

DBF DAYANAND COLLEGE OF ARTS AND SCIENCE, SOLAPUR

Program Outcome

Name of Department: Physics

- Demonstrate a rigorous understanding of the core theories and principles of physics, which include mechanics, electromagnetism, thermodynamics, quantum mechanics, electronics and nuclear physics.
- Students will demonstrate understanding of the applications of numerical techniques and apply critical reasoning skills to solve physics related problems.
- Demonstrate proficiency in the measurement, analysis and interpretation of data.
- Communicate scientific information in oral, written, and graphical formats.

D.B.F. Dayanand College of Arts and Science, Solapur

COURSE OUTCOME

Name of Department: **Physics**

B.A. / B.Sc. / M.A. / M.Sc.: B.Sc.		
NAME OF SUBJECT: Physics		
SEM I / II / III / IV / V / VI : Sem-I		
COURSE NUMBER (PAPER NUMBER): Paper I		
TITLE OF COURSE (NAME OF PAPER): Mechanics and Properties of Matter		
COURSE CONTENT	OBJECTIVES	OUTCOME
Moment of Inertia Review of M.I., Moment of Inertia of 1) Circular disc 2) Rectangular lamina 3) Spherical Shell 4) Fly wheel.	To understand the concept of Moment of Inertia and to calculate moment of inertia of various rigid bodies	Student understood the important concepts of Moment of Inertia. The students are able to calculate moment of inertia of various rigid bodies.
Pendulums Introduction, Theory of compound pendulum, Bar pendulum, Kater's Pendulum, Bassel's Theory, Bifilar pendulum (parallel suspensions of equal lengths), Torsional Pendulum.	To understand theory of compound pendulum. To study various pendulums like Bar pendulum, Kater's Pendulum, Bifilar pendulum, Torsional Pendulum.	Students understood the working theory of compound pendulum. Students are successfully able to understand theory of various pendulums like Bar pendulum, Kater's Pendulum, Bifilar pendulum, Torsional Pendulum.
Elasticity Introduction, Equivalence of shear strain to compression and extension strains, Relation between elastic constants, Poisson's ratio of rubber tube (Theory and experimental method)	To understand the concept of elasticity. To study elastic constant and relation between them. To study the Poisson's ratio of rubber tube.	Students understood the concept of elasticity. Students understood the relation between elastic constants. Students also studied the theory and experimental method to study Poisson's ratio.

<p>Surface Tension Review of S.T., relation between excess pressure and surface tension, excess pressure inside a liquid drop and soap bubble, Jaeger's method to determine Surface Tension, Factors affecting Surface Tension, Applications of Surface Tension.</p>	<p>To understand the concept of surface tension. To understand relation between excess pressure and surface tension, excess pressure inside a liquid drop and soap bubble. To study the factors affecting Surface Tension and Applications of Surface Tension.</p>	<p>Students understood the concept of surface tension. Students understood the relation between excess pressure and surface tension, excess pressure inside a liquid drop and soap bubble. Students understood the factors affecting Surface Tension and Applications of Surface Tension.</p>
<p>Viscosity and Fluid dynamics Introduction, Newton's law of viscosity, streamline and turbulent flow, Critical velocity and Reynolds number, Equation of continuity, Energy possessed by liquid, Poiseuille's equation, Bernoulli's theorem and its applications to 1) Venturimeter 2) Automiser. Factors Affecting on viscosity.</p>	<p>To understand the concept of Viscosity and Fluid dynamics. To understand Energy possessed by liquid, Poiseuille's equation, Bernoulli's theorem and its applications.</p>	<p>Students understood concept of Viscosity and Fluid dynamics. To understand Energy possessed by liquid, Poiseuille's equation, Bernoulli's theorem and its applications.</p>

