



HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Course Name : B. Sc. Chemistry Semester : II
PROGRAM CODE : SCIUG102
COURSE CODE : SC23MIDSCCHE202

Type of course : Minor (Elective) Discipline Specific course MIDSC

Name of course : Fundamentals of chemistry II

Total Marks : 50

Effective from June 2023 Under NEP 2020

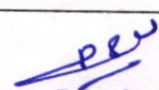
Total Credits : 02	Teaching Hours per Week: 02	Theory	External 25 Marks
	Teaching Hours per Semester: 30		Internal 25 Marks

Course Objectives:

1. To understand concepts of inorganic chemistry in terms of coordination compounds, p block elements
2. To apply Stereo chemistry and spatial arrangement of some compounds.

Course Outcomes:

1. Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Inorganic and Physical Chemistries.
2. Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.
3. Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behavior in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.
4. Students will be able to explain why chemistry is an integral activity for addressing social, economic, and environmental problems.


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Unit-I coordination chemistry - NIP

	basics of Werner's theory, Experimental evidence in favor of Werner's theory Sidgwick's effective atomic number (EAN) rules, Application of EAN rules, Nomenclature of Coordination compounds. Nature of Metal legend bonding VB theory, Limitation of VB theory. Isomerism in Coordination Compounds, Structural, Conformation, Ionization, Hydrate, Coordination, Linkage, Coordination position, Ligand and Polymerization isomerism. Stereo isomerism, Geometrical isomerism and Optical isomerism.		
2	Stereochemistry Introduction of Stereo Isomers; (A) Optical isomerism : General, Discussion of elements of symmetry, Molecular chirality, Enantiomers, Optical activity, Properties of enantiomers, Chiral and achiral molecules with two stereogenic centers, Diastereomers, R-S Nomenclature, Threo and Erythro diastereomers, Meso compounds. (B) Geometrical isomerism: Definition and general discussion of geometric isomers, General Methods of structure determination (physical methods), E-Z nomenclature, (Simple illustration should be given). (C) Conformational isomerism: Definition, Conformational analysis of ethane, n-butane with rotationalAnd tortional diagram, Conformation of cyclohexane, Axial and Equitorial bonds, Newmann projection, Show horse formula, Fisher & flying wedge formula, Difference between conformation and configuration.	1 MAP	15

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**Books Recommended:****Inorganic Chemistry**

1. 'Modern Inorganic Chemistry' by G.F.Liporni, ELBS, 4th edn. coiling Educational. 1983.
2. 'Inorganic Chemistry' D.F.Shriver. P.W.Atkinss and C.H.Longford, 3rd edn, ELPS Oxford University Press, 1999..
3. 'Concise Inorganic Chemistry' J.D.Lee. 5th edn.
4. 'Inorganic Chemistry', D.F.Slirjver, P.W.Atkinss, 3rd edn, Oxferd. 1999.
5. 'Concise Inorganic Chemistry' J.D.Lee, 4th edn, Champman and hall ELBS, 1991.
6. 'Inorganic Chemistry' by A.G.Sharp, 3rd edn, ELBS, Longman, 1990.

Organic Chemistry

1. 'Organic reaction and mechanism, P.S.Kalsi, New Age international Publishers.
2. Text book of organic Chemistry. P.S.Kalsi, New Age international Publishers.
3. Organic Chemistry Vol. I&II. S.M.Muklierji, S.P.Singh. R.P.Kapoor.
4. Reaction mechanism in Organic Chemistry, S.M.Mukhergi. S.P.Singh. 3rd edn. Macmillan.

Further Reading:

1. Reaction Mechanism and Reagents in Organic Chemistry, Gurdeep R. Chatwal 4th edn, Himalaya Publication House.
2. Text book of Organic Chemistry, Arun Bahal, S. Chand.
3. Organic Chemistry, R. Morrison and R. Boyd, 6th edn, Pearson Education 2003.
4. Organic Chemistry. T.W. Graham Solomons, 4th edn. John Wiley. 1998.
5. Nuclear Chemistry by C.V. Shekhar, Dominent-Publisher. New Delhi.
6. Essentials of physical Chemistr by B.S. Bahal, Arun Bahal. G. D. Tuli.
7. Physical Chemistry by P.W. Atkins. 5th edn. Oxferd 1994 7th edn-2002.
8. Physical Chemistry b R.A. Albert and R.J. Silby, John Wiley 1995.
9. Physical Chemistry by G.H. Barrow. 5th edn, Mac Graw Hill . 1988. 6th edn. 1996.
10. Physical Chemistry by W.J. Moore. 4th edn. Orient Longmans 1969.


