



Sarva Vidyalaya Kelvani Mandal, Kadi Sanchalit
PRAMUKH SWAMI SCIENCE & H.D.PATEL ARTS COLLEGE, KADI
Re-Accredited with Grade 'A' by NAAC Third Cycle (CGPA 3.25)
"College with Potential for Excellence" Phase I & II (2010-2019) by UGC,
AAA Rank-1 by Govt. of Gujarat



PRAMUKH SWAMI SCIENCE & H D PATEL ARTS COLLEGE, KADI

Affiliated with

**HEMCHANDRACHARYA NORTH GUJARAT
UNIVERSITY, PATAN**

SCIENCE FACULTY

Department of Physics

PSO & CO

Pramukh Swami Science and H. D. Patel Arts College, Kadi
Department of Physics

Programme: B.Sc. Physics

Programme Specific Outcomes (PSOs) for B.Sc. Physics

Sr. No.	On completing B.Sc. Physics, the student will be able to:
PSO 1	Acquire good knowledge and understanding in advanced and frontier areas of Physics.
PSO 2	Know mathematical methods and computer programming so as to model the advanced theories and provide deductions. Demonstrate a rigorous understanding of the core theories & principles of physics, which includes mechanics, electromagnetism, thermodynamics, & quantum mechanics.
PSO 3	Comprehend physics principles and their applications in the problems of everyday life
PSO 4	Provide knowledge about material properties and its application for developing technology to ease the problems related to the society. Not only stitch a fragmented problem into a complete one, but also create alternate solutions in diverse fields of physical, biological and social sciences.
PSO 5	Analyze the applications of mathematics to the problems in physics & develop suitable mathematical method for such application & for formulation of physical theories. Understand the advanced methods of scientific inquiry and develop skills for extensive research.
PSO 6	Possess industry-specific skills for the existing industrial jobs, and for developing new technologies. Careers as a Physicist in premier Research Organization like IPR, ISRO, PRL, DRDO etc.

Course Outcomes (COs): B.Sc. Physics

Semester I

Course Title: Mathematical Physics and Heat Thermodynamics

Course Code: SC23MJDSCPHY101

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understands the concepts and significance of Scalar and Vector Fields as well as operations of operator ∇ , Gauss's Theorem and Stoke's Theorem.	1, 3	Ap, R, U
CO 2	Understands the Thermodynamics, Carnot's theorem and concepts of entropy.	1, 2, 3	Ap, R, E, U
CO 3	Learns about Ultrasonic's, production and its applications.	1, 2, 3, 4, 5, 6	Ap, R, E
CO 4	Will Get sufficient knowledge of sound and theory of resonator.	1, 2, 3, 4, 5	An, Ap, R, E, U
CO 5	Learns sufficient knowledge of various rectifier, Filter circuits and applications of them.	1, 2, 3, 4, 6	An, Ap, R, E, U

Course Outcomes (COs): B.Sc. Physics

Semester II

Course Title: Electrostatics, Classical Mechanics, Electricity and Optics

Course Code: SC23MJDSCPHY201

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understands basics concepts of electrostatics. Learns how to determine the charge of an Electron	1, 2, 3	R, E, U
CO 2	Learns the concepts of Simple Harmonic Oscillations and combination of SHM.	1, 2, 3, 6	Ap, R, E, U
CO 3	Understands the concepts of Damped & Forced Oscillations and its applications	1, 2, 3, 6	An, Ap, R, E, U
CO 4	Learns basic concepts of DC Circuits, its functioning and principles of Network analysis. Also apply theorems to construct and solve electrical circuits.	1, 2, 3, 6	Ap, R, E, U
CO 5	Learns the knowledge of various type of Aberration and Interference	1, 2, 3	An, R, E, U
CO 6	Get sufficient knowledge of Newton's ring experiments and determine wavelength	1, 2, 3, 6	An, R, E, U

Course Outcomes (COs): B.Sc. Physics

Semester III

Course Title: THERMODYNAMICS, MODERN PHYSICS & SOLID STATE PHYSICS

Course Code: SC23MJDSCPHY301

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understand the principles of Heat and Thermodynamics	1, 2, 3, 5, 6	Ap, R, E, U
CO 2	Learns about Franck -Hertz Experiment	1, 2, 3, 6	Ap, R, E
CO 3	Learns the concepts Atomic Spectra	1, 2, 3, 6	An, Ap, R, U
CO 4	Get sufficient knowledge of Crystal Lattice and Crystal structure	1, 2, 3, 6	An, Ap, R, E, U

Course Outcomes (COs): B.Sc. Physics

Semester III (A)

