TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Ms.Nisha Pruthi

Department. Chemistry

Subject/Course: Chemistry-I(B-23-CHE-101) Programme: B.Sc. I (Life Science)

Semester: First(Ist)

August

Atomic Structure

Dual behaviour of matter and radiation, de Broglie's relation, Heinsenberg's uncertainty principle, concept of atomic orbitals, significance of quantum numbers, radial and angular wave functions, normal and orthogonal wave functions, significance of Ψ and Ψ2, shapes of s, p, d, f orbitals, Rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules.

Periodic table and atomic properties

Classification of periodic table, definition of atomic and ionic radii, ionisation energy, electron affinity and electronegativity, trend in periodic table (in s and p-block elements), Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.

Discussion and problemstaken

September

Gaseous State

Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity, and most Probable velocity. Collision diameter, collision number, collision frequency and mean free path (Derivations excluded), Deviation of Real gases from ideal behaviour, Derivation of Van der Waal' s Equation of State, its application in the calculation of Boyle's temperature (compression factorCritical Phenomenon

Concept of Critical temperature, critical pressure, critical volume, relationship between critical constants and Van der Waal's constants (Derivation excluded).

Assignment

Discussion and problems taken

October

Structure and Bonding

Localized and delocalized chemical bond, Van der Waals interactions. Concept of resonance and its applications, hyperconjugation, inductive effect, Electromeric effect and their comparison.

Mid Term Exam

Mechanism of Organic Reactions

Curved arrow notation, homolytic and heterolytic bond fission. Types of reagents: electrophiles and nucleophiles. Types of organic reactions: Substitution, Addition, Condensation, Elimination, Rearrangement, Isomerization and Pericyclic reactions. Reactive intermediates: Carbocations,carbanions, free radicals, carbenes (structure & stability).

Discussion and problems taken

November

Liquid State

Structure of liquids, Properties of liquids – surface tension, refractive index, viscosity, vapour pressure and optical rotation.

Solid State

Classification of solids, Law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry and symmetry elements, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of Laue method, rotating crystal method and powder pattern method.

Discussion and problems taken

Revision

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Ms Nisha *Department: Chemistry*

Subject/Course: Environmental Studies (VAC) *Programme: B.A./B.Com./BBA/BCA/B.Sc. (LS & PS)/Eng/Geo/Hist/Eco/Math (Hons.) I*

Semester: First (1st)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
	Introduction to environmental studies *Multidisciplinary nature of environmental studies; Scope and importance; Concept of sustainability and sustainable development.* ***Ecosystems*** *Definition, structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs, Major ecosystems types: Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystem (lakes, rivers, oceans).* ***Discussion and problems taken***	*August*
	Natural resources: Renewable and Non-renewable Resources *Land resources: Land degradation and soil erosion.* *Forest resources: Importance of forests, deforestation: causes and impacts on environment.* *Water resources: Use and over-exploitation of surface an ground water.* *Energy resources: Renewable and non- renewable energy sources.* ***Biodiversity and Conservation*** *Definition and its types, Endangered and endemic species of India.* *Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex- situ conservation of biodiversity.* *Ecosystem and biodiversity services: Ecological, economi social, ethical, aesthetic and informational values.* ***Discussion and problems taken*** ***Mid-Term Exam*** ***Assignment***	*September*
	Environmental pollution *Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution. Solid waste management: Sources, methods of disposal: Landfill, incineration and composting.* *Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.* ***Environmental Policies & Practices***	*October*

	Environmental laws: Environment (Protection) Act, 1986, Air (Prevention & Control of Pollution) Act, 1981, Water (Prevention and control of Pollution) Act, 1974 ***Discussion and problems taken***	
	Human Communities and the Environment *Human population growth: Impacts on environment, human health and welfare.* *Resettlement and rehabilitation of project affected person. Disaster management: floods, earthquake, cyclones, landslides and drought.* ***Environmental ethics:** Role of Indian and other religions and cultures in environmental conservation.* ***Discussion and problems taken*** ***Revision of chapters***	*November*

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Ms.Pushpa

Department. Chemistry

Subject/Course: Chemistry-I(B-23-CHE-101)

Programme: B.Sc. I (Physical Science)

Semester: First(Ist)

August

Atomic Structure

Dual behaviour of matter and radiation, de Broglie's relation, Heinsenberg's uncertainty principle, concept of atomic orbitals, significance of quantum numbers, radial and angular wave functions, normal and orthogonal wave functions, significance of Ψ and Ψ2, shapes of s, p, d, f orbitals, Rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules.

Periodic table and atomic properties

Classification of periodic table, definition of atomic and ionic radii, ionisation energy, electron affinity and electronegativity, trend in periodic table (in s and p-block elements), Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.

Discussion and problemstaken

September

Gaseous State

Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity, and most Probable velocity. Collision diameter, collision number, collision frequency and mean free path (Derivations excluded), Deviation of Real gases from ideal behaviour, Derivation of Van der Waal' s Equation of State, its application in the calculation of Boyle's temperature (compression factorCritical Phenomenon

Concept of Critical temperature, critical pressure, critical volume, relationship between critical constants and Van der Waal's constants (Derivation excluded).

