Bsc-5 CO & CO's

NEP-2020 start (2025-26)

HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Course Name: B. Sc. Chemistry Semester: V

PROGRAM CODE: SCIUG102
COURSE CODE: SC23MJDSCCHE501

Type of course: Major Discipline Specific course
Name of course: Fundamentals of Chemistry III (Major-1)
Total Marks: 100

Effective from June 2025 Under NEP 2020

Total Credits: 04	Teaching Hours per Week: 04	Theory	External 50 Marks
	Teaching Hours per Semester: 60		Internal 50 Marks

Course Objectives:

1. To understand the core concepts of electro motive force.
2. To understand physical chemistry concepts of Nucleophilic Substitution Reaction
3. To know about the Volumetric titrations and calculations for Acid Base Titration.
4. To study about the Symmetry group elements & symmetry operations.

Course Outcome:

1. Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in, physical and analytical chemistry.
2. Students will appreciate the central role of chemistry in our society and use this as a basis
for ethical behaviors in issues facing chemists including an understanding of safe handlingof 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	**Electro Motive Force** Introduction of Terms - Oxidation, Reduction, Redox, Anode, Cathode - Electrode, Half cell - Oxidation & Reduction Potential - Electro Chemical Series - Nernst Equation Without Transference with Transference Verification of Concentration cell and it's EMF equation. Electrolyte concentration cell Concentration cell without transference, Concentration cell with	1	15

The HNSB. Ltd. Science College GUJ. STATE ESD JUNE 1993 Himatnagar

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Course Name: B.Sc. Chemistry Semester: -V

PROGRAM CODE: SCIUG102
COURSECODE:SC23MJDSCCHE501

Type of course: Major Discipline Specific IKS course
Name of course: Ancient Indian Chemistry (Major-2)
Total Marks:100

Effective from June 2025 Under NEP2020

TotalCredits: 04	Teaching Hours per Week:04	Theory	External50 Marks
	Teaching Hours per Semester:60		Internal50Marks

Course Objectives:

1. To understand and appreciate Indian contribution to chemical sciences. .
2. To understand ancient Indian metallurgy and compare with present system.
3. To appreciate the contribution of Indian chemist sir P. C. in chemicals sciences and industrial chemistry.
4. To acknowledge the contribution of Raman effect ny indian lobel laurette Dr. C. V. Raman.
5. To know about extraction of various fragrances in ancient India.

Course Outcome:

1. Students will have firm faith in our knowledge systems.
2. Students will appreciate the central role of chemistry in uplifting our society for centuries.
3. Students will be able to understand and earlier methods of design/ synthesis/extraction of new components and compare these with present systems.
4. Students will be more motivated and believe in our indegenious sytems and get skilled in problem solving approach, critical thinking and analytical reasoning to have answers to social problems.
5. Students will know about Tradtional frangrances and their cultural, spiritual, and medicinal role.

Unit	Topic	Credit	Hours
1	**Indian traditional metallurgy** • Overview of Indian metallurgical tradition • Vedic Metallurgy of Copper, Iron. Zinc, Gold and Silver • Chemistry of Modern Alloy (mild Steel and Stainless steel, and German silver) and Ores (Gold, Silver, Iron, Aluminum Chemistry of Ashok Stambh • Techniques of Manufacturing Coins in Ancient India and in present times, Types of Historical Coins • Matels used in Ayurveda, Material and process, Rasayan and Bhasam	1	15

SPV

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HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Course Name: B. Sc. Chemistry Semester: V

PROGRAM CODE: SCIUG102
COURSE CODE: SC23PMJDSCCHE501B

Type of course: Practical Major Discipline Specific Course
Name of course: Practical's for Fundamentals of Chemistry III (Major-3)
Total Marks: 100

Effective from June 2025 Under NEP 2020

Group-A

Total Credits: 02	Teaching Hours per Week: 04	Practical	External 25 Marks
	Teaching Hours per Semester: 60		
	Minimum No. of. Practical to be Performed:12(Twelve)		Internal 25 Marks

Group-B

Total Credits: 02	Teaching Hours per Week: 04	Practical	External 25 Marks
	Teaching Hours per Semester: 60		
	Minimum No. of. Practical to be Performed:12(Twelve)		Internal 25 Marks

Course Objectives:
1. To Identify the organic components.
2. Preparation of solutions and their standardization.