Course Title: ELECTROMAGNETICS, OPTICS AND ELECTRONICS

Course Code: SC23MJDSCPHY301A

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understands basics concepts of electrostatics and Magneto statics.	1, 2, 3	Ap, R, U
CO 2	Learns the foundation of optics as well as the concepts of diffraction. Also understands the concepts of Single slit, Double Slit Fraunhofer diffraction	1, 2, 3, 6	An, R, E, U
CO 3	Learns basic concepts of Polarization and Retarders.	1, 2, 3	R, U
CO 4	Get sufficient knowledge of Basic Transistors	1, 2, 3, 4, 5, 6	R, E, U, Ap
CO 5	learns the knowledge of various type of Transistors Current Component, static (Input and Output) Characteristics	1, 2, 3, 4, 5, 6	An, Ap, R, U

Course Outcomes (COs): B.Sc. Physics

Semester IV

Course Title: CLASSICAL MECHANICS, NUCLEAR PHYSICS AND PLASMA PHYSICS

Course Code: SC23MJDSCPHY401

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Get complete understanding of classical mechanics through equation of motion, motion under force, Mechanics of system of particles, energy of the system etc.	1, 2, 3, 4, 5, 6	Ap, R, E, U
CO 2	Understand the nuclear physics through the Q equation, types of nuclear reaction, detectors, Accelerators, Cyclotron and Synchrotron.	1, 2, 3, 4, 5, 6	Ap, R, E, U
CO 3	Understand the details of radioactivity and its properties, radioactive growth and decay, determination Of the age of the Earth, Carbon dating etc.	1, 2, 3, 4, 5, 6	Ap, R, E, U
CO 4	The knowledge of basic concepts of Plasma, composition and characteristics of Plasma, collisions, Diffusion and mobility, viscosity, conductivity etc. will be accomplished.	1, 2, 3, 4, 5, 6	An, Ap, R, E, U

Course Outcomes (COs): B.Sc. Physics

Semester IV

Course Title: MATHEMATICAL PHYSICS, QUANTUM MECHANICS, ELECTRONICS

Course Code: SC23MJDSCPHY401A

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Get understanding of mathematical Physics through Fourier series, application of Fourier series, even And odd functions. As well as Curvilinear Coordinates, Scale factor for orthogonal systems.	1, 2, 3, 6	An, R, E, U
CO 2	Student will attain the knowledge of quantum mechanics through the study of normalization and Probability and particle in a square well potential, Schrodinger equation and stationer states.	1, 2, 3	An, Ap., R, E, U
CO 3	Students will get basic knowledge of transistor amplifiers, h-parameters with equivalent circuit, Mathematical analysis and solid state Devices.	1, 2, 3, 4, 5, 6	Ap., R, U
CO 4	Through the digital electronics students will study number system using Decimal, Binary, Hexadecimal and Octal, Binary, BCD, Gray, Excess-3 Codes, Universal Gate, Arithmetic Circuits – Exclusive – OR Gate, Application of X-OR Gate etc..	1, 2, 3, 4, 5, 6	Ap., R, U

Course Outcomes (COs): B.Sc. Physics**Semester - V****Course Title: Mathematical Physics, Classical Mechanics & Quantum Mechanics****Course Code: CC: PHY-501**

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understand the basic knowledge of generalized curvilinear coordinates and of various Differential equations.	1, 2, 3	R, E, U
CO 2	Learnt the various numerical techniques useful for the scientific data analysis.	1, 2, 3	An, R, U
CO 3	Understand applications of various differential equations and solve certain special physical problems.	1, 2, 3	An, R, E, U
CO 4	Understand concept of Langrangian Formulation, properties of angular momentum and Euler's Equation of motion.	1, 2, 3	R, E, U
CO 5	Get sufficient knowledge of Schrodinger equation, Degeneracy, Eigenvalue problem and Momentum Eigen functions. Also knows about Physical interpretation of Eigen values, Eigen Function.	1, 2, 3	R, E, U

Course Outcomes (COs): B.Sc. Physics**Semester - V****Course Title: STATISTICAL MECHANICS, SOLID STATE PHYSICS & PLASMA PHYSICS****Course Code: CC: PHY - 502**

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Various applications of Statistical Mechanics and sufficient knowledge of chemical potential as well as potential energy.	1, 2, 3, 4	Ap, R, E, U
CO 2	Also earn sufficient knowledge about Thermodynamic functions in terms of grand partition function, Ideal gas, Gibbs's Paradox and The Equipartition Theorem.	1, 2, 3, 4	An, Ap, R, U
CO 3	Drude model, Sommar-feld model, Hall co-efficient. Also aware about applications to plasmons, Polaritons and Polarons	1, 2, 3, 5, 6	Ap, R, E, U
CO 4	Characteristics of plasma in magnetic field and get sufficient knowledge of various application of plasma.	1, 2, 3, 4, 5, 6	Ap, R, U
CO 5	Plasma frequency, Oscillations of plasma, electromagnetic (Transeverse) oscillations.	1, 2, 3, 4, 5, 6	Ap, R, U

