

# Minor- Theory

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Course Name: B. Sc. Chemistry Semester: VI

PROGRAM CODE: SCIUG102

COURSE CODE: SC23MIDSCCHE602



Type of course: Minor Discipline Specific course

Name of course: Bioinorganic and Organic Chemistry

Total Marks: 100

Effective from June 2025 Under NEP 2020

|                      |                                 |        |                   |
|----------------------|---------------------------------|--------|-------------------|
| Total Credits:<br>02 | Teaching Hours per Week: 02     | Theory | External 25 Marks |
|                      | Teaching Hours per Semester: 30 |        | Internal 25 Marks |

## Course Objectives:

1. To understand the core concepts of Bioinorganic chemistry.
2. To understand physical chemistry concepts of Active Methylene Group Compounds.
3. To Understand Tautomerism

## Course Outcome:

1. Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in, inorganic and organic chemistry.
2. 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.
3. Students will be able to design and carry out scientific experiments as well as accurately record and analyse the results of such experiments.
4. Students will be skilled in problem solving approach, creative thinking and analytical reasoning as applied to scientific problems.
5. To know about the Volumetric titrations and calculations for estimation.

| Unit | Topic                                                                                                                                                                                                                                   | Credit | Hours |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------|
| 1    | <b>Bioinorganic chemistry</b><br>Introduction,<br>Essential elements,<br>Trace elements<br>Metal porphyrine,<br>Study of hemoglobin and myoglobin<br>Nitrogen fixation: In Vivo and In Vitro                                            | 1      | 15    |
| 2    | <b>Active Methylene Group Compounds</b><br>Introduction of Tautomerism<br>Determination of keto-enol tautomerism<br>Differences between Tautomerism and resonance<br>Synthesis and application of Ethyl aceto acetate and malonic ester | 1      | 15    |

SPV

MAP



**Books Suggested (Organic Chemistry):**

- (1) Analytical Chemistry: Gary D. Christian, 6<sup>th</sup> Edition; Wiley & Sons
- (2) Fundamentals of Analytical Chemistry: D. A. Skoog, D. M. West and F. J. Holler, 9<sup>th</sup> Edition, Cengage Learning.
- (3) Instrumental Methods of analysis: (CBS) H.H. Willard, L.L. Mirrit, J.A. Dean
- (4) Instrumental Methods of Inorganic Analysis: A.I. Vogel, ELBS
- (5) The principals of ion-selective electrodes and membrane transport: W.E.Morf  
Principles of Instrumental Analysis: Douglas A. Skoog., F. James Holler, Stanley R. Crouch, Cengage Learning; 6<sup>th</sup> Edition.

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# Practical - Minor - BSc-6

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Course Name: B. Sc. Chemistry Semester: VI

PROGRAM CODE: SCIUG102

COURSE CODE: SC23PMIDSCCHE602A



Type of course: Practical Minor Discipline Specific Course

Name of course: Practical's for Fundamentals of Chemistry III

Total Marks:50

Effective from June 2025 Under NEP 2020

|                      |                                                      |             |                   |
|----------------------|------------------------------------------------------|-------------|-------------------|
| Total Credits:<br>02 | Teaching Hours per Week: 04                          | Practical's | External 25 Marks |
|                      | Teaching Hours per Semester: 60                      |             |                   |
|                      | Minimum No. of. Practical to be Performed: 09 (Nine) |             | Internal 25 Marks |

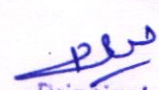
## Course Objectives:

1. To identify the organic, inorganic components.
2. Preparation of solutions and their standardization.

## Course Outcome:

1. Students will gain a comprehensive knowledge and skills in standardization and Preparation of solutions for carrying out reactions.

| Type | Topic                        |
|------|------------------------------|
| 1    | Inorganic Estimation Any 03  |
| 2    | Organic -Preparation -Any 03 |
| 3    | Physical-Any 03              |
| 4    | Total 09                     |

  
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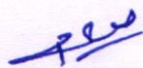


| Sr. No  | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Credit | Hours |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------|
| Group-A | <b>Inorganic Chemistry practical (Minimum 09)</b><br><b>Inorganic Estimation (Any 03)</b> <ul style="list-style-type: none"><li>1. Estimation of Calcium from Calcium Tablet by Complexometric titration.</li><li>2. Estimation of Chlorine from Bleaching powder by Iodometric Method.</li><li>3. Estimation of Zinc from Zinc powder by Complexometric Titration.</li><li>4. Estimation of Iron from Iron tablets using <math>\text{KMnO}_4</math> by Volumetrically.</li><li>5. Determination of Alkali Content in Antacid Tablet Using HCL.</li></ul> <b>Organic (Minimum 03)</b><br><b>Synthesis of Organic Compounds:</b> <ul style="list-style-type: none"><li>1. Preparation of N-butyl acetate from n-butanol</li><li>2. Preparation of p-nitro-acetanilide from p-nitro-aniline</li><li>3. Preparation of Adipic acid from cyclohexanol.</li><li>4. Preparation of D.D.T. from Chlorobenzene</li></ul> <b>Physical: (Minimum 03)</b> <ul style="list-style-type: none"><li>1. To Determine the Normality and Amount of <math>\text{XN NH}_4\text{OH}</math> by PH metric titration using 0.09 N to 0.12 N HCl.</li><li>2. To Determine the Normality and Amount of <math>\text{XN NH}_4\text{OH}</math> by Potentiometry titration using 0.09 N to 0.12 N HCl.</li><li>3. To Determine the Normality and Amount of <math>\text{XN NH}_4\text{OH}</math> by Conductometry titration using 0.09 N to 0.12 N HCl.</li><li>4. To Determine the Amount of <math>\text{K}_2\text{Cr}_2\text{O}_7</math> in the given unknown solution by Colorimetric method.</li><li>5. To Determine the Amount of <math>\text{CoCl}_3</math> in the given unknown solution by Colorimetric method.</li><li>6. To determine the viscosity and percentage composition of unknown mixture by theoretical method.</li></ul> | 2      | 60    |

Reference Books:

- 1) Advanced Practical Physical Chemistry Practical, by J B Yadav
- 2) Organic practical Mann & Saunders
- 3) Vogel's Textbook of Quantitative Chemical Analysis
- 4) Elementary practical Organic Chemistry Arthur I Vogel
- 5) Practical Organic Chemistry Pragati prakhan
- 6) A Textbook of Qualitative Chemical Analysis (Arthur I Vogel)
- 7) Comprehensive Practical Organic Chemistry (Preparation & Quantitative Analysis) V.K. Ahluwalia, Renu Aggarwal

Note :- Certified Journal must be compulsory

  
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