Assignment

Discussion and problems taken

October

Structure and Bonding

Localized and delocalized chemical bond, Van der Waals interactions. Concept of resonance and its applications, hyperconjugation, inductive effect, Electromeric effect and their comparison.

Mid Term Exam

Mechanism of Organic Reactions

Curved arrow notation, homolytic and heterolytic bond fission. Types of reagents: electrophiles and nucleophiles. Types of organic reactions: Substitution, Addition, Condensation, Elimination, Rearrangement, Isomerization and Pericyclic reactions. Reactive intermediates: Carbocations,carbanions, free radicals, carbenes (structure & stability).

Discussion and problems taken

November

Liquid State

Structure of liquids, Properties of liquids – surface tension, refractive index, viscosity, vapour pressure and optical rotation.

Solid State

Classification of solids, Law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry and symmetry elements, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of Laue method, rotating crystal method and powder pattern method.

Discussion and problems taken

Revision

Unit I – Introduction to Computer

Topics covered:

Computer and Latest IT gadgets

Evolution of Computers & its applications

Basics of Hardware and Software

Application Software

Systems Software

Utility Software

Central Processing Unit (CPU)

Input devices, Output devices

Computer Memory & Storage

Mobile Apps

September

Unit II – Introduction to Operating System

Topics covered:

Functions of the Operating System

Operating Systems for Desktop and Laptop

Operating Systems for Mobile Phones and Tablets

User Interface for Desktop and Laptop

Task Bar, Icons & Shortcuts

Running an Application

Operating System Simple Settings (Changing System Date & Time, Display Properties)

Add/Remove Programs and Features

Adding, Removing & Sharing Printers

File and Folder Management

Test and assignment

October

Unit III – Introduction to Internet and WWW

Topics covered:

Basic of Computer Networks

LAN (Local Area Network)

WAN (Wide Area Network)

Network Topology

Internet and its Applications

Website Address and URL

Popular Web Browsers (Internet Explorer/Edge, Chrome, Firefox, Opera, etc.)

Popular Search Engines

Searching on the Internet

Novermber

Unit IV – E-mail and Social Networking

Topics covered:

Using E-mails

Opening Email Account

Mailbox Inbox and Outbox

Creating and Sending a New E-mail

Replying to/Forwarding Emails

Attaching Files

Searching Emails

Email Signature

Social Networking (Facebook, Twitter, LinkedIn, Instagram)

Instant Messaging (WhatsApp, Facebook Messenger, Telegram)

Introduction to Blogs

Digital Locker

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Ms. Reetu

Department: Chemistry

Subject/Course: Chemistry-I(B-23-CHE-101)

Programme: B.Sc. I (Physical Science)

Semester: First(Ist)

August

Atomic Structure

Dual behaviour of matter and radiation, de Broglie's relation, Heinsenberg's uncertainty principle, concept of atomic orbitals, significance of quantum numbers, radial and angular wave functions, normal and orthogonal wave functions, significance of Ψ and Ψ2, shapes of s, p, d, f orbitals, Rules for filling electrons in various orbitals, effective nuclear charge, Slater's rules.

Periodic table and atomic properties

Classification of periodic table, definition of atomic and ionic radii, ionisation energy, electron affinity and electronegativity, trend in periodic table (in s and p-block elements), Pauling, Mulliken, Allred Rachow and Mulliken Jaffe's electronegativity scale, Sanderson's electron density ratio.

Discussion and problems taken

September

Gaseous State

Kinetic theory of gases, Maxwell's distribution of velocities and energies (derivation excluded) Calculation of root mean square velocity, average velocity, and most Probable velocity. Collision diameter, collision number, collision frequency and mean free path (Derivations excluded), Deviation of Real gases from ideal behaviour, Derivation of Van der Waal' s Equation of State, its application in the calculation of Boyle's temperature (compression factorCritical Phenomenon

Concept of Critical temperature, critical pressure, critical volume, relationship between critical constants and Van der Waal's constants (Derivation excluded).

Assignment

Discussion and problems taken

October

Structure and Bonding

Localized and delocalized chemical bond, Van der Waals interactions. Concept of resonance and its applications, hyperconjugation, inductive effect, Electromeric effect and their comparison.

Mid Term Exam

Mechanism of Organic Reactions

Curved arrow notation, homolytic and heterolytic bond fission. Types of reagents: electrophiles and nucleophiles. Types of organic reactions: Substitution, Addition, Condensation, Elimination, Rearrangement, Isomerization and Pericyclic reactions. Reactive intermediates: Carbocations,carbanions, free radicals, carbenes (structure & stability).

Discussion and problems taken

November

Liquid State

Structure of liquids, Properties of liquids – surface tension, refractive index, viscosity, vapour pressure and optical rotation.

Solid State

Classification of solids, Law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry and symmetry elements, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of Laue method, rotating crystal method and powder pattern method.

