



Vitthalbhai Patel & Rajratna P. T. Patel Science College
(Autonomous)

(Reaccredited with 'A' Grade by NAAC (CGPA 3.13))

Affiliated to SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar, Gujarat

Syllabus effective from the Academic Year 2024-2025



Course Code (Minor)	US01MICHE01	Title of the Course	BASIC CHEMISTRY- I
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	To make students familiar with: 1. Chemistry as a subject. 2. Historic development and scope of chemistry 3. Basic concepts related to organic and inorganic chemistry.
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Course Content		
Unit	Description	Weightage* (%)
1.	ALKANE, ALKENE AND ALKYNE Hydrocarbons : Physical properties of alkanes, alkene and alkynes, Common and IUPAC nomenclature of alkanes, alkenes and alkynes. Alkanes : Preparation from alkene by hydrogenation, reduction of alkyl halide, The Grignard reagent, Corey-House reaction, Wurtz reaction, Wurtz-Fittig reaction, Mechanism of halogenations, Orientation of halogenations : n-propane, n-butane, iso-butane, 2,3-dimethylbutane, n-pentane and isopentane, Ease of formation and stability of free radical. Alkenes : Geometrical isomerism (Cis-Trans and E-Z isomerism), Preparation of alkene from dehydrohalogenation of alkyl halide with Mechanism, dehydration of alcohol. The E ² mechanism, Evidence : Absence of hydrogen exchange, element effect, Heat of hydrogenation and stability of alkene, The E ¹ mechanism, Evidence accompanied by rearrangement, Electrophilic addition Mechanism, Electrophilic addition rearrangement, Mechanism of addition of halogen, Halohydrin formation, Free-radical addition, Hydroxylation, addition of alkene and alkane to alkene, Oxymercuration-Demercuration and Hydroboration-oxidation, Ozonolysis.	50

	<p>Alkynes: Preparation from dehydrohalogenation of alkyl halide, Reaction of metal acetylide with primary alkyl halides, Hydration of alkynes, Acidity of alkynes, Analysis of alkynes.</p>	
2.	<p>PERIODIC PROPERTIES</p> <p>Periodic Table: Definition of periodic table, Periodic Law, Modern periodic table (Long form of periodic table), Merits of long form of periodic table, Brief introduction and types of elements, Atomic, ionic and covalent radii and its related numericals, Shielding effect and effective nuclear charge, Factor affecting the magnitude of σ and Z_{eff} and their variation in the periodic table, Slater's rule for calculation σ and Z_{eff}.</p> <p>Ionization Energy: Successive ionization energy, Factor affecting magnitude of Ionization Energy, Variation of IE values in main group element, Variation of IE values in different element groups, Ionization energies of isoelectronic species, Find out the order of second IE values of the element of second period, Difference between Ionization potential and Electrode potential of a metal.</p> <p>Electron Affinity: Relation between EA of X(g) atom and IE of X-(g) ion, EA2 represents energy required, Factor affecting the magnitude of electron affinity, Variation of electron affinity in main group elements of the periodic table, Variation of electron affinity values of different groups.</p> <p>Electronegativity: Different methods used for calculating electronegativity (like Pauling, Mulliken, Allred-Rachow), Factor affecting the magnitude of electronegativity, Role of electronegativity in chemical behaviour, Variation of electronegativity of the elements of different group, Variation of electronegativity in a period of s and p Block elements, Application of electronegativity. Numerical based on above topics.</p>	50

Teaching-Learning Methodology	<p>Conventional method (classroom blackboard teaching), ICT.</p> <p>Courses for B. Sc. Chemistry programme are delivered through classroom, laboratory work in a challenging, engaging, and inclusive manner that accommodates a variety of learning styles and tools (PowerPoint presentations, audio visual resources, e-resources, seminars, workshops, models).</p>
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Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage (%)
1.	Continuous and compression evaluation : Class test/Internal written test 10 Marks (40%), Quiz 05 Marks (20%), Home Assignments 05 Marks (20%), Attendance 05 Marks (20%), (As per SPU Letter No. E-3/2748 dated 02/02/2024) [Total 25 Marks (50%)].	50
2.	Semester End Examination [Total 25 Marks (50%)].	50

Course Outcomes: Having completed this course, the learner will be able to	
1.	Gain the knowledge of Chemistry using various fundamental aspects of chemical sciences.
2.	Explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.
3.	To have knowledge of basic aspects of inorganic chemistry comprising of various aspects of periodic table.

Suggested References:	
Sr. No.	References
1.	Morrison, R. T. & Boyd, R. N., <i>Organic chemistry</i> (6 th edition).
2.	Clayden, J., Greeves, N., Warren, S., <i>Organic Chemistry</i> 2 nd Edition, Oxford University Press.
3	Prakash S., Tuli, G. D., Basu, S. K., Madan R. D., <i>Advance inorganic chemistry</i> (Vol. - I).
4	Cotton, F.A. & Wilkinson, G. <i>Basic Inorganic Chemistry</i> , Wiley.
5	Lee J. D., <i>Concise Inorganic Chemistry</i> (4 th Edition).

On-line resources to be used if available as reference material

On-line Resources : Google books, INFLIBNET, Google Web
