

Shikshan Prasarak Sanstha's
Padmabhushan Vasantraodada Patil Mahavidyalaya, KavatheMahankal

Department of Physics

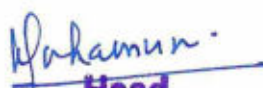
Mrs P U Mahamuni

Annual Teaching plan

Year 23 - 24

Month	Class/Paper	Unit/Topic/Article
July 23	B Sc I	General discussion of syllabus theory and practicals. Introduction of Mechanics II
	B Sc II	-----
	B Sc III	Introduction to Quantum mechanics syllabus P X , Pra set I
August 23	B Sc I	Surface tension, angle of contact, relation bet T, P and R. Jeagers method, applications of S T. Numericals Practical set I
	B Sc II	-----
	B Sc III	P X- Introduction to syllabus. Q M- M wave packet, relation bet ple velo, phase velo & grp velocity. Davisson & Germers expt. Uncertainty principle. Applications atter waves, De Broglie's hypothesis, wavelength of matter waves , Pra set I, Weekly test .
September 23	B Sc I	Applications of S T. Numericals, Practical set I
	B Sc II	-----
	B Sc III	Schrodingers wave equation in 1D and 3D, equation of continuity. Introduction to Oprators in Q M. X position oprator, P momentum oprator, T kinetic energy oprator, H, π , and L oprator., pra. Set II, weekly test.
October 23	B Sc I	Elasticity,--Introduction, bending moment, cantilever, work done in twisting wire, Determination of Y, K and η . Pra set II
	B Sc II	-----
	B Sc III	Applications of Schrodingers eq. Hydrogen atom eq. mcq Test on paper. Home assignment., Set III
Nov 23	B Sc I	Group discussion on P II
	B Sc II	-----
	B Sc III	University exam
12/11/23 to 23/11/23 Dipawali vacation		
Dec 23	B Sc I	-----Pra set II
	B Sc II	Introduction to P VIII, General discussion about syllabus. Resolving power of optical instruments, Rayleigh criterian of resolution, modified Rayleigh criterian, R P of prism and grating,

	B Sc III	P XV-- Atomic and Molecular physics and Astrophysics- Atomic spectra, hydrogen fine structure, spectral notations & optical spectral series. Na spectra, selection & int rules, normal & anomalous Zeeman effect. Weekly test. Pra Set III
Jan 24	B Sc I	-----Pra Set III
	B Sc II	Cardinal points, graphical construction of image, Newtons formula, Lateral and Axial Magnification
	B Sc III	Molecular spectra, - molecular spectra. Hydrogen bonding, hydrogen molecular ion, Rotational spectra, vibrational spectra, electronic spectra of diatomic molecules pra set III. Study tour, students seminars, skill testing practicals
Feb 24	B Sc I	-----Pra set III
	B Sc II	Polarisation of light by double refraction, Huygens explanation with uniaxial crystals, Nicols Prism, Circularly and elliptically polarised light, optical rotation, Polarimeter Set III Practical
	B Sc III	Raman spectra, classical & quantum theory, Raman lines, comparison of IR & Raman spectra. Structure of Universe- Big Bang, Steady state & Oscillating universe theory, Hubble law, Solar system, Origin, condensation theory and arguments. Skill testing experiments, Study tour
March 24	B Sc I	-----
	B Sc II	Interference by division of amplitude and division of wavefront, Lloyds mirror, Int. in parallel faced thin films, wedge shaped thin films, Newtons rings. Numericals. Diffraction- types, elementary theory of plane diff grating. MCQ test on paper, practical revision, Exam.....
	B Sc III	Stellar evolution, H- R diagram, Red giant and white dwarf stars, supernova, neutron stars, blackholes, Sunspots and Sunspot cycle. MCQ test, home assignment Practical revision and pra exam
Apr 24	B Sc I	-----practical exam
	B Sc II	Diffraction- types, elementary theory of plane diff grating, Half periods zones theory, comparison with convex lense
	B Sc III	Theory exam
May 24	B Sc I	Theory exam
	B Sc II	exam
	B Sc III	----


Head
Department of Physics
P.V.P. Mahavidyalaya
Kavathe Mahankal Dist-Sangli

Shikshan Prasarak Sanstha's

Padmabhushan Vasantrodada Patil Mahavidyalay, Kavathe Mahankal.

Annual Teaching Plan 2023-2024.

Class -B.Sc 1 (Phy.) P. No.-IV (Sem.2) NEP.

Name – Patil Sanjay B.

Month	Topic / Unit	Subtopic Completed.
November	A.C.Circuits.	Introduction to syllabus
Decembar	A.C.Circuits	Complex number. J operator and LCR series circuit. Reactance admittance and susceptance of circuit. Sharpness of resonance. Owen's bridge.
January	Magnetism.	Biot - Savart law. Magnetic induction due to to straight conductor, circular coil, solenoid. Ampere's circuital law. Properties of magnetic material. Magnetic induction permeability susceptibility. Para, dia. and ferromagnetic material.
February	Ballistic Galvonometer	Construction and Working of B.G. Damping Correction. Constants .
March / April.	Maxwell's equation and E.M. wave propagation.	Equation of continuity Displacement current. Maxwell equation. Poynting vector. Energy density in em field. Transverse nature of EM waves. Polarization.
May	Revision of syllabus.	University examination.

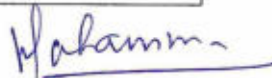
Class- B.Sc. 2(Phy.) Paper No. VI (Sem. 1) NEP

Month	Topic /Unit	Subtopic Completed.
July	Introduction to syllabus	Introduction to SHM.
August	Superposition of harmonic Oscillations.	Linearity and Superposition. superposition of two collinear harmonic oscillation having equal frequency and different frequencies. Two perpendicular harmonic oscillation having equal frequencies and having frequencies in the ratio 2:1.(graphical and analytical method) Lissajous figures.
September	Coupled Oscillations	Frequencies of cocpled oscillation .Normal modes and Normal coordinates . Energy of the coupled oscillation. Energy -transfer in the system.
October	Wave motion and ultrasonic waves	Transverse wave and standing wave on the string. Normal modes of vibration Phase velocity and Group velocity. Plane and spherical waves. Piezoelectric effect .Production of ultrasonic waves by piezoelectric generator. Detection and Properties of ultrasonic waves and its application.
October /November.	Viscosity.	Poiseuille's formula and experimental determ of coefficient of viscosity. Variation of n with temp. Poiseuille's mehod. Rotation Viscometer.Searles Viscometer.
November.	Sound and Acoustic of buildings.	Transducer and and their characteristics. Moving coil loudspeaker. Reverberation time Sabine's reverberation time formula. Requirements of good acoustics.

Class- B.Sc.3 (Phy.)P. No.- IX and XI (Sem. I) and P.No.XIII (Sem. II) CBCS.

Month	Topic /Unit	Subtopic Completed.
July	Introduction to syllabus	About D.E.
August	Partial differential equation . Frobenious method and Special functions	Introduction to differential equation .Method of separation of variables for solving second order differential equation. Solution of Laplace equation and wave equation. Singular point of 2'nd order diff.eq'n.Legendre and Bessel diff.eq'n.
September	Some special integrals and Complex analysis.	Gamma function and properties . Beta function and properties. Relation between beta and gamma function. Error function. Complex number and their graphical representation. Equal complex number. Addition , subtraction multiplication and division of complex number by geometry. Types of complex number s Square root of complex number Log function. Euler formula D' movier theorem . Cauchy- Riemann condition.
Octombar	Special theory of relativity.	Inertial and non inertial frame of reference . Galilean transformation equation. Michelson Morley experiment. Postulate of special theory of relativity. Lorentz transformation equation. Relative addition of velocities. Length contraction. Time dilation Mass energy relation.
Oct./Nov.	Lagrangian formulation and techniques of calculation of variation.	Constraints.D'Alembert's principal Lagrange's equation and application of Lagrange's equation. Hamilton's principal Lagrange's eqation from Hamilton's principle Geodesic.Branchistochrone problem.
November	Charged particles dynamics. (Sem.1 end).	Poisons and Laplace's equation.Physical significance . Laplace equation in one dimension and its solution. Motion of charged particle in in uniform electric field E magnetic field B Crossed uniform electric field E and magnetic field B .
Nov./Decm.	General properties of nuclei and nuclear model. (Sem.2 start.).	Constituents of nucleus and their intrinsic properties. Size, mass charge density Binding energy. Average binding energy.Its variation with mass number . Liquid drop model . Semi empirical mass formula Magic number.
January	Nuclear Detectors.	G-M counter -Construction and Working . Dead time and recovery time. Scintillation detector- principle , construction and working .Wilson cloud chamber. Semiconductor detectors.Crenkov radiation and detector
Feb./ March	Particle Accelerators	Need of accelerator. Cyclotron - Construction working , theory and limitation . Phase stable orbit . Synchrocyclotron - construction and working. Electrons Synchrotron. Proton synchrotron. Betatron - construction and working and condition Expression for energy gain.
April	Particle Physics.	Particle interaction. Classification of elementary particles. Symmetries and conservation laws- energy momentum, angular momentum and Parity Barium number Lepton number Concept of quark model.
May	University examination	

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 P.V.P. Mahalinga Aditya
 Kavathe Mahalinga Dist-Gangli

Shikshan Prasarak Sanstha's
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Annual Teaching Plan – 2023-24

Teacher – Dr. S. S. Shendage

B.Sc. I, Sem – II, Physics Paper – III (NEP)

(Electricity and Magnetism - I)

Month	Topic/Unit	Subtopic planned
Nov	Vector Analysis	Introduction
Dec/Jan	Vector Analysis	Syllabus discussion, Introduction, Del operator, Gradient of scalar field, Divergence of vector field, The curl of vector field, Line, surface and volume integrals of vector fields, Gauss-divergence theorem, Physical significance of Gauss divergence theorem, Stoke's theorem.
Feb	Electrostatics	Introduction, Electrostatic field, electric flux, Gauss's theorem of electrostatics, Electric potential as line integral of electric field, potential due to a point charge, Electric dipole, uniformly charged spherical shell and solid sphere,
Mar	Electrostatics	calculation of electric field from potential, Capacitance of an isolated spherical conductor, parallel plate, Spherical and cylindrical condenser, Energy per unit volume in electrostatic field.
April/May	Electrostatics Exam	Dielectric medium, polarization, Displacement vector, Gauss's theorem in dielectrics, parallel plate capacitor completely filled with dielectric.

B.Sc. II, Sem – III, Physics paper – V (NEP)

(Thermal Physics and Statistical Mechanics - I)

Month	Topic/Unit	Subtopic planned
July	Syllabus	Admission process, Syllabus discussion

Aug	Kinetic Theory of Gases and Thermometry	Introduction, Mean free path, Expressions for Mean Free Path and Molecular Diameter, Corrections applied by Claussius and Maxwell, Transport phenomena, Coefficient of viscosity, conduction and diffusion of gas
Sept	Kinetic Theory of Gases and Thermometry	Law of equipartition of energy, application of law of equipartition of energy to specific heat of gases, principles of thermometry, temperature on mercury in glass scale, temperature on platinum-resistance thermometer, temperature on constant-volume hydrogen scale, Mercury thermometer, Thermocouple, Thermocouple as thermometer, Platinum resistance thermometer, Thermistor as thermometer, examples.
Oct	Law of Thermodynamics	Introduction, Thermodynamic system and thermodynamic variables, equation of state, Thermodynamic equilibrium, Zeroth law of thermodynamics, Internal energy, First law of thermodynamics, Conversion of heat into work, specific heats of gases C_p and C_v , Applications of first law of thermodynamics.
Oct/Nov	Law of Thermodynamics	Work done during isothermal and adiabatic processes, Reversible and irreversible processes, second law of thermodynamics, Carnot's heat engine and Carnot's cycle, Carnot's theorem, Entropy, Physical significance of entropy, entropy changes in reversible and irreversible processes, third law of thermodynamics, examples.