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COURSE OUTCOME

Name of Department: **Physics**

B.A. / B.Sc. / M.A. / M.Sc.: B.Sc.		
NAME OF SUBJECT: Physics		
SEM I / II / III / IV / V / VI Sem-I		
COURSE NUMBER (PAPER NUMBER) Paper II		
TITLE OF COURSE (NAME OF PAPER): Optics and Laser		
COURSE CONTENT	OBJECTIVES	OUTCOME
Geometrical Optics and aberrations Introduction, Fermat's principle, Deduction of laws of reflection and refraction by Fermat's principle, Chromatic and Spherical aberration, methods to minimize Chromatic and Spherical aberrations.	To understand Fermat's Principle, its application, Aberration and its types.	The students understand Fermat's principle and Aberration.
Optical Instruments Introduction, Types of eye-pieces, Gauss eye piece, Ramsden's eye-piece, Huygen's eye-piece, Construction, working and Application of Spectrometer and Optical bench.	To get knowledge of types, construction and working of eye pieces, spectrometer and optical bench.	The students get knowledge of types, construction and working of eye pieces, spectrometer and optical bench.
Interference Introduction, Interference in parallel faced thin film (Reflected light only), wedge shaped film, Newton's rings and its applications.	To get knowledge of interference phenomenon in parallel faced, wedge shaped thin film and Newton's rings experiment.	The students get knowledge of interference phenomenon in parallel faced, wedge shaped thin film and Newton's rings experiment.
Diffraction Introduction, Types of diffraction, Plane diffraction grating and its elementary theory, its application to determine wavelength, Comparison between prism and grating spectra	To get knowledge of Types of diffraction, Plane diffraction and its elementary theory, its applications.	The students get knowledge of Types of diffraction, Plane diffraction and its elementary theory, its applications.
Laser Introduction, Spontaneous and Stimulated emission and absorption, Einstein's Coefficients, Population inversion, Optical Pumping, Cavity resonator, He-Ne and Ruby Laser, Properties and application.	To get knowledge of Laser basics, construction and working of He-Ne and Ruby Laser.	The students get knowledge of Laser basics, construction and working of He-Ne and Ruby Laser.

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COURSE OUTCOME

Name of Department: **Physics**

B.A. / B.Sc. / M.A. / M.Sc.: B.Sc.		
NAME OF SUBJECT: Physics		
SEM I / II / III / IV / V / VI Sem-II		
COURSE NUMBER (PAPER NUMBER) Paper III		
TITLE OF COURSE (NAME OF PAPER): Heat and Thermodynamics		
COURSE CONTENT	OBJECTIVES	OUTCOME
Transport Phenomenon Introduction, mean free path, Claussius expression for mean free path (Collision cross section), Transport Phenomenon, Coefficient of Viscosity, Thermal Conductivity and its dependence on temperature and pressure	To understand concept of transport phenomenon, its types, Coefficient of Viscosity and Thermal conductivity	The students understand concept of transport phenomenon, its types, Coefficient of Viscosity and Thermal conductivity
Liquefaction of Gases Liquefaction of gases by J-T effect, Linde's air liqefier; cooling by adiabatic demagnetization and expression for fall in temperature, experimental setup for adiabatic demagnetisation of paramagnetic substances, properties of liquid helium	To understand J-T effect and Liquefaction of gases, adiabatic demagnetization and properties of liquid helium	The students understand J-T effect and Liquefaction of gases, adiabatic demagnetization and properties of liquid helium
Thermodynamics Laws of thermodynamics, Reversible and Irreversible processes, Isothermal and adiabatic process, Adiabatic relations, work done during isothermal and adiabatic processes, Entropy change in reversible and irreversible processes	To get knowledge of Laws of thermodynamics, Reversible and Irreversible processes, Isothermal and adiabatic process, Adiabatic relations and entropy	The students get knowledge of Laws of thermodynamics, Reversible and Irreversible processes, Isothermal and adiabatic process, Adiabatic relations and entropy
Heat engines Introduction, Carnot's heat engine and its efficiency; Heat engine, Otto cycle and its efficiency, Diesel cycle and its efficiency, comparison between Otto and diesel engine.	To understand Carnot's heat engine, Otto engine, Diesel engine, efficiency and their comparison.	The students understand Carnot's heat engine, Otto engine, Diesel engine, efficiency and their comparison.
Refrigerator General principle, Refrigeration Cycle, coefficient of performance of refrigerator, Vapor compression Refrigerator, Air conditioning (principle and applications)	To get knowledge of principle of refrigeration cycle, COP, Vapor compression Refrigerator, Air conditioning & Applications	The students get knowledge of principle of Refrigeration cycle, COP, Vapor compression Refrigerator, Air conditioning & Applications

