

Department of Humanities and Sciences

Course outcomes

<p>B. Tech KAS101T /KAS201T</p>	<p>Engineering Physics</p>	<ul style="list-style-type: none"> ➤ To solve the classical and wave mechanics problems ➤ To develop the understanding of laws of thermodynamics and their application in various processes ➤ To formulate and solve the engineering problems on Electromagnetism & Electromagnetic Field Theory ➤ To aware of limits of classical physics & to apply the ideas in solving the problems in their parent streams.
<p>B. Tech KAS103T</p>	<p>Engineering Mathematics-I</p>	<ul style="list-style-type: none"> ➤ Remember the concept of matrices and apply for solving linear simultaneous equations. ➤ Understand the concept of limit , continuity and differentiability and apply in the study of Rolle,s , Lagrange,s and Cauchy mean value theorem and Leibnitz theorems . ➤ Identify the application of partial differentiation and apply for evaluating maxima, minima, series and Jacobians. ➤ Illustrate the working methods of multiple integral and apply for finding area, volume, centre of mass and centre of gravity. ➤ Remember the concept of vector and apply for directional derivatives, tangent and normal planes. Also evaluate line, surface and volume integrals.
<p>B. Tech KAS203T</p>	<p>Engineering Mathematics-II</p>	<ul style="list-style-type: none"> ➤ Understand the concept of differentiation and apply for solving differential equations. ➤ Remember the concept of definite integral and apply for evaluating surface areas and volumes. ➤ Understand the concept of convergence of sequence and series. Also evaluate Fourier series ➤ Illustrate the working methods of complex functions and apply for finding analytic functions. ➤ Apply the concept of complex functions for finding Taylor’s series, Laurent’s series and evaluation of definite integrals.
<p>B. Tech KAS102T /KAS202T</p>	<p>ENGINEERING CHEMISTRY</p>	<ul style="list-style-type: none"> ➤ Use of different analytical instruments. ➤ Measure molecular/ system properties such as surface tension, viscosity, conductance of solution, chloride and iron content in water. ➤ Measure hardness of water. ➤ Estimate the rate constant of reaction.
<p>B. Tech KNC-101</p>	<p>Soft Skills I</p>	<ul style="list-style-type: none"> ➤ Students will be enabled to understand the correct usage of grammar. ➤ Students will apply the fundamental inputs of communication skills in making speech delivery, individual conference, and group communication. ➤ Students will evaluate the impact of interpersonal communication on their performance as a professional and in obtaining professional excellence at the workplace. ➤ Skills and techniques of persuasion and negotiation would enhance the level of students at multifarious administrative and managerial platforms. ➤ Student will be able to equip with basics of communication skills and will apply it for practical and oral purposes by being honed up in presentation skills and voice-dynamics

B. Tech KNC-201	Soft Skills II	<ul style="list-style-type: none"> ➤ To converse well with effective LSRW skills in English. ➤ Evaluate the importance of conversation in personal and professional domain and apply it for extending professional frontiers ➤ Apply motivation skills for their individual and professional excellence ➤ To utilize teamwork and interpersonal communication skills to survive and excel in work-place. ➤ To evaluate creativity for professional innovation and critical thinking for competence
		<ul style="list-style-type: none"> ➤
B. Tech KAS402	Mathematics IV	<ul style="list-style-type: none"> ➤ Remember the concept of partial differential equation and to solve partial differential equations ➤ Analyze the concept of partial differential equations to evaluate the problems concerned with partial differential equations ➤ Understand the concept of correlation, moments, skewness and kurtosis and curve fitting ➤ Remember the concept of probability to evaluate probability distributions ➤ Apply the concept of hypothesis testing and statistical quality control to create control chart
B. Tech KAS303/KAS403	Mathematics III	<ul style="list-style-type: none"> ➤ Remember the concept of Laplace transform and apply in solving real life problems. ➤ Understand the concept of Fourier and Z –transform to evaluate ➤ Understand the concept of Fourier and Z –transform to evaluate ➤ Remember the concept of Formal Logic ,Group and Rings to evaluate real life problems ➤ Apply the concept of Set, Relation, function and Counting Techniques ➤ Apply the concept of Lattices and Boolean Algebra to create Logic Gates and Circuits, Truth Table, Boolean Functions, Karnaugh Maps
B. Tech KVE-401	Human Values and Professional Ethics	<ul style="list-style-type: none"> ➤ Understand the significance of values, understanding the need, basic guidelines content and process of value education ➤ Distinguish between the self and body, understand meaning of harmony at all levels ➤ Understand the value of harmonious relationships based on certain values. ➤ Understand the harmony in nature and existence. ➤ Distinguish between ethical and unethical practices and make strategy to live accordingly.
B. Tech KAS301/KAS401	Technical Communication	<ul style="list-style-type: none"> ➤ Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers. ➤ . Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions. ➤ Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience. ➤ Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence. ➤ It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.
B. Tech KNC501	Constitution of India, Law and Engineering	<ul style="list-style-type: none"> ➤ Identify and explore the basic features and modalities about Indian constitution. ➤ Differentiate and relate the functioning of Indian parliamentary system at the center and state level.