B.Sc. III, Sem – V, Physics paper – XII (CBCS)

(Digital and Analog Circuits and Instrumentation)

Month	Topic/Unit	Subtopic planned
July	Syllabus discussion	Syllabus discussion
Aug	Cathode Ray Oscilloscope	Introduction, principle, construction and working of CRT, block diagram of CRO, uses of CRO (measurement of AC, DC voltage, Lissajous figures, periodic time and frequency

		measurement).
	Oscillator	Introduction, Types of wave forms, Oscillations from tank circuit, Barkhausen's criterion for sustained oscillations, phase shift oscillator, Colpitt's oscillator, Crystal oscillator.
Sept	Transistor Amplifier	Single stage CE transistor amplifier, Dc and AC equivalent circuits, load line analysis.
Sept/Oct	Operational Amplifier and Timmer	Introduction, Differential amplifier and its types, comparison between normal and differential amplifier, qualitative explanation of common mode and differential mode gains and CMRR, Op-Amp symbol, block diagram of Op-Amp, Op-Amp parameters – input offset current, input offset voltage, input bias current, slew rate, input impedance, output impedance, open loop gain, close loop gain, band width, characteristics of ideal Op-Amp, necessity of negative feedback in Op-Amp, inverting amplifier, Op-Amp as a differentiator and integrator
Oct/Nov	Digital Electronics	Review of basic logic gates, study of NAND, NOR, EX-OR and Ex-NOR gates, De-Morgan's theorems, NAND and NOR as universal gates, R-S flip flop, J-K flip-flop, half adder, full adder and parallel binary adder.

B.Sc. III, Sem – VI, Physics paper – XIV

(Solid State Physics – P - XIV)

Month	Topic/Unit	Subtopic planned
Nov/Dec	Crystal Structure	Introduction, Solids: Amorphous, poly-crystalline and crystalline materials, lattice, basis, Unit cell-primitive and non-primitive, Bravais lattices in two and three dimensions, symmetry elements of cubic system, Miller indices, interplaner spacing, simple crystal structures – cubic (SC, BCC, FCC) and HCP.
	X-Ray Diffraction by	Reciprocal lattice and its properties, Diffraction of X-rays by crystals, Ewald construction and Bragg's law in reciprocal

Jan	Crystals	lattice, Brillouin zone, Experimental methods in X-ray diffraction, Analysis of cubic crystals by powder method.
Feb	Magnetic Properties of Matter	Introduction, Classical Langevin theory of diamagnetic materials, Classical Langevin theory of paramagnetic materials, Quantum mechanical treatment of paramagnetism, Curie law, Weiss theory of ferromagnetism, ferromagnetic domains, Explanation of B_H curve, Hysteresis and energy loss
	Elementary band theory of solids	Introduction, Concept of density states, Bloch theorem, Kronig-Penney model, Origin of energy gap, Velocity of electrons according to band theory, Effective mass of an electron, distinction between metals, semiconductors and insulators, Hall effect – Hall voltage and Hall coefficient.
Mar/April		
May	Revision	Revision, Exam

Mohammed

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SSS

(Dr. S.S. Shendage)

Shikshan Prasarak Sanstha's
Padmabhushan Vasanturadada Patil Mahavidyalaya, KavatheMahankal

DEPARTMENT OF PHYSICS

Annual Teaching Plan

Year 2023-2024

Mr. Sagar Sampatrao Shinde

Month	Class/ Paper	Unit/ Topic/ Article
July 23	B.Sc. I	Introduction of Syllabus of Paper I, Mechanics II – Gravitation, Oscillation, Elasticity and Surface tension
	B.Sc. II	---
	B.Sc. III	Introduction of Syllabus of Paper XI, Topic : Charged Particle Dynamics: Introduction , Poissons and Laplaces Eqns
August 23	B.Sc. I	Introduction of Syllabus of Paper I, Mechanics I, Conservation Theorems and Rotational motion. Conservation theorem for linear momentum and angular momentum of particle.
	B.Sc. II	.....
	B.Sc. III	Charged Particle Dynamics: Physical Significance of Poissons and Laplaces Eqns, Laplaces eqn in one dimensions and its solutions, motion of charged particle in uniform electric field.
September 23	B.Sc. I	Work Energy theorem, Conservation theorem for energy of a particle, Centre of mass , Conservation theorem for Energy of a particle. Practical set 1
	B.Sc. II	-----
	B.Sc. III	motion of charged particle in uniform Magnetic field, motion of charged particle in Crossed uniform and constant electric and magnetic fields.
October 23	B.Sc. I	Topic II : Rotational Motion, Angular velocity and momentum, torque, K.E. of rotation ,moment of Inertia, MI of spherical shell about its diameter, MI of solid cylinder about its axis of symmetry Practical set 1 &2
	B.Sc. II	---
	B.Sc. III	Topic II: Special Theory of Relativity—Frames of

		reference and its types , Galilean Transformations, Michelson morley experiment, postulates of theory of relativity., Lorentz transformation eqn, time dilation, relativistic addn of velocities, variation of mass with velocity, mass energy equivalence relation
November 23	B.Sc. I	Paper II Oscillation: SHM, Differential eqn of SHM, KE & PE, Total Energy , Damped oscillations, forced oscillations. Practical Set 2
	B.Sc. II	---
	B.Sc. III	University Exam
Dipawali Vacation 12/11/23 to 23/11/23		
December 23	B.Sc. I	---- Practical Set II
	B.Sc. II	Introduction of Syllabus of Paper VII--- Unit I Thermodynamic Potential- Enthalpy, Gibbs Function, Helmholtz and internal Energy function, Maxwells thermodynamical relations
	B.Sc. III	Introduction of Syllabus of Paper XVI: Energy Studies And Material Science. Unit II : Superconductivity: Introduction , Idea of superconductivity, critical temperature, critical ,magnetic field, meissner effect, type1 and2 superconductors
January 24	B.Sc. I	--- Practical Set 3
	B.Sc. II	Joule Thomsons effect, clausius clapeyron Eqn , Expression for $C_p - C_v$ and C_p / C_v , TdS eqns.
	B.Sc. III	London Eqn and Penetration depth, Isotope effect, application of magnetic levitation
February 24	B.Sc. I	--- Practical Set 3
	B.Sc. II	Theory of Radiation: Introduction , Black body radiation and its importance, Concept of Energy Density,
	B.Sc. III	Topic II: Nanotechnology—Introduction of Nanoscience and Nanotechnology, length scales to nano science nano structures 1D,2D and 3D nanostructures, size effect in nanosystem, quantum confinement
March 24	B.Sc. I	---- Practical Set IV
	B.Sc. II	Derivation of Plancks law , Deduction of wien's Distribution law, Rayleigh-Jeans law
	B.Sc. III	Synthesis of nano structured materials, photolithio graphy ,ball miling, nucleation and growth, applications

		of nanotechnology.
April 24	B.Sc. I	---Practical Exam
	B.Sc. II	Stephan Boltzmann law And wien's displacement law from Plancks law
	B.Sc. III	Theory Exam
May 24	B.Sc. I	Theory Exam
	B.Sc. II	Theory Exam
	B.Sc. III	----

Shinde
(Mrs. sagar S. shinde)

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DEPARTMENT OF PHYSICS

Annual Teaching Plan


Year 2023-2024

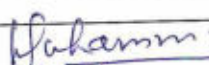
Mr. Raj Prakash Hasabe

Month	Class/ Paper	Unit/ Topic/ Article
August 23	B.Sc. I	Introduction of Syllabus of Paper I, Mechanics I, Vectors – Scalar and Vector, Vector Addition
	B.Sc. II	.....
	B.Sc. III	Introduction of Syllabus of Paper XI
September 23	B.Sc. I	Properties Of Vectors, Scalar Product , Vector Product, Scalar triple product its physical significance, Vector Triple Product and its Physical Significance Practical set 1
	B.Sc. II	-----
	B.Sc. III	Lagrangian Formulation--- Co- ordiante system, Constraints , Degrees of Freedom, Generalized Coordinates, D' Alemberts principle, Lagrangian Equation from D'Alembert, Applications Langrange Equation
October 23	B.Sc. I	Ordinary Differential Equation—Degree and Order of differential equations, 1 st order and 2 nd order Differential Equations and Examples Practical set 1 &2
	B.Sc. II	---
	B.Sc. III	Problems on Lagrangian Applications Topic II Techniques of Calculus of Variation— Hamiltons Principle, Deduction Of Hamilton Principle from D Alemberts Principle.
November 23	B.Sc. I	Paper II Gravitation – Introduction, Newtons Law of Gravitation, Keplers Laws , Satellites, Applications Of Satellite Practical Set 2
	B.Sc. II	---
	B.Sc. III	University Exam

Dipawali Vacation 12/11/23 to 23/11/23

December 23	B.Sc. I	---- Practical Set II
	B.Sc. II	Introduction of Syllabus of Paper VII--- Unit II Classical Statistics –Phase Space, Microstate and macrostate
	B.Sc. III	Introduction of Syllabus of Paper XVI: Energy Studies And Material Science. Energy and Wind Energy—Forms of Energy, Classification of Energy resources, Energy Demands, Wind Energy.
January 24	B.Sc. I	--- Practical Set 3
	B.Sc. II	Priory probability, Thermodynamic Probability, Probability Distribution
	B.Sc. III	Wind Power Density, Efficiency Factor of wind turbine, types of wind turbine generator unit, Horizontal axis type wind turbine Generator unit.
February 24	B.Sc. I	--- Practical Set 3
	B.Sc. II	M.B Distribution law, Evaluation of constants α and β , Entropy and Thermodynamic Probability.
	B.Sc. III	Topic II: Solar Energy—Solar energy Spectrum, Photovoltaic route, Solar constant, Clarity index, Soalr insulation, Solar Photovoltaic system, Solar PV panel
March 24	B.Sc. I	---- Practical Set IV
	B.Sc. II	Topic II: Quantum Statistics—Bose Einstein distribution law, Photon gas, electron gas
	B.Sc. III	Topic III: Biomass Energy—origin of biomass, Biomass energy resourses, Biomass conversion process.
April 24	B.Sc. I	---Practical Exam
	B.Sc. II	Femi-dirac Distribution law, Comparison of MB, BE and FD Statistics
	B.Sc. III	Theory Exam
May 24	B.Sc. I	Theory Exam
	B.Sc. II	Theory Exam
	B.Sc. III	----


(Raj P. Hasabe)


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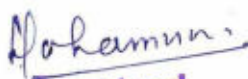
Department of Physics

Mrs P U Mahamuni

Annual Teaching plan Year 22 - 23

Month	Class/Paper	Unit/Topic/Article
Aug 22	B Sc I	Introduction to syllabus Paper II, general discussion of syllabus
	B Sc II	-----Practicals Set I (ONE BATCH)
	B Sc III	Introduction to syllabus P X , Pra set I
Sept 22	B Sc I	Surface tension, angle of contact, relation bet T, P and R. Jeagers method, applications of S T. Numericals MCQ Test on entire paper.ravitation
	B Sc II	-----Practicals set I
	B Sc III	P X- Introduction to syllabus. Q M- M wave packet, relation bet ple velo, phase velo & grp velocity. Davisson & Germers expt. Uncertainty principle. Applications atter waves, De Broglie's hypothesis, wavelength of matter waves , Pra set I
Oct 22	B Sc I	Gravitation—Newtons law, derivation of G, motion of particle in central force field, Keplars laws, numericals.
	B Sc II	-----Practicals Set II
	B Sc III	Oprators in Q M. X position oprator, P momentum operator, T kinetic energy operator, H, π , and L operator., Set II
Nov 22	B Sc I	Elasticity,--bending moment, cantilever, work done in twisting wire, Determination of Y, K and η . -----
	B Sc II	-----Practicals Set II
	B Sc III	Oprators in Q M. X, P, T, H, π , L, ladder oprators, Eigen values of L_x , L^2 mcq Test on paper. Home assignment., Set II PRACTICALS
Dec 22	B Sc I	test on each chapter, Home assignments.
16 December2022 to 2 Jan 2023 vacation		
Jan 23	B Sc I	-----
	B Sc II	Introduction to P VIII, General discussion about syllabus. Cardinal points, graphical construction of image, Newtons formula, Lateral, angular and axial magnification. Pra Set III
	B Sc III	P XV-- Atomic and Molecular physics and Astrophysics- Atomic spectra, hydrogen fine structure, spectral notations & optical spectral series.Na spectra, selection & int rules, normal & anomolous Zeeman effect. Pra Set III
Feb 23	B Sc I	-----
	B Sc II	Resolving power of optical instruments, Rayleigh criterion of resolution, modified Rayleigh criterian, R P of prism and grating,

		resolution, modified Rayleigh criterion, R P of prism and grating,
	B Sc III	Molecular spectra, - molecular spectra. Hydrogen bonding, hydrogen molecular ion, Rotational spectra, vibrational spectra, electronic spectra of diatomic molecules
Mar 23	B Sc I	-----
	B Sc II	Polarisation of light by double refraction, Huygens explanation with uniaxial crystals, Nicols Prism, Circularly and elliptically polarised light, optical rotation, Polarimeter Set III Practicals
	B Sc III	Raman spectra, classical & quantum theory, Raman lines, comparison of IR & Raman spectra. Structure of Universe- Big Bang, Steady state & Oscillating universe theory, Hubble law, Solar system, Origin, condensation theory and arguments. Skill testing experiments, Study tour
Apr 23	B Sc I	-----
	B Sc II	Interference by division of amplitude and division of wavefront, Lloyds mirror, Int. in parallel faced thin films, wedge shaped thin films, Newtons rings. Numericals. Diffraction- types, elementary theory of plane diff grating. MCQ test on paper, practical revision, Exam.....
	B Sc III	Stellar evolution, H- R diagram, Red giant and white dwarf stars, supernova, neutron stars, blackholes, Sunspots and Sunspot cycle. MCQ test, home assignment Practical revision and pra exam
May 23	B Sc I	-----
	B Sc II	Theory exam
	B Sc III	Theory exam


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Shikshan Prasarak Sanstha's

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Annual Teaching Plan 2022-2023.

