

Department of Chemistry

Course outcomes

B.Sc 1st year

Paper 1st (CH-101) - Inorganic chemistry

Unit 1st - Atomic Structure - Help students to learn about dual nature of electrons which is helpful to understand quantum chemistry

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

Unit 3rd - Chemical Bonding - Have detailed knowledge about the theories of covalent bonds, ionic bond, weak forces, students can find the shape and geometry of molecules

Unit 4th - S Block Elements - Able to understand the different compounds formed by the chemical reactions of s block elements and Noble gases

Unit 5th - P Block elements - Able to understand the different 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 to understand different type of bonds by learning about concept of hybridization, resonance, hyperconjugation, inductive effect 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 their cyclic structure (Cycloalkane)

Unit 2nd - Stereochemistry of Organic Compound - students can find the different shape and geometry and conformation of the molecule.

Unit 3rd - Alkenes Cycloalkenes, Dienes and Alkynes - The students can find the different product 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 compound and their chemical reaction mechanism.

Unit 5th Alkyl and aryl Halide - Can understand the chemical reaction 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 vapors state, real and ideal behavior of gases,

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 concept of colloids, 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, M.P. and B.P. determination, distillation, sublimation, 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 M.P. apparatus, crystallization, distillation, sublimation.


Dr. Preetpal Singh
Co-ordinator, NAAC
S.D.M. Govt. P.G. College,
Doiwala, Dehradun.


PRINCIPAL
S.D.M. Govt. PG College
Doiwala (Dehradun)

4. Get the idea about different functional group and their chemical reactions
5. Can able to find surface tension and viscosity of liquids which can clear their theories doubt also.

BSC 2nd year

Paper 1st (CH-201)- Inorganic chemistry

Unit 1st- Transition Elements- Students can compare the transition properties and the chemical behavior of 1st, 2nd, and 3rd transition series.

Unit 2nd-Co-Ordination Compound- Students are able to calculate the EAN and got Deep knowledge of theories of co-ordination compound

Unit 3rd-Chemistry of Lanthanides and Actinides-Can understand the periodic properties and chemical properties of Lanthanide and Actinide.

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

Unit 5th- Acids and Bases, Non Aqueous Solvents - Able to find the difference between acids and basis . Have a knowledge about the Arrhenius ,Bronsted theory. Can explain the non aqueous solvent and reaction in non aqueous solvent.

Paper 2nd – (CH-202)- Organic chemistry

Unit 1st - Electromagnetic Spectrum and Absorption Spectra-Students are able to interpret the IR and UV Spectra of simple molecule

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 Epoxide, Aldehyde and Ketone –They can differentiate between the aldehyde and ketonic functional group

Unit 4th – Carboxylic Acids – Student can compare acidic behavior of different molecule

Unit 5th – Organic Compound Of Nitrogen – 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, delta H, and delta U, also 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- ,Solutions – Have a deep knowledge about electrolyte and conductance, different type of solutions, Raoult's and Henry's law

Unit 5th – Electrochemistry 2nd , 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, and can use these concepts in material science and Engineering.

(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, Identification of organic compound qualitatively ,Determination of transition Temperature, phase Equilibrium, thermochemistry

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

Developed skills in the scientific method of planning, developing, conducting, 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.


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Co-ordinator, NAAC
S.D.M. Govt. P.G. College,
Doliwala, Dehradun.


PRINCIPAL
S.D.M. Govt. PG College
Doliwala (Dehradun)

B.Sc 3rd 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.

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 level equation for Rotational Vibrational, Raman ,and Electronic spectra.

Unit 4th – Photochemistry – Students can have knowledge about laws photochemistry also can differentiate photochemical reaction 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, organic synthesis, conductometry, refractometer, polarometry, 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 with chemical
3. How to perform inorganic and organic synthesis with a good yield and purity.
3. How to handle the different instruments used in practical as Column, Conductometer.



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