**TEACHER WISE LESSON PLAN**

**DEPARTMENT OF CHEMISTRY**

**EVEN SEMESTER 2021-22**

**2nd SEMESTER MEDICAL**

**INORGANIC CHEMISTRY**

**FACULTY:-Dr NEERU**

**APRIL**

**UNIT 1**

Hydrogen Bonding – Definition, Types, effects of hydrogen bonding on properties

of substances, application .

Discussion of various types of Vander Waals Forces .

Metallic Bond- Introduction to metallic bond, band theory of metallic bond

Semiconductors- Introduction, types and applications.

**UNIT 2 s-BLOCK ELEMENTS**:-

Comparative study of the elements, diagonal relationships, salient features of

hydrides (methods of preparation excluded), solvation and complexation

tendencies including their function in biosystems .

**MAY**

**UNIT 2 NOBLE GASES** :-

Chemistry of Noble Gases , Chemical properties of the noble gases with emphasis

on their low chemical reactivity, chemistry of xenon, structure and bonding of

fluorides, oxides & oxyfluorides of xenon.

**UNIT 3 p -BLOCK ELEMENTS :-**

comparative study of properties of p-block elements (including diagonal

relationship and excluding methods of preparation).

**Boron family (13th gp**):-

Diborane – properties and structure (as an example of electron – deficient

compound and multicentre bonding)

Borazene – chemical properties and structure Trihalides of Boron – Trends in lewis

Acid character structure of aluminium (III) chloride.

**Carbon Family (14th group):-**

Catenation, p π– d π bonding , carbides, fluorocarbons, silicates , silicons – general

methods of preparations, properties and uses.

**JUNE**

**UNIT 4 p BLOCK ELEMENTS:-**

**Nitrogen Family (15th group):-**

Oxides – structures of oxides of N,P. oxyacids – structure and relative acid strengths

Of oxyacids of Nitrogen and phosphorus.

Structure of white, yellow and red phosphorus.

**Oxygen Family (16th group):-**

Oxyacids of sulphur – structures and acidic strength H2O2 –structure, properties and

uses.

**Halogen Family (17th group):-**

Basic properties of halogen, interhalogens types properties ,hydro and oxyacids of

chlorine – structure and comparison of acid strength .

**2nd SEMESTER MEDICAL**

**ORGANIC CHEMISTRY**

*Lesson plan for Organic Chemistry Syllabus, B.Sc.Medical*

Academic Year -2021-22, 2nd semester

Teacher - Sonam Baghel

**April**

***Alkenes*:**  Nomenclature of alkenes, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes. Chemical reactions of alkenes mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff’s rule, hydroboration–oxidation, oxymercuration reduction, ozonolysis, hydration, hydroxylation and oxidation with KMnO4.

***Arenes and Aromaticity***: Nomenclature of benzene derivatives: Aromatic nucleus and side chain. Aromaticity: the Huckel rule, aromatic ions, annulenes up to 10 carbon atoms, aromatic, anti - aromatic and non – aromatic compounds.

**May**

***Arenes and Aromaticity***: Aromatic electrophilic substitution general pattern of the mechanism, mechansim of nitration, halogenation, sulphonation and Friedel-Crafts reaction. Energy profile diagrams. Activating, deactivating substituents and orientation.

***Dienes and Alkynes***: Nomenclature and classification of dienes: isolated, conjugated and cumulated dienes. Structure of butadiene. Chemical reactions 1,2- and 1,4- additions (Electrophilic & free radical mechanism), Diels-Alder reaction.

Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions, hydroboration- oxidation of alkynes.

**June**

***Alkyl and Aryl Halides***: Nomenclature and classes of alkyl halides, methods of formation, chemical reactions. Mechanisms and stereochemistry of nucleophilic substitution reactions of alkyl halides, SN2 and SN1 reactions with energy profile diagrams. Methods of formation and reactions of aryl halides. The addition-elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides.