Class -B.Sc 1 (Phy.) P. No.-IV (Sem.2) CBCS.

Name – Patil Sanjay B.

Month	Topic / Unit	Subtopic Completed.
Janeuary	A.C.Circuits.	Introduction to syllabus
Janeuary	A.C.Circuits	Complex number. J operator and LCR series circuit. Reactance admittance and susceptance of circuit. Sharpness of resonance. Owen's bridge.
Feb.	Magnetism.	Biot - Savart law. Magnetic induction due to to straight conductor, circular coil, solenoid.Ampere's circuital law. Properties of magnetic material. Magnetic induction permeability susceptibility. Para, dia. and ferromagnetic material.
March	Ballistic Galvonometer	Construction and Working of B.G. Damping Correction. Constants .
April / May	Maxwell's equation and E.M. wave propagation.	Equation of continuity Displacement current. Maxwell equation. Poynting vector. Energy density in em field. Transverse nature of EM waves. Polarization.
June	Revision of syllabus.	University examination.

Class- B.Sc. 2(Phy.) Paper No. VI (Sem. 1) CBCS

Month	Topic /Unit	Subtopic Completed.
August	Introduction to syllabus	.....
September	Superposition of harmonic Oscillations.	Linearity and Superposition superposition of two collinear harmonic oscillation having equal frequency and different frequencies. Two perpendicular harmonic oscillation having equal frequencies and having frequencies in the ratio 2:1.(graphical and analytical method) Lissajous figures.
October	Coupled Oscillations	Frequencies of cocpled oscillation .Normal modes and Normal coordinates . Energy of the coupled oscillation. Energy -transfer in the system.
November	Wave motion and ultrasonic waves	Transverse wave and standing wave on the string. Normal modes of vibration Phase velocity and Group velocity. Plane and spherical waves. Piezoelectric effect .Production of ultrasonic waves by piezoelectric generator. Detection and Properties of ultrasonic waves and its application.
November	Viscosity and Physics Of low Pressure.	Poiseuille's formula and experimental determ of coefficient of viscosity. Variation of n with temp. Production and measurement of low pressure. Rotary pump. Diffusion pump Molecular pump . Pirani gauge and detection of leakage.
December.	Sound and Acoustic of buildings.	Transducer and and their characteristics. Moving coil loudspeaker. Reverberation time Sabine's reverberation time formula. Requirements of good acoustics.

Class- B.Sc.3 (Phy.)P. No.- IX and XI (Sem. I) and P.No.XIII (Sem. II) CBCS.

Month	Topic /Unit	Subtopic Completed.
August	Introduction to syllabus	.....
September	Partial differential equation . Frobenius method and Special functions	Introduction to differential equation .Method of separation of variables for solving second order differential equation. Solution of Laplace equation and wave equation. Singular point of 2 nd order diff.eq'n.Legendre and Bessel diff.eq'n.
October.	Some special integrals and Complex analysis.	Gamma function and properties . Beta function and properties. Relation between beta and gamma function. Error function. Complex number and their graphical representation. Equal complex number. Addition , subtraction multiplication and division of complex number by geometry. Types of complex numbers Square root of complex number Log function. Euler formula D' Moivre theorem . Cauchy- Riemann condition.
November	Special theory of relativity.	Inertial and non inertial frame of reference . Galilean transformation equation. Michelson Morley experiment. Postulate of special theory of relativity. Lorentz transformation equation. Relative addition of velocities. Length contraction. Time dilation Mass energy relation.
December	Lagrangian formulation and techniques of calculation of variation.	Constraints.D'Alembert's principal Lagrange's equation and application of Lagrange's equation. Hamilton's principal Lagrange's equation from Hamilton's principle Geodesic.Branchistochrone problem.
December	Charged particles dynamics. (Sem.1 end).	Poissons and Laplace's equation.Physical significance . Laplace equation in one dimension and its solution. Motion of charged particle in in uniform electric field E magnetic field B Crossed uniform electric field E and magnetic field B .
January	General properties of nuclei and nuclear model. (Sem.2 start.).	Constituents of nucleus and their intrinsic properties. Size, mass charge density Binding energy. Average binding energy.Its variation with mass number . Liquid drop model . Semi empirical mass formula Magic number.
February	Nuclear Detectors.	G-M counter -Construction and Working . Dead time and recovery time. Scintillation detector- principle , construction and working .Wilson cloud chamber. Semiconductor detectors.Cerenkov radiation and detector
March/April	Particle Accelerators	Need of accelerator. Cyclotron - Construction working , theory and limitation . Phase stable orbit . Synchrocyclotron - construction and working. Electrons Synchrotron. Proton synchrotron. Betatron - construction and working and condition Expression for energy gain.
May	Particle Physics.	Particle interaction. Classification of elementary particles. Symmetries and conservation laws- energy momentum, angular momentum and Parity Baryon number Lepton number Concept of quark model.
June.		University examination

(S.B.Patil)

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Annual Teaching Plan – 2022-23

Teacher – Dr. S. S. Shendage

B.Sc. I, Sem – II, Physics Paper – III (NEP)

(Electricity and Magnetism - I)

Month	Topic/Unit	Subtopic planned
Jan	Vector Analysis	Introduction
Feb	Vector Analysis	Syllabus discussion, Introduction, Del operator, Gradient of scalar field, Divergence of vector field, The curl of vector field, Line, surface and volume integrals of vector fields, Gauss-divergence theorem, Physical significance of Gauss divergence theorem, Stoke's theorem.
Mar	Electrostatics	Introduction, Electrostatic field, electric flux, Gauss's theorem of electrostatics, Electric potential as line integral of electric field, potential due to a point charge, Electric dipole, uniformly charged spherical shell and solid sphere,
April	Electrostatics	calculation of electric field from potential, Capacitance of an isolated spherical conductor, parallel plate, Spherical and cylindrical condenser, Energy per unit volume in electrostatic field.
May/June	Electrostatics Exam	Dielectric medium, polarization, Displacement vector, Gauss's theorem in dielectrics, parallel plate capacitor completely filled with dielectric.

B.Sc. II, Sem – III, Physics paper – V (CBCS)

(Thermal Physics and Statistical Mechanics - I)

Month	Topic/Unit	Subtopic planned
Aug	Syllabus	Admission process, Syllabus discussion

Aug	Kinetic Theory of Gases and Thermometry	Introduction, Mean free path, Expressions for Mean Free Path and Molecular Diameter, Corrections applied by Claussius and Maxwell, Transport phenomena, Coefficient of viscosity, conduction and diffusion of gas
Sept	Kinetic Theory of Gases and Thermometry	Law of equipartition of energy, application of law of equipartition of energy to specific heat of gases, principles of thermometry, temperature on mercury in glass scale, temperature on platinum-resistance thermometer, temperature on constant-volume hydrogen scale, Mercury thermometer, Thermocouple, Thermocouple as thermometer, Platinum resistance thermometer, Thermistor as thermometer, examples.
Oct	Law of Thermodynamics	Introduction, Thermodynamic system and thermodynamic variables, equation of state, Thermodynamic equilibrium, Zeroth law of thermodynamics, Internal energy, First law of thermodynamics, Conversion of heat into work, specific heats of gases C_p and C_v , Applications of first law of thermodynamics.
Oct/Nov	Law of Thermodynamics	Work done during isothermal and adiabatic processes, Reversible and irreversible processes, second law of thermodynamics, Carnot's heat engine and Carnot's cycle, Carnot's theorem, Entropy, Physical significance of entropy, entropy changes in reversible and irreversible processes, third law of thermodynamics, examples.

**B.Sc. III, Sem – V, Physics paper – XII (CBCS)
(Digital and Analog Circuits and Instrumentation)**

Month	Topic/Unit	Subtopic planned
July	Syllabus discussion	Syllabus discussion
Aug	Cathode Ray Oscilloscope	Introduction, principle, construction and working of CRT, block diagram of CRO, uses of CRO (measurement of AC, DC voltage, Lissajous figures, periodic time and frequency)

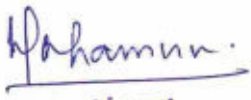
		measurement).
	Oscillator	Introduction, Types of wave forms, Oscillations from tank circuit, Barkhausen's criterion for sustained oscillations, phase shift oscillator, Colpitt's oscillator, Crystal oscillator.
Sept	Transistor Amplifier	Single stage CE transistor amplifier, Dc and AC equivalent circuits, load line analysis.
Sept/Oct	Operational Amplifier and Timmer	Introduction, Differential amplifier and its types, comparison between normal and differential amplifier, qualitative explanation of common mode and differential mode gains and CMRR, Op-Amp symbol, block diagram of Op-Amp, Op-Amp parameters – input offset current, input offset voltage, input bias current, slew rate, input impedance, output impedance, open loop gain, close loop gain, band width, characteristics of ideal Op-Amp, necessity of negative feedback in Op-Amp, inverting amplifier, Op-Amp as a differentiator and integrator
Oct/Nov	Digital Electronics	Review of basic logic gates, study of NAND, NOR, EX-OR and Ex-NOR gates, De-Morgan's theorems, NAND and NOR as universal gates, R-S flip flop, J-K flip-flop, half adder, full adder and parallel binary adder.


B.Sc. III, Sem – VI, Physics paper – XIV

(Solid State Physics – P - XIV)

Month	Topic/Unit	Subtopic planned
Nov/Dec	Crystal Structure	Introduction, Solids: Amorphous, poly-crystalline and crystalline materials, lattice, basis, Unit cell-primitive and non-primitive, Bravais lattices in two and three dimensions, symmetry elements of cubic system, Miller indices, interplaner spacing, simple crystal structures – cubic (SC, BCC, FCC) and HCP.
	X-Ray Diffraction by	Reciprocal lattice and its properties, Diffraction of X-rays by crystals, Ewald construction and Bragg's law in reciprocal

Jan	Crystals	lattice, Brillouin zone, Experimental methods in X-ray diffraction, Analysis of cubic crystals by powder method.
Feb	Magnetic Properties of Matter	Introduction, Classical Langevin theory of diamagnetic materials, Classical Langevin theory of paramagnetic materials, Quantum mechanical treatment of paramagnetism, Curie law, Weiss theory of ferromagnetism, ferromagnetic domains, Explanation of B_H curve, Hysteresis and energy loss
Mar/April	Elementary band theory of solids	Introduction, Concept of density states, Bloch theorem, Kronig-Penney model, Origin of energy gap, Velocity of electrons according to band theory, Effective mass of an electron, distinction between metals, semiconductors and insulators, Hall effect – Hall voltage and Hall coefficient.
May	Revision	Revision, Exam


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Dr. S. S. Shendye

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DEPARTMENT OF PHYSICS

Annual Teaching Plan

Year 2022-2023

Mr. Sagar Sampatrao Shinde

Month	Class/ Paper	Unit/ Topic/ Article
August 22	B.Sc. I	Introduction of Syllabus of Paper I, Mechanics I, Conservation Theorems and Rotational motion. Conservation theorem for linear momentum and angular momentum of particle.
	B.Sc. II	.....
	B.Sc. III	Charged Particle Dynamics: Physical Significance of Poissons and Laplaces Eqns, Laplaces eqn in one dimensions and its solutions, motion of charged particle in uniform electric field.
September 22	B.Sc. I	Work Energy theorem, Conservation theorem for energy of a particle, Centre of mass, Conservation theorem for Energy of a particle. Practical set 1
	B.Sc. II	-----
	B.Sc. III	motion of charged particle in uniform Magnetic field, motion of charged particle in Crossed uniform and constant electric and magnetic fields.
October 22	B.Sc. I	Topic II : Rotational Motion, Angular velocity and momentum, torque, K.E. of rotation, moment of Inertia, MI of spherical shell about its diameter, MI of solid cylinder about its axis of symmetry Practical set 1 & 2
	B.Sc. II	---
	B.Sc. III	Topic II: Special Theory of Relativity—Frames of reference and its types, Galilean Transformations, Michelson morley experiment, postulates of theory of relativity
November 22	B.Sc. I	Paper II Oscillation: SHM, Differential eqn of SHM, KE & PE, Total Energy, Damped oscillations, forced oscillations.

