***Lesson Plan-1***

**Name of the Faculty: Dr. Indu Ravish**

**Discipline: B.SC- I**

**Semester: I**

**Subject: Major Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| Month | Name of Topics |
| **July** | Introduction of Syllabus |
| **Aug** | Structure and Bonding: Localized and delocalized chemical bond, |
| Vander Waal’s interactions, |
| resonance: conditions, |
| resonance effect |
| **Sept** | Applications of resonance |
| inductive effect |
| Electromeric effect and their comparison |
| Curved arrow notation, hemolytic and heterolytic cleavage, |
| **Oct** | Types of reagents |
| Types of chemical reactions |
| carbocation |
| Test |
| Diwali Break |
| **Nov** | carbanion |
| Free radicals and carbenes |
| Revision and Class tests |
| Examination |

***Lesson Plan-1***

**Name of the Faculty: Dr. Indu Ravish**

**Discipline: B.SC- II**

**Semester: 3rd**

**Subject: Major Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| **Month** | **Name of the Topics** |
| **July** | Introduction to Chemistry |
| **August** | Alkynes Nomenclature and its structure. |
| Methods of formation: 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 KMnO4, ozonolysis. |
| Acidity of alkynes. Stereochemistry of Organic Compounds Concept of isomerism: Structural and Stereoisomerism. |
| **September** | Symmetry elements, enantiomers, threo- and erythro- nomenclature, meso-compounds. |
| optical activity, properties of enantiomers, chiral and achiral molecules (up-to 2 asymmetric centres), diastereomers, |
| Relative and absolute configuration, sequence rules, R and S system of nomenclature. Cis- Trans isomerism, |
| E & Z system of nomenclature, Conformational analysis of ethane |
| **October** | Conformational analysis of n-butane |
| structure and bonding in fluorides, |
| conformations of cyclohexane, axial and equatorial bonds |
| Newman and Sawhorse projection formulae, Benzene and its derivatives: Nomenclature, Aromatic nucleus and side chain, |
| Diwali Bresk |
| **November** | Huckels’ rule of aromaticity. Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation |
|  | Friedel- Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation. |
|  | Revision and Tests |
|  | Examination |

***Lesson Plan-1***

**Name of the Faculty: Dr. Indu Ravish**

**Discipline: B.SC- II**

**Semester: 3rd**

**Subject: Minor Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| **Month** | **Name of the Topics** |
| **July** | Introduction to Chemistry |
| **August** | Alkynes Nomenclature and its structure. |
| Methods of formation: 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 KMnO4, ozonolysis. |
| Acidity of alkynes. Stereochemistry of Organic Compounds Concept of isomerism: Structural and Stereoisomerism. |
| **September** | Symmetry elements, enantiomers, threo- and erythro- nomenclature, meso-compounds. |
| optical activity, properties of enantiomers, chiral and achiral molecules (up-to 2 asymmetric centres), diastereomers, |
| Relative and absolute configuration, sequence rules, R and S system of nomenclature. Cis- Trans isomerism, |
| E & Z system of nomenclature, Conformational analysis of ethane |
| **October** | Conformational analysis of n-butane |
| structure and bonding in fluorides, |
| conformations of cyclohexane, axial and equatorial bonds |
| Newman and Sawhorse projection formulae, Benzene and its derivatives: Nomenclature, Aromatic nucleus and side chain, |
| Diwali Bresk |
| **November** | Huckels’ rule of aromaticity. Aromatic electrophilic substitution, mechanism of nitration, halogenation, sulphonation |
|  | Friedel- Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation. |
|  | Revision and Tests |
|  | Examination |

**Name of the Faculty: Dr. Indu Ravish**

**Discipline: B.SC- II**

**Semester: III**

**Subject: MDC Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| **Month** | **Name of Topics** |
| **July** | **Introduction** |
| **Aug** | Pollution |
| Pollution: their types |
| Plastic and polyethene pollution |
| pollution sources |
| **Sept** | Recycling of plastic |
| greenhouse effect |
| ozone depletion |
| Test |
| **Oct** | Energy, |
| Energy sources |
| renewable sources |
| non-renewable sources |
| Diwali Break |
| **Nov** | cells and batteries |
| fuel cell, solar cell, polymer cell |
| Revision |

