

# Department of Science (BSc) Programme Outcomes

**Upon completion of the B.Sc Degree Programme the graduate will be able to -**

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

**PO 2:** The students will graduate with proficiency in the subject of their choice.

**PO 3:** The students will be eligible to continue higher studies in their subject.

**PO 4:** Solve the problem and also think methodically, independently and draw a logical conclusion.

**PO 5:** The students will be eligible to pursue higher studies abroad.

**PO 6:** The students will be eligible to appear for the examinations for their jobs in government organizations.

**PO 7:** Create an awareness of the impact of Science on the environment, society, and development outside the scientific community.

**PO 8:** The students will be eligible to pursue higher studies abroad.

**PO 9:** The students will be eligible to apply for jobs with a minimum requirement of B. Sc. Programme.

**PO 10:** To inculcate the scientific temperament in the students and outside the scientific community.

**Department of Science**

## (BSc) Programme Specific Outcomes

**PSO-1:** To nurture academicians with focus and commitment to their subject

**PSO-2:** To shape good and informed citizens from the students entering into the programme.

**PSO-3:** To credit a skilled workforce to match the requirements of the society.

**PSO-4:** To impart knowledge of science is the basic objective of this programme.

**PSO-5:** To develop scientific attitude is the major objective so as to make the students open minded, critical and curious.

**PSO-6:** To develop skill in practical work, experiments and laboratory materials and equipment's along with the collection and interpretation of scientific data to contribute to science.

**PSO-7:** Gain the knowledge of Chemistry, Botany, Microbiology through theory and practical's.

**PSO-8:** Develop research-oriented skills.

**PSO-9:** To explain nomenclature, structures, reactivity, and mechanism of all the subjects.

**PSO-10:** To make awareness and handle the sophisticated instruments/equipment's.

**Department of Science  
(BSc)  
Course Outcomes**

<b>First Year</b>		
<b>Semester – I</b>		
<b>Course Name</b>	<b>Code</b>	<b>Course Outcome</b>
<b>Plant life and utilization I</b>	<b>BO 111</b>	<ul style="list-style-type: none"> <li>➤ Learn about the structure, pigmentation, food reserves and methods of reproduction of Algae. Learn about the structure, pigmentation, food reserves and methods of reproduction of Fungi</li> <li>➤ Learn about the structure, pigmentation, food reserves and methods of reproduction of Algae. Learn about the structure, pigmentation, food reserves and methods of reproduction of Fungi</li> <li>➤ Know about the Economic importance of algae, Fungi and lichen.</li> </ul>
<b>Plant morphology and Anatomy</b>	<b>BO 112</b>	<ul style="list-style-type: none"> <li>➤ Understand in details with practical knowledge of the morphology of different types of inflorescence.</li> <li>➤ In depth understanding of the different types of fruits and their morphology.</li> <li>➤ Students will learn about the Anatomy, Types of tissues &amp; Internal Structure of dicot &amp; monocots root, stem &amp; leaf.</li> </ul>
<b>Practical based on BO 111 &amp; BO 112</b>	<b>BO 113</b>	<ul style="list-style-type: none"> <li>➤ Students will get the practical knowledge on internal primary structure of monocot &amp; dicot root &amp; stem.</li> <li>➤ Learn Inflorescence in depth.</li> <li>➤ Also, will study life cycle of Spirogyra, Agaricus &amp; Riccia in depth.</li> </ul>
<b>Introduction to Microbial World</b>	<b>MB 111</b>	<ul style="list-style-type: none"> <li>➤ The students will learn the scientific methods and the history of science is the embodiment of scientific knowledge.</li> <li>➤ As an introductory part of Microbiology, students will get the basic ideas and practices from the contribution of several Microbiologists in the field of microbiology.</li> <li>➤ They will have to know the diversity of microbial world like algae, fungi, protozoa and their general characteristics and importance.</li> </ul>
<b>Basic Techniques in Microbiology</b>	<b>MB 112</b>	<ul style="list-style-type: none"> <li>➤ The students will understand different types of microscopes.</li> <li>➤ They will get depth knowledge on staining techniques for observation of microorganisms.</li> <li>➤ Also, sterilization &amp; disinfection methods will be cleared in terms of microbiology.</li> </ul>
<b>Practical Course based on theory paper I and II</b>	<b>MB113</b>	<ul style="list-style-type: none"> <li>➤ Students will study different techniques used in microbiology.</li> <li>➤ They will be understood various laboratory practices, biosafety and also know the applications of important instruments like biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter.</li> <li>➤ Students can handle laboratory glassware, learn basic techniques of laboratory like wrapping of glassware, cotton plugging, washing of glassware, etc.</li> </ul>

