

Programme- B.Sc. PCM

PROGRAMME OUTCOME	COURSE NAME	COURSE CODE	COURSE OUTCOME
<ul style="list-style-type: none"> ❖ Evaluate hypotheses, theories, methods and evidence within their proper contexts. ❖ Critically interpret data, write reports and apply the basics of rules of evidence. ❖ Select, interpret and critically evaluate information from a range of sources that include books, scientific reports, journals, case studies and the internet. ❖ Develop proficiency in the analysis of complex physical problems and the use of mathematical or other appropriate techniques to solve them. ❖ Solve complex problems by critical understanding, analysis and synthesis. 	1. MECHANICS AND WAVE MOTION	BPCM-101	1. Learner will understand basic theorems and concepts of basic physics.
			2. To understand the dynamics of different types of pendulum and to determine 'g'.
			3. To understand the elastic properties of matter and expression of bending beam with its application as a cantilever.
			4. To understand concept of surface tension and its relation with excess pressure and radius of curvature.
			5. To acquire basic knowledge about dynamics, work and energy, elasticity, gravitation and central force motion.
			6. To understand concept of fluid flow and pressure energy in fluids.
	2. Atomic Structure, Bonding And Hydrocarbons	BPCM-102	1. Understanding the atomic structure, basics of quantum chemistry and its applications.
			3. Explaining theories of chemical bonding and molecular structure.
			4. Gathering basic knowledge of organic chemistry.
			5. Learning the basic principles of stereochemistry.
	3. Calculus	BPCM-103	1. To have a rigorous understanding of the concept of limit of a function.
			2. The geometrical properties of continuous functions on closed and bounded intervals.
			3. Extensively about the concept of differentiability using limits, leading to a better understanding for applications.
			4. The applications of mean value theorems and Taylor's theorem.
	4. KINETIC THEORY	BPCM-201	1. Learner will understand the gas consists of very small particles known as molecules.
			2. Understand the average velocity of the ideal gas particles.
3. Know about the mass of these particles.			
4. Describe The average kinetic energy of the gas particles.			

			5. To understand concept of Liquefaction of gases.
			6. To acquire basic knowledge about transport phenomena in gases.
	5. Chemical Energetics, Equilibria & Organic Chemistry	BPCM-202	1. Understanding the thermodynamic laws, principles of thermo chemistry and chemical equilibrium.
			2. Learning the solubility of ionic compounds and their solution properties.
			3. Illustrate the preparative methods of simple aromatic compounds.
			4. Explaining the preparation and reaction mechanism of alkyl and aryl halides.
			5. Preparation and reaction chemistry aliphatic and aromatic phenols, ethers.
	6. Differential Equations	BPCM-203	1. Formulate the differential equations for various mathematical models and solve first order non-linear differential equation.
			7. Solve linear differential equations of higher order using various techniques.
			8. Solve differential equations in series using various methods.
			9. Formulate the partial differential equations and solve first order linear partial differential equation.
	7. Thermodynamics	BPCM-301	1. To understand basic concept of thermodynamics and to distinguish between work done due to Adiabatic and isothermal changes.
			2. To understand Concept of thermodynamic process.
			3. To state laws of thermodynamics and concept of internal energy.
			4. To understand Carnot's ideal heats engine, Carnot cycle and its efficiency, Carnot's theorem, Otto and Diesel engines with their efficiencies.
			5. To state first and Second latent heat equations.
			6. To understand Concept of entropy, Change of entropy in Reversible process and Irreversible process, T-S diagram.
	8. Solutions, Electrochemistry & Organic Chemistry	BPCM-302	1. To have a comprehensive knowledge about Chemistry of halogenated hydrocarbons.
			2. To understand the preparation and properties of alcohols, phenols, ethers and epoxides.
			3. Understanding the concepts of carbonyl compounds.
			4. Formulate the preparation and reaction of carboxylic acids and its derivatives
	9. Basic Analytical	BPCM-302S	1. Able to analyze soil.

	Chemistry		2. Know the water analysis and quality of food products
			3. Able to apply various chromatographic techniques
			4. Know the Chemistry of cosmetics.
			5. Able to handle the possible analytical instruments
	10. Group Theory - I	BPCM-303	1. Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc;
			2. Link the fundamental concepts of Groups and symmetrical figures;
			3. Analyze the subgroups of cyclic groups;
			4. Explain the significance of the notion of cosets, normal subgroups, factor groups and group isomorphisms.
	11. Circuit Fundamentals And Basic Electronics	BPCM-401	1. To understand standards of measurements and calibration.
			2. To learn measurement of temperature using: Non - electrical, Electrical and Radiation Methods.
			3. To learn measurement of pressure using McLaugh Guage (b) Pirani Gauge.
			4. To solve problems associated with energy crisis by means of photo thermal conversion and photovoltaic conversion.
			5. To learn Measurement of flow using: Venturi tube, Pitot tube and Rotameter.
			6. To understand characteristics of sound and to know typical sound measuring system.
	12. Coordination Chemistry, States Of Matter & Chemical Kinetics	BPCM-402	1. Acquiring knowledge of phase equilibrium.
			2. To understand the concepts of Chemical kinetics
			3. study about catalysis
			4. Acquiring knowledge about the surface Chemistry
	13. Fuel chemistry and chemistry of cosmetics and perfumes	BPCM-402S	1. Able to know the Chemistry of fuels.
			2. Ability to know the petroleum products and industry
3. Able to know various cosmetics & perfumes.			
4. Ability to prepare cosmetics & perfumes			
14. Real Analysis	BPCM-403	1. Understand many properties of the real line and learn to define sequences in terms of functions.	

