

Department of Chemistry, College of Basic Science and Humanities

Class: 1st Year; +2 Science

Course Title: Chemistry

Lesson Plan

Unit No	Topic Title	No. of Lectures	Name of the Faculty
I	Some Basic Concepts of Chemistry	6	Dr. S. Muni / Dr (Mrs). S. Jena
II	Structure of Atom	7	Mr. S. R. Panda / Dr. H. S. Sahoo
III	Classification of Elements and Periodicity in Properties	3	
IV	Chemical Bonding and Molecular Structure	8	
V	States of matter: Gases and liquids	14	Miss S. Sahoo
VI	Chemical Thermodynamics	12	
VII	Equilibrium	6	Dr. S. Muni / Dr (Mrs). S. Jena
VIII	Redox reaction	3	
IX	Hydrogen	2	Mr. S. R. Panda / Dr. H. S. Sahoo
X	s-Block Elements (Alkali and Alkaline Earth Metals)	4	Mr. S. R. Panda / Dr. H. S. Sahoo
XI	Some p-block elements	8	Dr. S. Muni / Dr (Mrs). S. Jena
XII	Organic Chemistry - Some Basic Principles and Technique	11	Dr. P. K. Jena / Dr. H. Nayak
XIII	Hydrocarbons	14	
XIV	Environmental Chemistry	3	Dr. S. Muni / Dr (Mrs). S. Jena

Course break up

Unit-I: Topic Title: Some Basic Concepts of Chemistry

Name of the Faculty: Dr. S.Muni / Dr (Mrs). S. Jena

Lecture No.	Details of the topic to be covered
1.	General Introduction, Nature of matter, laws of chemical combination,
2.	Dalton's atomic theory: concept of elements, atoms and molecules
3.	Atomic and molecular masses and equivalent mass of elements
4.	Equivalent mass of acid, base, and salt, oxidants, reductants
5.	Mole concept and molar mass, percentage composition, Empirical and molecular formula
6.	Chemical, reactions, Stoichiometry and calculations based on stoichiometry

Unit – II Topic Title: Structure of atom

Name of the Faculty: Mr. S. R. Panda / Dr. H. S. Sahoo

Lecture No.	Details of the topic to be covered
1.	Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars
2.	Thomson's model and its limitations. Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and sub-shells,
3.	dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle
4.	Concept of orbitals, quantum numbers,
5.	Shapes of s, p and d orbitals, rules for filling electrons in orbitals – Aufbau principle,
6.	Pauli's exclusion principle and Hund's rule, electronic configuration of atoms
7.	Electronic configuration of atoms, stability of half filled.

Unit – X Topic Title: s-Block Elements (Alkali and Alkaline Earth Metals)**Name of the Faculty: Dr. H. S. Sahoo / Dr (Mrs). S. Jena**

Lecture No.	Details of the topic to be covered
1.	Group 1 and Group 2 Elements: General introduction, electronic configuration, occurrence, anomalous, properties of the first element of each group, diagonal relationship
2.	Trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen and halogens, uses.
3.	Preparation and Properties of Some Important Compounds : Sodium Carbonate, Sodium Chloride, Sodium Hydroxide and Sodium Hydrogencarbonate
4.	Biological importance of Sodium and Potassium. Calcium Oxide and Calcium Carbonate and their industrial uses, biological importance of Magnesium and Calcium.

Unit-XI Topic Title: Some p- Block Elements**Name of the Faculty: Dr. S.Muni / Dr (Mrs). S. Jena**

Lecture No.	Details of the topic to be covered
1.	General Introduction to p- Block Elements Group 13 Elements : General introduction, electronic configuration, occurrence
2.	Variation of properties, oxidation states, trends in chemical reactivity
3.	Anomalous properties of first element of the group, Boron - physical and chemical properties.
4.	Some important compounds, Borax, Boric acid, Boron Hydrides, Aluminium : Reactions with acids and alkalies, uses.
5.	Group 14 Elements: General introduction, electronic configuration, occurrence, variation of properties.
6.	Oxidation states, trends in chemical reactivity, anomalous behaviour of first elements.
7.	Carbon-catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides.
8.	Important compounds of Silicon and a few use: Silicon Tetrachloride, Silicones, Silicates and Zeolites, their uses.

Unit – XII Topic Title: Organic Chemistry - Some Basic Principles and Technique**Name of the Faculty: Dr. P. K. Jena / Dr. H. Nayak**

Lecture No.	Details of the topic to be covered
1.	General introduction, methods of purification, classification
2.	IUPAC nomenclature of organic compounds.
3.	IUPAC nomenclature of organic compounds.
4.	IUPAC nomenclature of organic compounds.
5.	IUPAC nomenclature of organic compounds.
6.	Electronic displacements in a covalent bond: inductive effect,
7.	Electromeric effect, resonance, application
8.	Hyperconjugation. Applications of hyperconjugation
9.	Homolytic and heterolytic fission of a covalent bond, electrophiles and nucleophiles
10.	Carbocations, Carbanions
11.	free radicals, Types of organic reactions

Unit –XIII Topic Title: Hydrocarbons
Name of the Faculty: Dr. P. K. Jena / Dr. H. Nayak

Lecture No.	Details of the topic to be covered
1.	Aliphatic Hydrocarbons :Alkanes - Nomenclature, isomerism,
2.	Conformation (ethane only), physical properties methods of preparation
3.	Chemical reactions including free radical mechanism of halogenation, combustion and pyrolysis.
4.	Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism
5.	Physical properties, methods of preparation, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides (Markownikoff's addition and peroxide effect),
6.	Ozonolysis, oxidation, mechanism of electrophilic addition
7.	Alkynes - Nomenclature, structure of triple bond (ethyne), physical properties, methods of preparation
8.	Chemical reactions: acidic character of alkynes, addition reaction of - hydrogen, halogens, hydrogen halides and water.
9.	Aromatic Hydrocarbons : Introduction, IUPAC nomenclature
10.	Benzene : resonance, aromaticity
11.	Chemical properties: mechanism of electrophilic substitution, nitration, sulphonation,
12.	Halogenation, Friedel Craft's alkylation and acylation,
13.	Directive influence of functional group in mono – substituted benzene
14.	Carcinogenicity and toxicity.

Unit-XIV Topic Title: Environmental Chemistry
Name of the Faculty: Dr. S. Muni / Dr (Mrs). S. Jena

Lecture No.	Details of the topic to be covered
1.	Environmental pollution - air, water and soil pollution, chemical reactions in atmosphere, smog, major atmospheric pollutants, acid rain.
2.	Ozone and its reactions, effects of depletion of ozone layer, greenhouse effect and global warming-pollution due to industrial wastes,
3.	Green chemistry as an alternative tool for reducing pollution, strategies for control of environmental pollution, Revision and doubt clear