<b>Physical Chemistry</b>	<b>CH-101</b>	<ul style="list-style-type: none"> <li>➤ Students will be able to apply thermodynamic principles to physical and chemical process.</li> <li>➤ Calculations of enthalpy, Bond energy, Bond dissociation energy, resonance energy,</li> <li>➤ Knowledge of Chemical equilibrium will make students to understand.</li> <li>➤ Relation between Free energy and equilibrium and factors affecting on equilibrium constant.</li> </ul>
<b>Organic Chemistry</b>	<b>CH-102</b>	<ul style="list-style-type: none"> <li>➤ The students are expected to understand the fundamentals, principles, and recent developments in the subject area.</li> <li>➤ It is expected to inspire and boost interest of the students towards chemistry as the main subject.</li> <li>➤ To familiarize with current and recent developments in Chemistry.</li> <li>➤ To create foundation for research and development in Chemistry.</li> </ul>
<b>Chemistry Practical –I</b>	<b>CH-103</b>	<ul style="list-style-type: none"> <li>➤ Importance of chemical safety and Lab safety while performing experiments in laboratory.</li> <li>➤ Determination of thermochemical parameters and related concepts.</li> <li>➤ Techniques of pH measurements.</li> <li>➤ Preparation of buffer solutions.</li> <li>➤ Elemental analysis of organic compounds (non-instrumental)</li> <li>➤ Chromatographic Techniques for separation of constituents of mixtures</li> </ul>
<b>Descriptive Statistics I</b>	<b>ST 111</b>	<ul style="list-style-type: none"> <li>➤ The students are able to compute various measures of central tendency, dispersion, skewness and kurtosis.</li> <li>➤ And to analyse data pertaining to attributes and to interpret the results.</li> </ul>
<b>Discrete Probability</b>	<b>ST 112</b>	<ul style="list-style-type: none"> <li>➤ The students are able to distinguish between random and non-random experiments.</li> <li>➤ They can also find the probabilities of events.</li> <li>➤ It will be easy to obtain a probability distribution of random variable (one or two dimensional) in the given situation by the students.</li> </ul>
<b>Statistics Practical Paper I</b>	<b>ST113</b>	<ul style="list-style-type: none"> <li>➤ Students are able to use various graphical and diagrammatic techniques and interpretation.</li> <li>➤ They can also analyse data pertaining to discrete and continuous variables and to interpret the results.</li> <li>➤ Computing various measures of central tendency, dispersion, skewness and kurtosis and to interpret summary statistics of computer output.</li> </ul>