**2nd SEMESTER MEDICAL**

**PHYSICAL CHEMISTRY**

**Teacher Name- Bhagyashree Date**

April2022

Kinetics-I:-Rate of reaction, rate equation, factors influencing the rate of a reaction –concentration, temperature, pressure, solvent, light, catalyst. Order of a reaction, integrated rate expression for zero order, first order, second and third order reaction. Half life period of a reaction. Methods of determination of order of reaction.

Kinetics-II Effect of temperature on the rate of reaction – Arrhenius equation.

May 2022

Kinetics-II:- Theories of reaction rate – Simple collision theory for unimolecular and bimolecular collision. Transition state theory of Bimolecular reactions

Electrochemistry-I:- Electrolytic conduction, factors affecting electrolytic conduction, specific, conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration. Arrhenius theory of ionization, Ostwald’s Dilution Law. Debye- Huckel – Onsager’s equation for strong electrolytes (elementary treatment only) Transport number, definition and determination by Hittorfs methods, (numerical included)

June 2022

Electrochemistry-II:- Kohlarausch’s Law, calculation of molar ionic conductance and effect of viscosity temperature & pressure on it. Application of Kohlarausch’s Law in calculation of conductance of weak electrolytes at infinite diloution. Applications of conductivity measurements: determination of degree of dissociation, determination of Ka of acids determination of solubility product of sparingly soluble salts, conductometric titrations. Definition of pH and pKa, Buffer solution, Buffer action, Henderson-Hazel equation, Buffer mechanism of buffer action.

**2nd SEMESTER NON-MEDICAL**

**INORGANIC CHEMISTRY**

**FACULTY:-Dr RITU MALIK**

**APRIL**

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uses.

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Basic properties of halogen, interhalogens types properties ,hydro and oxyacids of

chlorine – structure and comparison of acid strength .

**2nd SEMESTER NON-MEDICAL**

**ORGANIC CHEMISRY**

**Teachers - Pooja Singh**

**April**

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**Teacher Name- Dr. Pinku**

April2022

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**2nd SEMESTER BIOTECH**

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**FACULTY:-SONAM BAGHEL**

**APRIL**

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**2nd SEMESTER BIOTECH**

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**Teacher Name- Mr. Rustam Singh**

April2022

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**2nd SEMESTER ZOO (Hons.)**

**Teachers - Dypsy Khapra**

**April**

**Topics-** Periodic Properties Atomic and ionic radii, ionization energy, electron affinity and electronegativity – definition, trends in periodic table (in s & p block elements).

**s-Block** Elements Comparative study of the elements including, diagonal relationships and salient features of hydrides (methods of preparation excluded**).**

**p-Block** Elements Emphasis on comparative study of properties of p-block elements (including diagonal relationship and excluding methods of preparation).

**Boron family (13th gp):-** Diborane – properties and structure (as an example of electron – deficient compound and multicentre bonding), Borazene – chemical properties and structure.

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**2nd SEMESTER BOT (Hons)**

**Teachers - Pooja yadav**

**April**

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**s-Block** Elements Comparative study of the elements including, diagonal relationships and salient features of hydrides (methods of preparation excluded**).**

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**Boron family (13th gp):-** Diborane – properties and structure (as an example of electron – deficient compound and multicentre bonding), Borazene – chemical properties and structure.

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**4th SEMESTER MEDICAL**

**INORGANIC CHEMISTRY**

**Faculty : Ms. Payal Arora**

**April 2022: -**

**Chemistry of f – block elements Lanthanides**

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

**Chemistry of f – block elements Actinides**

General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U, Comparison of properties of Lanthanides and Actinides and with transition elements.

**May 2022**:-

**Theory of Qualitative and Quantitative Inorganic Analysis-I**

Chemistry of analysis of various acidic radicals, Chemistry of identification of acid radicals in typical combinations, Chemistry of interference of acid radicals including their removal in the analysis of basic radicals.

**June 2022:-**

**Theory of Qualitative and Quantitative Inorganic Analysis-II**

Chemistry of analysis of various groups of basic radicals, Theory of precipitation, co- precipitation, Post- precipitation, purification of precipitates.