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COURSE OUTCOME

Name of Department: **Physics**

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.		
NAME OF SUBJECT : Physics		
SEM I / II / III / IV / V / VI : Sem-II		
COURSE NUMBER (PAPER NUMBER) : Paper IV		
TITLE OF COURSE (NAME OF PAPER) : Electricity, Magnetism and Basic Electronics		
COURSE CONTENT	OBJECTIVES	OUTCOME
Varying Current: Introduction, Growth and decay of current in L-R circuit, Charging and discharging of capacitor through resistor and inductor separately. Time constant of the LR and CR circuits.	To understand the concept of Varying Current. To study the growth and decay of current in L-R circuit. To study Charging and discharging of capacitor through resistor and inductor.	Students understood concept of Varying Current. Students learned the growth and decay of current in L-R circuit. Students studied charging and discharging of capacitor through resistor and inductor.
A.C. Circuits: Complex number, J-Operator and its applications to AC circuits, Reactance, Susceptance, Impedance, Admittance and power factor, L-C-R circuit, series and parallel resonance circuits, sharpness of resonance and quality factor, AC bridge(Owen's bridge).	To understand concept of complex number and its application to study AC circuits. To study the various parameters like Reactance, Susceptance, Impedance, Admittance and power factor in L-C-R circuit, series and parallel resonance circuits, sharpness of resonance and quality factor, AC bridge.	Students learned the application of complex number to study AC circuits. Students understood the concepts of Reactance, Susceptance, Impedance, Admittance and power factor in L-C-R circuit, series and parallel resonance circuits, sharpness of resonance and quality factor, AC bridge.

<p>Magnetostatics and Ballistic Galvanometer: Introduction, Biot and Savart's law & its application to determine magnetic induction at a point on the axis of current carrying coil of single turn and Solenoid. Construction, theory and working of Ballistic Galvanometer, Constants of B G.</p>	<p>To study the working principle of Ballistic Galvanometer and various constants in Ballistic Galvanometer. To study the concept magnetostatics and Biot Savart law. To determine magnetic induction at a point on the axis of current carrying coil of single turn and Solenoid.</p>	<p>Students understood the working principle of Ballistic Galvanometer and various constants in Ballistic Galvanometer. Students studied the concept magnetostatics and Biot Savart law. To determine magnetic induction at a point on the axis of current carrying coil of single turn and Solenoid.</p>
<p>Electronic circuit components and Devices: Classification of electronic circuit components as passive and active (Resistor, Capacitor, Inductor, Transformer, Switches, Relays, Diodes, Transistor, FET, SCR, UJT and IC) with their symbol and specification. Bridge rectifier with Pie-Filter, Clippers, Clampers, Zener diode and its application as a voltage regulator.</p>	<p>To understand Classification of electronic circuit components as passive and active. To study Bridge rectifier with Pie-Filter, Clippers, Clampers, Zener diode and its application as a voltage regulator.</p>	<p>Students understood Classification of electronic circuit components as passive and active. Students understood Bridge rectifier with Pie-Filter, Clippers, Clampers, Zener diode and its application as a voltage regulator.</p>
<p>Bi-junction transistor: Construction and working of transistor, input-output and transfer characteristics of CE & CB mode, Relation between α and β. Transistor as amplifier (CE mode)</p>	<p>To understand Construction and working of transistor, input-output and transfer characteristics of CE & CB mode, Relation between α and β. Transistor as amplifier (CE mode)</p>	<p>Students understood Construction and working of transistor, input-output and transfer characteristics of CE & CB mode, Relation between α and β. Transistor as amplifier (CE mode)</p>

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Name of Department: **Physics**

