Govt. Degree College, Barkot, Uttarkashi

Department of Chemistry

Course Outcome in Chemistry

B.Sc 1st year

Paper I st (CH-101) -Inorganic Chemistry

Unit 1st- Atomic Structure- Students to learn about dual nature of electrons, rules of electronic configuration, quantum numbers.

Unit 2nd- Periodic Properties- learning about ionization energy, electronic affinity and electronegativity, help them to understand the chemical behaviour of elements.

Unit 3rd- Chemical Bonding -Have detailed knowledge about the theories of covalent bonds, ionic bond, week forces, students can find the shape and geometry of molecules, concept of hybridization and study of VSEPR & Molecular Orbital Theory.

Unit 4th- *s*-Block Elements- Able to understand general characteristics of *s*-block elements, oxides, hydroxide, carbonate & its complexes and Noble gases

Unit 5th- *p*-Block Elements - Able to understand the differentproperties and compounds formed by the chemical reactions of *p*- Block elements.

Paper 2nd (CH- 102) Organic Chemistry

Unit 1st- Structure and Bonding Mechanism of Organic Reactions, Alkanes & Cycloalkanes - Able tounderstand different type of bonds by learning about concept of hybridization, resonance, hyperconjugation, inductive effect, intermediate molecule help them to predict the mechanism of reactions which help them to determine the shape and stability of intermediate molecule help them to predict the mechanism of reactions.

Students are able to naming them by IUPAC, they can compare the structure and stability of alkane as well as cycloalkane.

Unit 2nd- Stereochemistry of Organic Compounds: students can find the different shape and geometry of the molecule, types of isomerism, concept of asymmetric carbon atom, concept of symmetry and relative and absolute configuration.

Unit 3rd- Alkenes Cycloalkenes, Dienes and Alkynes: The students can find the different product stability and yield based on regioselectivity, and rules described in their course.

Unit 4th- Arenes and Aromaticity: Students can analyze the extra stability and aromatic behavior of aromatic compounds and their physical properties and chemical reaction mechanism.

Unit 5th- Alkyl and Aryl Halide: Can understand the chemical reactions and can compare relative reactivity of alkyl and aryl halide

Paper 3rd (CH 103)- Physical Chemistry

Unit 1st Gaseous State: Can compare the gaseous and vapours state, real and ideal behavior of gases

Dr. Anju Bhatt
Co-ordinator, NAAC
Rajkiya mahavidyalaya Barkot

विभाग प्रभारी
रसायन विज्ञान विभाग
महाविद्यालय बड़कोट
उत्तरकाशी

Principal
Rajkiya mahavidyalaya Barkot
Uttarkashi

Unit 2nd- Liquid State - Able to understand the difference between liquid crystal, liquid and solid states sharply

Unit 3rd- Solid State: Can find out the crystal structure by different methods

Unit 4th- Colloidal State - Able to apply the basic knowledge of colloidal state, types, preparation, properties and applications of colloidal state, emulsions and gel

Unit 5th-Chemical Kinetics and Catalysis-By understanding the kinetics of the reaction they can predict the mechanism of reactions.

(CH-104)- Laboratory Practical-

Course Description - The course includes inorganic mixture analyses.Organic part include calibration of Thermometer, melting point and boiling point determination, distillation, sublimation and crystallization. Detection of an extra elements and functional group in organic compound, Physical Chemistry includes study of chemical kinetics and determination of surface tension and viscosity

Course Outcomes- After completion of course students gain understanding of-

1. How to maintain a scientific notebook.
2. How to engage a safe laboratory practices, handling glassware, equipments and chemical reagents.
3. How to perform common laboratory techniques including melting apparatus, crystallization and distillation.
4. Can able to find surface tension and viscosity of liquids.

B.Sc. 2nd year

Paper 1st (CH-201)- Inorganic Chemistry

Unit 1st- Transition Elements- Students can compare the transition properties and the chemical behavior of first, second and third transition series.

Unit 2nd- Coordination Compound- Students are able to calculate the EAN, nomenclature of coordination compounds, isomerism in coordination compounds, and got deep knowledge of theories of coordination compounds.

Unit 3rd- Chemistry of Lanthanides and Actinides- Can understand the periodic properties, lanthanide contraction and chemical properties of lanthanides and actinides.

Unit 4th- Oxidation and Reduction-Can use oxidation and reduction for extraction of the elements

Unit 5th- Acids and Bases, Non Aqueous Solvents- Able to find the difference between acids and bases. Have a knowledge about the Arrhenius, Bronsted-Lowry, Lux-Flood theory. Can explain the non aqueous solvent and reaction in non aqueous solvent with reference to liquid NH_3 and Liquid SO_2.

Dr. Anju Bhatt
Co-ordinator, NAAC
Rajkiya mahavidyalaya Barkot
Uttarkashi

विभाग प्रभारी
रसायन विज्ञान विभाग
राजकीय महाविद्यालय बड़कोट
उत्तरकाशी

Principal
Rajkiya mahavidyalaya Barkot
Uttarkashi

Paper 2nd(CH-202)- Organic Chemistry

Unit 1st- Electromagnetic Spectrum and Absorption Spectra- Can understand absorption laws, types of electronic transitions Concept of chromophore and auxochrome, Bathochromic, hypsochromic, hyperchromic and hypochromic shifts, molecular vibrations. Students are able to interpret the IR and UV Spectra of simple organic compounds.

Unit 2nd- Alcohols and Phenols- Completion of the course the students can have some idea about synthetic methods used in industries

Unit 3rd- Ether and Epoixde- Students can understand nomenclature, physical and chemical reactions of ethers and epoxides.