**4th SEMESTER MEDICAL**

**ORGANIC CHEMISTRY**

**Faculty:Deepak Kumar**

April

Section-A

Infrared (IR) absorption spectroscopy

Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds. Applications of IR spectroscopy in structure elucidation of simple organic compounds.

May

Section-B

Amines

Structure and nomenclatu re of amines, phys ical properties. Separation of a mixture of primary, secondary and tertiary amines.Structural featu res affecting basicity of amines. Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds. Gabrielphthalimide reaction, Hofmann bromamide reaction. electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.

Section-C

Diazonium Salts

Mechanism of diazotisation, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO2 and CN groups, reduction of diazonium salts to hyrazines, coupling reaction and its synthetic application.

Nitro Compounds

Preparation of nitro alkanes and nitro arenes and their chemical reactions. Mechanism of electrophilic substitution reactions in nitro arenes and their reductions in acidic, neutral and alkaline medium.

June

Section-D

Aldehydes and Ketones

Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent) pyridinium chlorochromate (PCC) and pyridinium dichromate.,

Physical properties. Comparison of reactivities of aldehydes and ketones.

Mechanism of nucleophilic additions to carbonyl group with particular

emphasis on benzoin, aldol, Perkin and Knoevenagel condensations.

Condensation with ammonia and its derivatives. Wittig reaction. Mannich

reaction.Oxidation of aldehydes, Baeyer–Villiger oxidation of ketones,

Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, LiAlH4 and

NaBH4 reductions.

**4th SEMESTER MEDICAL**

**PHYSICAL CHEMISTRY**

***Faculty : Ms. Pooja Singh***

**April**

*Thermodynamics-II*: Second law of thermodynamics, need for the law, different statements of the law, Carnot’s cycles and its efficiency, Carnot’s theorem, Thermodynamics scale of temperature. Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.

*Thermodynamics- III:* Third law of thermodynamics: Nernst heat theorem, statement of concept of residual entropy, evaluation of absolute entropy from heat capacity data.

**May**

*Thermodynamics- III:*

Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P, V and T.

*Electrochemistry:*

Electrolytic and Galvanic cells – reversible & Irreversible cells , conventional representation of electrochemical cells. EMF of cell and its measurement, Weston standard cell, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction ( G, H & K). Types of reversible electrodes – metal- metal ion gas electrode, metal –insoluble salt- anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential. Standard Hydrogen electrode, reference electrodes, standard electrodes potential, sign conventions, electrochemical series and its applications.

**June**

*Electrochemistry:*

Concentration cells with and without transference, liquid junction potential, application of EMF measurement i.e. valency of ions, solubility product activity coefficient, potentiometric titration (acid- base and redox). Determination of pH using - Hydrogen electrode, Quinhydrone electrode and glass electrode by potentiometric Methods.

**4th SEMESTER NON-MEDICAL**

**INORGANIC CHEMISTRY**

**Faculty : Dr. Ritu Malik**

**April 2022: -**

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Physical properties. Comparison of reactivities of aldehydes and ketones.

Mechanism of nucleophilic additions to carbonyl group with particular

emphasis on benzoin, aldol, Perkin and Knoevenagel condensations.

Condensation with ammonia and its derivatives. Wittig reaction. Mannich

reaction.Oxidation of aldehydes, Baeyer–Villiger oxidation of ketones,

Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, LiAlH4 and

NaBH4 reductions.

**4th SEMESTER NON- MEDICAL**

**PHYSICAL CHEMISTRY**

***Faculty : Mrs. Madhu Arora***

**April**

*Thermodynamics-II*: Second law of thermodynamics, need for the law, different statements of the law, Carnot’s cycles and its efficiency, Carnot’s theorem, Thermodynamics scale of temperature. Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.

*Thermodynamics- III:* Third law of thermodynamics: Nernst heat theorem, statement of concept of residual entropy, evaluation of absolute entropy from heat capacity data.

**May**

*Thermodynamics- III:*

Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P, V and T.