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Practical- Minor



HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Program Name : B. Sc. Chemistry

Semester : II

PROGRAM CODE : SCIUG102

COURSE CODE : SC23PMIDSCCHE202

Type of course : Practicals Minor (Elective) Discipline Specific Course PMIDSC

Name of Course : Practical's for Fundamentals of chemistry II

Total Marks : 50

Effective from June 2023 Under NEP 2020

Total Credits : 02	Teaching Hours per Week: 04	Practicals	External 25 Marks
	Lab Teaching Hours per semester:60		Internal 25 Marks
Minimum number of practicals to be performed: 10			

Course Objectives:

1. To identify the cationic and anionic ions in mixture.
2. Preparation of solutions for volumetric solutions.

Course Outcomes:

1. Students will gain a comprehensive knowledge and skills in identification of cations and anions.
2. Students will have basic knowledge of volumetric titrations.

Sr.No.	List of Practicals	Credit	Hr
1	Inorganic Chemistry Semi micro Analysis: (Any six) Cation analysis: separation and identification of ions from group I, II, III-A, III-B, IV, V-A, V-B. Anion analysis like (Water Soluble and insoluble). Candidate should perform the analysis of at least 08 compounds.	1	30
2	Volumetric Titrations (Any four) 1) To determine the strength of NaOH and Na ₂ CO ₃ present in the solution mixture of NaOH & Na ₂ CO ₃ and to find out their percentage composition. 2) To determine the strength of NaHCO ₃ and Na ₂ CO ₃ present in the solution mixture of NaHCO ₃ & Na ₂ CO ₃ and to find out their	1	30

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percentage composition.		
3) To determine the Normality, gram/liter and molarities of $\text{H}_2\text{C}_2\text{O}_4$ $2\text{H}_2\text{O}$ and H_2SO_4 present in the solution mixture of $\text{H}_2\text{C}_2\text{O}_4$ $2\text{H}_2\text{O}$ and H_2SO_4 by using X N NaOH and Y N KMnO_4 solutions.		
4) To determine the Normality, gram/liter and molarity of $\text{H}_2\text{C}_2\text{O}_4$ $2\text{H}_2\text{O}$ and $\text{K}_2\text{C}_2\text{O}_4$ present in the solution mixture of $\text{H}_2\text{C}_2\text{O}_4$ $2\text{H}_2\text{O}$ & $\text{K}_2\text{C}_2\text{O}_4$ by using X N NaOH and Y N KMnO_4 solutions.		
5) To determine the amount of Ca^{+2} and Mg^{+2} ion by EDTA solution from the mixture solution of CaCl_2 and MgCl_2 .		
6) Calibration of burette Pipette and measuring flasks.		

Books Recommended:

1. Practical Chemistry : For B.Sc. I, II And III Year Students of All India Universities By Pandey O.P. & et Al. publisher S. Chand's, Paperback December 2010.
2. Basic Principles of Practical Chemistry, by V. Venkateswaran (Author) publisher S. Chand's, Paperback – 1 January 2012
3. Chemistry In Laboratory-B.Sc.-Sem-I-Vi-Hons. By Dr.Subhojit Ghosh (Author), Dr.Madhushree Das Sharma (Author), publisher CBCS, Paperback – 1 January 2019.

Further Reading:

1. Practical Chemistry, By Sonia Ratnani (Author), Swati Agrawal (Author), Sujeet Kumar Mishra (Author) publisher Mc Graw Hill, 1st Edition Paperback – 16 September 2020.
2. B.Sc. Practical Chemistry First Year By Paperback, Dr. M.M.N. Tandon, Publisher: Shiva Lal Agarwal & Company, 2020.


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