

## Department of Chemistry

### Programme Outcome: B. Sc Chemistry

**After successful completion of three year degree program in Chemistry a student should be able to;**

**PO-1.** Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.

**PO-2.** Solve the problem and also think methodically, independently and draw a logical conclusion.

**PO-3.** Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.

**PO-4.** Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

**PO-5.** Find out the green route for chemical reaction for sustainable development.

**PO-6.** To inculcate the scientific temperament in the students and outside the scientific community.

**PO-7.** Use modern techniques, decent equipments and Chemistry software's

### Programme Specific Outcome

## **B.Sc. - MATHEMATICS, PHYSICS, CHEMISTRY (M.P.C.)**

### **Program specific outcome**

**PSO1: Becomes professionally skilled for higher studies in research institutions and to work in chemical industries.**

**PSO2: In-depth knowledge helps to qualify in competitive exams.**

**PSO3: Gains complete knowledge about all fundamental aspects of Chemistry**

**PSO4: Understands the background of organic reaction mechanisms, complex chemical structures, and instrumental method of chemical analysis, molecular rearrangements and separation techniques.**

**PSO5: Ability to interlink the skills and knowledge in mathematics, physics and chemistry and develop an aptitude to address the problems in various fields.**

**PSO6: Analyse the concepts of mathematics, physics and chemistry and understand the relation among them like physical chemistry, mathematical modelling of physics and chemistry problems.**

**PSO7: Understand the theoretical concepts of physical and chemical properties of materials and the role of mathematics in dealing with them in a quantitative way.**

**B.Sc. - MATHEMATICS, CHEMISTRY, COMPUTER SCIENCE (M.C.Cs.)**

**Program specific outcome**

**PSO 1:** Ability to apply knowledge of computing that may be relevant and appropriate to the domain.

**PSO2:** Ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.

**PSO 3:** Understanding of best practices and standards to develop user interactive and abstract application. An ability to assist and manage the execution of an effective project plan.

**PSO4:** Ability to interlink the skills and knowledge in mathematics, physics and chemistry and develop an aptitude to address the problems in various fields.

**PSO5:** Analyse the concepts of mathematics, physics and chemistry and understand the relation among them like physical chemistry, mathematical modelling of physics and chemistry problems.

**PSO6:** Understand the theoretical concepts of physical and chemical properties of materials and the role of mathematics in dealing with them in a quantitative way.

**B.Sc. - BOTANY, ZOOLOGY, CHEMISTRY (B.Z.C.)**

**Program specific outcome**

**PSO1:** Apply the knowledge of biology to make scientific queries and enhance the comprehension potential.

**PSO2:** Practical applications: Identify and classify plants according to the principles of plant systematics, apply techniques like plant propagation methods, organic farming, mushroom cultivation, preparation of bio fertilizers, bio pesticides etc. in daily life.

**PSO3:** To understand principles of origin of life and its evolutionary trends, Microbial diversity, chemical theory related to origin of life.

**PSO4:** To analysis the taxonomic range of various life forms as per their external characters and internal chemical constitutions (chemo taxonomy).

**PSO5:** The knowledge about of ecological and phyto geographical studies related in environmental biodiversity with biotic and abiotic factors.

**PSO6:** Skills to study the principles of tissue culture techniques in biology leads to various diversity of life forms (hybrids) by using chemically synthesised growth hormones.

**B.Sc. - CHEMISTRY, BIOTECHNOLOGY, MICROBIOLOGY (C.B.M)**

**Program specific outcome**

**PSO1:** Acquire knowledge on the fundamentals of biotechnology for sound and solid base which enables them to understand the emerging and advanced engineering concepts in life sciences.

**PSO2:** Acquire knowledge in domain of biotechnology enabling their applications in industry and research.

**PSO3:** To gain knowledge about the application of various types of Microscopy. To classify and explain the structure and general characteristics of micro organisms.

**PSO4:** Students will possess hands-on technical skills necessary to support biotechnology research activity.

**PSO5:** Students will be able to acquire, articulate, retain and apply knowledge relevant to microbiology.

**PSO:6** The design and execution of the experiment should demonstrate an understanding of good laboratory and the proper handling of chemical waste streams and also explain how the applications of Chemistry relates to the world.

**B.Sc. - Zoology, Chemistry, Aquaculture (Z.C.A)**

**Program specific outcome**

**PSO1:** The student will acquire an understanding of the biology of different types of aquaculture products (fish / molluscs etc.)