			<ol style="list-style-type: none"> Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence. Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.
15. Physical Optics	BPCM-501A	1. To learn Power of lens, Spherical aberration in lens, and to distinguish Chromatic aberration and Achromatism aberration.	
		2. To understand concept of interference pattern due to reflected light in parallel sided thin films and in thin wedge shaped film.	
		3. To demonstrate experimental set up for Newton's rings, theory and its application to determine wavelength of source and refractive index of liquids To learn Measurement of flow using: Venturi tube, Pitot tube and Rotameter.	
		4. To demonstrate Michelson Interferometer (experimental setup and its application for measurement of wavelength of monochromatic source).	
16. Statistical Mechanics	BPCM-501B	1. To understand basic concepts of probability and probability distribution.	
		2. To solve Random walk problem in one dimension and Gaussian probability distribution.	
		3. To understand specification of the state of the system (Classical & Quantum).	
		4. To state Basic postulate of equal a priori probability,	
		5. To understand Statistical Ensembles and Calculation of microstates of an ideal monatomic gas.	
17. Polymer Chemistry	BPCM-502A	1. Understanding the classification, structure, function and importance of polymers.	
		2. Examining the kinetics and mechanism of polymerization.	
		3. Acquiring the knowledge on nature and physical properties of polymers.	
		4. Knowing solubility parameters.	
		5. Analyzing the synthesis of different polymers and examining their properties	
18. Industrial Chemicals and environment	BPCM-502B	1. Bulk synthesis and handling the industrially important hazardous Chemicals.	
		2. Understanding the industrial preparation and purification of metals.	

			3. Able to explain the environmental impacts of toxic Chemicals in atmosphere.
			4. Able to explain the environmental impacts of toxic Chemicals in hydrosphere.
			5. Correlate the importance of energy sources and their environmental impacts
	19. Quantum Chemistry, Spectroscopy & Photochemistry	BPCM-502C	1. Understand the basic concept of quantum chemistry and its applications.
			2. Applying the Schrodinger equation in simple systems and understanding the quantum mechanical concept of bonding theory.
			3. Gathering the basic knowledge of spectroscopy and its application.
			4. Understanding the principle, application of Electronic, NMR, ESR spectroscopy.
			5. Acquiring knowledge about photochemistry and its applications.
	20. Food Chemistry	BPCM-502S	1. Able to know about the food adulteration and food poison.
			2. Acquire the knowledge on food additives and packaging of foods.
			3. Able to understand about the food preservation methods.
			4. Know the Chemistry of cosmetics.
			5. Able to know about chemistry of carbohydrates, proteins and amino acids.
	21. Numerical Methods	BPCM-503A	1. Some numerical methods to find the zeroes of nonlinear functions of a single variable and solution of a system of linear equations, up to a certain given level of precision.
			2. Interpolation techniques to compute the values for a tabulated function at points not in the table.
			3. Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical solutions.
	22. Latex and HTML	BPCM-506S	1. Typeset mathematical formulae, use nested list, tabular & array environments.
			2. Create or import graphics.
			3. Use beamer to create presentation and HTML to create a web page.
	23. Chemistry Of Main Group Elements	BPCM-602A	1. Understand about the concept of acids and bases.
			2. Understand about the unique position of hydrogen.
			3. Understanding the periodicity of <i>s</i> and <i>p</i> block elements.
			4. Understand about the properties of noble gases.
	24. Organometallics,	BPCM-602B	1. Study the oxidation states of different metals and the properties of

	Bioinorganic Chemistry And Spectroscopy		metallic compound.
			2. Gain the knowledge about the bonding and structure of organometallic.
			3. Introduce bio-inorganic chemistry and analyze the role of metal ions.
			4. Illustrate the properties of polynuclear, heteronuclear aromatic compounds.
			5. Apply spectroscopic techniques in analyzing the structure of simple organic.
	25. Molecules of Life	BPCM-602C	1. Study the classification, structures and properties of carbohydrates.
			2. Know the classification and synthetic methods of amino acids, peptides.
			3. Analyze the mechanisms of enzyme and drug actions and study.
			4. Classify the components of nucleic acids and lipids and understand role of RNA/DNA.
			5. Understand the concept of energy conversion in biological systems.
	26. Pesticide chemistry and pharmaceutical chemistry	BPCM-602S	1. Able to know the Chemistry of pesticides.
			2. Ability to analyze pesticides.
			3. Understand the Chemistry of drug molecules.
			4. Ability to apply fermentation techniques.
	27. Probability Theory & Statistics	BPCM-603A	1. To write the probability distribution of a given problem.
			2. Distributions to study the joint behavior of two random variables.
			3. To measure the scale of association between two variables, and to establish a formulation helping to predict one variable in terms of the other, i.e., correlation and linear regression.
			4. Central limit theorem, which helps to understand the remarkable fact that: the empirical frequencies of so many natural populations, exhibit a bell shaped curve, i.e., a normal distribution.
	28. Computer Algebra Systems and Related Softwares	BPCM-606S	1. Use of computer algebra systems (Mathematical / MATLAB/Maxima/Maple) as a calculator, for plotting functions, animations and various applications of matrices.
			2. Understand the use of the statistical software R for entry, summary calculation, pictorial representation of data and exploring relationship between data.
3. Analyze, test, and interpret technical arguments on the basis of geometry.			