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		Practical Set 2
	B.Sc. II	---
	B.Sc. III	Lorentz transformation eqn, time dilation, relativistic addn of velocities, variation of mass with velocity, mass energy equivalence relation
December 22	B.Sc. I	Paper II Gravitation – Introduction, Newtons Law of Gravitation, Keplers Laws , Satellites, Applications Of Satellite
	B.Sc. II	---
	B.Sc. III	University Exam

Dipawali Vacation 16/12/22 to 02/01/23

January 23	B.Sc. I	--- Practical Set 3
	B.Sc. II	Introduction of Syllabus of Paper VII--- Unit I Thermodynamic Potential- Enthalpy, Gibbs Function, Helmholtz and internal Energy function, Maxwells thermodynamical relations
	B.Sc. III	Introduction of Syllabus of Paper XVI: Energy Studies And Material Science. Unit II : Superconductivity: Introduction , Idea of superconductivity, critical temperature, critical ,magnetic field, meissner effect, type1 and2 superconductors
February 23	B.Sc. I	--- Practical Set 3
	B.Sc. II	Joule Thomsons effect, clausius clapeyron Eqn , Expression for $C_p - C_v$ and C_p / C_v , TdS eqns.
	B.Sc. III	London Eqn and Penetration depth, Isotope effect, application of magnetic levitation
March 23	B.Sc. I	--- Practical Set 3
	B.Sc. II	Theory of Radiation: Introduction , Black body radiation and its importance, Concept of Energy Density.
	B.Sc. III	Topic II: Nanotechnology—Introduction of Nanoscience and Nanotechnology, length scales to nano science nano structures 1D,2D and 3D nanostructures, size effect in nanosystem, quantum confinement
April 23	B.Sc. I	---- Practical Set IV
	B.Sc. II	Derivation of Plancks law , Deduction of wien's Distribution law, Rayleigh-Jeahs law
	B.Sc. III	Synthesis of nano structured materials, photolithio graphy ,ball miling, nucleation and growth, applications of nanotechnology.

May 23	B.Sc. I	Theory Exam
	B.Sc. II	Theory Exam
	B.Sc. III	Theory Exam

**Shikshan Prasarak Sanstha's
Padmabhushan Vasantrodada Patil Mahavidyalaya, KavatheMahankal**

DEPARTMENT OF PHYSICS

Annual Teaching Plan

Year 2022-2023

Mr. P.U. Kambale

Month	Class/ Paper	Unit/ Topic/ Article
August 22	B.Sc. I	Introduction of Syllabus of Paper I, Mechanics I, Vectors – Scalar and Vector, Vector Addition
	B.Sc. II	.....
	B.Sc. III	Introduction of Syllabus of Paper XI
September 22	B.Sc. I	Properties Of Vectors, Scalar Product , Vector Product, Scalar triple product its physical significance, Vector Triple Product and its Physical Significance Practical set 1
	B.Sc. II	-----
	B.Sc. III	Lagrangian Formulation--- Co- ordiante system, Constraints , Degrees of Freedom, Generalized Coordinates, D' Alemberts principle, Lagrangian Equation from D'Alembert, Applications Langrange Equation
October 22	B.Sc. I	Ordinary Differential Equation—Degree and Order of differential equations, 1 st order and 2 nd order Differential Equations and Examples Practical set 1 &2
	B.Sc. II	---
	B.Sc. III	Problems on Lagrangian Applications Topic II Techniques of Calculus of Variation—Hamiltons Principle, Deduction Of Hamilton Principle from D Alemberts Principle.
November 22	B.Sc. I	Paper II Gravitation – Introduction, Newtons Law of Gravitation, Keplers Laws , Satellites, Applications Of Satellite Practical Set 2
	B.Sc. II	---
	B.Sc. III	Hamiltons Principle, Deduction Of Hamilton Principle from D Alemberts Principle.
	B.Sc. II	---

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		Unit II Classical Statistics –Phase Space, Microstate and macrostate
	B.Sc. III	University Exam....
Dipawali Vacation (16/12/22-02/01/23)		
January 23	B.Sc. I	--- Practical Set 3
	B.Sc. II	Introduction of Syllabus of Paper VII--- Unit II Classical Statistics –Phase Space, Microstate and macrostate Priority probability, Thermodynamic Probability, Probability Distribution
	B.Sc. III	Wind Energy. Wind Power Density, Efficiency Factor of wind turbine, types of wind turbine generator unit, Horizontal axis type wind turbine Generator unit.
February 23	B.Sc. I	--- Practical Set 3
	B.Sc. II	M.B Distribution law, Evaluation of constants α and β , Entropy and Thermodynamic Probability.
	B.Sc. III	Topic II: Solar Energy—Solar energy Spectrum, Photovoltaic route, Solar constant, Clarity index, Solar insulation, Solar Photovoltaic system, Solar PV panel
March 23	B.Sc. I	---- Practical Set IV
	B.Sc. II	Topic II: Quantum Statistics—Bose Einstein distribution law, Photon gas, electron gas
	B.Sc. III	Topic III: Biomass Energy—origin of biomass, Biomass energy resources, Biomass conversion process.
April 23	B.Sc. I	---Practical Exam
	B.Sc. II	Fermi-dirac Distribution law, Comparison of MB, BE and FD Statistics
	B.Sc. III	Topic III: Biomass Energy—origin of biomass, Biomass energy resources, Biomass conversion process.
May 23	B.Sc. I	Theory Exam
	B.Sc. II	Theory Exam
	B.Sc. III	Theory Exam

**Shikshan Prasarak Sanstha's
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Department of Physics

Mrs P U Mahamuni

Annual Teaching plan Year 21 - 22

Month	Class/Paper	Unit/Topic/Article
Oct 21	B Sc I	Introduction to syllabus Paper II, Mechanics II general discussion of syllabus
	B Sc II	-----
	B Sc III	General discussion and Introduction to syllabus P X
Nov 21	B Sc I	Gravitation—Newton's laws of Gravitation, derivation, dimensions of G, motion of ple in central force field Numerical on gravitation
	B Sc II	-----
	B Sc III	P X- Introduction to syllabus. Q M- M wave packet, relation bet ple velo, phase velo & grp velocity. Davisson & Germers expt. Uncertainty principle. Applications atter waves, De Broglie's hypothesis, wavelength of matter waves
Dec 21	B Sc I	Oscillations- Intro to SHM, Diff eq., K E & P E, Oscillations- Total eng & time average, Damped osci, forced oscillations. Numericals, Surface tension, angle of contact, relation bet T, P and R. Jeagers method, applications of S T. Numericals MCQ Test on entire paper.
	B Sc II	-----
	B Sc III	Oprators in Q M. X position oprator, P momentum operator, T kinetic energy operator, H, π , and L operator.
Jan 22	B Sc I	Elasticity,--bending moment, cantilever, work done in twisting wire, Determination of Y, K and η . Numericals Surface tension, angle of contact, relation bet T, P and R. Jeagers method, applications of S T. Numericals MCQ Test on entire paper. -----
	B Sc II	-----
	B Sc III	Oprators in Q M. X, P, T, H, π , L, ladder oprators, Eigen values of L_x , L^2 mcq Test on paper. Home assignment.
24 Jan- 28Feb 22		Vacation
March 22	B Sc I	-----
	B Sc II	Introduction to P VIII, General discussion about syllabus. Cardinal points, graphical construction of image, Newtons formula, Lateral, angular and axial magnification.
	B Sc III	P XV-- Atomic and Molecular physics and Astrophysics- Atomic spectra, hydrogen fine structure, spectral notations & optical spectral series. Na spectra, selection & int rules, normal & anomolous Zeeman effect.

		anomalous Zeeman effect.
April 22	B Sc I	-----
	B Sc II	Resolving power of optical instruments, Rayleigh criterion of resolution, modified Rayleigh criterion, R P of prism and grating,
	B Sc III	Molecular spectra, - molecular spectra. Hydrogen bonding, hydrogen molecular ion, Rotational spectra, vibrational spectra, electronic spectra of diatomic molecules
May 22	B Sc I	-----
	B Sc II	Polarisation of light by double refraction, Huygens explanation with uniaxial crystals, Nicols Prism, Circularly and elliptically polarised light, optical rotation, Polarimeter
	B Sc III	Raman spectra, classical & quantum theory, Raman lines, comparison of IR & Raman spectra. Structure of Universe- Big Bang, Steady state & Oscillating universe theory, Hubble law, Solar system, Origin, condensation theory and arguments.
June 22	B Sc I	-----
	B Sc II	Interference by division of amplitude and division of wavefront, Lloyds mirror, Int. in parallel faced thin films, wedge shaped thin films, Newtons rings. Numericals. Diffraction- types, elementary theory of plane diff grating. MCQ test on paper Exam.....
	B Sc III	Stellar evolution, H- R diagram, Red giant and white dwarf stars, supernova, neutron stars, blackholes, Sunspots and Sunspot cycle. MCQ test, home assignment

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Annual Teaching Plan 2021-2022.

Class -B.Sc 1 (Phy.) P. No.-IV (Sem.2) CBCS.

Name – Patil Sanjay B.

Month	Topic / Unit	Subtopic Completed.
March	A.C.Circuits.	Introduction to syllabus
March	A.C.Circuits	Complex number.J operator and LCR series circuit. Reactance admittance and susceptance of circuit. Sharpness of resonance.Owen's bridge.
April	Magnetism.	Biot - Savart law. Magnetic induction due to straight conductor, circular coil, solenoid.Ampere's circuital law. Properties of magnetic material. Magnetic induction permeability susceptibility. Para, dia. and ferromagnetic material.
May	Electromagnetic induction.	Faraday's law, lenz's law. Self and mutual inductance. Inductance of single coil.M of two coils.
May	Maxwell's equation and E.M. wave propagation.	Equation of continuity Displacement current. Maxwell equation. Poynting vector. Energy density in em field. Transverse nature of EM waves. Polarization.
June	Revision of syllabus.	University examination.

Class- B.Sc. 2(Phy.) Paper No. VI (Sem. 1) CBCS

Month	Topic /Unit	Subtopic Completed.
October	Introduction to syllabus	.....
October	Superposition of harmonic Oscillations.	Linearity and Superposition superposition of two collinear harmonic oscillation having equal frequency and different frequencies. Two perpendicular harmonic oscillation having equal frequencies and having frequencies in the ratio 2:1.(graphical and analytical method) Lissajous figures.
November	Coupled Oscillations	Frequencies of cocpled oscillation .Normal modes and Normal coordinates . Energy of the coupled oscillation. Energy -transfer in the system.
November	Wave motion and ultrasonic waves	Transverse wave and standing wave on the string. Normal modes of vibration Phase velocity and Group velocity. Plane and spherical waves. Piezoelectric effect .Production of ultrasonic waves by piezoelectric generator. Detection and Properties of ultrasonic waves and its application.
December	Viscosity and Physics Of low Pressure.	Poiseuille's formula and experimental determ of coefficient of viscosity. Variation of n with temp. Production and measurement of low pressure. Rotary pump. Diffusion pump Molecular pump . Pirani gauge and detection of leakage.
January	Sound and Acoustic of buildings.	Transducer and their characteristics. Moving coil loudspeaker. Reverberation time Sabine's reverberation time formula. Requirements of good acoustics.

Class- B.Sc.3 (Phy.)P. No.- IX and XI (Sem. I) and P.No.XIII (Sem. II) CBCS.