## Semester II

Course Name	Code	Course Outcomes
-------------	------	-----------------

<b>Plant life and utilization II</b>	<b>BO 121</b>	<ul style="list-style-type: none"> <li>➤ Students will get knowledge on plant diversity.</li> <li>➤ Learn the classifications, habit, morphology, anatomy, lifecycles of Pteridophytes, Gymnosperms &amp; Angiosperms.</li> <li>➤ Learn about the diversity of the plants like Pteridophytes, Gymnosperms &amp; Angiosperms.</li> <li>➤ Know the lifecycle, classification &amp; its utilization.</li> <li>➤ Know about the Economic importance.</li> </ul>
<b>Principles of plant science</b>	<b>BO 122</b>	<ul style="list-style-type: none"> <li>➤ After completion of the course the students are familiar with various physiological aspects involved in the plant development.</li> <li>➤ Also get the knowledge of mechanism of photosynthesis, diffusion, osmosis, and plasmolysis.</li> <li>➤ The students are able to understand the structure of Plant cell, prokaryotic cell, eukaryotic cell, chloroplast &amp; cell cycles in plants.</li> <li>➤ Learn about DNA &amp; RNA structure.</li> </ul>
<b>Practical based on BO 121 &amp; BO 122</b>	<b>BO 123</b>	<ul style="list-style-type: none"> <li>➤ Microscopic observation and identification of algae, fungi, bryophytes, lichens, pteridophytes and gymnosperm</li> <li>➤ Observation of crop plants infected by the pathogens included in the syllabus and study of symptoms, causative agents and etiology.</li> <li>➤ Training students to prepare micro preparation and showing the stages of mitosis (Onion root tips) and showing permanent slides/photographs of mitosis and meiosis.</li> </ul>
<b>Bacterial Cell and Biochemistry</b>	<b>MB121</b>	<ul style="list-style-type: none"> <li>➤ Students will study the structure, functions &amp; components of the bacterial cell.</li> <li>➤ Students will gain knowledge about the chemistry of biomolecules.</li> <li>➤ Students will also learn about monosaccharides, disaccharides &amp; polysaccharides.</li> </ul>
<b>Microbial cultivation and growth</b>	<b>MB122</b>	<ul style="list-style-type: none"> <li>➤ Knowledge of microbial growth kinetics, influence of environmental factors and effect of nutrients</li> <li>➤ Different culture media and its use.</li> <li>➤ Understanding the growth curve, generation time &amp; diauxic growth of bacteria.</li> </ul>
<b>Practical Course based on theory paper I and II</b>	<b>MB123</b>	<ul style="list-style-type: none"> <li>➤ Ability to use techniques and instruments involved in the study of microorganisms and their products.</li> <li>➤ Understanding the use of laboratory instruments, glassware, etc.</li> <li>➤ Learning various staining techniques &amp; techniques for isolation of bacteria.</li> </ul>
<b>Inorganic Chemistry</b>	<b>CH-201</b>	<ul style="list-style-type: none"> <li>➤ Student will understand various theories and principles applied to reveal atomic structure.</li> <li>➤ Origin of quantum mechanics and its need to understand structure of hydrogen atom.</li> <li>➤ Schrodinger equation for hydrogen atom</li> </ul>
<b>Analytical Chemistry</b>	<b>CH-202</b>	<ul style="list-style-type: none"> <li>➤ This course helps in calculations of mole, molar concentrations and various units of concentrations which will be helpful for preparation of solution.</li> <li>➤ It will help in relation between molecular formula and empirical formula &amp; Stoichiometric calculation</li> <li>➤ It helps in learning the techniques of Chromatographic Techniques – Paper and Thin layer Chromatography.</li> <li>➤ Helps in understanding the working of pH meter.</li> </ul>

<b>Chemistry Practical-II</b>	<b>CH- 203</b>	<ul style="list-style-type: none"> <li>➤ Helps in understanding the Inorganic Estimations using volumetric analysis</li> <li>➤ Synthesis of Inorganic compounds</li> <li>➤ Analysis of commercial products</li> <li>➤ Purification of organic compounds</li> <li>➤ Preparations and mechanism of reactions involved</li> </ul>
<b>Descriptive Statistics II</b>	<b>ST121</b>	<ul style="list-style-type: none"> <li>➤ A students should be able to solve basic exercises of the type: given a graph with properties X, prove that the graph also has property Y.</li> <li>➤ A students should develop an appreciation for the literature on the subject and be able to read and present results from the literature</li> </ul>
<b>Discrete Probability Distributions</b>	<b>ST122</b>	<ul style="list-style-type: none"> <li>➤ To understand the relationship between two variables using scatter plot.</li> <li>➤ To compute coefficient of correlation, coefficient of regression.</li> <li>➤ To fit various regression models and to find best fit.</li> </ul>
<b>Statistics Practical Paper II</b>	<b>ST123</b>	<ul style="list-style-type: none"> <li>➤ To organize, manage and present data and analyse statistical data graphically using frequency distributions and cumulative frequency distributions.</li> <li>➤ To analyse statistical data using measures of central tendency, dispersion and location.</li> </ul>