B.A. / B.Sc. / M.A. / M.Sc.: B.Sc.		
NAME OF SUBJECT: Physics		
SEM I / II / III / IV / V / VI: Sem-III		
COURSE NUMBER (PAPER NUMBER) : V		
TITLE OF COURSE (NAME OF PAPER): General Physics, Heat and Sound		
COURSE CONTENT	OBJECTIVES	OUTCOME
Vectors 1.1 Scalar and vector triple product 1.2 Scalar and vector fields 1.3 Del operator 1.4 Gradient of a scalar 1.5 Divergence of a vector, curl of vector and their physical significance	To get knowledge of Scalar and vector triple product, Scalar and vector fields, Del operator, Gradient of a scalar, Divergence of a vector, curl of vector and their physical significance	The students get knowledge of Scalar and vector triple product, Scalar and vector fields, Del operator, Gradient of a scalar, Divergence of a vector, curl of vector and their physical significance
Precessional Motion 2.1 Precession 2.2 Nutation 2.3 Gyroscope 2.4 Lanchester's rules 2.5 Gyrostatic pendulum 2.6 Motion of rolling disc 2.7 Gyroscopic applications in brief	To understand Precession, Nutation, Lanchester's rules, Gyroscope and its applications	The students understand understand Precession, Nutation, Lanchester's rules, Gyroscope and its applications
Elasticity 3.1 Bending of a beam 3.2 Bending moment 3.3 Cantilever 3.4 Centrally loaded beam 3.5 Flat spiral spring expression for Y and η	To get knowledge of elasticity, Bending moment, Cantilever and expression for Y and η of Flat spiral spring.	The students get knowledge of elasticity, Bending moment, Cantilever and expression for Y and η of Flat spiral spring.
Viscosity 4.1 Viscosity of liquid by rotating cylinder method 4.2 Searle's viscometer 4.3 Ostwald's viscometer	To get knowledge of Viscosity, Searle's viscometer and Ostwald's viscometer.	The students get knowledge of Viscosity, Searle's viscometer and Ostwald's viscometer.
Heat 5.1 Entropy 5.2 Change in entropy 5.3 Physical concept and physical significance of entropy 5.4 T – S diagram 5.5 Entropy of a perfect gas 5.6 Entropy of a steam	To study Entropy, physical significance of entropy, T-S diagram and Entropy of a perfect gas & steam.	The students understand Entropy, physical significance of entropy, T-S diagram and Entropy of a perfect gas & steam.

<p>Sound</p> <p>6.1 Transducer 6.2 Pressure microphone 6.3 Moving coil Loudspeaker 6.4 Acoustics and its affecting factors 6.5 Reverberation time 6.6 Optimum reverberation time 6.7 Requirements of good acoustics 6.8 Sabine's formula 6.9 Ultrasonic production by piezoelectric method 6.10 Detection of ultrasonic 6.11 Properties and applications of ultrasonic</p>	<p>To get knowledge of Transducer, Acoustics and its affecting factors, Reverberation time, Requirements of good acoustics, Sabine's formula and production, Detection, Properties and applications of ultrasonic.</p>	<p>The students get knowledge of Transducer, Acoustics and its affecting factors, Reverberation time, Requirements of good acoustics, Sabine's formula and production, Detection, Properties and applications of ultrasonic.</p>
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COURSE OUTCOME