Discussion and problems taken

Revision

Unit I – Introduction to Computer

Topics covered:

Computer and Latest IT gadgets

Evolution of Computers & its applications

Basics of Hardware and Software

Application Software

Systems Software

Utility Software

Central Processing Unit (CPU)

Input devices, Output devices

Computer Memory & Storage

Mobile Apps

September

Unit II – Introduction to Operating System

Topics covered:

Functions of the Operating System

Operating Systems for Desktop and Laptop

Operating Systems for Mobile Phones and Tablets

User Interface for Desktop and Laptop

Task Bar, Icons & Shortcuts

Running an Application

Operating System Simple Settings (Changing System Date & Time, Display Properties)

Add/Remove Programs and Features

Adding, Removing & Sharing Printers

File and Folder Management

Test and assignment

October

Unit III – Introduction to Internet and WWW

Topics covered:

Basic of Computer Networks

LAN (Local Area Network)

WAN (Wide Area Network)

Network Topology

Internet and its Applications

Website Address and URL

Popular Web Browsers (Internet Explorer/Edge, Chrome, Firefox, Opera, etc.)

Popular Search Engines

Searching on the Internet

Novermber

Unit IV – E-mail and Social Networking

Topics covered:

Using E-mails

Opening Email Account

Mailbox Inbox and Outbox

Creating and Sending a New E-mail

Replying to/Forwarding Emails

Attaching Files

Searching Emails

Email Signature

Social Networking (Facebook, Twitter, LinkedIn, Instagram)

Instant Messaging (WhatsApp, Facebook Messenger, Telegram)

Introduction to Blogs

Digital Locker

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Miss. Savita rani

Department. Chemistry

Subject/Course: Chemistry

Program: B.Sc. 2nd Major (physical Science) and B.Sc. 1st Minor (physical Science & Life sci.)

Semester: 3rd & 1st

August

S and p-Block Elements

Salient features of hydrides, oxides, halides, hydroxides of s-block elements (methods of preparation excluded). Structure, preparation and properties of Diborane and Borazine. Catenation, carbides, fluorocarbons, silicates (structural aspects), structure of oxides of Nitrogen and Phosphorous, structure of while and red phosphorus. Structure of oxyacids of Nitrogen, phosphorous, sulphur and chlorine and comparison of acidic strength of oxyacids. low chemical reactivity of noble gases, chemistry of xenon, structure and bonding in fluorides, oxides and oxyflurides of xenon.

Discussion and problem taken

September

Electrochemistry-I

Electrolytic conduction, factors affecting electrolytic conduction, specific conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration. Application of Kohlrausch's Law in calculation of conductance of weak electrolytes at infinite dilution (Numericals) Concepts of pH and pK, Buffer solution, Buffer action, Henderson Hazel equation, Buffer mechanism of buffer action.

Electrochemistry-II

Reversible & irreversible cells, Calculation of thermodynamic quantities of cell reaction (AG, ΔH & K). Types of reversible electrodes - metal metal ion, gas electrode, metal insoluble salt - anion and redox electrodes. Nernst equation, Standard Hydrogen electrode, reference electrodes,

Applications of EMF measurement in solubility product and potentiometric titrations using glass electrode.

Discussion and problem taken

Assignment

October

Alkynes

Nomenclature and its structure. Methods of formaica: using Calcium carbide, dehydrohalogenation, Kolbe's electrolysis. Chemical reactions: Mechanism of electrophilic and nucleophilic addition reactions, formation of metal acetylides, addition of bromine and alkaline KMn04, ozonolysis. Acidity of alkynes.

Stereochemistry of Organic Compounds

Concept of isomerism: Structural and Stereoisomerism. Symmetry elements, enantiomers, optical activity, properties of enantiomers, chiral and achiral molecules (up to 2 asymmetric centres), diastereomers, threo-and erythro -nomenclature, meso-compounds, Relative and absolute Configuration, sequence rules. R and S system of nomenclature. Cis-Trans isomerism, E & Z system of nomenclature, Conformational analyis of ethane and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman and Sawhorse projection formulae.

Mid Term Exam

November

Benzene and its derivatives:

Nomenclature, Aromatic nucleus and side chain, Huckel's rule of aromaticity. Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation, and Friedel-Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation. Alkyl halides: Nomenclature, methods of formation: from alkenes and alcohol, nucleophilic substitution reactions of alkyl halides, S2 and S reactions with energy profile diagrams. Aryl halides: Methods of formation: halogenation, Sandmeyer reaction. The addition-elimination and the elimination-

addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl, and aryl halides.

Discussion and problems taken

Revision

TENTATIVE LESSON PLAN (SEMESTERS)
SESSION: 2025-26
Name of the Teacher: Ms.suman Rani
Department. Chemistry
Subject/Course: Chemistry-I(B-23-CHE-301) Programme: B.Sc. 3rd
Semester: 5th
Unit I – Coordination Compounds
August

Topics Covered:

- Werner's theory of coordination compounds
- EAN, chelates, nomenclature of coordination compounds
- Isomerism in coordination compounds

Metal Ligand Bonding in Transition Metal Complexes:

- Valence bond theory

- Applications and limitations
- Elementary idea of Crystal Field Theory (CFT)
- Crystal field splitting in octahedral, tetrahedral, and square planar complexes

Magnetic properties of transition metal complexes:

- Types of magnetic behavior
- Magnetic susceptibility
- Methods of determination
- Spin only formula
- Idea of L-S coupling

September

Unit II – Thermodynamics-II

Topics Covered:

- Third Law of Thermodynamics
- Nernst Heat Theorem
- Statement and concept of residual entropy
- Evaluation of absolute entropy from heat capacity data
- Gibbs function and Helmholtz function as thermodynamic quantities
- Criteria for thermodynamic equilibrium and spontaneity

