

KAKCHING KHUNOU COLLEGE

KAKCHING KAUNOU UMATHEL, KAKCHING DISTRICT, MANIPUR, 795103



DEPARTMENT OF CHEMISTRY

PROGRAM OUTCOMES (PO)

(B.Sc Chemistry)

After successful completion of three years degree program in chemistry, a student should be able to:

- ❖ Apply the knowledge gained from various branches of chemistry for higher studies.
- ❖ Demonstrate, solve and understand major concepts in all branches of chemistry.
- ❖ Solve problems and also think logically, methodically and draw a logical conclusion.
- ❖ Acquire critical thinking and scientific knowledge to design, convey out, record and analysis the result of the chemical reactions.
- ❖ Create awareness of impact of the chemistry on the environment, society and development outside the scientific community.
- ❖ Find out green route for chemical reaction for sustainable development.
- ❖ Inculcate scientific temperament in the students and outside the scientific community.
- ❖ Use modern techniques, decent equipments and chemistry softwares.
- ❖ Develop ability and the skills to acquire expertise over solving both theoretical and applied chemistry problems.
- ❖ Understand the concept of chemistry to interrelate and interact with the other subject like mathematics, physics, biological science etc.
- ❖ Get job opportunities in both government and private sectors like pharmaceutical industries, chemical manufacturing industries, plastic industries, agrochemical industries, forensic science department, Geochemical departments, water and waste management, oil and natural gas industries etc.
- ❖ Pursue their career in the field of teaching and technical writings.
- ❖ Appear entrance tests to joint to ISRO, B.Tech, Banking, SSC and Railways etc.

PROGRAM SPECIFIC OUTCOMES(PSO)

- ❖ Learn about the potential uses of analytical industrial chemistry.
- ❖ Carry out experiments in the area of organic and inorganic analysis, estimation, separation, derivation process, P^H metric, conductometric and potentiometric analysis.
- ❖ Learn the classical status of thermodynamics.
- ❖ Gather attention about the physical aspect of atomic structure, various energy transformation, molecular assembly in nanolevel and significance of electrochemistry.
- ❖ Understand good laboratory practices and safety.
- ❖ Introduce advance techniques and ideas required in developing area of chemistry.
- ❖ Make aware and handle the sophisticated instruments.
- ❖ Enhance students' ability to develop mathematical model for physical system.

COURSE OUTCOMES (CO)

(B.Sc Chemistry)

SEMESTER-I

Subject Code: CH-101

Subject Name: Chemistry (Inorganic, Organic and Physical)

After completion of this course students will be able :

- ❖ To understand the theory behind the Atomic structure, chemical bonding, classification of elements and quantitative and qualitative analysis of acids, bases etc.
- ❖ To understand the molecular structure and bonding, mechanism of organic reactions.
- ❖ To learn various theories related to the properties of gases, liquids and solids.
- ❖ To analyse inorganic mixtures and to estimate metals volumetrically.

SEMESTER-II

Subject Code: CH-202

Subject Name: Chemistry (Inorganic, organic and physical)

After completion of this course students will be able :

- ❖ To acquire the various concepts of acids, bases, redox reactions, non-aqueous solvents and properties of s-block elements.
- ❖ To acquire the knowledge of stereochemistry of organic compounds, structure and aromaticity of arenes, electrophilic and nucleophilic substitution reactions.
- ❖ To learn about various laws related to solutions, colloids and surface chemistry.
- ❖ To have the concept of distillation and crystallisation of organic compounds.

SEMESTER-III

Subject code: CH-303

Subject Name: Chemistry (Inorganic, organic and physical)

After completion of this course students will acquire:

- ❖ The knowledge of metallurgy of certain metals like Li, K, Be, Sn, Sb, Bi, Cr, Mn etc, comparative study of p-block elements, d-block elements and theories governing the co-ordination chemistry.
- ❖ The knowledge of various chemical properties of phenols, ethers, epoxides, aldehydes ketones and nitrogen containing organic compounds.
- ❖ The concepts of thermochemistry and thermodynamics, criteria and principles of chemical equilibrium and the law of chemical kinetics.
- ❖ To determine the surface tension, viscosity and P^H of the given liquid etc.