**PSO2:** To know the basis of technologies of fisheries and *aquaculture*, to understand the principles of its importance, purpose and application.

**PSO3:** Students will understand and adapt scientific knowledge in aquaculture and natural resource conservation planning and development.

**PSO4:** Recognize and apply the principles of atomic and molecular structure to predict chemical properties and chemical reactivity.

**PSO5:** To understand about various animal species, based on Phylum.

**PSO6:** Get an exposure to different process used in industries and their application.

**PSO7:** Recognize and apply the principles of atomic and molecular structure to predict chemical properties and chemical reactivity.

<b>COURSE OUTCOMES</b> <b>B.Sc.,</b> <b>Chemistry</b> <b>Semester-I</b>	
<b>COURSE</b>	<b>COURSE OUTCOMES</b>
<b>I Year B.Sc.,</b> <b>Chemistry</b> <b>Paper I</b>	<p><b>Content 1: p-block elements :</b>  Course outcome:</p> <ul style="list-style-type: none"> <li>• To describe the trends in the physical and chemical properties of group 13 to group 17 elements. Know the Chemistry of some important compounds of Boron, Carbon, and Silicon etc.</li> <li>• Able to tell the name of orbitals by recognizing shapes of orbitals.</li> <li>• Able to draw structures of different ionic solids</li> <li>• To know about Inter halogen compounds and pseudo halogens</li> </ul> <p><b>Content 2: Organometallic compounds</b>  Course outcome:</p> <ul style="list-style-type: none"> <li>• To know the Definition and classification of organometallic compounds, Nomenclature, preparation, properties and applications of alkyls of Li and Mg elements.</li> </ul> <p style="text-align: center;"><b><u>UNIT - II (Organic</u></b></p> <p><b><u>Chemistry)</u> Content 3: Structural theory in organic chemistry :</b>  Course outcome:</p> <ul style="list-style-type: none"> <li>• To Identify and judge the structure, type of reaction, mechanism</li> <li>• To identify chemical behavior of an organic compound during its transformation from reactants to products.</li> <li>• To identify the reason for the aromaticity of various organic compounds that is used in the manufacturing of many products.</li> <li>• To understand the importance of Structural theory in the organic chemistry which provides a strong basic knowledge for the students that helps in their further studies.</li> </ul> <p><b>Content 4: Alicyclic hydrocarbons (Cycloalkanes)</b>  Course outcome:</p> <ul style="list-style-type: none"> <li>• To study about nomenclature, synthesis, isomerism and physical properties of alkanes and cycloalkanes.</li> <li>• To study about the isomerism and types of isomerism.</li> <li>• Understand the nomenclature, synthesis, isomerism and physical properties of alkanes and cycloalkanes</li> <li>• Understand various types of reactive intermediates and factors affecting their stability .</li> </ul>

**Content 5: Benzene and its reactivity**

Course outcome:

- Understand the concept of resonance energy. Concept of aromaticity - General mechanism of electrophilic substitution, mechanism of nitration. Friedel Craft's alkylation and acylation. Orientation of aromatic substitution - Definition of ortho, para and meta directing groups. Ring activating and deactivating groups.

<b>Semester-II</b>	
<b>COURSE</b>	<b>COURSE OUTCOMES</b>
<b>I Year B.Sc., Chemistry Paper II</b>	<p style="text-align: center;"><b>UNIT - I (Physical Chemistry)</b></p> <p><b>Content 1: Solid State:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• To gain knowledge on the Symmetry of crystals and law of Symmetry.</li> <li>• Students should be able to describe the characteristic of the three states of matter.</li> <li>• To understand the concepts of Defects in crystals.</li> <li>• To learn about Bragg's Equation.</li> </ul> <p><b>Content 2: Gaseous State:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• The students will be able to compare and contrast the chemical behavior and physical properties of common substances.</li> <li>• Students should be able to determine the difference between solids, liquids and gases.</li> <li>• To learn about liquefaction of gases i) Linde's method ii) Claude's method.</li> <li>• To learn Vander waal's equation of state.</li> </ul> <p><b>Content 3: Liquid State:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• To know about the Classification of liquid crystals and its applications.</li> <li>• Students will be able to give examples of solids, liquids and gases.</li> <li>• Students will be able to define what matter is and where you can find it.</li> </ul> <p><b>Content 4: Solutions:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• Students will describe the relationship between partial pressures and total pressure as described in Dalton's Law of partial pressure.</li> <li>• To know about the Raoult's law, Henry's law, Nernst distribution law</li> <li>• To gain knowledge on the partially miscible water systems</li> </ul> <p style="text-align: center;"><b><u>UNIT - II (General Chemistry)</u></b></p> <p><b>Content 5: Surface chemistry:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• To know the definition, preparation, purification and properties of Colloids.</li> <li>• To Learn about adsorption isotherms</li> <li>• To gain knowledge on the Liquid in liquid emulsions</li> </ul> <p><b>Content 6: Chemical Bonding:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• To know about the Valency bond theory and Molecular orbital Theory.</li> <li>• To learn LCAO method and M.O Diagrams of Diatomic molecules.</li> </ul> <p><b>Content 7: Stereochemistry of carbon compounds:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• To gain knowledge on Optical isomerism and optical activity</li> <li>• D,L R,S and E,Z configuration</li> <li>• To know the definition of enantiomers and diastereomers.</li> </ul>

