

**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****(Bachelor of Science) (Undergraduate) (NEP-2020)****B. Sc. (UG) Semester-I**

Course Code	US01MACHE02	Title of the Course	PRACTICAL IN CHEMISTRY- I
Total Credits of the Course	4	Hours per Week	8
Course Objectives:	To make students familiar about: 1. Chemistry as a subject 2. Practical aspects of chemistry 3. Basic concepts related to volumetric analysis and qualitative analysis of inorganic substances. 4. Hands on training of laboratory practices.		

Course Content	
Practical	Description
	Introduction to chemical laboratory, use of glassware, chemical and reagents, organic and inorganic solvents, bench reagents, side reagents, safety practices in the chemistry laboratory, knowledge about toxic chemicals and safety precautions in their handling.
1.	Analysis of Inorganic substances (water soluble and water insoluble) Identification of inorganic substance [at least 12 substances] as a positive and negative radicals like : Pb^{+2} , Cu^{+2} , Fe^{+2} , Zn^{+2} , Al^{+3} , Ni^{+2} , Mn^{+2} , Ba^{+2} , Sr^{+2} , Ca^{+2} , Mg^{+2} , NH_4^+ , K^+ , Cl^- , Br^- , I^- , NO_3^- , CO_3^{-2} , S^{-2} , PO_4^{-3} (soluble and insoluble), SO_4^{-2} , CrO_4^{-2} , $\text{Cr}_2\text{O}_7^{-2}$.
2.	Volumetric analysis: For the following exercise student has to prepare solution of titrant, where ever required. (i) Standardization of NaOH using Succinic acid. (ii) Standardization of HCl using NaOH solution. (iii) To determine the amount and gm/lit, gm/500 mL, gm/250 mL of carbonate and bicarbonates mixture using phenolphthalein and methyl orange indicator. (iv) To determine the amount and gm/lit, gm/500 mL, gm/250 mL of NaOH and Na_2CO_3 mixture using phenolphthalein and methyl orange indicator. (v) To determine the amount of Fe^{+2} by titration of KMnO_4 against

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	<p>$\text{FeSO}_4(\text{NH}_4)_2 \cdot \text{SO}_4 \cdot 6\text{H}_2\text{O}$.</p> <p>(vi) To determine the amount of Fe^{+2} by titration of $\text{K}_2\text{Cr}_2\text{O}_7$ against $\text{FeSO}_4(\text{NH}_4)_2 \cdot \text{SO}_4 \cdot 6\text{H}_2\text{O}$.</p> <p>(vii) To determine the amount of Fe^{+2} by $\text{K}_2\text{Cr}_2\text{O}_7$ using diphenyl amine as an internal indicator.</p> <p>(viii) To determine the amount and gm/lit, gm/750 mL of Oxalic acid using KMnO_4.</p> <p>(ix) To determine the molarity of mixture and gm/lit of Oxalic acid and sodium oxalate solution mixture by using 0.1M KMnO_4 and 0.02M NaOH.</p> <p>(x) To determine the molarity of mixture and gm/lit of Oxalic acid and H_2SO_4 solution mixture by using 0.1M KMnO_4 and 0.1M NaOH.</p>
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Teaching-Learning Methodology	<p>Hands on training, Practical</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 : Laboratory work Assessment 20 (40%), Viva Voce/Lab Quiz 20 (40%), Attendance 10 (20%). [Total 50 Marks (100%)].	50
2.	Semester End Examination : Laboratory work Assessment 40 (80%), Viva Voce/Lab Quiz 10 (20%). (As per SPU Letter No. E-3/2748 dated 02/02/2024) [Total 50 Marks (100%)].	50

Course Outcomes: Having completed this course, the learner will be able to learn	
1.	About hands on training of Volumetric analysis and Analysis of Inorganic substances.



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2.	About improvement in practical skills of students.
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Suggested References:

Sr. No.	References
1.	Mendham, J., Denney, R. C., Barnes, J. D., Thomas, M. J. K., <i>Vogel's textbook of quantitative chemical analysis</i> , 6 th Edition.
2.	Pandey, O. P., Bajpai, D. N., Giri, S., <i>Practical Chemistry</i> .
3	Ghoshal, Mahapatra, Nad, <i>An Advanced course in Practical Chemistry</i> .

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

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