

DEPARTMENT OF CHEMISTRY

POLBA MAHAVIDYALAYA

3-Year Degree/4-Year Honours in Chemistry (NEP 2020)

Session: 2024-25

Course Outcome: B.Sc. Chemistry Programme

Course Name	Course Outcome
CHEMISTRY MAJOR CHEM 101-1: Basic Chemistry-I	Several fundamental aspects of inorganic, organic and physical chemistry is discussed for the basic understanding of the students. The topics covered will help the students for studying higher in chemical sciences. Easy organic chemistry practical using several chemical and physical methods will enhance the basic knowledge of students' hands-on training. Students will be introduced with several basic aspects of theory and practical of chemical sciences. This will grow the foundation of the subject for studying various advanced topics in future semesters.
CHEMISTRY Minor CHEM 102-1: General Chemistry-I	Several fundamental aspects of the subject are discussed so that the principles can be useful for studying other branches of science (physical and/or biological sciences). Practical experiments are designed in such a way that the students of other disciplines can have an experience of hands-on training in chemistry at the primary level. On studying the course, the students will have an idea of chemical sciences, which may be applied for in-depth study of other science streams.
CHEMISTRY MAJOR CHEM 201-1: Basic Chemistry-II	Several basic topics from inorganic, organic and physical chemistry have been chosen for the development of the general chemistry knowledge of the students. This will help to grow the foundation for studying the several aspects of applied chemistry in future. The topics will grow the foundation of the students for the subject chemistry for learning any further advanced topics.
CHEMISTRY Minor CHEM 202-1: General Chemistry-I	Several basic aspects from inorganic, organic and physical chemistry have been discussed. The idea created from this course may help to understand students for further studying physical, biological and material sciences.
CHEMISTRY MAJOR CHEM 301-1: Inorganic Chemistry (Th)	Bonding theories are discussed in this course. After studying several basic aspects of chemistry, students will go through their applications in studying coordination chemistry, s- and p-block elements. On studying different comparative properties s- and p-block elements, proper chemical logic will start to

	be developed among the students.
CHEMISTRY MAJOR CHEM 301-2: Inorganic Chemistry (Prac)	This course has one practical paper. This course helps to grow chemical knowledge through several hands-on qualitative experiments. Syntheses of several coordination compounds is to be learned. Towards qualitative detection of several radicals, different experiments have to be covered. These will actually grow a clear knowledge and conception in chemistry. Moreover, preparation of modern coordination compounds will create an insight to the synthetic coordination chemistry.
CHEMISTRY MAJOR CHEM 401-1: Organic Chemistry (Th)	This course helps to develop knowledge for several basic and advanced topics of organic chemistry such as stereochemistry and reaction mechanism etc.
CHEMISTRY MAJOR CHEM 401-2: Physical Chemistry (Th)	The course will help to develop physical chemistry knowledge of solid, liquid and gaseous states of matter. Students will also learn to do quantum chemical calculations for various systems.
CHEMISTRY MAJOR CHEM 401-3: Organic Chemistry (Prac)	Students will have a hands-on training for detection of elements (N, S, Cl, Br, etc) and functional groups in organic molecules. Synthesis/derivatization of several organic compounds will be studied.
CHEMISTRY Minor CHEM 402-1: General Chemistry-III	This course will help the students to develop advanced topics of chemistry, physics and biology. Students will learn to synthesize several coordination compounds. Students will also learn to estimate hardness of water by chemical analysis.

