



बिरसा मुंडा ट्रायबल युनिवर्सिटी

Birsa Munda Tribal University

राजपिपला, जि. नर्मदा Rajpipla, Dist. Narmada

Established by Tribal Development Department, Govt. of Gujarat

School of Science

B.Sc. (Chemistry) Programme

Subject Code & Name: - BS01MJCHE1: General Chemistry-I

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				CCE		SEE	
L	T	P	Total	TH	PWE	TH	PWE
3	-	1	4	37.5 %	12.5 %	37.5 %	12.5 %

Programme Name	B.Sc.(Chemistry)
Semester	I
Course Code	BS01MJCHE1
Course Title	General Chemistry-I
Course Content Type (Th./Pr.)	Theory & Practical
Course Credit	3+1
Sessions+ Lab. Per Week	3+2
Total Teaching/Lab. Hours	45 Theory Hours + 30 Practical Hours
* 2 Laboratory = 1 Session	

Learning Objectives

1. To review the basics concepts of atomic structure that has direct relevance to the fundamental concepts of organic chemistry. This material is essential to the understanding of organic molecular structure and, later on, reaction mechanisms.
2. The study of chemists is always interested in identifying and knowing how the chemical transformation occurs. It plays an essential role in science and plays a central role in daily life activities.
3. Understand that elements are placed on the periodic table due to similar properties. Identify a period and a group on the periodic table.
4. Be able to recognize, classify, explain, and apply fundamental organic reactions.





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Learning Outcomes

On the Completion of this course, students will able to:

1. Understand the concepts of mole, molarity, mole fraction, molecular weight and so forth.
2. Calculate percentage ratios of weight average, volume average and limiting values of the reagents which are present in the reactions.
3. Students can understand electronic configuration of elements, shape of orbitals, nodes and nodal plane.
4. Students can write IUPAC nomenclature of organic compounds.
5. Recognize electronic displacements, reaction intermediate and its stability as well as different types of organic reactions.

Detailed Contents

UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	Basic of Concepts of Chemistry <ul style="list-style-type: none">➤ Atomic Weight , Molecular Weight , Average Molecular Weight , Concept of Mole➤ Molarity, Normality, Molality, % W/W , % V/V , Mole Fraction, ppm➤ Limiting Reagent, Numerical➤ Determination of Molecular Formula Empirical formula, Numerical	15
II	Structure and properties of atoms <ul style="list-style-type: none">➤ Introduction to development of the structure of atom➤ Basic concept of Wave particle duality of electron, De-Broglie's equation, Heisenberg's uncertainty principle and its Numerical➤ Example based on de-Broglie's equation, Heisenberg's uncertainty principle➤ Shape of orbitals, nodes, nodal plane➤ Aufbau rule, Pauli's Principle, and Hund's rule for electronic configuration, stability of half-filled and completely filled orbitals	15





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III	<p>Basic Organic Chemistry</p> <ul style="list-style-type: none">➤ IUPAC Nomenclature of organic compounds (Acyclic, cyclic) and their application➤ Homolytic and heterolytic fission➤ Reaction Intermediates: basic introduction (1) Carbocation (2) Carbanion (3) Free radical➤ Electronic displacements in organic molecules: (1) Inductive effect (2) Electromeric effect (3) Mesomeric effect (4) Hyper conjugation➤ Introduction and generation of nucleophile and electrophiles➤ Types of organic reactions: general introduction (1) Substitution (2) Addition (3) Elimination (4) Rearrangement.	15
Unit – IV Practical(s)		30 Hours
<p>Volumetric analysis-Acid Base Titration (Any Four)</p> <ol style="list-style-type: none">1. To prepare a solution by dissolving 'x' g NaHCO_3 in 100 ml solution and determine its concentration in terms of normality and molarity using 0.1N HCl solution.2. To prepare a solution by dissolving 'x' g Na_2CO_3 in 100 ml solution and determine its concentration in terms of normality and molarity using 0.1N HCl solution.3. To determine the normality, molarity and g/lit of NaOH using 0.1N Na_2CO_3 solution.4. To determine the normality, molarity and g/lit of HCl using 0.1N Na_2CO_3 solution.5. To determine the normality, molarity and g/lit of each component in a given mixture of NaHCO_3 using 0.1N CH_3COOH solution.6. To determine the normality, molarity and g/lit of each component in a given mixture of Na_2CO_3 using 0.1N CH_3COOH solution.		



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Reference Books

1. Inorganic Chemistry - J. N. Gurtu & H. C. Khera
2. Principles of Inorganic chemistry- B. R. Puri, L. R. Sharma and K. C. Kalia; Vallabh publications, Delhi.
3. Coordination chemistry-Ajai Kumar ; Aaryush Education, U.P.
4. Basic Inorganic Chemistry – Gurdeep & Chatwal.
5. Undergraduate Organic Chemistry, Vol-1, Jagdamba Singh, L. D.S. Yadav, Pragati Prakashan, 8th edition-2013
6. Organic Reaction Mechanism, including Reaction Intermediates, V. K. Ahluwalia
7. Organic Chemistry by Morrison and Boyd.
8. Essentials of Physical Chemistry, B. S. Bahl, G. D. Tuli and Arun Bahl, S. Chand & Co.
9. Elements of Physical Chemistry, B. R. Puri, L. R. Sharma and Madan Pathania, Vishal Publishing Co. Jalandhar.
10. Physical Chemistry, B. K. Sharma, Goel Publication House. Meerut.
11. Physical Chemistry, 7th edition P. C. Rakshit

L:: Lecture, **T::** Tutorial , **P::**Practical

CCE:: Continuous and Comprehensive Evaluation

(CCE Theory includes Mid Semester Examination, Assignment, MCQ quizzes, Seminar, Reflective notes, class participation, case analysis and presentation, slip tests (announced/ surprised), attendance etc. or any combination of these)

PWE:: Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)

SEE:: Semester End Evaluation