Month	Topic /Unit	Subtopic Completed.
October	Introduction to syllabus	.....
October	Partial differential equation . Frobenious method and Special functions	Introduction to differential equation .Method of separation of variables for solving second order differential equation. Solution of Laplace equation and wave equation. Singular point of 2'nd order diff.eq'n.Legendre and Bessel diff.eq'n.
November	Some special integrals and Complex analysis.	Gamma function and properties . Beta function and properties. Relation between beta and gamma function. Error function. Complex number and their graphical representation. Equal complex number. Addition , subtraction multiplication and division of complex number by geometry. Types of complex number s Square root of complex number Log function. Euler formula D' movier theorem . Cauchy- Riemann condition.
November	Special theory of relativity.	Inertial and non inertial frame of reference . Galilean transformation equation. Michelson Morley experiment. Postulate of special theory of relativity. Lorentz transformation equation. Relative addition of velocities. Length contraction. Time dilation Mass energy relation.
December	Lagrangian formulation and techniques of calculation of variation.	Constraints.D'Alembert's principal Lagrange's equation and application of Lagrange's equation. Hamilton's principal Lagrange's eqation from Hamilton's principle Geodesic.Branchistochrone problem.
January	Charged particles dynamics. (Sem.1 end).	Poisons and Laplace's equation.Physical significance . Laplace equation in one dimension and its solution. Motion of charged particle in in uniform electric field E magnetic field B Crossed uniform electric field E and magnetic field B .
March	General properties of nuclei and nuclear model. (Sem.2 start.).	Constituents of nucleus and their intrinsic properties. Size, mass charge density Binding energy. Average binding energy.Its variation with mass number . Liquid drop model . Semi empirical mass formula Magic number.
March	Nuclear Detectors.	G-M counter -Construction and Working . Dead time and recovery time. Scintillation detector- principle , construction and working .Wilson cloud chamber. Semiconductor detectors.Crenkov radiation and detector
April	Particle Accelerators	Need of accelerator. Cyclotron - Construction working , theory and limitation . Phase stable orbit . Synchrocyclotron - construction and working. Electrons Synchrotron. Proton synchrotron. Betatron - construction and working and condition Expression for energy gain.
May	Particle Physics.	Particle interaction. Classification of elementary particles. Symmetries and conservation laws- energy momentum, angular momentum and Parity Barium number Lepton number Concept of quark model.
June.	University examination	

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Annual Teaching Plan – 2021-22

Class – B.Sc I, Sem – I, Sub – Physics Paper – I (CBCS)

(Mechanics – I)

Teacher – Dr. S. S. Shendage

Month	Topic /Unit	Subtopic planned
Nov	Syllabus discussion Vectors	Introduction, vector algebra, scalar and vector products, Derivatives of a vector with respect to a parameter velocity and acceleration.
Dec	Ordinary Differential Equation	Differential equation, ordinary and partial differential equations, first order homogeneous differential equations, second order homogeneous differential equations with constant coefficients, examples.
Jan	Laws of Motion	Introduction, Frames of reference, Newton's laws of motion.
	Momentum and Energy	Introduction, Conservation of linear and angular momentum.
Feb	Momentum and Energy	Conservation of work and energy theorem, conservation of energy (single particle), Dynamics of a system of particles (linear momentum, angular momentum and energy), center of mass, Motion of rockets.
March	Rotational Motion	Introduction, Angular velocity, angular momentum and torque, kinetic energy of rotation and moment of inertia, Moment of inertia of a spherical shell, solid cylinder (only about axis of symmetry), Motion of spherical shell and solid cylinder rolling down an inclined plane.

B.Sc. I, Sem – II, Physics Paper – III (CBCS)

(Electricity and Magnetism - I)

Month	Topic/Unit	Subtopic planned
April	Vector Analysis	Syllabus discussion, Introduction, Scalar product, Vector

		product, Gradient of scalar field, Divergence of vector field, The curl of vector field, Line, surface and volume integrals of vector fields, Gauss-divergence theorem, Physical significance of Gauss divergence theorem.
April	Electrostatics	Introduction, Electrostatic field, electric flux, Gauss's theorem of electrostatics, Electric potential as line integral of electric field, potential due to a point charge, Electric dipole, uniformly charged spherical shell and solid sphere, calculation of electric field from potential, Capacitance of an isolated spherical conductor,
May	Electrostatics	parallel plate, Spherical and cylindrical condenser, Energy per unit volume in electrostatic field.
	Electrostatics Exam	Dielectric medium, polarization, Displacement vector, Gauss's theorem in dielectrics, parallel plate capacitor completely filled with dielectric.

**B.Sc. II, Sem – III, Physics paper – V (CBCS)
(Thermal Physics and Statistical Mechanics - I)**

Month	Topic/Unit	Subtopic planned
Oct	Syllabus discussion	Admission process, Syllabus discus Introduction, Mean free path, Expressions for Mean Free Path and Molecular Diameter,
Nov	Kinetic Theory of Gases and Thermometry	Corrections applied by Claussius and Maxwell, Maxwell's law of distribution of velocities, experimental verifications of Maxwell's law distribution of velocities, Transport phenomena, Coefficient of viscosity, conduction and diffusion of gas
	Kinetic Theory of Gases and Thermometry	Law of equipartition of energy, application of law of equipartition of energy to specific heat of gases, principles of thermometry, temperature on mercury in glass scale, temperature on platinum-resistance thermometer, temperature on constant-volume hydrogen scale, Mercury thermometer,

		Thermocouple, Thermocouple as thermometer, Platinum resistance thermometer, Thermistor as thermometer, examples.
Dec	Law of Thermodynamics	Introduction, Thermodynamic system and thermodynamic variables, equation of state, Thermodynamic equilibrium, Zeroth law of thermodynamics, Internal energy, First law of thermodynamics, Conversion of heat into work, specific heats of gases C_p and C_v , Applications of first law of thermodynamics. Work done during isothermal and adiabatic processes, Reversible and irreversible processes,
Jan	Law of Thermodynamics	second law of thermodynamics, Carnot's heat engine and Carnot's cycle, Carnot's theorem, Entropy, Physical significance of entropy, entropy changes in reversible and irreversible processes, third law of thermodynamics, examples.

**B.Sc. II, Sem – IV, Physics paper – VII
(Optics and Lasers)**

Month	Topic/Unit	Subtopic planned
Mar	Thermodynamics Potentials	Introduction, Enthalpy, Gibbs, Helmholtz, Internal energy functions.
	Thermodynamics Potentials	Maxwell's thermodynamic relations, Joule Thomson effect
April	Thermodynamics Potentials	Clausius-Clapeyron equation, expression for $(C_p - C_v)$
May	Thermodynamics Potentials	Expression for C_p/C_v , TdS equations.

**B.Sc. III, Sem – VI, Physics paper – XIV and XVI
(Energy Studies and Material Science - P – XVI, Solid State Physics – P - XIV)**

Month	Topic/Unit	Subtopic planned
Mar	Syllabus Discussion	Syllabus Discussion

Mar	Energy and Wind Energy	Introduction, Energy, Forms of energy, Man and Environment, Energy Chains, classification of energy resources, age of renewables and alternatives, energy demands, wind energy, wind energy chains, wind energy quantum, Planning of Wind Farms, wind power density, power of wind turbine for a incoming wind velocity, efficiency factor of wind turbine (P-H graph), types of wind turbine generator unit, horizontal axis propeller type wind turbine generator unit.
	Solar Energy & Biomass energy	Introduction, solar energy, solar energy spectrum, Utilization of solar energy - thermal route and photovoltaic route, essential subsystems in solar energy plant, solar constant, clarity index, solar insolation, solar energy from satellite station through microwave to earth station, solar photovoltaic systems, Merits and Limitations of solar PV panel system, power of a solar cell and solar PV panel. Introduction, origin of biomass, biomass energy resources
April		
	Superconductivity	Idea of superconductivity, critical temperature, effect of magnetic field, Meissner effect, type-I and type-II superconductors, London equation and penetration depth, Isotope effect, Application of superconductor (Magnetic Levitation).
	Nanotechnology	Introduction of nano-science and nanotechnology, Length scales relevant to Nano science, nanostructure – 1D, 2D, 3D nanostructures, size effects in Nano systems, quantum confinement, photolithography, nucleation and growth, applications of nanotechnology.
	Crystal Structure	Introduction, Solids: Amorphous, poly-crystalline and crystalline materials, lattice, basis, Unit cell-primitive and non-primitive, Bravais lattices in two and three dimensions, symmetry elements of cubic system, Miller indices, interplaner spacing, simple crystal structures – cubic (SC,

		BCC, FCC) and HCP.
	X-Ray Diffraction by Crystals	Reciprocal lattice and its properties, Diffraction of X-rays by crystals, Ewald construction and Bragg's law in reciprocal lattice, Brillouin zone, Experimental methods in X-ray diffraction, Analysis of cubic crystals by powder method.
May	Magnetic Properties of Matter	Introduction, Classical Langevin theory of diamagnetic materials, Classical Langevin theory of paramagnetic materials, Quantum mechanical treatment of paramagnetism, Curie law, Weiss theory of ferromagnetism, ferromagnetic domains, Explanation of B_H curve, Hysteresis and energy loss
	Elementary band theory of solids	Introduction, Concept of density states, Bloch theorem, Kronig-Penney model, Origin of energy gap, Velocity of electrons according to band theory, Effective mass of an electron, distinction between metals, semiconductors and insulators, Hall effect – Hall voltage and Hall coefficient.

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Shikshan Prasarak Sanstha's

Padmabhushan Vasanturadada Patil Mahavidyalaya, KavatheMahankal.

DEPARTMENT OF PHYSICS

Annual Teaching Plan

Year 2021-2022

Mr. Sagar Sanipatrao Shinde

Month	Class/ Paper	Unit/ Topic/ Article
July 21	B.Sc. I	Introduction of Syllabus of Paper I, Mechanics II – Gravitation, Oscillation, Elasticity and Surface tension
	B.Sc. II	---
	B.Sc. III	Introduction of Syllabus of Paper XI, Topic : Charged Particle Dynamics: Introduction , Poissons and Laplaces Eqns
August 21	B.Sc. I	Introduction of Syllabus of Paper I, Mechanics I, Conservation Theorems and Rotational motion. Conservation theorem for linear momentum and angular momentum of particle.
	B.Sc. II	.....
	B.Sc. III	Charged Particle Dynamics: Physical Significance of Poissons and Laplaces Eqns, Laplaces eqn in one dimensions and its solutions, motion of charged particle in uniform electric field.
September 21	B.Sc. I	Work Energy theorem, Conservation theorem for energy of a particle, Centre of mass , Conservation theorem for Energy of a particle. Practical set 1
	B.Sc. II	-----
	B.Sc. III	motion of charged particle in uniform Magnetic field, motion of charged particle in Crossed uniform and constant electric and magnetic fields.
October 21	B.Sc. I	Topic II : Rotational Motion, Angular velocity and momentum, torque, K.E. of rotation ,moment of Inertia, MI of spherical shell about its diameter, MI of solid cylinder about its axis of symmetry Practical set 1 &2
	B.Sc. II	---
	B.Sc. III	Topic II: Special Theory of Relativity—Frames of reference and its types , Galilean Transformations, Michelson morley experiment, postulates of theory of relativity., Lorentz transformation eqn, time dilation, relativistic addn of velocities, variation of mass with velocity, mass energy equivalence relation

November 21	B.Sc. I	Paper II Oscillation: SHM, Differential eqn of SHM, KE & PE, Total Energy, Damped oscillations, forced oscillations. Practical Set 2
	B.Sc. II	---
	B.Sc. III	University Exam
Dipawali Vacation 01/11/21 to 15/11/21		
December 21	B.Sc. I	---- Practical Set II
	B.Sc. II	Introduction of Syllabus of Paper VII--- Unit I Thermodynamic Potential- Enthalpy, Gibbs Function, Helmholtz and internal Energy function, Maxwells thermodynamical relations
	B.Sc. III	Introduction of Syllabus of Paper XVI: Energy Studies And Material Science. Unit II : Superconductivity: Introduction, Idea of superconductivity, critical temperature, critical magnetic field, meissner effect, type1 and2 superconductors
January 22	B.Sc. I	--- Practical Set 3
	B.Sc. II	Joule Thomsons effect, clausius clapeyron Eqn, Expression for $C_p - C_v$ and C_p / C_v , TdS eqns.
	B.Sc. III	London Eqn and Penetration depth, Isotope effect, application of magnetic levitation
February 22	B.Sc. I	--- Practical Set 3
	B.Sc. II	Theory of Radiation: Introduction, Black body radiation and its importance, Concept of Energy Density,
	B.Sc. III	Topic II: Nanotechnology—Introduction of Nanoscience and Nanotechnology, length scales to nano science nano structures 1D, 2D and 3D nanostructures, size effect in nanosystem, quantum confinement
March 22	B.Sc. I	---- Practical Set IV
	B.Sc. II	Derivation of Plancks law, Deduction of wien's Distribution law, Rayleigh-Jeans law
	B.Sc. III	Synthesis of nano structured materials, photolithio graphy, ball milling, nucleation and growth, applications of nanotechnology.
April 22	B.Sc. I	---Practical Exam
	B.Sc. II	Stephan Boltzmann law And wien's displacement law from Plancks law
	B.Sc. III	Theory Exam
May 22	B.Sc. I	Theory Exam
	B.Sc. II	Theory Exam
	B.Sc. III	---