<b>Semester-III</b>	
<b>COURSE</b>	<b>COURSE OUTCOMES</b>
<b>II Year B.Sc., Chemistry Paper III</b>	<p style="text-align: center;"><b>UNIT - I (Inorganic Chemistry)</b></p> <p><b>Content -1: d-Block Elements:</b> Course Outcome</p> <ul style="list-style-type: none"> <li>• Will be able to predict magnetic and spectral properties of d-block elements</li> <li>• Can be able to identify the Stability of various oxidation states.</li> <li>• Can be able to explain catalytic properties and ability to form complexes.</li> <li>• To study d block elements which is useful in determination of colored complex formation in Dye industry</li> </ul> <p><b>Content -2: Theories of bonding in metals:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• Can be able to explain Definitions of conductors, semiconductors and insulators</li> <li>• Can be able to identify thermal and electrical conductivity of metals</li> </ul> <p><b>Content -3: Metal carbonyls:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• Can be able to explain EAN rule</li> <li>• Can be able to identify structures and shapes of metal carbonyls</li> <li>• Will be able to predict Effective Atomic number of various compounds.</li> </ul> <p><b>Content -4: f-block elements:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• Will be able to predict magnetic and spectral properties of d-block elements.</li> <li>• Can be able to predict the type of symmetry present in the given molecules.</li> </ul> <p style="text-align: center;"><b>UNIT - II (Organic Chemistry)</b></p> <p><b>Content -5: Halogen compounds:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• To gain command on <math>SN^1</math> and <math>SN^2</math>–reaction mechanism.</li> <li>• Can be able to explain Nucleophilic aliphatic substitution reactions.</li> <li>•</li> </ul> <p><b>Content -6: Hydroxy compounds:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• To identify the reason for the Identification of alcohols by oxidation with <math>KMnO_4</math>, Ceric ammonium nitrate, Lucas reagent</li> <li>• Studying about oxidizing and reducing Reagents, reactions and their mechanisms</li> <li>• To learn about Bromination, Kolbe-Schmidt reaction, Reimer-Tiemann reaction, Fries rearrangement, azo coupling, Pinacol-Pinacolone rearrangement.</li> <li>•</li> </ul> <p><b>Content -7: Carbonyl compounds:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• To understand the importance of Structural theory in the organic chemistry which provides a strong basic knowledge for the students that helps in their further studies.</li> <li>• To Identify and judge the structure, type of reaction, mechanism and chemical behavior of an organic compound during its transformation from reactants to products.</li> </ul>



- Will be able to predict synthesis of ketones from nitriles and from carboxylic acids

**Content -8: Carboxylic acids and derivatives:** Course outcome:

- To understand the ways in which mono, di and unsaturated carboxylic acids are easily prepared by at industrial level
- To learn about Degradation of carboxylic acids by Huns-Diecker reaction, decarboxylation by Schimdt reaction

**Content -9: Active methylene compounds:** Course outcome

- To understand Preparation of a) monocarboxylic acids. b) Dicarboxylic acids. c) Reaction with urea
- To know about the applications in other fields such as organic reaction mechanisms.

