



Department of Chemistry
Baosi Banikanta Kakati College, Nagaon, Barpeta (Assam)

Programme Outcome

PO1: Students will be skilled in problem solving, critical thinking and analytical reasoning.

PO2: Students would have clear understanding of the concepts related to all the major aspects in chemistry viz., Physical, Inorganic, Organic, Biochemistry, Analytical Chemistry, polymer chemistry, Fuel chemistry, Chemical technology etc.

PO3: Students will be able to design, carry out, record and analyse the results of chemical experiments.

PO4: Students will be able to know the proper procedures and regulations for safe handling and use of chemicals.

PO5: Students will understand the ethical and environmental dimensions of problems and issues facing by chemists.

PO6: Students find employment opportunities in various domains of teaching, industry and other jobs in both government and private sectors.

Course Outcome
(B.Sc. Honors and Regular course)

Sl. no.	Course code	Title of the paper	Course Outcome
1	CHE-HC-1016	Inorganic Chemistry-I	1. Have the concept related to atomic and molecular structure. 2. Have the concept of chemical bonding, periodic properties and redox behavior of chemical species.
		Lab	1. Have hands on experience of standard solution preparation in different core units. 2. Learn volumetric estimation through titration.
2	CHE-HC-1026	Physical Chemistry-I	1. Learn the kinetic theory of gases, ideal gases and real gases. 2. Learn the qualitative treatment of the structure of the liquid along with properties like vapour pressure surface tension, viscosity. 3. Elementary idea of symmetry 4. Learn the basic solid state chemistry. 5. Learn about ionic equilibria.
		Lab	1. Learn the experimental determination of surface tension, viscosity. 2. Learn experimental determination of pH of solution and pH metric filtration.
3	CHE-HG/RC-1016	Chemistry 1	1. Students will learn the atomic structure through the basic concepts of quantum mechanics. 2. Students will understand the chemical bonding through VB and MO approaches. 3. In organic part, the students are expected to learn basic ideas used in organic chemistry, stereochemistry, functional groups, alkanes, alkenes, alkynes etc.
		Lab	1. Estimation of different metal ions by titration method. 2. Detection of elements (N, S, Cl, Br and I) in organic compounds. 3. Separation of mixtures by Chromatography.
4	CHE-HC-2016	Organic Chemistry-I	1. Learn to identify different classes of organic compounds and describe their elasticity. 2. Learn to analyze chemical and stereo chemical aspects of organic compounds.



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		Lab	1. Learn to determine the m.p. and b.p. of organic compound. 2. Learn to determine a mixture of two definite organic compounds.
5	CHE-HC-2026	Physical Chemistry-II	1. Learn the laws of Thermodynamics, thermo chemistry and Thermodynamic function. 2. Learn partial molar quantities. 3. Learn about chemical equilibrium. 4. Learn about solution and colligative properties.
		Lab	1. Learn to measure / calculate heat capacity of calorimeter, enthalpy of neutralization, intrigral enthalpy.
6	CHE-RC/HG-2016	Chemistry 2	1. Students will learn periodic properties in main group elements, transition metals. 2. Learn the crystal field theory in coordination chemistry unit. 3. Learn the kinetic theory of gases, ideal gas and real gases, surface tension, viscosity, basic solid state chemistry and chemical kinetics.
		Lab	1. Semi-micro qualitative analysis of ions using H ₂ S of mixtures. 2. Surface tension measurement, Viscosity measurement.
7	CHE-HC-3016	Inorganic Chemistry-II	1. Learn to apply theoretical principles of redox chemistry in the understanding of metallurgical process. 2. Learn to identify the variety of S and P block compounds and their preparation structure, bonding properties and uses.
		Lab	1. Learn the quantitative estimation skill. 2. Learn the preparative method in inorganic chemistry.
8	CHE-HC-3026	Organic Chemistry-II	1. Learn to describe classify organic compounds in terms of their function groups and reactivity.
		Lab	1. Learn to detect functional groups experimentally. 2. Learn the preparative methods of some organic compounds.
9	CHE-HC-3036	Physical Chemistry-III	1. Learn phase rule and its applications in some specific systems. 2. Learn rate laws of chemical reactions and their determination.
		Lab	1. Learn experimental determination of CST. 2. Learn to construct phase diagram. 3. Learn to study the kinetics of some reactions.
10	CHE-RC/HG-3016	Chemistry 3	1. To understand the chemical system from thermodynamic points of view. 2. They will also learn chemical equilibrium and ionic equilibrium. 3. The students are expected to learn various classes of organic molecules-alkyl halides, aryl halides, alcohols, phenols, ethers, aldehydes and ketones.
		Lab	1. Determination of heat capacity of calorimeter, enthalpy, pH measurements. 2. Purification of organic compounds by crystallization, Preparations of organic compounds, recrystallisation, melting point determination and calculation of quantitative yields.
11	CHE-HC-4014	Inorganic Chemistry-III	1. Learn the nomenclature, structure, bonding, variety and reactivity of co-ordination compound. 2. Learn the general trends in the properties of transition elements in the periodic table. 3. Learn the useful and harmful aspects of metals in biological systems.
		Lab	1. Learn to prepare, estimate or separate metal compound. 2. Learn to design experiments independently depending upon the requirements.
12	CHE-HC-4026	Organic Chemistry-III	1. Learn to identify and classify different types of N based derivatives including alkaloids and terpenoids and their potential applications. 2. Learn about structures, synthesis and reactivity of N based compounds.
		Lab	1. Learn experimental detection of elements and functional groups in organic compounds.