Shinde
(Mrs. sagars s. shinde)

Hokamni
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Kavathe Mahankal Dist-Sangli

**Shikshan Prasarak Sanstha's
Padmabhushan Vasantodada Patil Mahavidyalaya, KavatheMahankal**

DEPARTMENT OF PHYSICS

Annual Teaching Plan

Year 2021-2022

Mr. P.U.Kambale

Month	Class/ Paper	Unit/ Topic/ Article
August 21	B.Sc. I	Introduction of Syllabus of Paper I, Mechanics I, Vectors – Scalar and Vector, Vector Addition
	B.Sc. II	.....
	B.Sc. III	Introduction of Syllabus of Paper XI
September 21	B.Sc. I	Properties Of Vectors, Scalar Product , Vector Product, Scalar triple product its physical significance, Vector Triple Product and its Physical Significance Practical set 1
	B.Sc. II	-----
	B.Sc. III	Lagrangian Formulation--- Co- ordiante system, Constraints , Degrees of Freedom, Generalized Coordinates, D' Alemberts principle, Lagrangian Equation from D'Alembert, Applications Langrange Equation
October 21	B.Sc. I	Ordinary Differential Equation—Degree and Order of differential equations, 1 st order and 2 nd order Differential Equations and Examples Practical set 1 &2
	B.Sc. II	---
	B.Sc. III	Problems on Lagrangian Applications Topic II Techniques of Calculus of Variation—Hamiltons Principle, Deduction Of Hamilton Principle from D Alemberts Principle.
November 21	B.Sc. I	Paper II Gravitation – Introduction, Newtons Law of Gravitation, Keplers Laws , Satellites, Applications Of Satellite Practical Set 2
	B.Sc. II	---
	B.Sc. III	University Exam
Dipawali Vacation 01/11/23 to 15/11/23		

P. U. Kambale

(P. U. Kambale)

Dr. J. K. Jadhav

Head

**Department of Physics
P.V.P. Mahavidyalaya
Kavathe Mahankal Dist-Sangli**

December 21	B.Sc. I	---- Practical Set II
	B.Sc. II	Introduction of Syllabus of Paper VII--- Unit II Classical Statistics –Phase Space, Microstate and macrostate
	B.Sc. III	Introduction of Syllabus of Paper XVI: Energy Studies And Material Science. Energy and Wind Energy—Forms of Energy, Classification of Energy resources, Energy Demands, Wind Energy.
January 22	B.Sc. I	--- Practical Set 3
	B.Sc. II	Priory probability, Thermodynamic Probability, Probability Distribution
	B.Sc. III	Wind Power Density, Efficiency Factor of wind turbine, types of wind turbine generator unit, Horizontal axis type wind turbine Generator unit.
February 22	B.Sc. I	--- Practical Set 3
	B.Sc. II	M.B Distribution law, Evaluation of constants α and β , Entropy and Thermodynamic Probability.
	B.Sc. III	Topic II: Solar Energy—Solar energy Spectrum, Photovoltaic route, Solar constant, Clarity index, Soalr insulation, Solar Photovoltaic system, Solar PV panel
March 22	B.Sc. I	---- Practical Set IV
	B.Sc. II	Topic II: Quantum Statistics—Bose Einstein distribution law, Photon gas, electron gas
	B.Sc. III	Topic III: Biomass Energy—origin of biomass, Biomass energy resourses, Biomass conversion process.
April 22	B.Sc. I	---Practical Exam
	B.Sc. II	Femi-dirac Distribution law, Comparison of MB, BE and FD Statistics
	B.Sc. III	Theory Exam
May 22	B.Sc. I	Theory Exam
	B.Sc. II	Theory Exam
	B.Sc. III	----

Shikshan Prasarak Sanstha's
Padmabhushan Vasantrodada Patil Mahavidyalaya, KavatheMahankal

Department of Physics

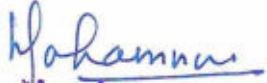
Mrs P U Mahamuni

Annual Teaching plan Year 20 - 21

Month	Class/Paper	Unit/Topic/Article
June 20	B Sc I	----
	B Sc II	-----
	B Sc III	Counselling about admissions, General discussion and Introduction to syllabus P X & P XII
July 20	B Sc I	-----
	B Sc II	-----
	B Sc III	P XII Digital electronics- Basic & derived logic gates, Universal gates, De Morgan's thm. Full, half, four bit parallel adder Transistor amp & Oscillators-- CE amp, DC, AC equi. Ckt, - DC, AC loadline analysis, Q point. MCQ Test. CRO block dia, cons, working, applications, Lissajous figures.
August 20	B Sc I	-----
	B Sc II	-----
	B Sc III	OPAMP & Timers—Diff Amp & types, opamp block dia, parameters, characteristics of ideal opamp, IC 741. Applications Inverting & noninverting amp, adder, subtractor, differentiator, integrator. IC 555 block dia, pin function, Astable & monostable multivibrator. MCQ Test paper. Home assignment.
September 20	B Sc I	-----
	B Sc II	-----
	B Sc III	P X- Introduction to syllabus. Q M- Matter waves, De Broglie's hypothesis, wavelength of matter waves,
October 20	B Sc I	-----
	B Sc II	-----
	B Sc III	wave packet, relation bet ple velo, phase velo & grp velocity. Davisson & Germers expt. Uncertainty principle. Applications
November 20	B Sc I	Introduction to syllabus Paper II, Mechanics II general discussion of syllabus
	B Sc II	
	B Sc III	Schrodingers wave eq, time dependent & independent eq in 1D & 3D, eigen values & eigen fun. expectation values.,
December 20	B Sc I	Gravitation—Newton's laws of Gravitation, derivation, dimensions of G, motion of ple in central force field
	B Sc II	
	B Sc III	expectation values., applications of Schrodingers eq.

January 21	B Sc I	Numerical on gravitation, Oscillations- Intro to SHM, Diff eq., K E & P E, Oscillations- Total eng & time average, Damped osci, forced oscillations. Numericals,
	B Sc II	
	B Sc III	Oprators in Q M. X position oprator, P momentum operator, T kinetic energy operator, H, π , and L operator.
February 21	B Sc I	Surface tension, angle of contact, relation bet T, P and R. Jeagers method, applications of S T. Numericals MCQ Test on entire paper.
	B Sc II	-----
	B Sc III	Oprators in Q M. X, P, T, H, π , L, ladder oprators, Eigen values of L_x , L^2 mcq Test on paper. Home assignment.
March 21	B Sc I	Elasticity,--bending moment, cantilever, work done in twisting wire, Determination of Y, K and η . Numericals
	B Sc II	Introduction to P VIII, General discussion about syllabus. P VII- Classical statistics, Micro and Macrostates, priory prob, Planks law, Weins law, Rayleigh Jeans law, Stefan Bolzmanns law,
	B Sc III	Paper XV Introduction to syllabus
Aprll 21	B Sc I	Revision, MCQ test on entire paper
	B Sc II	Cardinal points, graphical construction of image, Newtons formula, Lateral, angular and axial magnification.
	B Sc III	P XV- Atomic and Molecular physics and Astrophysics- Atomic spectra, hydrogen fine structure, spectral notations & optical spectral series.Na spectra, selection & int rules, normal & anomalous Zeeman effect.
May 21	B Sc I	----
	B Sc II	Resolving power of optical instruments, Rayleigh criterian of resolution, modified Rayleigh criterian, R P of prism and grating,
	B Sc III	Molecular spectra, - molecular spectra. Hydrogen bonding, hydrogen molecular ion, Rotational spectra, vibrational spectra, electronic spectra of diatomic molecules
June 21	B Sc I	-----
	B Sc II	Polarisation of light by double refraction, Huygens explanation with uniaxial crystals, Nicols Prism, Circularly and elliptically polarised light, optical rotation , Polarimeter
	B Sc III	Raman spectra, classical & quantum theory, ramen lines, comparison of IR & Raman spectra. Structure of Universe- Big Bang, Steady state & Oscillating universe theory, Hubble law, Solar system, Origin, condensation theory and arguments.
July 21	B Sc I	Surface tension, angle of contact, relation bet T, P and R. Jeagers method, applications of S T. Numericals MCQ Test on entire paper.
	B Sc II	Interferance by division of amplitude and division of wavefront, Lloyds mirror, Int. in parallel faced thin films, wedge shaped thin films, Newtons rings. Numericals.
	B Sc III	Steler evolution, H- R diagram, Red giant and white dwarf stars, supernova, neutron stars, blackholes, Sunspots and Sunspot cycle. MCQ

		test , home assignment.
August 21	B Sc I	Exam
	B Sc II	Diffraction- types, elementary theory of plane diff grating. MCQ test on paper Exam.....
	B Sc III	Exam


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Annual Teaching Plan 2020-2021.
Class -B.Sc 1 (Phy.) P. No.-IV (Sem.2) CBCS.
Name – Patil Sanjay B.

Month	Topic / Unit	Subtopic Completed.
April	A.C.Circuits.	Introduction to syllabus
May	A.C.Circuits	Complex number.J operator and LCR series circuit. Reactance admittance and susceptance of circuit. Sharpness of resonance.Owen's bridge.
June	Magnetism.	Biot - Savart law. Magnetic induction due to straight conductor, circular coil, solenoid.Ampere's circuital law. Properties of magnetic material. Magnetic induction permeability susceptibility. Para, dia. and ferromagnetic material.
July	Electromagnetic induction.	Faraday's law, lenz's law. Self and mutual inductance. Inductance of single coil.M of two coils.
August	Maxwell's equation and E.M. wave propagation.	Equation of continuity Displacement current. Maxwell equation. Poynting vector. Energy density in em field. Transverse nature of EM waves. Polarization.
August.	Revision of syllabus.	University examination.

Class- B.Sc. 2(Phy.) Paper No. VI (Sem. 1) CBCS

Month	Topic /Unit	Subtopic Completed.
June	Introduction to syllabus	to
July	Superposition of harmonic Oscillations.	Linearity and Superposition superposition of two collinear harmonic oscillation having equal frequency and different frequencies. Two perpendicular harmonic oscillation having equal frequencies and having frequencies in the ratio 2:1.(graphical and analytical method) Lissajous figures.
November	Coupled Oscillations	Frequencies of cocpled oscillation .Normal modes and Normal coordinates . Energy of the coupled oscillation. Energy -transfer in the system.
December	Wave motion and ultrasonic waves	Transverse wave and standing wave on the string. Normal modes of vibration Phase velocity and Group velocity. Plane and spherical waves. Piezoelectric effect .Production of ultrasonic waves by piezoelectric generator. Detection and Properties of ultrasonic waves and its application.
January	Viscosity and Physics Of low Pressure.	Poiseuille's formula and experimental determ of coefficient of viscosity. Variation of n with temp.Production and measurement of low pressure. Rotary pump. Diffusion pump Molecular pump . Pirani gauge and detection of leakage.
February and March.	Sound and Acoustic of buildings.	Transducer and and their characteristics. Moving coil loudspeaker. Reverberation time Sabine's reverberation time formula. Requirements of good acoustics.

Class- B.Sc.3 (Phy.)P. No.- IX and XI (Sem. I) and P.No.XIII (Sem. II) CBCS.