		<ul style="list-style-type: none"> ➤ Differentiate different aspects of Indian Legal System and its related bodies. ➤ Discover and apply different laws and regulations related to engineering practices. ➤ Correlate role of engineers with different organizations and governance models.
B. Tech ROE074	Understanding the human being Comprehensively Human Aspiration audits fulfilment	<ul style="list-style-type: none"> ➤ To help the students having the clarity about human aspirations, goal, activities and purpose of life. ➤ To facilitate the competence to understand the harmony in nature/existence and participation of human being in the nature/existence. ➤ To help the students to develop the understanding of human tradition and its various components.
B. Tech KNC602	Indian Tradition Cultural and Society	<ul style="list-style-type: none"> ➤ To enable the students to understand the importance of our surroundings and encourage the students to contribute towards sustainable development. ➤ Sensitize students towards issues related to ‘Indian’ culture, tradition and its composite character ➤ To make students aware of holistic life styles of Yogic-science and wisdom capsules in Sanskrit literature that are important in modern society with rapid technological advancements and societal disruptions. ➤ To acquaint students with Indian Knowledge System, Indian perspective of modern scientific world-view and basic principles of Yoga and holistic health care system ➤ Ability to understand, connect up and explain basics of Indian Traditional knowledge modern scientific perspective
B.SC I st Year (First Semester) Math Paper I	Differential Calculus	<ul style="list-style-type: none"> ➤ Gain Knowledge of fundamental concepts of real numbers. ➤ Verify the value of the limit of a function at a point using the definition of the limit ➤ Introduction to sequence and series. ➤ Geometrical representation and problem solving on MVT and Rolle's theorem. ➤ Finding extreme values of function.
B.SC I st Year (First Semester) Math Paper II	Integral Calculus	<ul style="list-style-type: none"> ➤ Student will be to understand differentiation and fundamental theorem in differentiation and various rules. ➤ Finding extreme values of function. ➤ Introduction to Ordinary Differential Equation. ➤ Study multiple integration. ➤ Gain Knowledge of fundamental concepts of real numbers in n dimensions.
B.SC I st Year (First Semester) Physics Paper I	Mechanics and Wave Motion	<ul style="list-style-type: none"> ➤ Grasped the fundamentals of different type of frames of reference and transformation laws – both Galilean and Lorentz. ➤ Learned conservation laws of energy and linear and angular momentum and apply them to solve problems. ➤ Learn the basics of potentials and fields, central forces and Kepler's laws. ➤ Learn the basic properties of matter, how Young's modulus and rigidity modulus are defined and how they are evaluated for different shapes of practical relevance. ➤ .Learn the fundamentals of harmonic oscillator model, including damped and forced oscillators and grasp the significance of terms like quality factor and damping coefficient.