Test and assignment

Variation of G with P, V, T

- Maxwell's relations
- Thermodynamic derivation of relations between Cp and Cv
- Joule-Thomson coefficient and inversion temperature
- Thermodynamic equations of state
- October

Phase Equilibria:

- Statement and meaning of terms: phase, component, degrees of freedom

- Phase rule and its thermodynamic derivation
- Application of phase rule to one-component and two-component systems

Unit III – Quantum Mechanics-I **and** Spectroscopy-I

Quantum Mechanics-I:

- Black body radiation
- Planck's radiation law
- Photoelectric effect
- Heat capacity of solids
- Bohr's model of hydrogen atom (its limitations)
- Dual behavior of matter and radiation
- De Broglie's relation
- Heisenberg uncertainty principle
- Schrodinger wave equation
- Application of Schrodinger wave equation to particle in 1D box

Spectroscopy-I:

- Electromagnetic radiation
- Interaction with matter
-
- Absorption and emission spectroscopy
- Rotational spectrum of diatomic molecules (rigid rotator model)
- Isotopic effect
- Selection rules
- Use of spectroscopic techniques for structure elucidation

NOVEMBER

Unit IV –

- **Organic Synthesis via Enolates:**

- Acidity of α-hydrogens, alkylation of diethyl malonate and ethyl acetoacetate.
- Synthesis of ethyl acetoacetate through the Claisen condensation.
- Keto-enol tautomerism of ethyl acetoacetate.
- **Heterocyclic Compounds:**
- Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene, and pyridine.
- Methods of synthesis and chemical reactions with an emphasis on electrophilic substitution mechanisms.
- Nucleophilic substitution reactions in pyridine derivatives and a comparison of the basicity of pyridine, piperidine, and pyrrole.
- **Name of the Teacher: Ms.suman Rani**
- **Department. Chemistry**
- **Subject/Course: Chemistry-I(B-23-CHE-301) Programme: B.Sc.first**
- **Semester: 1st**
- **August**

Unit I – Introduction to Computer

Topics covered:

- Computer and Latest IT gadgets
- Evolution of Computers & its applications
- Basics of Hardware and Software
- Application Software
- Systems Software
- Utility Software
- Central Processing Unit (CPU)
- Input devices, Output devices
- Computer Memory & Storage
- Mobile Apps
- September

Unit II – Introduction to Operating System

Topics covered:

- Functions of the Operating System
- Operating Systems for Desktop and Laptop
- Operating Systems for Mobile Phones and Tablets
- User Interface for Desktop and Laptop
- Task Bar, Icons & Shortcuts
- Running an Application
- Operating System Simple Settings (Changing System Date & Time, Display Properties)
- Add/Remove Programs and Features
- Adding, Removing & Sharing Printers
- File and Folder Management
- Test and assignment
- October

Unit III – Introduction to Internet and WWW

Topics covered:

- Basic of Computer Networks
- LAN (Local Area Network)
- WAN (Wide Area Network)
- Network Topology
- Internet and its Applications
- Website Address and URL
- Popular Web Browsers (Internet Explorer/Edge, Chrome, Firefox, Opera, etc.)
- Popular Search Engines
- Searching on the Internet
- Novermber

Unit IV – E-mail and Social Networking

Topics covered:

- Using E-mails
- Opening Email Account
- Mailbox Inbox and Outbox
- Creating and Sending a New E-mail
- Replying to/Forwarding Emails
- Attaching Files
- Searching Emails
- Email Signature
- Social Networking (Facebook, Twitter, LinkedIn, Instagram)
- Instant Messaging (WhatsApp, Facebook Messenger, Telegram)
- Introduction to Blogs
- Digital Locker

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Monika Sandhu *Department: Chemistry*

Subject/Course: Introductory Chemistry - I (B-23-CHE-103) *Programme: MDC*

Semester: First (1st)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1	***Atomic Structure and Bonding*** *Introduction, elementary introduction of atomic structure and chemical bonding, Representation of elements/ atoms, Lewis structure, Electronic configurations (1-30)* ***Discussion and problems taken***	August

2	***Carbon and It's Compounds*** *Introduction, Tetravalency of Carbon, Allotropes of carbon and their properties, Hydrocarbons (1-5), Nomenclature (linear compounds), Applications of hydrocarbons.* ***Assignment*** ***Discussion and problems taken***	September
3	***Polymers*** *Introduction, elementary idea of synthetic and natural polymers, Homo polymers and Copolymers, uses and properties (Natural rubber, Vulcanized rubber, Polythene, PVC, Styrene, Teflon, PAN, Nylon-66).* ***Mid-Term Exam*** ***Discussion and problems taken***	October
4	***Food Preservatives*** *Elementary idea of natural and synthetic food preservatives, rancidity, uses and properties, different food preservation processes (pickle, Jam), Artificial sweeteners, uses and properties.* ***Discussion and problems taken*** ***Revision***	November

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: MONIKA Sandhu *Department: Chemistry*