Month	Topic /Unit	Subtopic Completed.
June	Introduction to syllabus	.....
July	Partial differential equation . Frobenious method and Special functions	Introduction to differential equation .Method of separation of variables for solving second order differential equation. Solution of Laplace equation and wave equation. Singular point of 2'nd order diff.eq'n.Legendre and Bessel diff.eq'n
November	Some special integrals and Complex analysis.	Gamma function and properties . Beta function and properties. Relation between beta and gamma function. Error function. Complex number and their graphical representation. Equal complex number. Addition , subtraction multiplication and division of complex number by geometry. Types of complex number s Square root of complex number Log function. Euler formula D' movier theorem . Cauchy- Riemann condition.
December	Special theory of relativity.	Inertial and non inertial frame of reference . Galilean transformation equation. Michelson Morley experiment. Postulate of special theory of relativity. Lorentz transformation equation. Relative addition of velocities. Length contraction. Time dilation Mass energy relation.
January	Lagrangian formulation and techniques of calculation of variation.	Constraints.D'Alembert's principal Lagrange's equation and application of Lagrange's equation. Hamilton's principal Lagrange's eqation from Hamilton's principle Geodesic.Branchistochrone problem.
February and March	Charged particles dynamics. (Sem.1 end).	Poissons and Laplace's equation.Physical significance . Laplace equation in one dimension and its solution. Motion of charged particle in in uniform electric field E magnetic field B Crossed uniform electric field E and magnetic field B .
March	General properties of nuclei and nuclear model. (Sem.2 start.).	Constituents of nucleus and their intrinsic properties. Size, mass charge density Binding energy. Average binding energy.Its variation with mass number . Liquid drop model . Semi empirical mass formula Magic number.
April	Nuclear Detectors.	G-M counter -Construction and Working . Dead time and recovery time. Scintillation detector- principle , construction and working .Wilson cloud chamber. Semiconductor detectors.Crenkov radiation and detector
May	Particle Accelerators	Need of accelerator. Cyclotron - Construction working , theory and limitation . Phase stable orbit . Synchrocyclotron - construction and working. Electrons Synchrotron. Proton synchrotron. Betatron - construction and working and condition Expression for energy gain.
June	Particle Physics.	Particle interaction. Classification of elementary particles. Symmetries and conservation laws- energy momentum, angular momentum and Parity Barium number Lepton number Concept of quark model.
July	University examination	

Fahil

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Shikshan Prasarak Sanstha's
Padmabhushan Vasantrodada Patil Mahavidyalaya, Kavathemahankal
Annual Teaching Plan – 2020-21
Class – B.Sc I, Sem – I, Sub – Physics Paper – I (CBCS)
(Mechanics – I)
Teacher – Dr. S. S. Shendage

Month	Topic /Unit	Subtopic planned
Nov	Syllabus discussion Vectors	Introduction, vector algebra, scalar and vector products, Derivatives of a vector with respect to a parameter velocity and acceleration.
Dec	Ordinary Differential Equation	Differential equation, ordinary and partial differential equations, first order homogeneous differential equations, second order homogeneous differential equations with constant coefficients, examples.
Jan	Laws of Motion	Introduction, Frames of reference, Newton's laws of motion.
	Momentum and Energy	Introduction, Conservation of linear and angular momentum.
Feb	Momentum and Energy	Conservation of work and energy theorem, conservation of energy (single particle), Dynamics of a system of particles (linear momentum, angular momentum and energy), center of mass, Motion of rockets.
March	Rotational Motion	Introduction, Angular velocity, angular momentum and torque, kinetic energy of rotation and moment of inertia, Moment of inertia of a spherical shell, solid cylinder (only about axis of symmetry), Motion of spherical shell and solid cylinder rolling down an inclined plane.

B.Sc. I, Sem – II, Physics Paper – III (CBCS)
(Electricity and Magnetism - I)

Month	Topic/Unit	Subtopic planned
April	Vector Analysis	Syllabus discussion, Introduction, Scalar product, Vector

		product, Gradient of scalar field, Divergence of vector field, The curl of vector field, Line, surface and volume integrals of vector fields, Gauss-divergence theorem, Physical significance of Gauss divergence theorem.
May	Electrostatics	Introduction, Electrostatic field, electric flux, Gauss's theorem of electrostatics, Electric potential as line integral of electric field, potential due to a point charge, Electric dipole, uniformly charged spherical shell and solid sphere,
June	Electrostatics	calculation of electric field from potential, Capacitance of an isolated spherical conductor, parallel plate, Spherical and cylindrical condenser, Energy per unit volume in electrostatic field.
July	Electrostatics Exam	Dielectric medium, polarization, Displacement vector, Gauss's theorem in dielectrics, parallel plate capacitor completely filled with dielectric.
Aug	Revision	Revision

**B.Sc. II, Sem – III, Physics paper – V (CBCS)
(Thermal Physics and Statistical Mechanics - I)**

Month	Topic/Unit	Subtopic planned
July	Syllabus discussion	Admission process, Syllabus discussion
Nov	Kinetic Theory of Gases and Thermometry	Introduction, Mean free path, Expressions for Mean Free Path and Molecular Diameter, Corrections applied by Claussius and Maxwell, Maxwell's law of distribution of velocities, experimental verifications of Maxwell's law distribution of velocities, Transport phenomena, Coefficient of viscosity, conduction and diffusion of gas
Dec	Kinetic Theory of Gases and Thermometry	Law of equipartition of energy, application of law of equipartition of energy to specific heat of gases, principles of thermometry, temperature on mercury in glass scale,

		temperature on platinum-resistance thermometer, temperature on constant-volume hydrogen scale, Mercury thermometer, Thermocouple, Thermocouple as thermometer, Platinum resistance thermometer, Thermistor as thermometer, examples.
Jan-21	Law of Thermodynamics	Introduction, Thermodynamic system and thermodynamic variables, equation of state, Thermodynamic equilibrium, Zeroth law of thermodynamics, Internal energy, First law of thermodynamics, Conversion of heat into work, specific heats of gases C_p and C_v , Applications of first law of thermodynamics.
Feb	Law of Thermodynamics	Work done during isothermal and adiabatic processes, Reversible and irreversible processes, second law of thermodynamics, Carnot's heat engine and Carnot's cycle, Carnot's theorem, Entropy, Physical significance of entropy, entropy changes in reversible and irreversible processes, third law of thermodynamics, examples.
Mar	Revision	Revision


**B.Sc. II, Sem – IV, Physics paper – VII
(Optics and Lasers)**

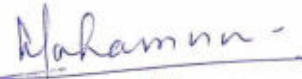
Month	Topic/Unit	Subtopic planned
April	Thermodynamics Potentials	Introduction, Enthalpy, Gibbs, Helmholtz, Internal energy functions.
May	Thermodynamics Potentials	Maxwell's thermodynamic relations, Joule Thomson effect
June	Thermodynamics Potentials	Clausius-Clapeyron equation, expression for $(C_p - C_v)$
July	Thermodynamics Potentials	Expression for C_p/C_v , TdS equations.
April	Revision, Exam	Revision, Exam

B.Sc. III, Sem – VI, Physics paper – XIV and XVI
(Energy Studies and Material Science - P – XVI, Solid State Physics – P - XIV)

Month	Topic/Unit	Subtopic planned
July	Syllabus Discussion	Syllabus Discussion
July/Nov	Energy and Wind Energy	Introduction, Energy, Forms of energy, Man and Environment, Energy Chains, classification of energy resources, age of renewables and alternatives, energy demands, wind energy, wind energy chains, wind energy quantum, Planning of Wind Farms, wind power density, power of wind turbine for a incoming wind velocity, efficiency factor of wind turbine (P-H graph), types of wind turbine generator unit, horizontal axis propeller type wind turbine generator unit.
	Solar Energy & Biomass energy	Introduction, solar energy, solar energy spectrum, Utilization of solar energy - thermal route and photovoltaic route, essential subsystems in solar energy plant, solar constant, clarity index, solar insolation, solar energy from satellite station through microwave to earth station, solar photovoltaic systems, Merits and Limitations of solar PV panel system, power of a solar cell and solar PV panel. Introduction, origin of biomass, biomass energy resources
Dec	Superconductivity	Idea of superconductivity, critical temperature, effect of magnetic field, Meissner effect, type-I and type-II superconductors, London equation and penetration depth, Isotope effect, Application of superconductor (Magnetic Levitation).
	Nanotechnology	Introduction of nano-science and nanotechnology, Length scales relevant to Nano science, nanostructure – 1D, 2D, 3D nanostructures, size effects in Nano systems, quantum confinement, photolithography, nucleation and growth, applications of nanotechnology.

Jan	Crystal Structure	Introduction, Solids: Amorphous, poly-crystalline and crystalline materials, lattice, basis, Unit cell-primitive and non-primitive, Bravais lattices in two and three dimensions, symmetry elements of cubic system, Miller indices, interplaner spacing, simple crystal structures – cubic (SC, BCC, FCC) and HCP.
	X-Ray Diffraction by Crystals	Reciprocal lattice and its properties, Diffraction of X-rays by crystals, Ewald construction and Bragg's law in reciprocal lattice, Brillouin zone, Experimental methods in X-ray diffraction, Analysis of cubic crystals by powder method.
Feb	Magnetic Properties of Matter	Introduction, Classical Langevin theory of diamagnetic materials, Classical Langevin theory of paramagnetic materials, Quantum mechanical treatment of paramagnetism, Curie law, Weiss theory of ferromagnetism, ferromagnetic domains, Explanation of B_H curve, Hysteresis and energy loss
	Elementary band theory of solids	Introduction, Concept of density states, Bloch theorem, Kronig-Penney model, Origin of energy gap, Velocity of electrons according to band theory, Effective mass of an electron, distinction between metals, semiconductors and insulators, Hall effect – Hall voltage and Hall coefficient.
Mar	Revision	Revision


C.D.S.S. Shewale


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Padmabhushan Vasanttraodada Patil Mahavidyalaya, KavatheMahankal

Department of Physics

Mrs P U Mahamuni

Annual Teaching plan Year 19 - 20

Month	Class/Paper	Unit/Topic/Article
June	B Sc I	Introduction to syllabus Paper II, Mechanics II general discussion of syllabus
	B Sc II	-----
	B Sc III	Counselling about admissions, General discussion and Introduction to syllabus P X & P XII
July	B Sc I	- Gravitation—Newton's laws of Gravitation, derivation, dimensions of G, motion of ple in central force field Pra set I
	B Sc II	-----
	B Sc III	P XII Doublet fine structure, optical spectral series. Na spectra. Spin orbit interaction, Term value calculation, int and selection rules. Pra set I
August	B Sc I	Keplars laws, satellites, applications, GEO, Basic idea of GPS Pra set I
	B Sc II	-----
	B Sc III	Anamolous Zeeman effect, Vector atom model, Paschen Beck effect. Comparison bet Zeeman and Paschen Beck effect, Set II Pra
September	B Sc I	Numerical on gravitation, Oscillations- Intro to SHM, Diff eq., K E & P E, Oscillations- Total eng & time average, Damped osci, forced oscillations. Numericals, Set I repetition
	B Sc II	-----
	B Sc III	Molecular spectra, hydrogen molecular ion, rotational spectra, vibrational spectra. Raman effect, classical theory. Milky way galaxy and solar system Evolutionary theories and cosmological tests. Mcq test on paper, Home assignment. Set II pra
October	B Sc I	-- Elasticity,--bending moment, cantilever, work done in twisting wire, Determination of Y, K and η . Numericals Pra set II
	B Sc II	
	B Sc III	P X- Introduction to syllabus. Q M- Matter waves, De Broglie's hypothesis, wavelength of matter waves, wave packet, relation bet ple velo, phase velo & grp velocity. Davisson & Germers expt. Uncertainty principle. Applications Set III Pra

November	B Sc I	Surface tension, angle of contact, relation bet T, P and R. Jeagers method, applications of S T. Numerical on S T MCQ Test on entire paper Pra set II
	B Sc II	P VIII—Introduction to syllabus
	B Sc III	Schrodingers wave eq, time dependent & independent eq in 1D & 3D, eigen values & eigen fun. expectation values. Applications of Schrodingers eq. Pra set III
December	B Sc I	Practical set II
	B Sc II	Relativity, Galileon transformations, Ether hypothesis, M-M experiment, Lorentz transformation eq, variation of length, time, mass with velocity, mass energy relation.
	B Sc III	. Oprators in Q M. X position oprator, P momentum operator, T kinetic energy operator, H, π , and L operator. Oprators in Q M. X, P, T, H, π , L, ladder oprators, Eigen values of L_x , L^2 mcq Test on paper. Home assignment Study Tour Pra set IV
January 20	B Sc I	Repeation set II PRA SET III
	B Sc II	Wave particle duality, de Broglies hypothesis, Davison Germers expt. Heisenbergs Uncertainty principle, Applications.
	B Sc III	Introduction to P XV, Electrostatics and charged particle dyanamics, Time varying fields, Faraday law, Lentz Law, self and mutual inductance. Pra set IV
February 20	B Sc I	PRA SET III
	B Sc II	Xrays, types, Duane and Hunts law, Mosleys law, Braggs law, Compton effect, experimental verification.
	B Sc III	.Maxwells equations, Biot Saverts law, equation of Continuiety, displacement current, significance of Maxwells equations Pra set IV
March 20	B Sc I	Repeation all pra, journal completion
	B Sc II	Vector atom model, Stern Gerlach expt, quantum no, Poulies exclusion principle, spin orbit interaction, Zeeman effect.
	B Sc III	Electromagnetic waves, equation for E and B. Orthoganality condition, attenuation of waves in metal, skin deptrepeation all pra, journal completion and exam Pra set VA and VB
Aprl 20	B Sc I	Exam
	B Sc II	Radioactivity half and mean life, successive radioactive transformations. Test on paper VIII.
	B Sc III	Poyntings theorem., Home assignment, MCQ on paper. Exam..