MULTIDISCIPLINARY COURSES	
CHEM103-1: Chemistry for Household Importance	This course includes only theory paper. After completion of this course, students would be able to explain the chemistry behind household things such as food additives, food color, antibiotics, vitamin, preservatives, soap, detergents and many more. After studying the topics these may help the students to get employment.
CHEM 203-1: Chemistry of Dyes, pigments, cosmetics and perfumes	Idea of every day products of chemical industries are discussed. Development of idea of several molecules and materials related to dye and cosmetics industry may help students to get employment.
CHEM 303-1: Chemistry of Soil and Fertilizer	Exploring the knowledge of fundamental chemistry towards soil, fertilizer, detergent will not only create general chemical knowledge of the students but also will generate the possibility of employability.
SKILL ENHANCEMENT COURSES(SEC)	
CHEM105-1: Drugs and pharmaceuticals	This course includes a theory paper. Theory paper include drug discovery, design and development, synthesis of the representative drugs, analgesics agents, antipyretic agents, anti-inflammatory agents which will make them expertise in pharmaceutical field. It will help to build their job-oriented skill.

CHEM 205-1: Basic Analytical Chemistry	This course will develop the analysis as well as separation skills of the students which may help them to motivate for joining research and/or have employment.
CHEM 305-1: IT skill in Chemistry	This course supports the development of mathematical knowledge and knowledge for computer programming and the knowledge for different data handling software. The course will help the students sound for doing several chemical computations.

Programme Outcome: B.Sc. Chemistry (General) NEP

- The B.Sc. Programme develops scientific spirit among the science graduates.
- This programme enhances observation, precision, analytical mind, logical thinking, clarity of thought and expression among the students.
- This programme teaches the students to formulate and solve problems in a logical manner.
- Students gain proficiency in laboratory techniques and the safe handling of chemicals and equipment. Students should be able to conduct experiments, interpret data, and present findings effectively.
- The field work and project work in this programme make the students compatible to the needs of modern industry and research field.
- The programme also enables the students to appear for various competitive examinations as well as start their own business.
- After completion of this programme, students can apply the principles of chemistry in other scientific disciplines such as biology, physics, materials science, and environmental science, facilitating an interdisciplinary approach to problem-solving.
- The programme is designed for holistic development of the students understand the ethical issues in scientific research and industry. Students should also be aware of the environmental impact of chemical processes and the importance of sustainability in chemical practices.

Programme Specific Outcome: B.Sc. Chemistry Programme (NEP)

After graduating with a degree in chemistry, the students have a wide scope in different fields. They can go for a master degree after successful completion of chemistry major programme. There is also a scope for going with research. Apart from opting for higher studies, the students can also build their carrier in a variety of related branches of science.

- Industrial field
- Laboratory technician
- Pathological expertise
- Medical representative and marketing field
- Health Science
- Home Science
- Nutrition expertise
- Analytical Field
- Instrument Operator
- Material Supplier

DEPARTMENT OF CHEMISTRY

POLBA MAHAVIDYALAYA

Course Outcome: B.Sc. Chemistry (General) Programme (CBCS)

Session: 2024-25

CORE COURSES (CC)	
Course Name	Course Outcome
CC1A: General Inorganic and Organic chemistry	This course includes a theory as well as a practical paper. Theory deals with the basic ideas of inorganic and organic chemistry. Origin and fundamental ideas about atomic structure will help to understand the electronic configuration of one and many electron atom. Chemical periodicity will help to understand general characteristics and different periodic properties of s, p, d and f block elements. Different Acids and Bases concepts will help the acidity or basicity nature of the elements. Redox reactions will help to do balance the different chemical reactions by oxidation no or ion-electron methods. Organic chemistry begins with the knowledge of resonance, hyperconjugation, electrophile, nucleophile, Stereochemistry of the compounds etc which will be helpful in understanding the reaction mechanism.
CC1B: Physical and Inorganic Chemistry	This course includes a theory as well as a practical paper. Physical parts include Vanderwaals equation and its application for explaining real gas behavior which is one of the most important topic of this part. Idea about critical state is needed for deriving the critical constants of real gases. Experimental determination of surface tension and viscosity by stalagmometer and viscometer will create more interest to the students about this course. Inorganic parts will provide comparative studies of different kinds of P-Block elements, bonding nature and Molecular Structure of different homonuclear and heteronuclear Molecules including VSEPR and LCAO approaches.
CC1C: Physical and Organic Chemistry	This course includes a theory as well as a practical paper. After completion of this course, students would be able to explain the concept of enthalpy, entropy, state functions, Carnot engine which will enrich students. They will learn how this parameters change with surrounding pressure, temperature and many more. Functional group app roach for Aromatic hydrocarbons, Organometallic compounds, Aryl halides, Alcohols; Phenols & ethers and Carbonyl compounds (preparations & reactions) to be studied in context to their structures.
CC1D: Physical and Analytical and Environmental Chemistry	This course includes a theory as well as a practical paper. Theory paper include phase diagram, conductance, electromotive forces and different properties of physical existence of an entity. Student will learn chemical analysis, chromatographic technique in analytical part as well as in practical portion.