<b>SEMESTER-IV</b>	
<b>COURSE</b>	<b>COURSE OUTCOMES</b>
<b>II Year B.Sc., Chemistry Paper IV</b>	<p style="text-align: center;"><b><u>UNIT – I (Spectroscopy)</u></b></p> <p><b>Content -1: Spectrophotometry:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• To understand the ways in transmittance, Absorbance, and molar absorptivity of Beer-Lambert's law</li> <li>• To acquire knowledge on application of Beer-Lambert law for quantitative analysis.</li> </ul> <p><b>Content -2: Electronic spectroscopy:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• To analyze the sample materials by using spectrophotometer in research and development.</li> <li>• To know the Selection rules for electronic spectra.</li> </ul> <p><b>Content -3: Infra red spectroscopy:</b> Course outcome:</p> <ul style="list-style-type: none"> <li>• To acquire the knowledge of handling sophisticated instruments like spectrophotometer which are used to identify functional groups(I.R)</li> <li>• Characteristic absorption bands of various functional groups</li> <li>• To learn about atomic absorption, emission and fluorescence spectrosopes, electro analytical methods and radio chemical methods</li> </ul> <p><b>Content -4: Proton magnetic resonance spectroscopy (<sup>1</sup>H-NMR):</b> CO:</p> <ul style="list-style-type: none"> <li>• Will be able to know N.M.R technique is useful in quality control and research for determining the contents and purity of a sample as well as its molecular structure.</li> <li>• Determine the impurities and conjugation in organic compound and biological macro molecules</li> </ul> <p style="text-align: center;"><b><u>UNIT – II (Physical Chemistry)</u></b></p> <p><b>Content -5: Dilute solutions:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• To gain command on Dilute Solutions, Elevation of B.P. &amp; depression of Freezing point, osmotic pressure, colligative properties</li> <li>• To acquire knowledge on Raoult's law, relative lowering of vapour pressure, its relation to molecular weight of non-volatile solute</li> </ul> <p><b>Content -6: Electrochemistry-I:</b> Course Outcome:</p> <ul style="list-style-type: none"> <li>• To acquire knowledge on Application of conductivity measurements-conductometric titrations.</li> <li>• Students should be able to describe the different physical properties of each state of matter.</li> </ul> <p><b>Content -7: Electrochemistry-II:</b> Course Outcome:</p>

	<ul style="list-style-type: none"><li>• To understand the Nernst distribution law – its thermodynamic derivation, modification of distribution law when solute undergoes dissociation, association and chemical combination. Applications of distribution law</li><li>• Able to derive relationship between modification of distribution law when solute undergoes dissociation</li></ul> <p><b>Content -8: Phase rule:</b> Course Outcome:</p> <ul style="list-style-type: none"><li>• Able to derive relationship between modification of distribution law when solute undergoes dissociation</li><li>• To understand thermodynamic terms: system, surrounding etc. Types of systems, intensive and extensive properties. State and path functions and their differentials</li><li>• Able to predict the energy change in heat capacities at constant volume and pressure and their relationship.</li></ul>
--	---

<b>SEMESTER-V</b>	
<b>COURSE</b>	<b>COURSE OUTCOMES</b>
<b>III Year B.Sc., Chemistry Paper V</b>	<p><b><u>Content 1: Coordination Chemistry:</u></b></p> <ol style="list-style-type: none"> <li>1. To be able to use Crystal Field Theory to understand the magnetic properties of coordination compounds.</li> <li>2. To be able to describe the shapes and structures of coordination complexes with CN 4 &amp; 6</li> <li>3. To be able to recognize the types of isomers in coordination compounds.</li> <li>4. To be able to name coordination compounds and to be able to draw the structure based on its name.</li> <li>5. To become familiar with some applications of coordination compounds. At the end of the course, the student has acquired knowledge on the chemistry of coordination compounds and their properties as well as the principal laboratory methodologies for the synthesis and characterization of coordination compounds.</li> </ol> <p><b><u>Content 2: Spectral and magnetic properties of metal complexes:</u></b></p> <p>Student will be able to know the Electronic absorption spectrum of complex ions. Types of magnetic behavior, spin-only formula, calculation of magnetic moments, Experimental determination of magnetic susceptibility</p> <p><b><u>Content 3: Stability of metal complexes:</u></b> To be able to describe the Thermodynamic stability and kinetic stability of metal complexes.</p> <p><b><u>Content 4: Nitro alkanes:</u></b> To be able to know the -Tautomerism of nitroalkanes leading to aci and keto form, Preparation and chemical reactivity of Nitroalkanes.</p> <p><b><u>Content 5: Amines:</u></b> To be able to learn Classification into 1°, 2°, 3° Amines, preparative methods and chemical properties of amines.</p> <p><b><u>Content 6: Cyanides and Isocyanides:</u></b></p> <p>To be able to know the Preparation of Cyanides from: a) Alkyl halides b) from amides c) from aldoximes. Preparation of Isocyanides from: Alkyl halides and Amines. Chemical properties of Cyanides and Isocyanides:</p> <p><b><u>Content 7: Thermodynamics:</u></b></p> <ol style="list-style-type: none"> <li>1. Define the meaning of the state of a working substance.</li> <li>2. Understand concepts of heat, work, and energy.</li> <li>3. Explain basic thermodynamic properties and units.</li> <li>4. Develop and apply the continuity equation for open and closed</li> </ol>

systems.