Subject/Course: Waste Management Technique *Programme: SEC*

Semester: Third(3rd)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1	**Waste**: Classification, generations and characterization. Basic aspects of Solid waste management generation; on-site handling, storage and processing; collection of solid wastes; transfer and transport; processing techniques; ultimate disposal. Hazardous waste –Definition, sources, effects, disposal and management techniques. Physical, chemical, physicochemical treatment, and thermal treatment;- Solidification,chemical fixation, encapsulation, pyrolysis and incineration.Biomedical wastes – Definition, categories, and management, E-waste: Sources and management	August
2	**Disposal of Solid waste**: sanitary land filling – site selection, design and operation of sanitary landfills – Leachate collection & treatment. Secure land filling. Incineration: Mass burn, Rotatory Kiln, Fluidized Bed incinerator, liquid injection incinerator, Waste gas flare incinerator, fixed grate incinerators, Plasma Pyrolysis.Composting, vermicomposting. ***Assignment*** ***Discussion and problems taken***	September
3	**Principles of Industrial waste treatment** - sources of pollution physical chemical, organic and biological properties. Manufacturing processes, flow sheets, characteristics and composition of wastes including waste reduction, treatment and disposal methods for Food Industries: Sugar, Fermentation, Material Industries: Paper, Steel - Metal -plating and petroleum refineries. ***Discussion and problems taken***	October
4	**Role of Biotechnology in waste minimizatio**n; Recovery of byproducts and raw material from wastewater conversion: waste recovery and reuse, reclamation by ground recharge,agriculture reuse of effluent; sludge as fertilizer; biomass for energy, metal recovery, bioscrubbing. Biological Treatment Biological methods for waste processing: Biomethanation, Biodiesal, Biogas ***Discussion and problems taken***	November

	Revision	

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Poonam Sihag *Department: Chemistry*

Subject/Course: Introductory Chemistry - I (B-23-CHE-103) *Programme: MDC*

Semester: First (1st)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1	***Atomic Structure and Bonding*** *Introduction, elementary introduction of atomic structure and chemical bonding, Representation of elements/ atoms, Lewis structure, Electronic configurations (1-30)* ***Discussion and problems taken***	August
2	***Carbon and It's Compounds*** *Introduction, Tetravalency of Carbon, Allotropes of carbon and their properties, Hydrocarbons (1-5), Nomenclature (linear compounds), Applications of hydrocarbons.* ***Assignment*** ***Discussion and problems taken***	September
3	***Polymers*** *Introduction, elementary idea of synthetic and natural polymers, Homo polymers and Copolymers, uses and properties (Natural rubber, Vulcanized rubber, Polythene, PVC, Styrene, Teflon, PAN, Nylon-66).* ***Mid-Term Exam*** ***Discussion and problems taken***	October
4	***Food Preservatives*** *Elementary idea of natural and synthetic food preservatives, rancidity, uses and properties, different food preservation processes (pickle, Jam), Artificial sweeteners, uses and properties.* ***Discussion and problems taken*** ***Revision***	November

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Miss. Sushma rani

Department. Chemistry

Subject/Course: Chemistry

Program: B.Sc. 2nd Major (physical Science) and B.Sc. 1st Minor (physical Science & Life sci.)

Semester: 3rd & 1st

August

S and p-Block Elements

Salient features of hydrides, oxides, halides, hydroxides of s-block elements (methods of preparation excluded). Structure, preparation and properties of Diborane and Borazine. Catenation, carbides, fluorocarbons, silicates (structural aspects), structure of oxides of Nitrogen and Phosphorous, structure of while and red phosphorus. Structure of oxyacids of Nitrogen, phosphorous, sulphur and chlorine and comparison of acidic strength of oxyacids. low chemical reactivity of noble gases, chemistry of xenon, structure and bonding in fluorides, oxides and oxyflurides of xenon.

Discussion and problem taken

September

Electrochemistry-I

Electrolytic conduction, factors affecting electrolytic conduction, specific conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration. Application of Kohlrausch's Law in calculation of conductance of weak electrolytes at infinite dilution (Numericals) Concepts of pH and pK, Buffer solution, Buffer action, Henderson Hazel equation, Buffer mechanism of buffer action.

Electrochemistry-II

Reversible & irreversible cells, Calculation of thermodynamic quantities of cell reaction (AG, ΔH & K). Types of reversible electrodes - metal metal ion, gas electrode, metal insoluble salt - anion and redox electrodes. Nernst equation, Standard Hydrogen electrode, reference electrodes, Applications of EMF measurement in solubility product and potentiometric titrations using glass electrode.

Discussion and problem taken

Assignment

October

Alkynes

Nomenclature and its structure. Methods of formaica: using Calcium carbide, dehydrohalogenation, Kolbe's electrolysis. Chemical reactions: Mechanism of electrophilic and nucleophilic addition reactions, formation of metal acetylides, addition of bromine and alkaline KMn04, ozonolysis. Acidity of alkynes.

Stereochemistry of Organic Compounds

Concept of isomerism: Structural and Stereoisomerism. Symmetry elements, enantiomers, optical activity, properties of enantiomers, chiral and achiral molecules (up to 2 asymmetric centres), diastereomers, threo-and erythro -nomenclature, meso-compounds, Relative and absolute Configuration, sequence rules. R and S system of nomenclature. Cis-Trans isomerism, E & Z system of nomenclature, Conformational analyis of ethane and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman and Sawhorse projection formulae.

