

<b>B.Sc. II SEMESTER</b>			
Part-A: Introduction			
Program: Certificate Course		Session-2023-24	
1.	Course Code	CHSC-2T	
2.	Course Title	Basic Chemistry-2	
3.	Course Type	Discipline Specific Course(DSC)	
4.	Pre-requisite (if any)	To study this course our students must have had the subject chemistry in class +2 equivalent	
5.	Course Learning Outcome(CLO)	At the end of this course, the students will be able to learn the following aspects of chemistry	
		<ul style="list-style-type: none"> <li>To understand group trends for s and p – block elements in the periodic table</li> </ul>	
		<ul style="list-style-type: none"> <li>Learn properties and bonding of compounds of the noble gases</li> </ul>	
		<ul style="list-style-type: none"> <li>Learn about basics of colloidal state</li> </ul>	
		<ul style="list-style-type: none"> <li>Basic concepts of chemical kinetics and catalysis</li> </ul>	
		<ul style="list-style-type: none"> <li>Understand fundamentals of stereochemistry &amp; conformational analysis</li> </ul>	
		<ul style="list-style-type: none"> <li>Chemistry of aromatic hydrocarbon , alkyl and aryl halides</li> </ul>	
6.	Credit Value	03	
7.	Total Marks	Max. Marks:	100 (80+20)

<b>Part-B: Content of Course</b>		
Total No. Of Lectures:		
Unit	Topic	No. Of Hours
<b>I</b>	<b>INORGANIC CHEMISTRY</b> <b>A.s-Block Elements</b> Comparative study, salient features of hydrides, salivation and complexation tendencies including their function in bio systems, and introduction to alkyls and aryls, derivatives of alkali and alkaline earth metals. <b>B. p-Block Elements</b> Halides hydrides, oxides and oxyacids of Boron , Aluminium, Nitrogen and phosphorus, boranes, borazines, fullerenes and silicates, interhalogens and pseudohalogens. <b>C. Chemistry of Noble Gases</b> Chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds.	<b>12</b>
<b>II</b>	<b>PHYSICAL CHEMISTRY</b> <b>A. Colloidal State</b> Classification, kinetic, optical and electrical properties of Colloids, coagulation Hardy Schulze law, flocculation value, protection, Gold number, emulsion, micelle, Gel, syneresis and thixotropy, application of colloids <b>B. CATALYSIS</b> Homogeneous and heterogeneous catalysis, types of catalyst, characteristics of	<b>11</b>

	<p>catalyst , enzyme catalysed reactions, micelle or catalyzed reaction, industrial application of catalysis.</p> <p><b>C. CHEMICAL KINETICS</b></p> <p>Rate of a reaction, factors influencing the rate of a reaction, rate constant, Order and molecularity of reaction, zero order, first order, second order reaction, methods of determining the order of reaction, complex reaction: consecutive, opposing and side reaction ,chain reactions, Temperature dependence of reaction rate, Arrhenius theory, physical significance of activation energy, collision theory, demerits of collision theory, non mathematical concept of transition state theory.</p>	
<b>III</b>	<p><b>A -ORGANIC STEREOCHEMISTRY AND CONFORMATIONAL ANALYSIS</b></p> <p>(i) Optical isomerism-Optical activity, elements of symmetry, enantiomers, diastereomers, threo and erythro , meso compounds, resolution of enantiomers, inversion retention and racemization.Relative and absolute configuration, sequence rules, D &amp; L and R &amp; S system of nomenclature (ii) Geometrical isomerism-Syn and anti forms ,E &amp; Z system of nomenclature ,properties of cis and trans isomers</p> <p><b>B.(i)</b>Conformational analysis of alkanes, ethane, butane, cyclohexane and sugars. Relative stability and Energy diagrams.</p> <p><b>(ii)</b>Types of cycloalkanes and their relative stability, Baeyer strain theory: Theory of strainless rings Chair, Boat and Twist boat conformation of cyclohexane with energy diagrams; Relative stability of mono-substituted cycloalkanes and disubstituted cyclohexane</p> <p><b>C</b></p>	<b>11</b>
<b>IV</b>	<p><b>A..AROMATIC HYDROCARBONS</b></p> <p>Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/ carbanions and heterocyclic compounds with suitable examples.Structure of Benzene and Naphthalene Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directive effects of the groups.</p> <p><b>B. Alkyl and Aryl Halides- Alkyl halides:</b> Methods of preparation, nucleophilic substitution reactions – <math>S_N1</math>, <math>S_N2</math> and <math>S_N1</math> mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination.</p> <p><b>Aryl halides:</b> Preparation, including preparation from diazonium salts. nucleophilic aromatic substitution; <math>S_NAr</math>, Benzyne mechanism.</p> <p>Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.</p>	<b>11</b>
	<b>PART -C LEARNING RESOURCES</b>	
	<p><b>REFERENCE BOOKS:</b></p> <ol style="list-style-type: none"> <li>1. Basic inorganic chemistry; F.A. Cotton, G. Willkinson and P. I. Gaus, J.wiley.</li> <li>2. Concise inorganic chemistry; J. D. Lee, ELBS. .</li> <li>3. Advanced Inorganic Chemistry; Satya Prakash.</li> <li>4. Advanced Inorganic Chemistry ;Puri &amp; Sharma , S. Naginchand.</li> <li>5. Inorganic Chemistry ; Madan, S.Chand.</li> <li>6. Selected Topics in Inorganic Chemistry ; Madan Malik &amp;Tuli ,S. Chand</li> </ol>	

	<p>7. Organic Chemistry ; Morrison and Boyd, Prentice Hall.</p> <p>8. Organic Chemistry ; F.A. Carey McGraw Hill.</p> <p>9. Organic Chemistry ;P.L.Soni</p> <p>10. Organic Chemistry; Bahal&amp; Bahal.</p> <p>11. Organic Chemistry : I.L. Finar Vol.I&amp;II</p> <p>12. The Element of Physical Chemistry; P. W. Atkin, Oxford</p> <p>13. Physical Chemistry B.D. Khosla.</p> <p>14. Physical Chemistry ; Puri &amp;Sharma.</p> <p>15. Bhautik Rasayan ; P. L. Soni.</p> <p>16. Bhautik Rasayan; Bahal &amp; Tuli.</p> <p>17. Bautik Rasayan;Puri &amp;Sharma</p> <p>18. Vogel`s Text Book of Quantitative Inorganic Analysis; revised,ELBS.</p> <p>19. Vogel`s Qualitative Analysis ,revised; Longman.</p> <p><b>E-learning Resources:</b></p> <p><b>Fundamental Chemistry related topics on SWAYAM platform and E-pathshala</b></p>	
	<b>Part - D: Assessment and Evaluation</b>	
<b>Suggested Continuous Evaluation Methods :</b>		
<b>Maximum Marks : 100 Marks</b>		
<b>Continuous Comprehensive Evaluation(CCE) : 20 Marks</b>		
<b>Semester End Examination(SEE) : 80 Marks</b>		
<b>Internal Assessment: Continuous Comprehensive Evaluation (CCE)</b>	<b>Two Internal Test of 10 Marks each Assignment/Seminar –01 of 10 Marks</b>	<b>Total of maximum obtained marks in test exam and Assignment</b>
<b>Semester End Exam (SEE):</b>	<b>Paper – Two section – A &amp; B</b> <b>Section A: Objective &amp; Short answer type questions – 1 x10 + 3 x 10 = 40 Marks</b> <b>Section B: Descriptive answer type questions unit wise – 10 x 04 = 40 Marks</b> <b>Total Marks-80</b>	

**Chairmen and Members of B.O.S.-**