



Re-Accredited 'B++' 2.86 CGPA by NAAC

VEER NARMAD SOUTH GUJARAT UNIVERSITY

University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.

વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી

યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.

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-: પરિપત્ર :-

વિજ્ઞાન વિદ્યાશાખા હેઠળની સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, NEP-2020 અંતર્ગત શૈક્ષણિક વર્ષ ૨૦૨૩-૨૪થી અમલમાં આવનાર B.Sc.Chemistry Sem.-2 ની Teaching & Evaluation Scheme તથા MDC અને SEC ના અભ્યાસક્રમ સંદર્ભે રસાયણશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૦૪/૧૨/૨૦૨૩ ની સભાના ઠરાવ ક્રમાંક:૦૨ અન્વયે કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખા વતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૦૬/૧૨/૨૦૨૩ની સભાનાં ઠરાવ ક્રમાંક: ૪૨ થી મંજૂર કરેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

રસાયણશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૦૪/૧૨/૨૦૨૩ ની સભાનાં ઠરાવ ક્રમાંક:૦૨

:: આથી ઠરાવવામાં આવે છે કે, NEP-2020 અનુસાર શૈક્ષણિક વર્ષ ૨૦૨૩-૨૪ થી અમલમાં આવનાર B.Sc.Chemistry Sem.-2 નો MDC અને SEC નો અભ્યાસક્રમ સર્વાનુમતે મંજૂર કરી વિજ્ઞાન વિદ્યાશાખાને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૦૬/૧૨/૨૦૨૩ની સભાનાં ઠરાવ ક્રમાંક: ૪૨

:: આથી ઠરાવવામાં આવે છે કે, NEP-2020 અંતર્ગત શૈક્ષણિક વર્ષ ૨૦૨૩-૨૪ થી અમલમાં આવનાર B.Sc. Chemistry Sem.-2 MDC અને SEC ના અભ્યાસક્રમ સંદર્ભે રસાયણશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૦૪/૧૨/૨૦૨૩ની સભાના ઠરાવ ક્રમાંક :૦૨ અન્વયે કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખાવતી મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ સ્વીકારી મંજૂર કરવામાં આવે છે.

બિડાણ: ઉપર મુજબ

ક્રમાંક : એસ./સાયન્સ/પરિપત્ર/૩૦૫૧૫/૨૦૨૩
તા.૦૮-૧૨-૨૦૨૩


કુલસચિવ

પ્રતિ,

- ૧) વિજ્ઞાન વિદ્યાશાખા હેઠળની સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ.
..... આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારું.
- ૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા.
- ૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
.....તરફ જાણ તેમજ અમલ સારું.

એકેડેમિક કાઉન્સિલ તા. ૦૬-૧૨-૨૦૨૩

બાબદ... ૧૨..... બિડાણપત્રિકા... ૨૭.....

Veer Narmad South Gujarat University,
Surat



B.Sc. (Chemistry)
Syllabus as per

NEP 2020

(Effective from June, 2023)

Faculty તા. A.C. માં મુદ્દા લખાયા છે.

(1 પૃષ્ઠ)

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

B. Sc. Chemistry

As per NEP 2020

B.Sc. Chemistry is an undergraduate degree program that focuses on the study of various aspects of chemistry, including its principles, theories, and practical applications. It is a comprehensive program that equips students with a solid foundation in the field of chemistry and prepares them for a wide range of career opportunities.

Upon completion of the program, graduates are expected to possess the following general outcomes:

- **Knowledge and Understanding:** Graduates will have a strong theoretical and practical knowledge of the fundamental concepts and theories in chemistry, including organic, inorganic, physical, and analytical chemistry.
- **Laboratory Skills:** Graduates will be proficient in laboratory techniques, including the handling of chemicals, operation of laboratory equipment, and conducting experiments safely and accurately.
- **Critical Thinking and Problem Solving:** Graduates will develop critical thinking skills and the ability to analyse and solve complex problems in the field of chemistry. They will be adept at designing experiments, interpreting data, and drawing logical conclusions.
- **Communication Skills:** Graduates will be able to effectively communicate scientific ideas and findings through written reports, presentations, and scientific discussions. They will also possess strong teamwork skills, enabling them to collaborate with peers and professionals in the field.
- **Ethical and Professional Conduct:** Graduates will understand the importance of ethical conduct in scientific research and demonstrate professionalism in their interactions with colleagues, clients, and the broader community.

In addition to these general outcomes, B.Sc. Chemistry programs may also have specific outcomes tailored to meet the needs of the particular institution or program.

The specific outcomes:

- **Specialized Knowledge:** Graduates will have in-depth knowledge in specific sub-disciplines of chemistry, such as environmental chemistry, medicinal chemistry, dyes, or materials chemistry.
- **Research Skills:** Graduates will possess research skills and the ability to design and carry out independent research projects in chemistry.