Mid Term Exam

November

Benzene and its derivatives:

Nomenclature, Aromatic nucleus and side chain, Huckel's rule of aromaticity. Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation, and Friedel-Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation. Alkyl halides: Nomenclature, methods of formation: from alkenes and alcohol, nucleophilic substitution reactions of alkyl halides, S2 and S reactions with energy profile diagrams. Aryl halides: Methods of formation: halogenation, Sandmeyer reaction. The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl, and aryl halides.

Discussion and problems taken

Revision

B.Sc. 1st Minor (physical Science and Life Sci.)

Semester: 1st

August

Covalent Bond

Shapes of simple inorganic molecules and ions based on valence shell electron pair repulsion (VSEPR) theory and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.

Discussion and problems taken

September

Chemical Kinetics

Concept of reaction rates, factors influencing the rate of reaction, Order and molecularity of a reaction, integrated rate expression for zero and first order reactions.

Discussion and problems taken

October

Alkanes (upto 5 carbon atoms)

Alkanes, nomenclature, classification of carbon atoms in alkanes. Isomerism in alkanes, methods of formation: Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids.

Discussion and problems taken

Mid Term Exam

November

Metallic Bond and semiconductors

Metallic bond Qualitative idea of Band theory of metallic bond (conductors, semiconductors, insulators).

Discussion and problems taken

Revision

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Miss. Renu devi

Department. Chemistry

Subject/Course: Chemistry

Program: B.Sc. 2nd minor (physical Science) and MDC 3rd sem

Semester: 3rd & 1st

August

S and p-Block Elements

Salient features of hydrides, oxides, halides, hydroxides of s-block elements (methods of preparation excluded). Structure, preparation and properties of Diborane and Borazine. Catenation, carbides, fluorocarbons, silicates (structural aspects), structure of oxides of Nitrogen and Phosphorous, structure of while and red phosphorus. Structure of oxyacids of Nitrogen, phosphorous, sulphur and chlorine and comparison of acidic strength of oxyacids. low chemical reactivity of noble gases, chemistry of xenon, structure and bonding in fluorides, oxides and oxyflurides of xenon.

Discussion and problem taken

September

Electrochemistry-I

Electrolytic conduction, factors affecting electrolytic conduction, specific conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration. Application of Kohlrausch's Law in calculation of conductance of weak electrolytes at infinite dilution (Numericals) Concepts of pH and pK, Buffer solution, Buffer action, Henderson Hazel equation, Buffer mechanism of buffer action.

Electrochemistry-II

Reversible & irreversible cells, Calculation of thermodynamic quantities of cell reaction (AG, ΔH & K). Types of reversible electrodes - metal metal ion, gas electrode, metal insoluble salt - anion and redox electrodes. Nernst equation, Standard Hydrogen electrode, reference electrodes, Applications of EMF measurement in solubility product and potentiometric titrations using glass electrode.

Discussion and problem taken

Assignment

October

Alkynes

Nomenclature and its structure. Methods of formaica: using Calcium carbide, dehydrohalogenation, Kolbe's electrolysis. Chemical reactions: Mechanism of electrophilic and nucleophilic addition reactions, formation of metal acetylides, addition of bromine and alkaline KMn04, ozonolysis. Acidity of alkynes.

Stereochemistry of Organic Compounds

Concept of isomerism: Structural and Stereoisomerism. Symmetry elements, enantiomers, optical activity, properties of enantiomers, chiral and achiral molecules (up to 2 asymmetric centres), diastereomers, threo-and erythro -nomenclature, meso-compounds, Relative and absolute Configuration, sequence rules. R and S system of nomenclature. Cis-Trans isomerism, E & Z system of nomenclature, Conformational analyis of ethane and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman and Sawhorse projection formulae.

Mid Term Exam

November

Benzene and its derivatives:

Nomenclature, Aromatic nucleus and side chain, Huckel's rule of aromaticity. Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation, and Friedel-Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation. Alkyl halides: Nomenclature, methods of formation: from alkenes and alcohol, nucleophilic substitution reactions of alkyl halides, S2 and S reactions with energy profile diagrams. Aryl halides: Methods of formation: halogenation, Sandmeyer reaction. The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl, and aryl halides.

Discussion and problem taken

Revision

MDC 3rd sem

August

Pollution and their types: Plastic and polyethene pollution, pollution sources, Recycling of plastic, greenhouse effect, ozone depletion.

Discussion and problem taken

September

Energy: Energy sources, renewable and non-renewable sources, cells and batteries, fuel cell, solar cell, polymer cell.

Assignment

Discussion and problem taken

October

Water: Sources of drinking water and uses, water conservation, Permissible TDS, Techniques of purification of water, R.O. water purification process (Osmosis and Reverse Osmosis), waste water management.

Discussion and problem taken

Mid Term Exam

November

Pesticides and Herbicides: General Introduction and Definition, Biological Control and Chemical Control, Natural and Synthetic Pesticides, Benefits and Adverse Effects of DDT, BHC, Malathion.