**Second Year****Semester – III**

<b>Course Name</b>	<b>Code</b>	<b>Course Outcome</b>
<b>Taxonomy of Angiosperms &amp; Plant Ecology</b>	<b>BO 231</b>	<ul style="list-style-type: none"> <li>➤ Helps in understanding the Plant structure</li> <li>➤ The students will know the Plant structure</li> </ul>
<b>Plant Physiology</b>	<b>BO 232</b>	<ul style="list-style-type: none"> <li>➤ To demonstrate the commercial bio fertilizers, inhibition in seeds.</li> <li>➤ To isolate leaf protein concentration.</li> </ul>
<b>Medical Microbiology &amp; Immunology</b>	<b>MB 231</b>	<ul style="list-style-type: none"> <li>➤ Helps to understand the depth knowledge of disease and its causes.</li> <li>➤ Helps to know the immune related concepts.</li> </ul>
<b>Bacterial Physiology &amp; Fermentation Technology</b>	<b>MB 232</b>	<ul style="list-style-type: none"> <li>➤ To know the use of microorganism in Fermentation technology.</li> <li>➤ To know the benefits of fermentation technology in industry.</li> </ul>
<b>Physical and Analytical Chemistry</b>	<b>CH-301</b>	<ul style="list-style-type: none"> <li>➤ To understand adsorption isotherms, Concepts of kinetics etc.</li> <li>➤ To solve problems using surface theory</li> </ul>
<b>Inorganic and Organic Chemistry</b>	<b>CH-302</b>	<ul style="list-style-type: none"> <li>➤ To identify structure of alcohols &amp; phenols.</li> <li>➤ To give synthesis of expected alcohols and phenols.</li> </ul>

**Semester – IV**

<b>Course Name</b>	<b>Code</b>	<b>Course Outcomes</b>
<b>Plant Anatomy and Embryology</b>	<b>BO 241</b>	<ul style="list-style-type: none"> <li>➤ Understand the scope &amp; importance of Anatomy and Embryology.</li> <li>➤ Know various tissue systems.</li> <li>➤ Understand the normal and anomalous secondary growth in plants and their causes.</li> <li>➤ Perform the techniques in anatomy.</li> <li>➤ Understand structure and development in microsporangium and megasporangium.</li> <li>➤ Understand microsporogenesis and megasporogenesis.</li> <li>➤ Understand male and female gametophytes.</li> <li>➤ Know fertilization, endosperm and embryogeny.</li> </ul>
<b>Plant Biotechnology</b>	<b>BO 242</b>	<ul style="list-style-type: none"> <li>➤ Provides a detailed view of the visualizing concepts and technique for genetic engineering and biotechnology.</li> <li>➤ Deals mainly with science, methodology and applications of plant tissue culture methods in Cell and organ culture. Practical approaches of single cell culture, etc,</li> <li>➤ Enhances application on bioremediation, biofuel technology &amp; Plant Genetic engineering.</li> </ul>
<b>Practical based on BO 241 &amp; BO 242</b>	<b>BO 243</b>	<ul style="list-style-type: none"> <li>➤ Students will understand the pattern origin, diversification and cultivation of plants in nature.</li> <li>➤ Learn secondary growth of Dicot stem, Monocot embryo, etc</li> <li>➤ They are able to learn the laboratory cultivation of Spirulina.</li> </ul>
<b>Bacterial Genetics</b>	<b>MB 241</b>	<ul style="list-style-type: none"> <li>➤ Basic concepts like: DNA as genetic material; Physical basis of heredity; Chromosomes; Cell division, Gene transfer mechanisms., mendelian genetics</li> </ul>