DISCIPLINE SPECIFIC ELECTIVE COURSES (DSE)	
Course Name	Course Outcome
DSE 1A: Analytical and Industrial Chemistry	This course includes a theory as well as a practical paper. After successfully completing this course, students would gain knowledge about various industrial methods, error analysis, computer applications, Transition Metal including Lanthanoids and actinoids & Coordination Chemistry with Crystal field theory etc.
DSE 1B: Organic and Industrial Chemistry	This course includes a theory as well as a practical paper. After successfully completing this course, students would have a clear idea about large scale industrial preparation of organic compounds, Amino acids & Carbohydrates, polymers, manufacture of paints, dyes, drugs, pesticides, soaps & detergents, fats and other food additives etc.

SKILL ENHANCEMENT COURSES(SEC)	
SEC1: Analytical clinical biochemistry	This course includes a theory paper. After completion of the course students would be able to understand the chemistry behind carbohydrates, proteins, structure & biological actions of DNA and RNA, transcription, replication, translocation, nomenclature & classification of Enzymes, effect of pH and temperature, enzyme inhibition, biocatalysis etc. A keen interest on Gene therapy and Genetic coding grows a new desire among the students. The Students also learn a diagnostic approach using Blood & Urine sample to analyze the biochemistry of a disease.
SEC2: Pharmaceutical Chemistry	This course includes a theory paper. After completion of the course students would be able to understand the chemistry behind drugs and pharmaceuticals and their preparation, identification and applications etc.
SEC3: Computer application in Chemistry	This course includes a theory paper. After completion of the course students would be able to use computer for their study work. Writing chemical equations, drawing structures using various software will enrich their knowledge.
SEC4: Polymer Chemistry	This course includes a theory paper. After completion of the course students would gain knowledge about the various polymeric materials that we use in our daily life. Then synthesis of polymer, uses and applications part are also covered here which will be very interesting to the students.

Programme Outcome: B.Sc. Chemistry (General) CBCS

- The B.Sc. Programme develops scientific spirit among the science graduates.
- This programme enhances observation, precision, analytical mind, logical thinking, clarity of thought and expression among the students.
- This programme teaches the students to formulate and solve problems in a logical manner.
- The laboratory based practical work in this programme enable the students to have hand on experience on various equipment which will enhance their scientific knowledge and employability.
- The field work and project work in this programme make the students compatible to the needs of modern industry and research field.
- The programme also enables the students to appear for various competitive examinations as well as start their own business.
- After completion of this programme, students can engage themselves in diverse fields including medical, engineering, industries education, banking, business public service, self-business etc. proficiently.
- The programme is designed for holistic development of the students so that they become socially responsible, ethically correct and knowledgeable and contribute to the development and progression of the nation.

Programme Specific Outcome: B.Sc. Chemistry (General) Programme (CBCS)

After graduating with a degree in Chemistry, the students have a wide scope in different fields. Apart from opting for higher studies, the students can also build their carrier in a variety of related branches of science:

- Industrial Field
- Laboratory Technician
- Medical Representative and Marketing Field
- Health Science
- Analytical Field
- Instrument Operator
- Material Supplier