of stereochemistry
- To learn the basics of analytical chemistry
- Understanding the importance of laboratory work and laboratory safety

- Acquire knowledge about types of glassware and their calibration
- Development of analytical skills by analysis of various organic compounds

ARRANGEMENT OF LECTURE DURATION AND PRACTICAL SESSION AS PER DEFINED CREDIT NUMBERS

Units	Lecture Duration (In Hrs.)		Calculation of Credits (In Numbers)		Total Lecture Duration	Credit Calculation
	Theory	Practical	Theory	Practical	Theory+ Practical	Theory+ Practical
Unit – 1	15	30	3	1	45+30	4
Unit – 2	15					
Unit – 3	15					
TOTAL	**45**	**30**	**3**	**1**	**75**	**4**

EVALUATION

Theory Marks	Practical Marks	Total Marks
75	**25**	**100**

REFERENCE BOOKS

1	A Textbook of Organic Chemistry	K.S. Tewari, N. K. Vishnoi, and S.N. Mehrotra
2	Organic Chemistry	Morrison Boyd
3	'Instrumental Method & Chemical Analysis	B.K. Sharma.
4	Fundamental of analytical chemistry	Skoog & West
5	Vogel's Qualitative Inorganic Analysis	G. Svehla, B. Sivasankar
6	Practical Chemistry	Pandey, O. P., Bajpai, D. N., Giri, S.