***Lesson Plan***

**Name of the Faculty: Dr. Indu Ravish**

**Discipline: B.SC- III**

**Semester: V**

**Subject: Organic Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| Month | Name of Topics |
| **July** | Brief introduction of syllabus |
| **Aug** | Principle of nuclear magnetic resonance |
| The PMR spectrum |
| Number of signals, peak Areas, Equivalent and non equivalent protons positions of signals and chemical shift |
| shielding and deshielding of protons proton counting, splitting of signals |
| **Sept** | Coupling constants, magnetic equivalence of proton |
| Discuss ion of PMR spectra of the molecules: ethyl bromide, n- propyl bromide, isopropyl bromide, |
| Discuss ion of PMR spectra of the molecules: 1,1-dibromoethane, 1,1,2-tribromoethane., ethanol, Acetaldehyde, ethyl acetate, toluene, |
| Discuss ion of PMR spectra of the molecules: benzaldehyde and acetophenone, Introduction to Classification and nomenclature |
| **Oct** | Monosaccharides, mechanism of osazone formation,  Interconversion of glucose and fructose, |
| Chain lengthening and chain shortening of aldoses. Configuration  of monosaccharides. Erythro and threo diastereomers |
| Conversion of glucose in to mannose. Formation of glycosides, ethers and esters. Determination of ring size of glucose and fructose. |
| Open chain and cyclic structure of D(+)-glucose & D(-) fructose.  Mechanism of mutarotation. Structures of ribose anddeoxyribose, disaccharides and polysaccharides |
| Diwali Break |
| **Nov** | Organomagnesium compound, Grignard reagents-formation, structure and chemical reactions. |
| Organozinc compounds: formation and chemical reactions. |
| Revision |
| Examination |

***Lesson Plan***

**Name of the Faculty: Dr. Poonam**

**Discipline: B.SC- I**

**Semester: I**

**Subject: Major Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| **Month** | **Name of Topics** |
| **July** | Introduction of Syllabus |
| **Aug** | Dual behaviour of matter and raditions, de-broglie’s relation |
| Heisenberg’s principle concept of atomic orbitals |
| Radial and angular wave functions and significance |
| Normal and orthogonal wave functions and significance |
| **Sept** | Shapes of s, p, d and f orbitals |
| Effective nuclear charge, slater’s rule |
| Classification of periodic table |
| Atomic and ionic radii |
| **Oct** | Ionization energy, electron affinity |
| Electonegativity trends in periodic table |
| Pauling, Mullikan scale |
| Jaffe’s scale |
| Diwali Break |
| **Nov** | Sanderson’s density ratio |
| Revision |

**Name of the Faculty: Dr. Poonam**

**Discipline: B.SC- I**

**Semester: I**

**Subject: MDC Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| **Month** | **Name of Topics** |
| **July** | **Introduction** |
| **Aug** | Carbon and its compound- introduction |
| Tetravalency of carbon |
| Allotropes of carbons- Diamond |
| Allotropes of carbons- Graphite |
| **Sept** | Hydrocarbons introduction |
| Hydrocarbons nomenclature |
| Application of hydrocarbons |
| Test |
| **Oct** | Atomic structure intrduction |
| Introduction of chemical bonding |
| Lewis structure of simple molecules |
| Electronic configurations upto atomic no. 30 |
| Diwali Break |
| **Nov** | Test |
| Revision |

***Lesson Plan-1***

**Name of the Faculty: Dr. Poonam**

**Discipline: B.SC- II**

**Semester: 3rd**

**Subject: Minor Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| **Month** | **Name of the Topics** |
| **July** | Introduction to Chemistry |
| **August** | s and p-Block Elements, |
| Salient features of hydrides, oxides, halides, hydroxides of sblock elements (methods of preparation excluded) |
| preparation and properties of Diborane and Borazine |
| Structure, Catenation, carbides, fluorocarbons, silicates (structural aspects) |
| **September** | structure of oxides of Nitrogen and Phosphorous |
| Structure of oxyacids of Nitrogen, phosphorous, |
| structure of white and red phosphorus. |
| sulphur and chlorine and comparison of acidic strength of oxyacids |
| **October** | low chemical reactivity of noble gases, |
| structure and bonding in fluorides, |
| **October** | chemistry of xenon, oxides and oxyfluorides of xenon. |
| Aryl halides: Methods of formation: halogenation, Sandmeyer reaction. |
| Diwali Bresk |
| **November** | The addition-elimination, and the elimination- addition mechanisms of nucleophilic aromatic substitution reactions. |
|  | Relative reactivities of alkyl halides vs allyl, vinyl, and aryl halides. |
|  | Revision and Tests |
|  | Examination |