		<ul style="list-style-type: none"> ➤ Study the general equation of wave motion in general and TM waves in stretched strings and longitudinal waves in gases.
B.SC I st Year (First Semester) Physics Paper II	Circuit Fundamental and Basic Electronics	<ul style="list-style-type: none"> ➤ Have basic knowledge of fundamental circuits. ➤ Have basic knowledge of semiconductor physics. ➤ Acquire the knowledge about how a semiconductor diode rectifies an input signal. ➤ Learn how to construct a transistor amplifier.
B.SC I st Year (First Semester) Chemistry Paper I	Inorganic Chemistry	<ul style="list-style-type: none"> ➤ The bonding fundamentals for both ionic and covalent compounds, including electronegativities, bond distances and bond energies using MO diagrams and thermodynamic data. ➤ Predicting geometries of simple molecules ➤ The fundamentals of the chemistry of the s and p group elements, and important real world applications of many of these species ➤ The bonding models, structures, reactivity's, and chemistry of S-N compounds. ➤ Basic knowledge of nuclear structure, stable and unstable atomic nuclei, nuclear reactions and different modes of radioactive decay and also methods for measurements of radioactivity.
B.SC I st Year (First Semester) Chemistry Paper II	Organic Chemistry	<ul style="list-style-type: none"> ➤ To understand the concept of organic reactions mechanism and recognize the type of organic reactions ➤ Discuss kinetics, mechanism and stereochemistry of SN1 and SN2 reactions. ➤ To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions. ➤ Understand the evidences, reactivity and mechanism of various elimination and substitution reactions.
B.SC I st Year (Second Semester) Math Paper I	Matrices & Differential Equation	<ul style="list-style-type: none"> ➤ Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. ➤ Student will be able to find the complete solution of a non-homogeneous differential equation as a linear combination of the complementary function and a particular solution. ➤ Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients ➤ Be familiar with the modelling assumptions and derivations that lead to PDEs. ➤ Be competent in solving linear PDEs using classical solution methods. ➤ Recognize the major classification of PDEs and the qualitative differences between the classes of equations.
B.SC I st Year (Second Semester) Math Paper II	Geometry	<ul style="list-style-type: none"> ➤ Introduction to analytical geometry of 2 dimensional. ➤ Study of lines in 2 and 3 dimension. ➤ Finding equation in various form of line, circle, ellipse, sphere, cones etc ➤ Give the knowledge of geometry using maxima software. ➤ Recognize the major classification of PDEs and the qualitative differences between the classes of equations.
B.SC I st Year (Second Semester) Physics Paper I	Optics	<ul style="list-style-type: none"> ➤ Understand the basic of the matrix method to solve the problems of geometrical optics. ➤ Use the principle of wave motion and superposition to explain the physics of polarisation. ➤ Understand the basics of modern optics like fibre optics and Holography

		<ul style="list-style-type: none"> ➤ Solve the problems in optics by selecting the appropriate equation and performing numerical and analytical calculations.
B.SC 1 st Year (Second Semester) Chemistry Paper I	Physical Chemistry	<ul style="list-style-type: none"> ➤ To apply the concepts of colloidal, solid, liquid state and liquid crystals. ➤ To apply the concepts of colloidal, solid, liquid state and liquid crystals. ➤ To understand mathematical concept of logarithm, probability graphics methods. ➤ To explain the binary arithmetic, number system, computer functioning, ➤ To understand the chemical kinetics, rate of reaction, order of reaction, chain reaction, effect of pressure and temperature
B.SC 2 nd Year (Third Semester) Math Paper I	Algebra	<ul style="list-style-type: none"> ➤ Learn to solve system of linear equation. ➤ Learn to solve Diophantine equation. ➤ Learn to find roots of polynomial over rational. ➤ Learn to find graphs, roots and primes integer using maxima software ➤ Introduction to complex analysis.
B.SC 2 nd Year (Third Semester) Math Paper II	Mathematical Methods	<ul style="list-style-type: none"> ➤ Understand the concept of limit, continuity and differentiability of two independent variables and apply to solve the problems. ➤ Analyze the concept of Laplace Transformation and apply to solve the initial value problems. ➤ Understand the concept of representing the function in terms of periodic functions and apply to solve by Fourier series. ➤ Remember the concept of variations and apply in solving the problems.
B.SC 2 nd Year (Third Semester) Physics Paper I	Electricity and Magnetism	<ul style="list-style-type: none"> ➤ Have gained elaborated knowledge about electrostatics and laws governing the charge distribution. ➤ Have ability for calculating potentials. ➤ To realise the importance of application of Bio Savarts law and Amperes laws ➤ To understand the relevance of different magnetization and the boundary condition of magnetic field.
B.SC 2 nd Year (Third Semester) Chemistry Paper I	Physical Chemistry	<ul style="list-style-type: none"> ➤ Learn the thermodynamic description of exact, inexact differential and state function. ➤ Learn the thermodynamic description of exact, inexact differential and state function. ➤ Know the statistical thermodynamics and various partition functions. ➤ Problem solving through Nernst Equations, use of electrochemical cells
B.SC 2 nd Year (Fourth Semester) Math Paper I	Differential Equation	<ul style="list-style-type: none"> ➤ Understand the concept of differentiation and apply for solving differential equations. ➤ Remember the concept of special functions of and apply to solve the problems having special functions. ➤ Analyze the concept of partial differential equation to evaluate the problems concerned with partial differential equations. ➤ Understand the concept of classification of partial differential equation to evaluate the problems of second order partial differential equation.
B.SC 2 nd Year (Fourth Semester) Math Paper II	Mechanics	<ul style="list-style-type: none"> ➤ Understand the motion of objects in different frame of references ➤ Understand the idea of conservation of angular momentum, central forces and the effective potential. ➤ Understand the application of central force to the stability of circular orbits, Kepler's laws of planetary motion, Orbital Precession and Rutherford scattering ➤ Understand the dynamics of rotating objects i.e. rigid bodies, angular