*Electrochemistry:*

Electrolytic and Galvanic cells – reversible & Irreversible cells , conventional representation of electrochemical cells. EMF of cell and its measurement, Weston standard cell, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction ( G, H & K). Types of reversible electrodes – metal- metal ion gas electrode, metal –insoluble salt- anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential. Standard Hydrogen electrode, reference electrodes, standard electrodes potential, sign conventions, electrochemical series and its applications.

**June**

*Electrochemistry:*

Concentration cells with and without transference, liquid junction potential, application of EMF measurement i.e. valency of ions, solubility product activity coefficient, potentiometric titration (acid- base and redox). Determination of pH using - Hydrogen electrode, Quinhydrone electrode and glass electrode by potentiometric Methods.

**4th SEMESTER BIOTECH**

**INORGANIC CHEMISTRY**

**Faculty :** Ms. Payal Arora

**April 2022: -**

**Chemistry of f – block elements Lanthanides**

Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.

**Chemistry of f – block elements Actinides**

General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U, Comparison of properties of Lanthanides and Actinides and with transition elements.

**May 2022**:-

**Theory of Qualitative and Quantitative Inorganic Analysis-I**

Chemistry of analysis of various acidic radicals, Chemistry of identification of acid radicals in typical combinations, Chemistry of interference of acid radicals including their removal in the analysis of basic radicals.

**June 2022:-**

**Theory of Qualitative and Quantitative Inorganic Analysis-II**

Chemistry of analysis of various groups of basic radicals, Theory of precipitation, co- precipitation, Post- precipitation, purification of precipitates.

**4th SEMESTER BIOTECH**

**ORGANIC CHEMISTRY**

**Faculty:Deepak Kumar**

April

Section-A

Infrared (IR) absorption spectroscopy

Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds. Applications of IR spectroscopy in structure elucidation of simple organic compounds.

May

Section-B

Amines

Structure and nomenclatu re of amines, phys ical properties. Separation of a mixture of primary, secondary and tertiary amines.Structural featu res affecting basicity of amines. Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds. Gabrielphthalimide reaction, Hofmann bromamide reaction. electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.

Section-C

Diazonium Salts

Mechanism of diazotisation, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO2 and CN groups, reduction of diazonium salts to hyrazines, coupling reaction and its synthetic application.

Nitro Compounds

Preparation of nitro alkanes and nitro arenes and their chemical reactions. Mechanism of electrophilic substitution reactions in nitro arenes and their reductions in acidic, neutral and alkaline medium.

June

Section-D

Aldehydes and Ketones

Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent) pyridinium chlorochromate (PCC) and pyridinium dichromate.,

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Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, LiAlH4 and

NaBH4 reductions.

**4th SEMESTER BIOTECH**

**PHYSICAL CHEMISTRY**

***Faculty : Pooja Singh***

**April**

*Thermodynamics-II*: Second law of thermodynamics, need for the law, different statements of the law, Carnot’s cycles and its efficiency, Carnot’s theorem, Thermodynamics scale of temperature. Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.

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*Thermodynamics- III:*

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Electrolytic and Galvanic cells – reversible & Irreversible cells , conventional representation of electrochemical cells. EMF of cell and its measurement, Weston standard cell, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction ( G, H & K). Types of reversible electrodes – metal- metal ion gas electrode, metal –insoluble salt- anion and redox electrodes. Electrode reactions, Nernst equations, derivation of cell EMF and single electrode potential. Standard Hydrogen electrode, reference electrodes, standard electrodes potential, sign conventions, electrochemical series and its applications.

**June**

*Electrochemistry:*

Concentration cells with and without transference, liquid junction potential, application of EMF measurement i.e. valency of ions, solubility product activity coefficient, potentiometric titration (acid- base and redox). Determination of pH using - Hydrogen electrode, Quinhydrone electrode and glass electrode by potentiometric Methods.