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13	CHE-HC-4036	Physical Chemistry-IV	1. Learn theories of conductance and electrochemistry. 2. Learn the basic theoretical ideas of electrical and magnetic properties of atoms and molecules.
		Lab	1. Learn experimental definition of cell constant equivalent conductance dissociation construction of weak acid. 2. Learn to perform conductometric and potentiometric titration.
14	CHE-SE - 4014	Analytical Clinical Biochemistry	1. Expected to learn the basics of analysis of pathological samples (blood and urine). 2. Able to identify various molecules relevant to a particular pathological condition and their estimation protocols.
15	CHE-RC/HG-4016	Chemistry 4	1. The students learn solutions, phase rule and its application in specific cases, basics of conductance and electrochemistry. 2. Students will also learn some important topics of organic and biochemistry- carboxylic acids, amines, amino acids, peptides, proteins and carbohydrates.
		Lab	1. Experimental study of equilibrium of reactions by the distribution method, construction of the phase diagram, performs the conductometric titrations, perform the potentiometric titrations. 2. Systematic Qualitative Organic Analysis of Organic Compounds possessing monofunctional groups (-COOH, phenolic, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative. 3. Separation of amino acids by paper chromatography. 4. Determination of the saponification value and iodine value of an oil/fat. 5. Extraction of DNA from onion/ cauliflower.
16	CHE-HC-5016	Organic Chemistry-IV	1. Students will be able to explain/describe the important features of nucleic acids, amino acids and enzymes and develop their ability to examine their properties and applications.
		Lab	1. Students will be able to do the experimental estimation of glycine, estimation of proteins etc. 2. Students will be able to do the saponification value of an oil or a fat, determination of Iodine number of an oil/ fat and isolation and characterization of DNA from onion/ cauliflower/peas.
17	CHE-HC-5026	Physical Chemistry-V	1. To understand the application of quantum mechanics in some simple chemical systems such as hydrogen atom or hydrogen like ions. 2. To learn chemical bonding in some simple molecular systems. 3. To understand the basics of various kinds of spectroscopic techniques and photochemistry.
		Lab	1. To learn the experimental understanding of UV/Visible spectroscopy. 2. To learn the experimental understanding of the Lambert-Beer's law application.
18	CHE-HE-5026	Analytical Method in Chemistry	1. To have theoretical understanding about choice of various analytical techniques used for qualitative and quantitative characterization of samples.
		Lab	1. To gain hands on experience of the different chromatography techniques. This will enable students to take judicious decisions while analyzing different samples.
19	CHE-HE-5056	Polymer Chemistry	1. To learn about basic polymer chemistry. 2. To learn the brief introduction of preparation, structure and properties of some industrially important and technologically promising polymers.
		Lab	1. To gain experimental experience of the synthesis, characterization and analysis of various polymers by different techniques.
20	CHE-SE-5014	Chemical Technology & Society	1. Students shall be familiarized with processes and terminologies in chemical industry, like mass balance, energy balance etc... 2. To use chemical and scientific literacy as a means to better understand the topics related to the society.