5. Derive and discuss the first law of thermodynamics.
6. Discuss basic thermodynamic cycles and systems.
7. Apply the second law of thermodynamics to thermal cycles.

<b>SEMESTER -V</b>	
<b>COURSE</b>	<b>COURSE OUTCOMES</b>
<p style="text-align: center;"><b>III Year B.Sc., Chemistry Paper VI</b></p>	<p style="text-align: center;"><b>UNIT –I (Inorganic Chemistry)</b></p> <p><u>REACTIVITY METAL COMPLEXES:</u> <u>COURSE OUTCOMES:</u></p> <ul style="list-style-type: none"> <li>• Can be able to explain the substitution reactions of square planar complexes</li> <li>• To understand the biological significance of Na, Mg, Ca, Fe, Co, Ni, Cu, Zn and Cl.</li> <li>• To learn about Trans effect and its application.</li> <li>• Can be able to draw and explain the structure and functions of haemoglobin, myoglobin and chlorophyll.</li> </ul> <p style="text-align: center;"><b>UNIT –II (PHYSICAL CHEMISTRY)</b></p> <p><u>CHEMICAL KINETICS:</u> COURSE OUTCOME:</p> <ul style="list-style-type: none"> <li>• To know about the Order and Molecularity.</li> <li>• Can be able to derive the Rate constants for First, Second, Third and Zero order reactions and examples.</li> </ul> <p><u>PHOTO CHEMISTRY:</u> COURSE OUTCOME:</p> <ul style="list-style-type: none"> <li>• To gain the knowledge about Laws of Photo chemistry- Grothus Drapers law and Stark-Einstein's law of photochemical equivalence.</li> <li>• To be able to predict the Qualitative description of fluorescence, phosphorescence, photosensitized reactions.</li> </ul> <p style="text-align: center;"><b>UNIT-III(ORGANIC CHEMISTRY)</b></p> <p><u>HETEROCYCLIC COMPOUNDS:</u> <u>COURSE OUTCOME:</u></p> <ul style="list-style-type: none"> <li>• To study about the five membered ring compounds with one heteroatom.</li> <li>• Will be able to predict the Electrophilic substitution at 2 or 5 positions Halogenation, Nitration and Sulphonation.</li> </ul> <p><u>CARBOHYDRATES:</u> COURSE OUTCOME:</p> <ul style="list-style-type: none"> <li>• Will be able to explain the cyclic structure of Glucose.</li> <li>• To predict the cyclic structure of Fructose.</li> <li>• Can be able to explain the formation of Osazone from Glucose and Fructose.</li> </ul>

AMINO ACIDS AND PROTINES: COURSE OUT COME:

- To learn about the definition and classification of amino acids.
- To understand the preparation of alpha aminoacids.
- To learn about the zwitter ion.
- Will be able to predict the peptides and proteins.