		<p>velocity, the moment of inertia.</p> <ul style="list-style-type: none"> ➤ Understand the basics of material properties like, elasticity, elastic constants and their relation.
B.SC 2 nd Year (Fourth Semester) Physics Paper I	Thermal Physics and Elementary Statistical Mechanics	<ul style="list-style-type: none"> ➤ Become familiar with the various thermodynamic process and work done in each of the process. ➤ Have a clear understanding about reversible and irreversible process and also working of a Carnot engine and knowledge of calculating change in entropy for various processes. ➤ Realise the importance of thermodynamic functions and applications of Maxwell's relations ➤ Familiarize in depth about statistical distribution and have basic ideas about Maxwell Boltzmann, Boltzmann, Bose Einstein's and Fermi Dirac statistics.
B.SC 2 nd Year (Fourth Semester) Physics Paper II	Elements of Modern Physics	<ul style="list-style-type: none"> ➤ Have a deep knowledge of Relativistic Mechanics, ideas about Einstein's special theory of relativity and their applications. ➤ Become familiar with basic ideas of classical mechanics. ➤ Understanding the principles of Classical Mechanics like Lagrange's equations from D'Alembert's principle, Hamilton's principle and its role in Lagrangian formulation. Hamiltonian formulation and Hamilton's equation of motion. ➤ Have gain knowledge of the application of Classical Mechanics.
B.SC 2 nd Year (Fourth Semester) Chemistry Paper I	Inorganic	<ul style="list-style-type: none"> ➤ After completion of degree, students should gain the theoretical as well as practical knowledge of handling chemicals. ➤ They should expand the knowledge available opportunities related to chemistry in the government services, and the chemical industry like cement industries, agro product, Paint industries, Rubber industries, Petrochemical industries, Food processing industries, Fertilizer industries etc. ➤ Understand the importance of the elements in the periodic table including their physical and chemical nature and role in the daily life. ➤ Apply fundamental principles of measurement, matter, atomic theory, chemical periodicity, chemical bonding, general chemical reactivity and solution chemistry to subsequent courses in science.
B.SC 2 nd Year (Fourth Semester) Chemistry Paper II	Organic Chemistry	<ul style="list-style-type: none"> ➤ The fundamentals of electronic structure and bonding in conjugated and aliphatic and aromatic compounds. ➤ Reactivity patterns of conjugated and organic molecules. ➤ The fundamental electronic structure and bonding in aliphatic and aromatic compounds ➤ Substituent effects on pKa (in the case of carboxylic acids). ➤ The reactivity of carbonyl compounds with both hard and soft nucleophiles (carboxylic acids, aldehydes and ketones) ➤ The kinetics and thermodynamics of carbonyl condensation reactions. ➤ The fundamental properties and reactivity of biologically important molecules (e.g. organic compound of nitrogen, and amines)
B.SC 3 rd Year (Fifth Semester) Math Paper I	Numerical Analysis	<ul style="list-style-type: none"> ➤ Understand the basic concept of Algebra and apply to evaluate the roots of algebraic and transcendental equations. ➤ Remember the concept of solution of simultaneous linear equations to evaluate their solutions by Numerical methods. ➤ Understand the concept of initial value problems and apply different Numerical methods to solve them. ➤ Remember the basic concept of difference equations and apply to solve difference equations.
B.SC 3 rd Year (Fifth Semester) Math Paper II	Linear and abstract Algebra	<ul style="list-style-type: none"> ➤ Introduction to vector space and subspace. ➤ Use computational techniques and algebraic skills essential for the study of systems of Linear equations, matrix algebra, vector spaces, eigen values and eigenvectors.