		<ul style="list-style-type: none"> <li>➤ Regulation of gene expression in prokaryotes and eukaryotes: Operon concept-lac, ara and trp operons, nif regulon;</li> <li>➤ Environmental factors of gene regulation; Chromosome remodelling; RNA editing; SiRNA and RNA Interference</li> </ul>
<b>Air, Water and Soil Microbiology</b>	<b>MB 242</b>	<ul style="list-style-type: none"> <li>➤ Students will learn about the different fields in air, water &amp; soil microbiology.</li> <li>➤ Students will gain knowledge about the different types of microorganisms and their significance.</li> <li>➤ Students will study different techniques used in microbiology.</li> <li>➤ To use microorganisms as indicators of alteration of an ecosystem.</li> <li>➤ To know and understand the role of microbes in the environment and evaluation of anthropogenic activities on pollution, climate change as well as environmental protection.</li> </ul>
<b>Practical based on Theory papers MB 241 and 242</b>	<b>MB 243</b>	<ul style="list-style-type: none"> <li>➤ Students will learn about the principle, working and applications of commonly used instruments in microbiology.</li> <li>➤ Students will also learn applications for portability of water.</li> <li>➤ Students will understand the sampling of Air Flora</li> </ul>
<b>Physical and Analytical Chemistry</b>	<b>CH-401</b>	<ul style="list-style-type: none"> <li>➤ Know the principles of common ion effect and solubility product.</li> <li>➤ Study the methods of thermo-gravimetric analysis.</li> <li>➤ Understand the principles of Spectro-photometric analysis and properties of electromagnetic radiations.</li> <li>➤ Study the Voltammetry and Polarography as an analytical tool.</li> <li>➤ Measure the absorbance of atoms by AAS.</li> </ul>
<b>Inorganic and Organic Chemistry</b>	<b>CH-402</b>	<ul style="list-style-type: none"> <li>➤ To study UV, IR and NMR spectroscopy.</li> <li>➤ Discuss different types of rearrangement reactions.</li> <li>➤ Determine structure of compound by spectroscopic methods.</li> <li>➤ Understand the difference between carbocation and carbanion.</li> <li>➤ To study alkaloids, Ephedrine, citral molecule with their properties and application.</li> <li>➤ Study the electronic configuration of lanthanides and actinides.</li> <li>➤ Get knowledge of Crystalline solid.</li> <li>➤ Understand different operation in stoichiometric molecule.</li> <li>➤ Study the Bio-inorganic chemistry and understand the p-type semiconductor and n-type semiconductor.</li> </ul>
<b>Chemistry Practical - IV</b>	<b>CH-403</b>	<ul style="list-style-type: none"> <li>➤ Study the gravimetric and volumetric analysis of ores and alloy.</li> <li>➤ Prepare a various inorganic complex and determine its % purity.</li> <li>➤ To study binary mixture with removal of borate and phosphate.</li> <li>➤ To understand the chromatographic techniques.</li> <li>➤ Perform the Binary mixtures.</li> <li>➤ Preparation of organic compounds, their purifications and run TLC.</li> <li>➤ Determination of physical constant: Melting point, Boiling point.</li> <li>➤ Different separation techniques</li> </ul>



<b>Third Year</b>		
<b>Semester – V</b>		
<b>Specialisation – Micro-Biology</b>		
<b>Course Name</b>	<b>Code</b>	<b>Course Outcome</b>
<b>Medical Microbiology-I</b>	<b>MB 351</b>	<ul style="list-style-type: none"> <li>➤ Understand the human anatomy, pathogens associated with diseases.</li> <li>➤ Acquire knowledge of principles underlying establishment of pathogens in human body.</li> <li>➤ Comprehend of pathogenesis of specific pathogens causing microbial diseases.</li> <li>➤ Assess epidemiological patterns of microbial disease transmission as various modes, intensity at local and global level.</li> <li>➤ Gain Knowledge principles of chemotherapy of microbial diseases and development of drug resistance among pathogens and strategies to mitigate.</li> <li>➤ Develop identification systems for microbial disease diagnosis, disease treatment and prevention measures.</li> </ul>
<b>Immunology-I</b>	<b>MB 352</b>	<ul style="list-style-type: none"> <li>➤ Understand immune system structure, composition, function and comparison of different types of immunity.</li> <li>➤ Acquire knowledge about antigens, Recognition of pathogens; antigen processing and presentation; Immunity to infection and pathological consequences of immunodeficiency's.</li> <li>➤ To learn the applications of Immunology in monoclonal antibodies, vaccines production and Immunotherapy.</li> <li>➤ Understand abnormal working of Immune system in hypersensitivity, auto immune diseases, immune tolerance and transplantation immunology.</li> <li>➤ To develop strategies for Diagnosis of diseases based on antigen and antibody reactions with emphasis on prevailing communicable diseases.</li> </ul>
<b>Enzymology</b>	<b>MB 353</b>	<ul style="list-style-type: none"> <li>➤ To understand methods of active site determination, role of enzymes and its cofactors in microbial physiology.</li> <li>➤ To learn to perform enzyme assay, purification and quantification of enzymes activity, enzyme kinetics in terms of initial, final velocity, mathematical expression of enzyme kinetic parameters.</li> <li>➤ To correlate regulation of metabolism at enzymatic levels and apply, methodology for commercial applications of enzymes</li> <li>➤ To learn mechanisms of transport of solutes across the membrane</li> <li>➤ To get acquainted with mechanism of biosynthesis and degradation of bio molecules.</li> <li>➤ To comprehend basic concept of autotrophic mode of metabolism of prokaryotes</li> </ul>
<b>Genetics</b>	<b>MB 354</b>	<ul style="list-style-type: none"> <li>➤ To exhibit a knowledge base in Genetics and Molecular Biology to understand the central dogma of Molecular Biology.</li> <li>➤ To construct genetic map of bacteria and fungi</li> <li>➤ To get introduced to concept of recombination and bacteriophage Genetics</li> <li>➤ To understand the concept cloning in bacteria</li> <li>➤ To demonstrate the knowledge of common and advanced laboratory practices in Molecular Biology</li> </ul>