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- **Industrial Applications:** Graduates will be familiar with the applications of chemistry in various industries, such as pharmaceuticals, dyes, petrochemicals, materials science, and environmental science.
- **Advanced Instrumentation Skills:** Graduates will have hands-on experience with advanced analytical instruments used in chemical analysis, such as spectroscopy, chromatography, pH Metry and conductometry.
- **Advanced Computational Skills:** Graduates will be proficient in using computational tools and software for modelling chemical structures, predicting properties, and simulating chemical reactions.

Overall, the B. Sc. Chemistry program aims to provide students with a solid foundation in chemistry, preparing them for various careers in the chemical industry, research institutions, academia, and other related fields. It equips students with the necessary theoretical knowledge, practical skills, and critical thinking abilities to excel in the diverse and ever evolving field of chemistry.

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B.Sc. Chemistry

Teaching & Evaluation

Scheme

F. Y. B. Sc. Semester-II

MAJOR (MJ) COURSE							
Course Code	Paper Title	Course credit	Teaching schedule Hrs./week	Internal marks	External marks	Total Marks	Duration of external exam
CH-MJ-201	Chemistry-I	3	3	35	35	70	2
CH-MJ-202	Chemistry-II	3	3	35	35	70	2
CHP-MJ-2	Organic qualitative analysis and Standardization	2	4	30	30	60	4
Total				100	100	200	
MINOR (ME) COURSE							
CH-ME-201	Fundamental of Chemistry-I	2	2	25	25	50	1
CHP-ME-201	Organic qualitative analysis and Volumetric titration	2	4	25	25	50	4
Total				50	50	100	

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MULTIDISCIPLINARY COURSE (MDC)							
CH-MDC-201	Agrochemistry	2	2	25	25	50	01
CH-MDC-P-201	Soil analysis, Organic and Inorganic Preparation	2	2	25	25	50	04
Total				50	50	100	
SKILL ENHANCEMENT COURSE (SEC)							
CH-SEC-201	Chemistry in Practice	1	1	13	13	26	01
CH-SEC-P-201	Water analysis Practical	1	2	12	12	24	02
Total				25	25	50	

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B. Sc. Chemistry
VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Syllabus effective from June, 2023 For

B. Sc. Semester- II

Multidisciplinary Subject

Total credit: 02 (Theory)

Total Hrs: Theory: 30

Course Code	CH-MDC-201	Title of the Course	Agrochemistry
Total Credits of the Course	2	Hours per Week	2 hr.

Course Outcome: By the end of the course, students will be able to understand

1.	The basics of Agricultural Chemistry, the role of manures and fertilizers in supplying nutrients to plants, types of fertilizers and synthesis of nitrogenous and phosphate fertilizers
2.	Introduction the various concepts of Agrochemistry and to impart knowledge about physical properties of soil and processes in relation to plant growth.

Unit- I: Fertilizers

15 hours

- Classification and types of fertilizers
- Nitrogenous fertilizers: Ammonium nitrate, Urea, Calcium cyanamide, Calcium ammonium nitrate, Sodium nitrate, Ammonium chloride: introduction, Raw materials, Action as a fertilizers
- Phosphate fertilizers: Normal super phosphate, Triple super phosphate, Ammonium phosphate, Potassic fertilizers, mixed fertilizers (NPK), factors affecting optimum fertilizer dose.

Unit –II Soil, Pesticides, and Insecticides

15 hours

- Composition of soil, Significance of soil analysis, Interpretation of soil pH, Determination of pH of soil
- Pesticides and Insecticides: Classification (Based on use and chemical composition), Chemistry, composition and processing of agricultural Insecticides & Pesticides. Benefits of Pesticides, Potential hazards of Pesticides.

Recommended Books and References:

1. Jack R Plimmer, Encyclopaedia of Agrochemicals , Nil edition ,Wiley-Blac, New Jersey (2003)
2. R.J Cremlyn, Agrochemicals: Preparation and mode of Action, 2nd Edition, Wiley-Blackwell publishers, New Jersey (1991).
3. S.M Khopkar, Concepts in Analytical Chemistry, 3rd Edition, New Academic Science, New York (2008).
4. Willard, Merittee and Dean, Instrumental methods of Analysis, 5th Edition, Van
5. Nostrand Publishers, Newyork (1974).
6. John H Montgomery, Agrochemicals Desk Reference, 2nd Edition, CRC Press, Boca Raton (1997).
7. A textbook of soil chemistry by Saroj Kumar Sanyal, Astral publication.
8. Industrial chemistry by B. K. Sharma, GOEL Publication

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B. Sc. Chemistry
VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Syllabus effective from June, 2023 For

B. Sc. Semester- II

Multidisciplinary Subject

Total credit: 02 (Practical)

Total Hrs:60

Course Code	CH-MDC-P-201	Title of the Course	Soil analysis, Organic and Inorganic Preparation
Total Credits of the Course	2	Hours per Week	4 hr.