Course Outcome:
1. Students will gain a comprehensive knowledge and skills in standardizations, hands on instruments, Separation techniques and Preparation of solutions for carrying out reactions.

Type	Topic
1	Organic Practical (Any 08 Binary Mixtures)
2	Inorganic Practical (Any 4 Alloy & Any 4 Preparation)
3	Physical Practical (Any 08)

Group	Practicals	Practicals	Marks
A	Organic -08	Inorganic-04(Alloy)	25
B	Physical-08	Inorganic-04(Preparation)	25

Note: Certified Practical Journal is Compulsory for Practical Examination

This syllabus is to be completed by assigning four laboratory session per week, each of three periods. The number of students in the laboratory batch should not exceed ten(10) the medium of instruction will be English in laboratory course.

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HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Course Name: B. Sc. Chemistry Semester: V

PROGRAM CODE: SCIUG102
COURSE CODE: SC23MIDSCCHE502

Type of course: Minor Discipline Specific Course
Name of course: Simplified of Chemistry II (Minor-1)
Total Marks: 100

Effective from June 2025 Under NEP 2020

Total Credits: 04	Teaching Hours per Week: 04 Teaching Hours per Semester: 60	Theory	External 50 Marks Internal 50 Marks

Course Objectives:

1. To understand the core concepts of Corrosion.
2. To understand Organic chemistry concepts of Carbohydrate.
3. To know about the Colloidal State and preparation and application of Colloidalmaterials.
4. To know about the Colloidal State and preparation and application of Colloidalmaterials.

Course Outcome:

1. Students will have a firm foundation in the fundamentals and application of currentchemical and scientific theories including those in, inorganic and physical chemistry.
2. Students will appreciate the central role of chemistry in our society and use this as a basis for ethical behaviors 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 accuratelyrecord and analyse the results of such experiments.
4. Students will be skilled in problem solving approach, critical 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	Water Technology • Introduction, • sources of water, • types of impurities in water, Physical impurities and Chemical impurities and Biological impurities • hardness of wate, temporary and permanent hardness, units of hardness, disadvantages of hard water In domestic use and In Industrial use. Estimation of hardness by EDTA method. • Determination of Alkalinity and Acidity of a water sample. Determination of the Chloride content in water • Treatment of water for domestic purpose. • Removal of suspended impurities. • Boiler troubles • Estimation of dissolved oxygen.	1	15

APK

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HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Course Name: B. Sc. Chemistry

Semester: V

PROGRAM CODE: SCIUG102

COURSE CODE: SC23PMIDSCCHE502A

Type of course: Practical Minor Discipline Specific Course
Name of course: Practical's for simplified chemistry III (Minor-2)
Total Marks: 100

Effective from June 2025 Under NEP 2020

Group-A

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

Group-B

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

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, hands on instruments and preparation of solutions for carrying out reactions.

Type	Topic
1	Inorganic Practicals(Any 5)
2	Organic Practicals (Any 04 Preparation & Any 03 Estimation)
3	Physical Practicals (Any 06)

Group	Practicals	Practicals	Marks
A	Inorganic-5	Organic -any 04(Preparation)	25
B	Physical-6	Organic - 03(Estimation)	25

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HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN

Course Name: B. Sc. Chemistry Semester: V

PROGRAM CODE: SCIUG102
COURSE CODE: SC23SECCHE506B

Type of course: Skill Enhancement course SEC
Name of course: Medicinal Chemistry (SEC-3)
Total Marks: 50

Effective from June 2025 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 the core concepts of Nomenclature of drug, classification of drug and an important terminology of Medicinal Chemistry
2. To study about the drug design, drug receptor and drug administration.

Course Outcome:
1. Students will have a firm foundation in the fundamentals and application of current Chemical and scientific theories including those in, medicinal 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, critical thinking and analytical reasoning as applied to scientific problems.
5. To know about the medicinal chemistry. This is useful in CSIR NET & GSETExamination.

Unit	Topic	Credit	Hours
1	**Medicinal Chemistry-1** Introduction of Medicinal ChemistryHistory of Medicinal Chemistry Some important terminology of Medicinal Chemistry Nomenclature of Drug Basic classification of Drug Difference between Drug and Medicine	1	15
2	**Medicinal Chemistry-2** Introduction Pharmacopeias Basic concept of Drug Design Basic concept of Drug & Receptor InteractionRotes of Drug Administration Adverse effect of drug & minimization of adverse effect	1	15

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