<b>Fermentation Technology-I</b>	<b>MB 355</b>	<ul style="list-style-type: none"> <li>➤ To impart technical understanding of commercial fermentations.</li> <li>➤ To apply classical, advanced strain improvement and isolation techniques for fermentation processes.</li> <li>➤ To optimize and sterilize media used in fermentation industry for commercially economical and efficient fermentations.</li> <li>➤ To recover the product using suitable methods and ensuring quality of the finished product by quality assurance tests.</li> <li>➤ To acquaint fermentation economics, process patentability, process validation.</li> <li>➤ To comprehend the large scale productions of commercially significant fermentation products of classical and recent significance.</li> </ul>
<b>Agricultural Microbiology</b>	<b>MB 356</b>	<ul style="list-style-type: none"> <li>➤ To understand plant growth improvement with respect to disease resistance, environment tolerance.</li> <li>➤ To correlate stages of plant disease development, epidemiology, and symptom based classification, control methods.</li> <li>➤ To understand the importance of microorganisms in sustainable agriculture, biotechnological application of bio films, edible vaccines.</li> <li>➤ To correlate Soil Micro biome and Role of microorganisms in soil health</li> <li>➤ To determine the use of Microorganisms as tools in plant genetic engineering.</li> </ul>
<b>Marine Microbiology</b>	<b>MB 3510</b>	<ul style="list-style-type: none"> <li>➤ To impart the awareness of unseen and unexplored niche of marine ecosystem of microbes.</li> <li>➤ To acquire advances in the knowledge of marine microbes and marine ecology.</li> <li>➤ To learn the field research on marine processes and laboratory research on microorganisms.</li> <li>➤ To comprehend the role of marine microbes in bioremediation and bioprospecting.</li> <li>➤ To avail career opportunities in marine education, industry and research.</li> </ul>
<b>Dairy Microbiology</b>	<b>MB 3511</b>	<ul style="list-style-type: none"> <li>➤ To understand prospects of dairying at commercial marketing.</li> <li>➤ To acquire skills of processing of milk and dairy products.</li> <li>➤ To assess quality control in dairy industry.</li> <li>➤ To comprehend production of dairy products of commercial significance with emphasis to local and global market demand.</li> </ul>
<b>Specialisation Chemistry</b>		
<b>Course Name</b>	<b>Code</b>	<b>Course Outcomes</b>
<b>Physical Chemistry-I</b>	<b>CH-501</b>	<ul style="list-style-type: none"> <li>➤ To understand idea of wave function</li> <li>➤ Helps to solve Schrodinger equation for 1D, 2D and 3D model</li> <li>➤ To enhance the experimental method for the determination of quantum yield</li> <li>➤ Experimental determination of dipole moment.</li> </ul>
<b>Analytical Chemistry-I</b>	<b>CH-502</b>	<ul style="list-style-type: none"> <li>➤ Explain the fundamentals of analytical chemistry and steps of a characteristic analysis.</li> <li>➤ The course explains principles involved In the Spectrophotometry, Gravimetry</li> <li>➤ Identifies important parameters in analytical processes of estimations</li> </ul>