Unit 4th- Aldehyde and Ketone -They can differentiate between the aldehyde and ketonic functional group and their chemical properties.

Unit 5th- Carboxylic Acids- Student can compare acidic behavior of different molecule

Unit 6th- Organic Compound of Nitrogen-students have a knowledge about reaction of N containing organic compounds

Paper 3rd (CH-203)- Physical Chemistry

Unit 1st - Thermodynamics 1st- Student will gain understanding of first law of thermodynamics, Can calculate the q, w, ΔH,ΔU andalso can calculate Enthalpy.

Unit 2nd- Thermodynamics 2nd- Have a knowledge about second and third law of thermodynamics. Can define entropy.

Unit 3rd- Chemical Equilibrium- Student learn depth knowledge about Chemical Equilibrium.

Unit 4th- Electrochemistry 1st, Solutios- Students have a deep knowledge about electrolyte and conductance, different type of solutions, Raoult's and Henry's law

Unit 5th- Electrochemistry2nd, Phase Equilibrium -Can explain about reversible electrode, Nernst Equation, standard electrode potential, determination of pH by electrode. Can define phase, component, degree of freedom, and phase rule.

(CH 204)- Laboratory Practical-

Course Description - The course includes calibration of fractional weight, pipettes, burettes, preparation of standard solutions, dilution, volumetric analysis, gravimetric analysis, thin layer chromatography, paper chromatography, qualitative identification of organic compound, determination of transition temperature, phase equilibrium, thermochemistry

Course Outcomes-After completion of course students gain understanding of

1. Developed skills in the scientific method of planning, developing, reviewing and reporting experiments.
2. Developed skills in the scientific procedure and instruments used in the practical.
3. Developed expertise relevant to the professional practice of chemistry.

Dr. Anju Bhatt
Co-ordinator, NAAC
Rajkiya mahavidyalaya Barkot
Uttarkashi

विभाग प्रभारी
रसायन विज्ञान विभाग
राजकीय महाविद्यालय बड़कोट
उत्तरकाशी

Principal
Rajkiya mahavidyalaya Barkot
Uttarkashi

B.Sc 3 year

Paper 1st-(CH-301)- Inorganic Chemistry

Unit 1st -Transition Metal Complexes-The students are familiar about the transition metal complexes and their stability based on thermodynamic and kinetic aspect.

Unit 2nd - Magnetic Properties of Metal Complexes and Electronic Spectra - Can understand magnetic properties and electronic spectra of some inorganic molecule.

Unit 3rd- Organometallic Compounds - Students can understand the concept of organometallic compound and also have some idea about inorganic polymers

Unit 4th- Hard and Soft Acid and Basis-Have some idea about HSAB principle, about inorganic acid and basis.

Unit 5th - Bioinorganic Chemistry-Can have idea about the metals in bioinorganic molecule and their importance.

Paper 2nd(CH-302)-Organic Chemistry

Unit 1st- Spectroscopy- Students are able to elucidate NMR spectra of some simple organic molecules

Unit 2nd- Organometallic Compound- Can understand organometallic compound and heterocyclic compound and their chemical and biological importance and structure

Unit 3rd-Carbohydrates, Amino Acid ,Peptides, Properties and Nucleic acid -Students are able to understand the reaction and structure of different carbohydrates molecule and their importance.Students can recognize different amino acids and can understand the chemical structure of nucleic acid as well as DNA

Unit 4th- Fats Oil and Detergents-They are able to know the basic reaction used in fat oil and detergent industries.

Unit 5th- Organic Reaction via Enolates- They can predict mechanism of reactions which proceed through enolate formation

Paper 3rd-(CH-303)- Physical Chemistry

Unit 1st- Photo Radiation Elementary Quantum Mechanics-Can understand photo radiation absorption and emission by modals. Now able to calculate the energies of electrons, and also can construct MOs and AOS

Unit 2nd- Physical Properties and Molecular Structure - Can calculate dipole momentum and structure of molecule

Unit 3rd- Spectroscopy - Familiar with the basics of spectroscopy can drive the different energy levels equation for rotational vibrational, Raman and electronic spectra.

विभाग
रसायन विज्ञान
राजकीय महाविद्यालय
उत्तरकाशी

Dr Anju Bhatt
Co-ordinator, NAAC
Rajkiya mahavidyalaya Barkot
Uttarkashi

Principal
Rajkiya mahavidyalaya Barkot
Uttarkashi

Unit 4th- Photochemistry

Students can have knowledge about law photochemistry differentiate photochemical reactions with thermal reaction mechanism.

Unit 5th- Solutions, Dilute Solutions and Colligative Properties- Have a deep knowledge about solutions and their colligative properties.

(CH-304)- Laboratory Practical

Course Description- The course includes-inorganic synthesis, colorimetry, steam distillation, column chromatography, thin layer chromatography, organic synthesis, refractometer, polarimetry, conductometry, molecular weight determinations

Course Outcomes-After completion of course students gain understanding of

1. Developed an understanding of concept of chemistry
2. Developed some understanding of the professional and safety responsibilities residing in working withchemical
3. How to perform inorganic and organic synthesis with a good yield and purity.
4. How to handle the different instruments used in practical as column, conductometer.

विभाग प्रभारी
रसायन विज्ञान विभाग
राजकीय महाविद्यालय बड़कोट
उत्तरकाशी

Dr. Anju Bhatt
Co-ordinator, NAAC
Rajkiya mahavidyalaya Barkot
Uttarkashi

Principal
Rajkiya mahavidyalaya Barkot
Uttarkashi