Course Outcomes (COs): B.Sc. Physics

Semester - V

Course Title: NUCLEAR PHYSICS & MOLECULAR SPECTRA

Course Code: CC: PHY - 503

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Properties of Nucleus also Rutherford scattering as well as estimation of Nuclear size.	1, 2, 3	Ap., R, E, U
CO 2	Different types of spectra and decay of alpha, Beta and Gamma rays.	1, 2, 3	An, Ap., R, U
CO 3	Liquid drop model, Nuclear Energy and Fission of Lighter Nuclei and Fission Chain Reaction	1, 2, 3, 4, 5, 6	An, Ap., R, U
CO 4	Various Elementary particles like Leptons, Hadrons, Neutrons, Anti-neutrons, Hadrons and Quarks	1, 2, 3	An, R, U, Ap.
CO 5	Characteristics of Molecular Energy and Molecular Spectra	1, 2, 3	An, Ap., R, E, U
CO 6	Rotational Spectra and Salient Features of Vibrational-Rotational Spectra and Applications	1, 2, 3	An, Ap., R, E, U

Course Outcomes (COs): B.Sc. Physics

Semester V

Course Title: ELECTRONICS & COMPUTER

Course Code: CC: PHY-504

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	The Network Transmission and various type of network sections like T and sections, the bridged – T-network and the Lattice Network.	1, 2, 3, 4, 5, 6	An, Ap, R, U
CO 2	Triac, Diac, LDR, Solar cell. To learn applications of LDR, Characteristics of Solar cell and of LASER	1, 2, 3, 4, 5, 6	An, Ap, R, U
CO 3	Basic Current and Voltage amplifiers, Common Emitter Amplifiers with Emitter Resistor and Simplified Common Emitter Hybrid Model. Also Multistage amplifier (RC-coupled Amplifiers) and Regulated power supply.	1, 2, 3, 4, 5, 6	An, Ap, R, U
CO 4	About computer, executing a C Program, programming style and programming C.	1, 2, 3, 4, 5, 6	An, Ap, R, U

Course Outcomes (COs): B.Sc. Physics

Semester - VI

Course Title: MATHEMATICAL PHYSICS, CLASSICAL MECHANICS & QUANTUM MECHANICS

Course Code: CC: PHY - 601

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	The numerical techniques for Legendre, Bessel, Hermite differential equation and can able to solve Leguerre, Legendre, Rodriguez's polynomials equations.	1, 2, 3	An, R, E, U
CO 2	The motion of rigid body and get knowledge of Lagrange's and Hemilton's Equations and applications of them.	1, 2, 3	E, U, An, R,
CO 3	The physical interpretations of the energy-eigen functions, Properties of Stationary States and Coherent States and the Angular momentum operators.	1, 2, 3	E, U, An, R

Course Outcomes (COs): B.Sc. Physics

Semester - VI

Course Title: STATISTICAL MECHANICS, SOLID STATE PHYSICS & OPTICS

Course Code: CC: PHY – 602

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Bose Einstein, Fermi Dirac Distribution and get knowledge of different partition function.	1, 2, 3	R, U
CO 2	The ideal gas system and Debye's model of solids. Also knows Type-I and Type-II super conductors as well as Meisner effect.	1, 2, 3, 4, 5, 6	Ap., R, E, U
CO 3	About Superconductivity, Thermodynamic properties and BCS theory. Also aware about Josephson tunneling and its Applications.	1, 2, 3, 4, 5, 6	Ap., R, E, U
CO 4	The principle of Holography and its applications. Also get awareness about Fibre optics and Characteristics of the Fibres	1, 2, 3, 4, 5, 6	Ap., R, E, U

Course Outcomes (COs): B.Sc. Physics

Semester - VI

Course Title: ELECTRODYNAMICS & MOLECULAR SPECTRA

Course Code: CC: PHY - 603

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understand the Laplaces' equations.	1, 2, 3	R, E, U
CO 2	Understand the boundary conditions & Process of different co-ordinates.	1, 2, 3	R, E, U
CO 3	Learn electromagnetic induction as well as electromagnetic waves and potential formulation.	1, 2, 3, 6	U, R, E,
CO 4	Understand Raman effect with experimental arrangement for Raman spectra and molecular structure. Also understand electronic spectra.	1, 2, 3, 6	Ap., R, E, U

Course Outcomes (COs): B.Sc. Physics

Semester - VI

Course Title: ELCTRONICS AND COMPUTER PROGRAMMING

Course Code: CC: PHY - 604

Sr. No.	On completing B.Sc. Physics, the student will be able to:	PSOs addressed	Cognitive levels
CO 1	Understand the basic concept of feedback & negative feedback	1, 2, 3, 4, 5, 6	R, E, U, Ap.
CO 2	Understand the operation of different oscillators and awareness of modulation within concept of techniques.	1, 2, 3, 4, 5, 6	R, E, U, Ap.
CO 3	Know digital electronic techniques and operation within it,	1, 2, 3, 4, 5, 6	R, E, U, Ap.
CO 4	Understand the programming in C with various aspects.	1, 2, 3, 4, 5, 6	R, E, U, Ap.