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21	CHE-RE-5056	Polymer Chemistry	1. To learn the definition and classifications of polymers, kinetics of polymerization, molecular weight of polymers, glass transition temperature, and polymer solutions etc. 2. To learn the brief introduction of preparation, structure and properties of some industrially important and technologically promising polymers.
		Lab	1. Experimentally synthesis, characterization and analysis of polymers by different methods.
22	CHE-HC-6016	Inorganic Chemistry-IV	1. Students will be expected to learn about how ligand substitution and redox reactions take place in coordination complexes. 2. Students will also learn about organometallic compounds, comprehend their bonding, stability, reactivity and uses. 3. They will be familiar with the variety of catalysts based on transition metals and their application in industry. 4. Students will be able to appreciate the use of concepts like solubility product, common ion effect, pH etc. in analysis of ions and how a clever design of reactions, it is possible to identify the components in a mixture.
		Lab	1. To supplement their theoretical knowledge, students would also do the Experiments related to synthesis and characterization of coordination compounds.
23	CHE-HC-6026	Organic Chemistry-V	1. Students will be able to explain/describe basic principles of different spectroscopic techniques and their importance in chemical/organic analysis. 2. Students shall be able to classify/identify/critically examine carbohydrates, polymers and dye materials.
		Lab	1. Experimentally extract caffeine from tea leaves. 2. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars. 3. Qualitative analysis of unknown organic compounds containing monofunctional groups (carbohydrates, aryl halides, aromatic hydrocarbons, nitro compounds, amines and amides) and simple bifunctional groups, for e.g. salicylic acid, cinnamic acid, nitrophenols etc. 4. Identification of simple organic compounds by IR spectroscopy and NMR spectroscopy (Spectra to be provided).
24	CHE-HE-6036	Inorganic Materials of Industrial Importance	1. This course will establish the basic foundation of industrial inorganic chemistry among the students. 2. This will be helpful for pursuing further studies of industrial chemistry in future.
		Lab	1. Experiments will help the Students to gather the experience of qualitative and quantitative chemical analysis. 2. Capable of doing analysis of the inorganic materials which are used in our daily life. 3. Students will have insight of the industrial processes.
25	CHE-SE-6034	Fuel Chemistry	1. To learn about the renewable and non-renewable energy sources. 2. To learn about the composition of coal and crude petroleum, their classification, isolation of coal and petroleum products and their usage in various industries. 3. Also learn to determine industrially significant physical parameters for fuels and lubricants.
26	CHE-RE-6036	Inorganic Materials of Industrial Importance	1. This course will establish the basic foundation of industrial inorganic chemistry among the students. 2. This will be helpful for pursuing further studies of industrial chemistry in future.
		Lab	1. Experiments will help the Students to gather the experience of qualitative and quantitative chemical analysis. 2. Capable of doing analysis of the inorganic materials which are used in



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For FYUGP (Semester I and Semester II)

Sl. no.	Course code	Title of the paper	Course Outcome
1	CHE0100104	Chemistry I	1. On successful completion, students would have clear understanding of the concepts related to atomic and molecular structure, chemical bonding, periodicity and states of matter.
		Laboratory Course I	1. Experimental introduce to various laboratory apparatus, calibration of apparatus, preparation of standard solutions, measurement of physical properties, and laboratory safety.
2	SEC0101003	Basic analytical Chemistry	1. Students shall be able to explain the basic principles of chemical analysis. 2. Design/implement microscale and semimicro experiments, record, interpret and analyze data following scientific methodology.
		Lab	1. Learn about chromatographic techniques, separation and identifications of a mixture. 2. Separation of organic compounds present in a mixture by TLC method. 3. Estimation of different metals by gravimetric analysis.
3	CHE0200104	Chemistry II	1. Students shall understand and apply the concepts of chemical bonding, coordination chemistry, acids and bases and the reactive intermediates. 2. They shall also understand the chemistry from a thermodynamic point of view.
		Laboratory Course II	1. Students will acquire preliminary training on quantitative analysis, synthesis of coordination compounds, qualitative analysis of organic compounds and measurement of a few basic thermodynamic parameters.
4	SEC0200303	Analytical Clinical Biochemistry	1. Student will be able to identify various molecules relevant to a particular pathological condition and their estimation protocols. 2. Students are also expected to learn the basics of analysis of pathological samples (blood and urine).
		Lab	1. Identification and estimation of the following: Carbohydrates, Lipids (qualitative and quantitative analysis). 2. Determination of the iodine number of oil, saponification number of oil, concentration of protein. 3. Isolation of protein.