		<ul style="list-style-type: none"> ➤ Study of various integral domain in ring. ➤ Introduction to field. ➤ Extend group structure to finite permutation groups (Caley Hamilton Theorem).
B.SC 3 rd Year (Fifth Semester) Math Paper III	Linear Programming	<ul style="list-style-type: none"> ➤ Understand and apply the concept of optimality criteria for various types of optimization problems. ➤ Solve various constrained and unconstrained problems in single variable as well as multivariable. ➤ Develop linear programming (LP) models for shortest path, maximum flow. ➤ Understand the mathematical tools that are needed to solve optimization problems. ➤ Formulate the nonlinear programming models.
B.SC 3 rd Year (Fifth Semester) Physics Paper I	Electronics	<ul style="list-style-type: none"> ➤ Have a basic knowledge of Semiconductor Physics ➤ Acquire knowledge about how a semiconductor diode rectifies an input AC signal. ➤ Learn how to construct a transistor amplifier and how its gain varies with frequency. ➤ Learn how to construct a transistor amplifier and how its gain varies with frequency.
B.SC 3 rd Year (Fifth Semester) Physics Paper II	Nuclear Physics	<ul style="list-style-type: none"> ➤ Gain a clear picture of nuclear composition and various nuclear models ➤ Have a deep knowledge about radioactivity, nuclear Fission and Nuclear Fusion, the relevance of nuclear transformation. ➤ Understand the working of nuclear detectors and counters. ➤ Become familiar with nuclear particles, nuclear models, radioactivity and nuclear reactions.
B.SC 3 rd Year (Sixth Semester) Math Paper I	Analysis	<ul style="list-style-type: none"> ➤ Remember the concept of sequences and apply to solve the convergence of sequences. ➤ Understand the concept of analyticity to evaluate the problem of complex variable function. ➤ Illustrate the working methods of complex function and apply for finding analytic function. ➤ Apply the concept of complex functions for finding Taylor's series, Laurant's and evaluation series of definite integrals.
B.SC 3 rd Year (Sixth Semester) Math Paper II	Differential Geometry & Tensor Analysis	<ul style="list-style-type: none"> ➤ Students will able to understand two dimensional transformations ➤ Students will able to understand three dimensional transformations. ➤ To get acquainted with typical problem on CG and existence solution. ➤ Introduction to projection and its types. ➤ Bezier curves.
B.SC 3 rd Year (Sixth Semester) Math Paper III	Discrete Maths	<ul style="list-style-type: none"> ➤ Understand the concepts of Lattices and their types, ➤ Understand the concepts Boolean algebra, switching circuits and their applications ➤ Understand the concepts Graphs, their types and its applications in study of shortest path algorithms.
B.SC 3 rd Year (Sixth Semester) Physics Paper I	Mathematical Methods and Numerical Technique	<ul style="list-style-type: none"> ➤ Have gained basic knowledge of complex number and its various applications. ➤ Expected to gain knowledge of the partial differential equation and different types of functions. ➤ Become familiar with mean value theorem, Fourier series, and its transform. ➤ Have gained knowledge numerical methods for solution of partial , differential and integral equations and different formulas.

<p>B.SC 3rd Year (Sixth Semester) Physics Paper II</p>	<p>Elements of Realistic and Classical Mechanics</p>	<ul style="list-style-type: none"> ➤ Have a deep knowledge of Relativistic Mechanics, ideas about Einstein's special theory of relativity and their applications. ➤ Become familiar with basic ideas of classical mechanics. ➤ Understanding the principles of Classical Mechanics like Lagrange's equations from D'Alembert's principle, Hamilton's principle and its role in Langrangian formulation. Hamiltonian formulation and Hamilton's equation of motion. ➤ Have gain knowledge of the application of Classical Mechanics.
<p>B.SC 3rd Year (Sixth Semester) Physics Paper III</p>	<p>Solid State Physics</p>	<ul style="list-style-type: none"> ➤ Have a clear picture of crystal structure and a clear understanding about X ray diffraction. ➤ Have knowledge of crystal binding and elementary lattice dynamics. ➤ Have knowledge of crystal binding and elementary lattice dynamics. ➤ Expected to gain knowledge of magnetic and dielectric properties of materials.