Discussion and problem taken

Revision

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Mr. Ankit *Department: Chemistry*

Subject/Course: Environmental Studies (VAC) (LS & PS)/Eng/Geo/Hist/Eco/Math (Hons.) I *Programme: B.A./B.Com./BBA/BCA/B.Sc.*

Semester: First (1st)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1.	***Introduction to environmental studies*** *Multidisciplinary nature of environmental studies; Scope and importance; Concept of sustainability and sustainable development.* ***Ecosystems*** *Definition, structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs, Major ecosystems types: Forest ecosystem, Grassland ecosystem, Desert ecosystem and Aquatic ecosystem (lakes, rivers, oceans).* ***Discussion and problems taken***	*August*
2.	***Natural resources: Renewable and Non-renewable Resources*** *Land resources: Land degradation and soil erosion.* *Forest resources: Importance of forests, deforestation: causes and impacts on environment.* *Water resources: Use and over-exploitation of surface an ground water.* *Energy resources: Renewable and non- renewable energy sources.* ***Biodiversity and Conservation*** *Definition and its types, Endangered and endemic species of India.* *Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex- situ conservation of biodiversity.* *Ecosystem and biodiversity services: Ecological, economi social, ethical, aesthetic and informational values.* ***Discussion and problems taken*** ***Mid-Term Exam*** ***Assignment***	*September*
3.	***Environmental pollution*** *Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution. Solid waste management: Sources, methods of disposal: Landfill, incineration and composting.* *Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.* ***Environmental Policies & Practices*** *Environmental laws: Environment (Protection) Act, 1986, Air (Prevention & Control of Pollution) Act, 1981, Water (Prevention and control of Pollution) Act, 1974* ***Discussion and problems taken***	*October*
4.	*Human Communities and the Environment* *Human population growth: Impacts on environment, human health and welfare.* *Resettlement and rehabilitation of project affected person. Disaster management: floods, earthquake, cyclones, landslides and drought.* ***Environmental ethics:*** *Role of Indian and other religions and cultures in environmental conservation.* ***Discussion and problems taken*** ***Revision of chapters***	*November*

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Mr. Ankit *Department: Chemistry*

Subject/Course: Chemistry of Cosmetics & Perfumes (VOC) *Programme: B.Sc.(PS) III*

Semester: Fifrh (5^{th})

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1.	*Cosmetics- Definition, History, Classification, Ingredients, Nomenclature, A general study including preparation and uses of the following: Hair dye, Hairspray, Shampoo, Conditioners, Suntan lotion.* ***Discussion and problems taken***	*August*
2.	*Preparation and uses of Face powder, Lipsticks, Talcum powder, Nail enamel.* ***Discussion and problems taken*** ***Mid-Term Exam*** ***Assignment***	*September*
3.	*Preparation and uses of creams (cold, vanishing, and shaving creams), Antiperspirants and Artificial flavours.* ***Discussion and problems taken***	*October*
4.	*Essential oils and their importance in cosmetic industries with reference to Eugenol, Geraniol, Sandal wood oil, Eucalyptus, Rose oil, 2-Phenylethyl alcohol, Jasmone, Civetone, Muscone.* ***Discussion and problems taken*** ***Revision of chapters***	*November*

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Mr. Ankit *Department: Chemistry*

Subject/Course: Environment and Society (VAC Chemistry) *Programme: Eng /Geo /Hist (Hons.) II*

Semester: Third (3rd)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1.	***Introduction:*** *Social and cultural construction of 'environment'; environmental thought from historical and contemporary perspective in light of the concepts of Gross Net Happiness and Aldo Leopold's Land Ethic.* ***Issues in Environmentalism:*** *Significant global environmental issues such as acid rain, climate change, and resource depletion; historical developments in cultural, social and economic issues related to land, forest, and water management in a global context; interface between environment and society.* ***Discussion and problems taken****.*	*August*
2.	***Development-Environment Conflict:*** *Developmental issues and related impacts such as ecological degradation; environmental pollution; development-induced displacement. resettlement, and rehabilitation: problems, concerns, and compensative mechanisms; discussion on Project Affected People (PAPs).* ***Urbanization and environment:*** *Production and consumption oriented approaches to environmental issues in Indian as well as global context; impact of industry and technology on environment; urban sprawl, traffic congestion and social-economic problems; conflict between economic and environmental interests.* ***Discussion and problems taken*** ***Mid-Term Exam*** ***Assignment***	*September*
3.	***Environment and Social Inequalities:*** *Inequalities of race, class, gender, region, and nation-state in access to healthy and safe environments; history and politics surrounding environmental, ecological and social justice; environmental ethics, issues and possible solutions.* ***Regulatory Framework:*** *Brief account of Forest Conservation Act 1980 1988; Forest Dwellers Act 2008; Land Acquisition Act1894, 2007, 2011, 2012; Land Acquisition Rehabilitation and Resettlement Act 2013.* ***Discussion and problems taken***	*October*
4.	***Community Participation:*** *State, corporate, civil society, community, and individual-level initiatives to ensure sustainable development; case studies of environmental movements (Appiko Movement, Chipko Movement, Narmada BachaoAndolan); corporate responsibility movement; appropriate technology movement; citizen groups; role played by NGOs; environmental education and awareness.* ***Discussion and problems taken*** ***Revision of chapters***	*November*

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Monika Jaglan *Department: Chemistry*