<b>SEMESTER-VI</b>	
<b>COURSE</b>	<b>COURSE OUTCOMES</b>
III Year B.Sc., Paper-VII (Elective paper) <b>ENVIRONMENTAL            CHEMISTRY</b>	<p><b><u>Content 1: Environmental Chemistry-Introduction:</u></b>            Course Outcome: Demonstrate knowledge of chemical and biochemical principles of fundamental environmental processes in air, water, and soil. Apply basic chemical concepts to analyze chemical processes involved different environmental problems (air, water &amp; soil).</p> <p><b><u>Content 2: Air pollution:</u></b> Ability to identify air pollution problems and interpret air quality data on chemical characteristic. Ability to recognize various biotic and abiotic environmental transformation processes of pollutants.</p> <p><b><u>Content 3: Water Pollution:</u></b> After studying this course, student should be able to: describe the chemical ... describe the main sources of <i>water pollution</i>, the main types of pollutant and how each type may be <i>controlled</i>. Outline the extent of <i>water pollution</i>.</p> <p><b><u>Content 4: Chemical Toxicology:</u></b> Explain the basic concepts of chemical hazard and exposure as determinants of chemical toxicity. Describe key pathways and mechanisms of chemical absorption, distribution, metabolism, storage and excretion in the human body. Explain dose-response relationships as the basis of toxicity.</p> <p><b><u>Content 5: Ecosystem:</u></b> define the basic rules and concepts of the ecology science. Define all biotic and abiotic factors that are related to individual, population, community and ecosystem and defines the relationships between them. Define the ecosystems and material cycles.</p> <p><b><u>Content 6: Biodiversity:</u></b> To determine the best predictors of success for protected areas in conserving biodiversity ("biodiversity outcomes", such as population increase, or decreased rate of decline), and to establish mechanisms to maintain such analysis into the future.</p>
<b>SEMESTER-VI</b>	
<b>COURSE</b>	<b>COURSE OUTCOMES</b>
<b>III B.SC            CLUSTER            ELECTIVE – 1</b>	<p style="text-align: center;"><b>FUEL CHEMISTRY AND BATTERIES</b></p> <p><b>UNIT-I</b></p> <ul style="list-style-type: none"> <li>• Will be able to know about the fuels and their calorific values.</li> <li>• Can be able to know the composition of coal gas ,water gas, producergas and their manufacture</li> </ul> <p><b>UNIT-II</b></p> <ul style="list-style-type: none"> <li>• Will be able to get knowledge of composition of crude oil</li> <li>• Can be able to know the refining process of crude oil</li> </ul> <p><b>UNIT-III</b></p> <ul style="list-style-type: none"> <li>• Can be able to get the knowledge of converting crude oil and naturalgas into various effective fuels of high calorific value like LPG, CNG, petrol etc.,</li> <li>• Can be able to know the composition and importance of variousfuels</li> </ul> <p><b>UNIT-IV</b></p> <ul style="list-style-type: none"> <li>• Will be able to know about the lubrication process and varioustypesof lubricants and their properties</li> </ul> <p><b>UNIT-V</b></p> <ul style="list-style-type: none"> <li>• Able to know the difference between primary and secondary</li> </ul>



	<p>batteries.</p> <ul style="list-style-type: none"><li>• Can able to know the construction and working of various batteries</li></ul>
--	--

III B.Sc  
CLUSTER  
ELECTIVE –2

**INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE**

**UNIT-I: RECAPITULATION OF s- AND p-BLOCK ELEMENTS:**  
COURSE OUTCOMES:

- Will be able identify the periodicity in s- and p- block elements with respect to electronic configuration, atomic size, ionization enthalpy, electronegativity.
- To learn about the inert pair effect, diagonal relationship and anomalous behaviour of first member of each group.

**UNIT-II: SILICATE INDUSTRIES:**  
COURSE OUTCOMES:

GLASS:

- Will be able to explain the glassy state and its properties.
- To able to identify the composition of soda lime glass, lead glass, safety glass, and photosensitive glass.

CERAMICS:

- Will be able to predict the classification of cement, ingredients and their role.
- Can be able to explain the manufacture of cement setting process, quick setting cements.

**UNIT-III: FERTILIZERS:**

COURSE OUTCOMES:

- Can be able to identify the different types of fertilizers.
- Will be able to manufacture of the urea, ammonium, nitrate, calcium ammonium nitrate, ammonium phosphate, polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

**III B.SC**  
**CLUSTER**  
**ELECTIVE – 3**

**ANALYSIS OF APPLIED**  
**INDUSTRIAL**  
**PRODUCTS**

**UNIT**

-

**I**

- Will be able to know the composition of various soaps and oils.
- Will be able to determine the various parameters of testing quality of soap and oils.

**UNIT-**

**II**

- Will be able to know the composition of different types of paints.
- Can be able to analyse the quality of various paints and industrial solvents.

**UNIT-**

**III**

- Can be able to determine the composition of various fertilisers and pesticides.
- Can be able to check the quality of fertilisers and pesticides.

**UNIT-**

**IV**

- Will be able to know the quality of fuels like petrol and diesel through their octane number and cetane number.
- Can be able to know the percentage of various gaseous fuels in their mixture and the quality of coal.

**UNIT-V**

- To get the knowledge of testing the quality of cement.

- Can be able to know the composition and quality of glass