**4th SEMESTER ZOOLOGY HONS.**

**Lesson Plan for Chemistry Syllabus B. Sc. Zoo (H) 4th sem**

**Paper Code – ZOO 404**

**Academic Year – 2021-22, Even semester**

**Teachers – Mrs. Khushbu Jain, Asst. Prof. Zoo H**

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| **Month** | **Topics** |
| April ‘22 | **Thermodynamics**  Third law of thermodynamics: Nernst heat theorem, Thermodynamic functions G, H, E, A & S.  Criteria for thermodynamic equilibrium and spontaneity of a process in terms of thermodynamic functions.  **Chemical Equilibrium**  Equilibrium constant and free energy, concept of chemical potential, Thermodynamic derivation of law of chemical equilibrium. Clapeyron equation and Clausius – Clapeyrou equation and its applications.  **Electrochemistry**  Electrolytic and Galvanic cells – reversible & irreversible cells, conventional representation of electrochemical cells. EMF of cell and its measurement, Weston standard cell, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction (G, H & K). Nernst equation, prediction of single electrode potential and EMF of cell.  Reference electrodes - standard hydrogen electrode & calomel electrode, standard electrode potential, sign convention, electrochemical series and its applications. |
| May ‘22 | **Non-aqueous Solvents**  Physical properties of a solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH3 and liquid SO2.  **Acids and Bases, HSAB Concept**  Arrhenius, Bronsted – Lowry, the Lux – Flood, Solvent system and Lewis concepts of acids & bases, relative strength of acids & bases, Concept of Hard and Soft Acids & Bases.  Chemistry of f – block elements  **Lanthanides**  Occurrence, Electronic structure, oxidation states and ionic radii and lanthanide contraction and complex formation of lanthanide compounds.  **Actinides**  General features and chemistry of actinides, Comparison of properties of Lanthanides and  Actinides and with transition elements. Elementary idea about the transuranic elements. |
| June‘22 | **Infrared (IR) absorption spectroscopy**  Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups.  **Amines**  Structure and nomenclature of amines, physical properties. Separation of a mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Gabriel- phthalimide reaction, Hofmann bromamide reaction. Electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.  **Diazonium Salts**  Mechanism of diazotisation, structure of benzene diazonium chloride, replacement of diazo group by H, OH, F, Cl, Br, I, NO2 and CN groups.  **Aldehydes and Ketones**  Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent) pyridinium chlorochromate (PCC) and pyridinium dichromate.,. Comparison of reactivities of aldehydes and ketones. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin and aldol, condensations. Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction. |

**4th SEMESTER BOTANY HONS.**

**Lesson Plan for Chemistry Syllabus B. Sc. Bot (H)**

**Paper Code – BOT 404**

**Academic Year – 2021-22, Even semester**

Teachers –Mrs. Bhagyashree Date (Bot (H)

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| --- | --- |
| **Month** | **Topics** |
| April ‘22 | **Thermodynamics**  Third law of thermodynamics: Nernst heat theorem, Thermodynamic functions G, H, E, A & S.  Criteria for thermodynamic equilibrium and spontaneity of a process in terms of thermodynamic functions.  **Chemical Equilibrium**  Equilibrium constant and free energy, concept of chemical potential, Thermodynamic derivation of law of chemical equilibrium. Clapeyron equation and Clausius – Clapeyrou equation and its applications.  **Electrochemistry**  Electrolytic and Galvanic cells – reversible & irreversible cells, conventional representation of electrochemical cells. EMF of cell and its measurement, Weston standard cell, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction (G, H & K). Nernst equation, prediction of single electrode potential and EMF of cell.  Reference electrodes - standard hydrogen electrode & calomel electrode, standard electrode potential, sign convention, electrochemical series and its applications. |
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**6th SEMESTER MEDICAL**

**INORGANIC CHEMISTRY**

**Pooja( Department of chemistry)**

**April 2022 :-**

# Organometallic Chemistry

Definition, nomenclature and classification of organometallic compounds. Preparation, properties, and bonding of alkyls of Li, Al, Hg, and Sn a brief account of metal-ethylenic complexes, mononuclear carbonyls and the nature of bonding in metal carbonyls

**Acids and Bases, HSAB Concept**

Arrhenius, Bronsted — Lowry, the Lux — Flood, Solvent system and Lewis concepts of acids & bases, relative strength of acids & bases.

