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 (Inter Disciplinary)	**US02IDCHE01**	Title of the Course	**FUNDAMENTALS OF CHEMISTRY-II**
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	To make students familiar with: 1. Some advanced topics of basic chemistry. 2. Historic development and scope of various branches of chemistry. 3. Basic concepts related to d-Block elements, coordination chemistry and fundamental aspects of chemical kinetics.

Course Content		
Unit	Description	Weightage* (%)
1.	**[A] FUNDAMENTAL CONCEPT OF COORDINATION CHEMISTRY** Definition of some terms, Classification of ligands, Chelate, chelating ligand and Chelation, Classification of chelates, Uses of Chelates, Co-ordination number and Stereochemistry including distortion of complexes having coordination number 7, Nomenclature of co-ordination compounds, Stability of complexes, Detail factors affecting the stability of complexes. **[B] BENZENE AND THEIR DERIVATIVES** Classification of substituent group, Mechanism of nitration, Sulphonation, Friedal-Craft alkylation, Friedal-Craft acylation and Halogenation of benzene, Limitations of Friedal-Craft alkylation, Halogenation of alkyl benzene: ring Vs side chain, Side-chain halogenations of alkyl benzene.	**50**
2.	**CHEMICAL KINETICS** Introduction, Concentration Effects, Differential Rate Laws, The Integrated Rate Laws, Experimental Determination of rate laws, Reaction Mechanisms, Elementary Processes, Mechanism and rate laws, Collision	**50**

	Theory of Gaseous Reactions, Temperature effects, Numerical Problems based on above topics.	

Teaching-Learning Methodology	Conventional method (classroom blackboard teaching), ICT. 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).

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 (100%)].	50
2.	Semester End Examination [Total 25 Marks (100%)].	50

Course Outcomes: Having completed this course, the learner will be able to	
1.	Learn about basic concepts of co-ordination chemistry, chemical kinetics, d-block elements. This learning will be helpful in understanding second and third year B.Sc. chemistry course.
2.	Have knowledge of nomenclature of complexes and ligands.
3.	To gain knowledge of d-block elements and various bonds in inorganic complexes.

Suggested References:	
Sr. No.	References

1.	Barrow, G. M., *Physical chemistry* (6^{th} Edition).
2.	Bahl, B.S., Tuli J. D., and Bahl, A, *Essentials of Physical Chemistry*.
3	Prakash S., Tuli, G. D., Basu, S. K., Madan R. D., *Advance inorganic chemistry* (Vol. - II).
4	Mahan, B.H. *University Chemistry*, 3^{rd} Edition Narosa.
5	Selected Topics in Inorganic Chemistry, Wahid U. Malik, G. D. Tuli, R. D. Madan.
6	Cotton, F.A. & Wilkinson, G. *Basic Inorganic Chemistry*, Wiley.
7	Lee J. D., *Concise Inorganic Chemistry* (4^{th} Edition).
8	Sharma K. K and Sharma L. K. *A Text Book of Physical chemistry*, (5^{th} Edition), Vikas Publishing House.

On-line resources to be used if available as reference material.
On-line Resources : Google books, INFLIBNET, Google Web.

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