Course Outcome: By the end of the course, students will be able to

- | | |
|----|--|
| 1. | Perform practical based on the analysis of Soil |
| 2. | Perform some selected Organic and Inorganic preparations |

(Minimum 7 Practical, to be performed)

1. Measurement of soil pH using potentiometer
2. Estimation of Calcium and Magnesium ions concentrations in soil as CaCO_3 by complexometric titration method.
3. Inorganic Preparation of Hexamine Nickel II Chloride.
4. Inorganic Preparation of Mohr's Salt (Ferrous Ammonium Sulphate)
5. Inorganic Preparation of Sodium Cobaltinitrite.
6. Organic Preparation of Anthraquinone from Anthracene (Oxidation).
7. Organic Preparation of Phthalic anhydride from Phthalic acid.
8. Organic Preparation of Iodoform derivative of Acetone
9. Organic Preparation of Red azo dye of Aniline
10. Organic Preparation of Methyl salicylate from Salicylic acid.

Reference book:

- 1) Textbook of practical inorganic chemistry – A.I. Vogel
 - 2) Practical Chemistry by Dr O. P. Pandey, D. N. Bajpai, Dr. S. Giri
 - 3) Advance inorganic analysis by Agarwal, Keemti lal
 - 4) Qualitative Inorganic analysis - Vogel
 - 5) Inorganic practical by Chatwal and Anan Vogels Textbook of Quantitative Chemical Analysis, 6th Eds, (2006).
 - 6) A text book of practical organic chemistry – A. I. Vogel
 - 7) Comprehensive Practical Organic Chemistry: Preparations and Quantitative Analysis V K Ahluwalia & R. Aggarwal Universities Press.
 - 8) An Advance Course in practical Chemistry, A K. Nad, B. Mahapatra and A. Ghoshal.
- On-line resources to be used if available as reference material

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Syllabus effective from June, 2023 For

B. Sc. Semester- II

Chemistry in Practice (Skill Enhancement Course)

Total credit: 01 (Theory)

Total Hrs: Theory: 15

Course Code	CH-SEC-201	Title of the Course	Chemistry in Practice
Total Credits of the Course	1	Hours per Week	1 hr.

Course Outcome: By the end of the course, students will be able to

- | | |
|----|---|
| 1. | Understand basic idea of Glass, manufacturing process of Glass and types of glass |
| 2. | Learn concept of pure water, contamination, sampling methods and pH of water |

Unit - I: Glass

- Introduction of glass
- Manufacture of glass
- Types of glass

Unit- II: Analysis of water

- Concept of pure water
- Water contamination
- Water sampling methods
- Water purification methods
- pH of water

Reference books:

- 1) Industrial chemistry by B. K. Sharma, GOEL Publication
- 2) Analytical Chemistry: Skill Enhancement Course
- 3) Krishna Chattopadhyay & Manas Mandal, CBS Publishers & Distributors Pvt. Ltd.
- 4) Glass Engineering Hand Book, E.B.Shand, McGraw-Hill book co.,
- 5) Glass manufactures Vol. I & Vol. I, F.V.Tooley, New York, N.Y., Ashlee Pub. Co.,

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B. Sc. Chemistry
VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Syllabus effective from June, 2023 For
B. Sc. Semester- II
SEC (Skill Enhancement Course)
Total credit: 01 (Practical)
Total Hrs: Practical: 30

Chemistry Lab Operations and Safety Measures:

Course Code	CH-SEC-P-201	Title of the Course	Water Analysis Practical
Total Credits of the Course	1	Hours per Week	2 hrs.

Course Outcome: By the end of the course, students will be able to

- | |
|---|
| Learn and perform practical for analysis of water |
| To impart basic knowledge of pH of water, acidity and Alkanity of water |

(Minimum 4 Practical, to be performed)

1. Determination of pH of water
 - (a) Using pH paper
 - (b) Using pH meter
2. Acidity of water: determination of acidity or water
3. Alkalinity of water: determination of hydroxide, carbonate and bicarbonate alkalinity of water
4. Determination of Dissolved oxygen (DO) in water sample using Winkler's (azide modification) method
5. Analysis of water sample.

Recommended Books/References:

- 1) Textbook of practical inorganic chemistry – A.I. Vogel
- 2) Practical Chemistry by Dr O. P. Pandey, D. N. Bajpai, Dr. S. Giri
- 3) Advance inorganic analysis by Agarwal, Keemti lal
- 4) Qualitative Inorganic analysis - Vogel
- 5) Inorganic practical by Chatwal and Anand

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