# May 2022:-

**Acids and bases ,HSAB concept**

Concept of Hard and soft acid and bases. Symbiosis, electronegativity and hardness and softness

**Bioinorganic Chemistry**

Essential and trace elements in biological processes, metalloporphyrins with special reference to hemoglobin and myoglobin. Biological role of alkali and alkaline earth metal ions with special reference to Ca2+. Nitrogen fixation.

**June 2022:-**

**Sil icones and Phosphazenes**

Silicones and phosphazenes, their preparation, properties,structure and use

**6th SEMESTER MEDICAL**

**ORGANIC CHEMISTRY**

### Dypsy Khapra (department of chemistry)

### April 2022:-

**Heterocyclic Compounds-I**

Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives. Comparison of basicity of pyridine, piperidine and pyrrole.

**Heterocyclic Compounds-II**

Introduction to condensed five and six- membered heterocycles. Prepration and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline.

### May 2022:-

### Organosulphur Compounds

Nomenclature, structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides and sulphaguanidine. Synthetic detergents alkyl and aryl sulphonates.

 **Organic Synthesis *via* Enolates**

Acidity of -hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate.

### Synthetic Polymers

Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers.

Condensation or step growth polymerization. Polyesters, polyamides, phenol formaldehyde resins, urea formaldehyde resins, epoxy re sins and polyurethanes.

Natural and synthetic rubbers.

# June 2022:-

### Amino Acids, Peptides & Proteins

Classification, of amino acids. Acid-base behavior, isoelectric point and electrophoresis. Preparation of alpha -amino acids.Structure and nomenclature of peptides and proteins. Classification of proteins. Peptide structure determination, end group analysis, selective hydrolysis of peptides. Classical peptide synthesis, solid– phase peptide synthesis. Structures of peptides and proteins: Primary & Secondary structure

**6th SEMESTER MEDICAL**

**PHYSICAL CHEMISTRY**

**Name of Teacher:- Mrs. Khushbu Jain**

**Month:- April**

**Spectroscopy-III**

**Electronic Spectrum**

Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck- Condon principle.Qualitative description of sigma and pie and n molecular orbital (MO) their energy level and respective transitions.

**Photochemistry**

Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grotthus-Drapper law, Stark- Einstein law (law of photochemical equivalence) Jablonski diagram depiciting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence,

**Month:- May**

Non radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions-energy transfer processes (simple examples).

**Solutions:**

Dilute Solutions and Colligative Properties,Ideal and non-ideal solutions, methods of expressing concentrations of solutions,activity and activity coefficient. Dilute solution,Colligative properties, Raolut’s law, relative lowering of vapour pressure, molelcular weight determination, Osmosis law of osmotic pressure and its measurement, determination of molecularweight from osmotic pressure. Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties. Abnormal molar mass, degree of dissociation and association of solutes.

**Month :- June**

**Phase Equillibrium**

Statement and meaning of the terms – phase component and degree of freedom,thermodynamic derivation of Gibbs phase rule, phase equilibria of one component system –Example – water and Sulpher systems.Phase equilibria of two component systems solid-liquid equilibria, simple eutectic Example Pb-Ag system, desilerisation of lead lesson plan

**6th SEMESTER NON-MEDICAL**

**INORGANIC CHEMISTRY**

**Payal Arora ( Department of chemistry)**

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Arrhenius, Bronsted — Lowry, the Lux — Flood, Solvent system and Lewis concepts of acids & bases, relative strength of acids & bases.

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Silicones and phosphazenes, their preparation, properties,structure and uses

**6th SEMESTER NON-MEDICAL**

**ORGANIC CHEMISTRY**

### Deepak Kumar (department of chemistry)

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**6th SEMESTER NON-MEDICAL**

**PHYSICAL CHEMISTRY**

**Name of Teacher:- Mr. Rustam Singh**

**Month:- April**

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**Electronic Spectrum**

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**Pooja( Department of chemistry)**

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