<b>Physical Chemistry Practical-I</b>	<b>CH-503</b>	<ul style="list-style-type: none"> <li>➤ With the help of this practical course student will titrate ions from the mixture.</li> <li>➤ Determines refractive index</li> <li>➤ Viscosity experiment helps to choose oils with low viscosity used in car engines (light machinery).</li> </ul>
<b>Inorganic Chemistry-I</b>	<b>CH-504</b>	<ul style="list-style-type: none"> <li>➤ To gain the knowledge MOT of octahedral complexes, Stereochemistry of mechanism</li> <li>➤ Students will know the important applications of d &amp; f block elements.</li> </ul>
<b>Industrial Chemistry</b>	<b>CH-505</b>	<ul style="list-style-type: none"> <li>➤ To gain the knowledge of various industrial aspects</li> <li>➤ Use of various chemicals and manufacturing process.</li> <li>➤ Students will know that this course is career oriented and gives applications in alcohol, Baker's Yeast, antibiotics, enzymes, etc. producing companies are mainly Fermentation Industries.</li> <li>➤ To understand raw materials required for soap manufacture, Dyes and Pigments Synthesis.</li> </ul>
<b>Inorganic Chemistry Practical-I</b>	<b>CH-506</b>	<ul style="list-style-type: none"> <li>➤ Student will enhance the practical knowledge of Gravimetric estimation, inorganic preparation, inorganic qualitative analysis</li> </ul>
<b>Organic Chemistry-I</b>	<b>CH-507</b>	<ul style="list-style-type: none"> <li>➤ Course gives brief idea about polynuclear and heteronuclear aromatic hydrocarbons.</li> <li>➤ Synthetic applications of ethyl acetoacetate and malonic ester.</li> <li>➤ Molecular rearrangements</li> <li>➤ To understand Stereochemistry by using models.</li> </ul>
<b>Chemistry of Biomolecules</b>	<b>CH-508</b>	<ul style="list-style-type: none"> <li>➤ The course helps the students to learn concepts of biomolecules, Properties of carbohydrates, amino acids</li> <li>➤ Various types of proteins, Enzymes, Industrial applications of enzymes</li> <li>➤ Mechanism action of lipophilic and hydrophilic hormones</li> </ul>
<b>Organic Chemistry Practical-I</b>	<b>CH-509</b>	<ul style="list-style-type: none"> <li>➤ To expose the students to an extent of experimental techniques using modern instrumentation</li> <li>➤ The student will learn the laboratory skills needed to design, safely conduct and interpret chemical research</li> <li>➤ To understand stoichiometric calculations and relate them to green process metrics.</li> </ul>

## Semester VI

<b>Specialisation – Micro Biology</b>		
<b>Course Name</b>	<b>Code</b>	<b>Course Outcomes</b>
<b>Medical Microbiology II</b>	<b>MB 361</b>	<ul style="list-style-type: none"> <li>➤ The student will be able to identify common mode of action of antimicrobial agents on Bacteria, Fungi, Viruses, and Protozoa.</li> <li>➤ The student will be able to learn mechanisms of Drug Resistance.</li> </ul>
<b>Immunology II</b>	<b>MB 362</b>	<ul style="list-style-type: none"> <li>➤ It is to develop concepts in role and the underlying mechanisms for the functioning of immunological cells and their interactions.</li> <li>➤ The regulation of molecular synthesis, signalling, immune responses and allied activities of immune system at the molecular level.</li> </ul>
<b>Metabolism</b>	<b>MB 363</b>	<ul style="list-style-type: none"> <li>➤ The students will get deep knowledge on the membrane transport mechanisms like active &amp; passive transports.</li> <li>➤ They will also get knowledge on the metabolic pathways and their autotrophy.</li> <li>➤ They will also learn on the concept of chemolithotrophy bacteria.</li> </ul>
<b>Molecular Biology</b>	<b>MB 364</b>	<ul style="list-style-type: none"> <li>➤ Understanding of gene structure, expression and regulation of gene expression in both prokaryotes and eukaryotes for application in molecular research.</li> <li>➤ This course develops concepts in molecular biology: DNA packaging, DNA damage and repair, gene structure, expression and regulation in both prokaryotes and eukaryotes</li> </ul>
<b>Fermentation Technology II</b>	<b>MB 365</b>	<ul style="list-style-type: none"> <li>➤ The students will also learn on the Solid-State Fermentation &amp; Submerged fermentation.</li> <li>➤ They will also know the Metabolites and its description in depth.</li> <li>➤ They will also know the types of Enzymes, Immune sera &amp; modern trends of microbial populations.</li> </ul>
<b>Food Microbiology</b>	<b>MB 366</b>	<ul style="list-style-type: none"> <li>➤ To describe food safety problems and solutions in India and global scale.</li> <li>➤ Identify and classify types of microorganisms in food processing and compare their Characteristics and behaviour</li> <li>➤ To learn food classification based on their perishability, intrinsic and extrinsic factors affecting the growth of microbes in foods, role of microorganisms in food fermentation.</li> <li>➤ To acquire knowledge about food spoilage, food borne diseases, predisposition and preventive and control measures.</li> <li>➤ To apply principles of sanitation, heat treatment, irradiation, modified atmosphere, antimicrobial preservatives and combination of method (hurdle concept) to control microbial growth with emphasis on HACCP guidelines.</li> </ul>
<b>Waste management</b>	<b>MB 3610</b>	<ul style="list-style-type: none"> <li>➤ To understand waste management and its practicable applicability.</li> <li>➤ To assess the magnitude and influence of hazardous content of waste, pollution of waters and waste water treatment technologies.</li> <li>➤ To learn the design and working of treatment plants and methods used for liquid and solid waste treatment.</li> <li>➤ To impart the understanding of kinetics of biological systems used in waste treatment.</li> </ul>