SEMESTER-IV

Subject code: CH-404

Subject Name: Chemistry (Inorganic, organic and physical)

After completion of this course students will be able :

- ❖ To understand the positions and properties of lanthanides, actinides and noble gases and the concepts of hardness and softness of acids and bases.
- ❖ To have the knowledge of structure, preparation, properties of carboxylic acids and its derivatives, organometallics and polymers.
- ❖ To have the concepts of catalysis, ionic equilibria and phase equilibria.
- ❖ To have the concept how to determine the hardness of water and saponification value of the given fat or oil and to estimate the amount of reducing sugar.

SEMESTER-V

Subject code: CH-505

Subject Name: Inorganic Chemistry

After completion of this course students should be able :

- ❖ To know the Nuclear and Radiochemistry and its applications.
- ❖ To understand the chemistry of compounds of non-transition elements, characteristics and relationships of 3d, 4d and 5d elements, role of transition elements in biology, alloy formation and interhalogens.
- ❖ To understand the fundamental Laws of UV-visible spectroscopy and IR spectroscopy and its application in chemical analysis.
- ❖ To study a brief outline of thermodynamics and its treatment and preventive measures.
- ❖ To prepare inorganic complexes, to estimate two constituents from a binary mixture and semimicroanalysis.

SEMESTER-V

Subject code: CH-506

Subject Name: Organic Chemistry

After completion of this course students should be able :

- ❖ To have the knowledge about the chemical characteristics of Carbohydrates, Nucleic acids, Natural fats and oils, Terpenoids and Alkanoids.
- ❖ To get the complete knowledge of enzymes (biocatalysts).
- ❖ To provide the knowledge of different types of synthetic dyes.

SEMESTER-V

Subject code: CH-507

Subject Name: Physical Chemistry

After completion of this course students should be able :

- ❖ To understand how mathematics is applied in chemistry.
- ❖ To understand the fundamental treatment and the study of atomic structure, quantum chemistry and photochemistry.
- ❖ To understand the laws governing energetics, specific heat of solids and statistical thermodynamics.
- ❖ To understand how molecules interact with electromagnetic radiations.
- ❖ To know the synthesis of polymers, the metallic and electrolytic conductances and their measurements.
- ❖ To study equilibrium, P^H metric and potentiometric titration and phase equilibria experimentally.

SEMESTER-VI

Subject code: CH-608

Subject Name: Inorganic Chemistry

After completion of this course students should be able :

- ❖ To understand the theories and rules governing the bonding in coordination compounds, the magnetic properties of transition metal complexes.
- ❖ To know the different types of inorganic polymers.
- ❖ To understand thermoanalytical methods like TGA, DTA, DSC and factors affecting these techniques.
- ❖ To understand about organometallics, 18 electron rules and its applications.
- ❖ To have the knowledge of bioinorganic chemicals and biological role of the ions Na^+ , K^+ , Ca^+ etc.
- ❖ To understand about inorganic rings and cages, non-stoichiometric compounds, structures and defects on their crystal lattices.

SEMESTER-VI

Subject code: CH-609

Subject Name: Organic Chemistry

After completion of this course students should be able :

- ❖ To introduce and provide knowledge of Green chemistry.
- ❖ To provide the knowledge of Medicinal Chemistry (Drugs and Antibiotics).
- ❖ To introduce the knowledge of basic instrumental techniques (chromatography, NMR, Mass-spectroscopy etc.)
- ❖ To provide the knowledge about the complete identification of organic compounds through qualitative analysis and their preparations.

SEMESTER-VI

Subject code: CH-610

Subject Name: Physical Chemistry

After completion of this course students should be able :

- ❖ To understand the basic concept of computer and its application in chemistry.
- ❖ To understand Schrodinger wave equation and its importance and application.
- ❖ To understand about the rotational spectra and vibrational spectra of diatomic molecules and Raman spectroscopy.
- ❖ To understand about the symmetry operation of various point groups.
- ❖ To know about the construction of chemical cells, concentration cells, their kinds and applications and theories of strong electrolytes.
- ❖ To learn about the basic principles of statistical thermodynamics.
- ❖ To understand about surface active agents and micelles formation.
- ❖ To learn about the collision theory and transition state theory of the reaction rates, mechanism and kinetics of complex reaction.
- ❖ To learn about phase equilibria of two components system, solid solutions.