***Lesson Plan-1***

**Name of the Faculty: Dr. Poonam**

**Discipline: B.SC- II**

**Semester: 3rd**

**Subject: Major Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| **Month** | **Name of the Topics** |
| **July** | Introduction to Chemistry |
| **August** | s and p-Block Elements, |
| Salient features of hydrides, oxides, halides, hydroxides of sblock elements (methods of preparation excluded) |
| preparation and properties of Diborane and Borazine |
| Structure, Catenation, carbides, fluorocarbons, silicates (structural aspects) |
| **September** | structure of oxides of Nitrogen and Phosphorous |
| Structure of oxyacids of Nitrogen, phosphorous, |
| structure of white and red phosphorus. |
| sulphur and chlorine and comparison of acidic strength of oxyacids |
| **October** | low chemical reactivity of noble gases, |
| structure and bonding in fluorides, |
| **October** | chemistry of xenon, oxides and oxyfluorides of xenon. |
| Aryl halides: Methods of formation: halogenation, Sandmeyer reaction. |
| Diwali Bresk |
| **November** | The addition-elimination, and the elimination- addition mechanisms of nucleophilic aromatic substitution reactions. |
|  | Relative reactivities of alkyl halides vs allyl, vinyl, and aryl halides. |
|  | Revision and Tests |
|  | Examination |

**Name of the Faculty: Dr. Poonam**

**Discipline: B.SC- II**

**Semester: III**

**Subject: MDC Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| **Month** | **Name of Topics** |
| **July** | **Introduction** |
| **Aug** | Water: Sources of drinking water and uses |
| water conservation |
| Permissible TDS |
| Techniques of purification of water |
| **Sept** | R.O. water purification process (Osmosis and Reverse Osmosis) |
| Waste water management |
| Pesticides and Herbicides |
| Test |
| **Oct** | General introduction and definition |
| biological control |
| chemical control |
| natural and synthetic pesticides, |
| Diwali Break |
| **Nov** | benefits and adverse effects of DDT, BHC, malathion. |
| Revision |

**Name of the Faculty: Dr. Poonam**

**Discipline: B.SC- III**

**Semester: V**

**Subject: Inorganic Chemistry**

**Lesson Plan duration: July 2024- to Nov. 2024**

|  |  |
| --- | --- |
| Month/Week | **Name of Topics** |
| **July** | Introduction of Syllabus |
| **Aug** | Metal -Ligand Bonding in Transition Metal complexes Limitations of valence bond theory, an elementary idea of crystal field theory |
| Shapes of different type of d-orbitals, crystal field splitting in octahedral complexes, Crystal field stabilizing energy |
| Crystal field stabilizing energy for octahedral complexes, crystal field splitting in tetrahedral and square planer complexes, |
| Factors affecting the crystal field parameters Thermodynamics and Kinetic Aspects of metal complexes |
| **Sept** | A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, Irving William Series |
| substitution reactions  and its type, Nucleophilic substitution reactions of square planer complexes of Pt[II], Trans effect with examples |
| Color of transition metal complexes, limitation of crystal field theory, comparison of crystal field theory and Valance Bond Theory |
| Magnetic properties of Transition metal complexes,Types of magnetic materials, |
| **Oct** | magnetic susceptibility, method of determining magnetic susceptibility |
| spin only formula, L-S coupling, correlation of μs and μeff values, orbital contribution to magnetic moments |
| Relationship between magnetic susceptibility and magnetic moment, variation of magnetic susceptibility with temperature |
| Orbital contribution to magnetic moment, quenching of orbital angular momentum I octahedral complexes, orbital contribution in tetrahedral complexes |
| Diwali Break |
| **Nov** | Temperature independent paramagnetism, magnetic behavior of first row transition mtal compound, anamolous magnetic moment and diamagnetic –paramagnetic equilibrium |
| Electronic spectra of transition metal complexes- Basis of electron absorption spectroscopy, term symbol and coupling scheme |
| spectroscopic ground states, spectrochemical series, orgel energy level diagram for d1 and d9 states |
| Examination |