		<ul style="list-style-type: none"> <li>➤ To learn the standards of waste management and competent authorities involved at National and international level.</li> </ul>
<b>Nano biotechnology</b>	<b>MB 3611</b>	<ul style="list-style-type: none"> <li>➤ To understand design, development and application of Nanomaterials and their application in Nano devices.</li> <li>➤ To learn fundamentals of nanotechnology as to Synthesis and characterization techniques of nanoparticles.</li> <li>➤ To acquire knowledge of applications of nanomaterials in different disciplines of human life.</li> <li>➤ To compare the merits of using nanotechnology with existing technologies.</li> </ul>
<b>Specialisation – Chemistry</b>		
<b>Course Name</b>	<b>Code</b>	<b>Course Outcomes</b>
<b>Physical Chemistry-II</b>	<b>CH-601</b>	<ul style="list-style-type: none"> <li>➤ To illustrate the knowledge of electrochemical cells, their working</li> <li>➤ Determination of crystal structure of NaCl.</li> <li>➤ Detection and measurement of radioactivity.</li> </ul>
<b>Physical Chemistry - III</b>	<b>CH-602</b>	<ul style="list-style-type: none"> <li>➤ To know factors affecting on solid state reactions.</li> <li>➤ Rate laws of solid state reactions</li> <li>➤ Phenomena of photoconductivity</li> <li>➤ Chemical bonding and molecular forces in polymer</li> </ul>
<b>Physical Chemistry Practical-II</b>	<b>CH-603</b>	<ul style="list-style-type: none"> <li>➤ To find the concentration of solute in a given solution by measuring the potential between two electrodes.</li> <li>➤ Electronic pH meter is used to obtain more accurate pH measurements.</li> <li>➤ To determine plateau voltage of given G M counter.</li> </ul>
<b>Inorganic Chemistry-II</b>	<b>CH-604</b>	<ul style="list-style-type: none"> <li>➤ To understand M-C bond and to define organometallic compounds</li> <li>➤ Phenomena of Catalysis, its basic principles and terminologies</li> <li>➤ To identify the biological role of inorganic ions &amp; compounds, types of polymers</li> <li>➤ To know the technological importance of ionic liquids</li> </ul>
<b>Inorganic Chemistry-III</b>	<b>CH-605</b>	<ul style="list-style-type: none"> <li>➤ The course helps to learn the concept of acid base and their theories.</li> <li>➤ To identify C.N. of an ion in ionic solid</li> <li>➤ Synthesis and applications of zeolites</li> <li>➤ Synthesis of nanoparticles, impact of toxic chemicals on enzyme</li> </ul>
<b>Inorganic Chemistry Practical-II</b>	<b>CH-606</b>	<ul style="list-style-type: none"> <li>➤ To determine concentrations of unknown substances.</li> <li>➤ The accurate concentration of the metal ion in the solution cannot be measured. It cannot directly detect and determine the presence of inert gases.</li> </ul>
<b>Organic Chemistry-II</b>	<b>CH-607</b>	<ul style="list-style-type: none"> <li>➤ Student will understand the principle of UV spectroscopy and the nature of UV spectrum</li> <li>➤ The stability, energy calculations and optical activity of the conformers</li> </ul>
<b>Organic Chemistry-III</b>	<b>CH-608</b>	<ul style="list-style-type: none"> <li>➤ This course gives information about organic reaction mechanism, reagents in organic synthesis</li> <li>➤ Extraction and purification of natural products.</li> </ul>
<b>Organic Chemistry Practical-II</b>	<b>CH-609</b>	<ul style="list-style-type: none"> <li>➤ To apply the principles of extraction</li> <li>➤ To understand the basic parameters in chromatography</li> <li>➤ This course explains 'fingerprint region' of an infrared spectrum can used in the identification of an unknown compound.</li> </ul>