Subject/Course:Food Adulteration Testing. *Programme: SEC*

Semester: Third(3rd)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1	Common foods and adulteration Common Foods subjected to Adulteration - Adulteration Definition - Types: Poisonous substances. Foreign matter, Cheap substitutes. Spoiled parts. Adulteration through Food Additives - Intentional and incidental. General Impact on Human Health.	*August 2025*
2	1 Adulteration of Common Foods and Methods of Detection Vicans of Adulteration, Methods of Detection Adulterants in the following Foods; Milk Dil. Grain, Sugar, Spices. Processed food, Fruits and vegetables. Additives anc Sweetening agents (at least three methods of detection for each food item). ***Discussion and problems taken***	*September 2025*
3	Present Laws and Procedures on Adulteration Highlights of Food Safety and Standards Act 2006 (FSSA) -Food Authority of India-Rules and Procedures of Local Authorities ***Mid-Term Exam*** ***Discussion and problems taken***	*October 2025*
4	Role of voluntary agencies such as, Agmark, I.S.I. Quality control laboratories o companies. Private testing laboratories, Quality control laboratories of consumer co-operatives. Consumer education, Consumer's problems rights and responsibilities. COPRA 2019 - Offenses and Penalties - Procedures to Complain - Compensation to Victims. ***Discussion and problems taken*** ***Revision***	*November 2025*

Lesson plan

Name of the Teacher: Monika Jaglan *Department:-Chemistry.*

Subject/Course: Fertilizer and pesticides *Programme: VOC*

Semester: Fifth (5th)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*

1	Methods and time of fertilizer applications, tips to get best efficiency of Applied fertilizers, Integrated nutrient management, fertilizers and its relations to plant nutrients, Factors effecting optimum fertilizer dose.	August 2025
2	Classification and types of fertilizers, Nitrogenous fertilizers: A m m o n i u m nitrate, Ammonium Nitrate, SOcia Cler, Camomide, Chloride Introduction, Raw materials, Action of as a fertilizers.	September 2025
3	Phosphate fertilizers: Normal super phosphate, Triple Super Phosphate, Ammonium Phosphate. Potassic fertilizers (Types and optimum doses) Midterm exam Assignment	October 2025
4	Pesticides: Classification, synthesis, structure activity relationship(SAR), mode of action, uses and adverse effects of representative pesticides in the following classes: Organochlorines (DDT, Gammaxene); Organophosphates (Malathion, Parathion); Carbamates (Carbofuranand Carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).	November 2025

TENTATIVE LESSON PLAN (SEMESTERS)

SESSION: 2025-26

Name of the Teacher: Seema Redhu. *Department: Chemistry*

Subject/Course:Food Adulteration Testing. *Programme: SEC*

Semester: Third(3rd)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1	Common foods and adulteration Common Foods subjected to Adulteration - Adulteration Definition - Types: Poisonous substances. Foreign matter, Cheap substitutes. Spoiled parts. Adulteration through Food Additives - Intentional and incidental. General Impact on Human Health.	*August 2025*
2	1 Adulteration of Common Foods and Methods of Detection Vicans of Adulteration, Methods of Detection Adulterants in the following Foods; Milk Dil. Grain, Sugar, Spices. Processed food, Fruits and vegetables. Additives anc Sweetening agents (at least three methods of detection for each food item). ***Discussion and problems taken***	*September 2025*
3	Present Laws and Procedures on Adulteration Highlights of Food Safety and Standards Act 2006 (FSSA) - Food Authority of India-Rules and Procedures of Local Authorities ***Mid-Term Exam*** ***Discussion and problems taken***	*October 2025*
4	Role of voluntary agencies such as, Agmark, I.S.I. Quality control laboratories o companies. Private testing laboratories, Quality control laboratories of consumer co-operatives. Consumer education, Consumer's problems rights and responsibilities. COPRA 2019 - Offenses and Penalties - Procedures to Complain - Compensation to Victims. ***Discussion and problems taken*** ***Revision***	*November 2025*

Lesson plan

Name of the Teacher: seema Redhu *Department: Chemistry*

Subject/Course: Introductory Chemistry - I (B-23-CHE-103) *Programme: MDC*

Semester: First (1st)

Unit	*Name of Topic/Contents*	*Tentative Dates/Days*
1	***Atomic Structure and Bonding*** *Introduction, elementary introduction of atomic structure and chemical bonding, Representation of elements/ atoms, Lewis structure, Electronic configurations (1-30)* ***Discussion and problems taken***	August
2	***Carbon and It's Compounds*** *Introduction, Tetravalency of Carbon, Allotropes of carbon and their properties, Hydrocarbons (1-5), Nomenclature (linear compounds), Applications of hydrocarbons.* ***Assignment*** ***Discussion and problems taken***	September
3	***Polymers*** *Introduction, elementary idea of synthetic and natural polymers, Homo polymers and Copolymers, uses and properties (Natural rubber, Vulcanized rubber, Polythene, PVC, Styrene, Teflon, PAN, Nylon-66).* ***Mid-Term Exam*** ***Discussion and problems taken***	October
4	***Food Preservatives***	November

	Elementary idea of natural and synthetic food preservatives, rancidity, uses and properties, different food preservation processes (pickle, Jam), Artificial sweeteners, uses and properties. ***Discussion and problems taken*** ***Revision***	