Johannu

Head

**Department of Physics
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Kavathe Mahankal Dist-Sangli**

Shikshan Prasarak Sanstha's
Padmabhushan Vasantodada Patil Mahavidyalay, Kavathe Mahankal

Annual Teaching Plan 2019-2020

Class -B.Sc 1 (Physics). Paper No.-IV (Sem.2) CBCS.

Name – Patil Sanjay B.

Month	Topic / Unit	Subtopic Completed.
November	A.C.Circuits.	Introduction to syllabus
December	A.C.Circuits	Complex number. J operator and LCR series circuit. Reactance admittance and susceptance of circuit. Sharpness of resonance. Owen's bridge.
January	Magnetism.	Biot - Savart law. Magnetic induction due to straight conductor, circular coil, solenoid. Ampere's circuital law. Properties of magnetic material. Magnetic induction permeability susceptibility. Para, dia. and ferromagnetic material.
February	Electromagnetic induction.	Faraday's law, lenz's law. Self and mutual inductance. Inductance of single coil. M of two coils.
March	Maxwell's equation and E.M. wave propagation.	Equation of continuity Displacement current. Maxwell equation. Poynting vector. Energy density in em field. Transverse nature of EM waves. Polarization.
April	Revision of syllabus.	University examination.

Class- B.Sc. 2 (Physics). Paper No. VI (Sem. 1). CBCS.

Month	Topic /Unit	Subtopic Completed.
June	Introduction to syllabus	.....
July	Superposition of harmonic Oscillations.	Linearity and Superposition superposition of two collinear harmonic oscillation having equal frequency and different frequencies. Two perpendicular harmonic oscillation having equal frequencies and having frequencies in the ratio 2:1.(graphical and analytical method) Lissajous figures.
August	Coupled Oscillations	Frequencies of cocpled oscillation .Normal modes and Normal coordinates . Energy of the coupled oscillation. Energy -transfer in the system.
September	Wave motion and ultrasonic waves	Transverse wave and standing wave on the string. Normal modes of vibration Phase velocity and Group velocity. Plane and spherical waves. Piezoelectric effect .Production of ultrasonic waves by piezoelectric generator. Detection and Properties of ultrasonic waves and its application
October	Viscosity and Physics Of low Pressure.	Poiseuille's formula and experimental determ of coefficient of viscosity. Variation of n with temp.Production and measurement of low pressure. Rotary pump. Diffusion pump Molecular pump . Pirani gauge and detection of leakage.

November	Sound and Acoustic of buildings	Transducer and their characteristics. Moving coil loudspeaker. Reverberation time Sabine's reverberation time formula. Requirements of good acoustics.
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Class- B.Sc.3 (Phy.) Paper No.- IX and XI (Sem. I) and Paper No.XIII (Sem. II) (REVISED).

Month	Topic /Unit	Subtopic Completed.
June	Introduction to syllabus	.....
July	O.C.C.System and Differential equation	Introduction to cartesian , spherical, cylindrical coordinate system. Gradient divergence and curl Laplacian in OCC system and their extension formula. Types of differential equation. Partial diff. Equation solution of Laplace equation and wave equation.
August	Classical and Quantum statistics.	Phase space. Micro and macro state. Probability distribution.M-B statistics. Molecular speed and law of equipartition of energy.B-E statistics. Planck's law of radiation Rayleigh- Jeans law. Wiens displacement law Stephen's law.F-D statistics. Comparison between three statistics. Black body radiation. Energy density .Radiation pressure.
Sept.	Introduction to mechanics and coupled oscillation.	Mechanics of particles. Conservation theorem of linear, angular momentum and energy. Frequencies of coupled oscillation Normal modes and Normal coordinates. Energy of the coupled oscillation.
October	Lagrangian formulation and techniques of calculation of variation.	Constraints.D'Alembert's principal Lagrange's equation and application of Lagrange's equation. Hamilton's principal Lagrange's equation from Hamilton's principle Geodesic.Branchistochrone problem.
November	Moving co-ordinate system and Rigid body motion. Dipavali Holiday	Rotating co-ordinate system .Coriolis force.Euler'sThm. and equation . Angular momentum and kinetic energy.
December	Accelerator.	Cyclotron. Construction and working. Synchrocyclotron Betatron.
January	Nuclear detector.	G-M counter Construction and Working Bubble chamber Scintillation counter. Wilson cloud chamber- construction working
February	Nuclear Properties and Elementary particles	Composition of nucleus. Nuclear size, radius, Nuclear magnetic moment, quadrupole moment. Mass defect .Packing fraction Binding energy, Binding energy curve. Semi empirical mass formula. Classification of elementary particles cosmic rays .Hard and Soft component.
March	Nuclear energy levels and Nuclear reactions	Alpha Ray spectra and energy levels Alpha disintegration energy. Beta Ray spectra. Continuous nature of beta rays spectrum.End point energy. Origin of gamma rays. K- electron capture. Nuclear energy levels Nuclear reaction. Q- value of reaction .Exothermic and Endothermic reaction. Deuteron reaction. Stripping reaction.
April	University examination	

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Annual Teaching Plan – 2019-20

Class – B.Sc I, Sem – I, Sub – Physics Paper – I (CBCS)

(Mechanics – I)

Teacher – Dr. S. S. Shendage

Month	Topic /Unit	Subtopic planned
June	Syllabus discussion Vectors	Introduction, vector algebra, scalar and vector products, Derivatives of a vector with respect to a parameter velocity and acceleration.
July	Ordinary Differential Equation	Differential equation, ordinary and partial differential equations, first order homogeneous differential equations, second order homogeneous differential equations with constant coefficients, examples.
August	Laws of Motion	Introduction, Frames of reference, Newton's laws of motion.
	Momentum and Energy	Introduction, Conservation of linear and angular momentum.
Sept.	Momentum and Energy	Conservation of work and energy theorem, conservation of energy (single particle), Dynamics of a system of particles (linear momentum, angular momentum and energy), center of mass, Motion of rockets.
Oct.	Rotational Motion	Introduction, Angular velocity, angular momentum and torque, kinetic energy of rotation and moment of inertia, Moment of inertia of a spherical shell, solid cylinder (only about axis of symmetry), Motion of spherical shell and solid cylinder rolling down an inclined plane.
Nov.	Exam.	Exam.

B.Sc. I, Sem – II, Physics Paper – III (CBCS)

(Electricity and Magnetism - I)

Month	Topic/Unit	Subtopic planned
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Nov	Syllabus discussion Vector Analysis	Introduction
Dec	Vector Analysis	Scalar and vector product, gradient, divergence, curl and their significance
Jan	Vector Analysis	Vector integration, Line, surface and volume integrals of vector fields, Gauss-divergence theorem and Stoke's theorem of vector fields.
Feb	Electrostatics	Introduction, Electrostatic field, electric flux, Gauss's theorem of electrostatics, Electric potential as line integral of electric field, potential due to a point charge, Electric dipole, uniformly charged spherical shell and solid sphere,
Mar	Electrostatics	calculation of electric field from potential, Capacitance of an isolated spherical conductor, parallel plate, Spherical and cylindrical condenser, Energy per unit volume in electrostatic field, Dielectric medium, polarization,
April	Electrostatics Exam	Displacement vector, Gauss's theorem in dielectrics, parallel plate capacitor completely filled with dielectric.

**B.Sc. II, Sem – III, Physics paper – V (CBCS)
(Thermal Physics and Statistical Mechanics - I)**

Month	Topic/Unit	Subtopic planned
June	Syllabus discussion	Admission process, Syllabus discussion
July	Kinetic Theory of Gases and Thermometry	Introduction, Mean free path, Expressions for Mean Free Path and Molecular Diameter, Corrections applied by Claussius and Maxwell, Maxwell's law of distribution of velocities, experimental verifications of Maxwell's law distribution of velocities, Transport phenomena, Coefficient of viscosity, conduction and diffusion of gas
Aug	Kinetic Theory	Law of equipartition of energy, application of law of

	of Gases and Thermometry	equipartition of energy to specific heat of gases, principles of thermometry, temperature on mercury in glass scale, temperature on platinum-resistance thermometer, temperature on constant-volume hydrogen scale, Mercury thermometer, Thermocouple, Thermocouple as thermometer, Platinum resistance thermometer, Thermistor as thermometer, examples.
Sept	Law of Thermodynamics	Introduction, Thermodynamic system and thermodynamic variables, equation of state, Thermodynamic equilibrium, Zeroth law of thermodynamics, Internal energy, First law of thermodynamics, Conversion of heat into work, specific heats of gases C_p and C_v , Applications of first law of thermodynamics.
Oct	Law of Thermodynamics	Work done during isothermal and adiabatic processes, Reversible and irreversible processes, second law of thermodynamics, Carnot's heat engine and Carnot's cycle, Carnot's theorem, Entropy, Physical significance of entropy, entropy changes in reversible and irreversible processes, third law of thermodynamics, examples.

**B.Sc. II, Sem – IV, Physics paper – VII
(Optics and Lasers)**

Month	Topic/Unit	Subtopic planned
Nov	Syllabus Discussion	Syllabus Discussion
Dec	Thermodynamics Potentials	Introduction, Enthalpy, Gibbs, Helmholtz, Internal energy functions.
Jan	Thermodynamics Potentials	Maxwell's thermodynamic relations, Joule Thomson effect
Feb	Thermodynamics Potentials	Clausius-Clapeyron equation, expression for $(C_p - C_v)$
Mar	Thermodynamics Potentials	Expression for C_p/C_v , TdS equations.

April	Revision, Exam	Revision, Exam
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B.Sc. III, Sem – VI, Physics paper – XIV and XVI
(Energy Studies and Material Science, Solid State Physics)

Month	Topic/Unit	Subtopic planned
Nov	Syllabus Discussion	Syllabus Discussion
Dec	Renewable Energy Resources	Introduction, Energy, classification of energy resources, age of renewables and alternatives, energy demands, wind energy, wind energy chains, wind energy quantum, wind power density, power of wind turbine for a incoming wind velocity, efficiency factor of wind turbine (P-H graph), types of wind turbine generator unit, horizontal axis propeller type wind turbine generator unit.
	Solar Energy	Introduction, solar energy, solar energy spectrum, thermal route, photovoltaic route, essential subsystems in solar energy plant, solar constant, clarity index, solar insolation, solar energy from satellite station through microwave to earth station, solar photovoltaic systems, power of a solar cell and solar PV panel.
Jan	Atomic Disorder in Materials	Impurities in solids, solid solution in metals, rules of solid solubility, imperfection in crystals, defects in solids-point, line, surface and volume, atomic diffusion-definition mechanism, Fick's law.
	Superconductivity	Idea of superconductivity, critical temperature, effect of magnetic field, Meissner effect, type-I and type-II superconductors.
	Nanotechnology	Introduction of nano-science and nanotechnology, synthesis of nano-materials by mechanical method, evaporation based methods like sputter deposition and chemical vapour deposition, chemical method- growth of nano-particles, synthesis of metal and semiconductor nano-particles by colloidal route method, applications of nano-particles.

Feb	Crystal Structure	Crystalline and non-crystalline solids, space lattice, basis and crystal structure, Unit cell-primitive and non-primitive, Bravais lattices-space groups and crystal structures, symmetry elements of cubic system, Miller indices, relation between lattice constant, interplaner spacing and Miller indices, simple crystal structures – cubic (SC, BCC, FCC) and HCP.
	X-Ray Diffraction by Crystals	Reciprocal lattice, properties of reciprocal lattice, Bragg's law in reciprocal lattice, powder method of X-ray diffraction and analysis of cubic crystal structure.
March	Lattice Vibrations	Elastic vibrations of linear one-dimensional monoatomic lattice, expression for frequency and dispersion curve, elastic vibrations of linear one dimensional diatomic lattice – optical and acoustical excitations in ionic crystals, experimental determination of dispersion relations.
	Free electron theory of metals and band theory of solids	Sommerfeld's free electron model for electrical conductivity of metals, Fermi-Dirac distribution, origin of energy bands – valance band, conduction band, band gap energy, distinction between metals, semiconductors and insulators, Hall effect – Hall voltage and Hall coefficient.
	Solid State Device	Timer (IC – 555) – Block diagram, function of each block, pin configuration, applications – astable, monostable and bistable multivibrator
April	Exam	Exam

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