Name of Department Physics

B.A. / B.Sc. / M.A. / M.Sc.		
NAME OF SUBJECT Physics		
SEM I / II / III / IV / V / VI		
COURSE NUMBER (PAPER NUMBER) VI		
TITLE OF COURSE (NAME OF PAPER) ELECTRONICS		
COURSE CONTENT	OBJECTIVES	OUTCOME
Transistor amplifier : 1.1 Transistor biasing: voltage divider bias 1.2 Two stage R-C coupled transistor amplifier 1.3 Frequency response curve of an amplifier 1.4 Feedback 1.5 Effect of negative feedback on the frequency response curve 1.6 Differential amplifier 1.7 Modes of operation 1.8 Common mode and differential mode signals 1.9 Comparison between normal amplifier and differential amplifier	To understand biasing and its need in its amplifiers. Modifications in amplifiers with feedback. Differential amplifier.	The students understand amplifier and modifications in amplifiers.
Oscillator : 2.1 Types of waveforms 2.2 Oscillations from tank circuit 2.3 Barkhausen's criterion for sustained oscillations 2.4 Concept of AF and RF Oscillator 2.5 Phase shift oscillator 2.6 Colpitt's oscillator 2.7 Hartley oscillator, 2.8 Crystal Oscillator (qualitative treatment only)	To understand oscillators. theory of oscillations and different types of oscillators.	The students understand oscillators and different types of oscillators
Unipolar Devices: 3.1 FET: Construction, operation	To study unipolar devices –FET and UJT	The students understand FET and UJT with its

<p>and characteristics</p> <p>3.2 Application of FET as VVR</p> <p>3.3 UJT: Construction, operation and characteristics</p> <p>3.4 UJT as voltage sweep generator</p>	<p>with its construction and operation and application</p>	<p>construction and operation and application</p>
<p>Digital Electronics :</p> <p>4.1 De Morgan's theorems</p> <p>4.2 Half adder</p> <p>4.3 Full adder</p> <p>4.4 Construction and working of RS flip flop</p> <p>4.5 Construction and working of JK flip flop</p>	<p>To study digital electronics with different gates with related adders and flip-flops.</p>	<p>The students understand digital electronics with different gates with related adders and flip-flops</p>
<p>Regulated power supply</p> <p>5.1 Regulated power supply (with block diagram) and its need</p> <p>5.2 Line and load regulation</p> <p>5.3 Transistor Series power supply</p> <p>5.4 IC voltage regulators</p> <p>5.5 Fixed output voltage regulators (using IC 78XX and 79XX)</p> <p>5.6 Dual power supply using 3 pin IC</p>	<p>To study different regulated power supply with IC voltage regulators</p>	<p>The students studied different regulated power supply with IC voltage regulators</p>
<p>Electronic Instruments:</p> <p>6.1 Principle, Construction and working of CRT</p> <p>6.2 Block diagram of CRO</p> <p>6.3 Uses of CRO</p> <p>6.4 Block diagram of digital multimeter (DMM) and its applications</p>	<p>To study Electronic Instruments-CRO and DMM</p>	<p>The students studied CRO and DMM</p>

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COURSE OUTCOME

Name of Department Physics

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.		
NAME OF SUBJECT : Physics		
SEM I / II / III / IV / V / VI : IV		
COURSE NUMBER (PAPER NUMBER) VI		
TITLE OF COURSE (NAME OF PAPER) OPTICS		
COURSE CONTENT	OBJECTIVES	OUTCOME
Cardinal points: 1.1 Lagrange's equation 1.2 Cardinal points of optical system 1.3 Graphical construction of image using cardinal points 1.4 Newton's formula 1.5 Relation between focal lengths for any optical system 1.6 Relation between lateral, axial and angular magnifications 1.7 Thick lens (introduction) 1.8 combination of two thin lenses	To study Cardinal points, Newton's formula, Relation between focal lengths for any optical system, Relation between lateral, axial and angular magnifications, Thick lens (introduction) combination of two thin lenses	Students studied Cardinal points, Newton's formula, Relation between focal lengths for any optical system, Relation between lateral, axial and angular magnifications, Thick lens (introduction) combination of two thin lenses
Interference of light: 2.1 Michelson's interferometer 2.2 Applications of Michelson's interferometer to measure i) wavelength of light ii) Difference in wavelengths and iii) Refractive index of thin film 2.3 Construction and working of Michelson's interferometer 2.4 Superiority of F.P. interferometer over Michelson's interferometer	To study Michelson's interferometer and Michelson's interferometer	Students studied Michelson's interferometer and Michelson's interferometer

<p>Diffraction of light: 3.1 Fresnel's half period zones 3.2 Explanation of rectilinear propagation of light 3.3 Zone plate 3.4 Fresnel's diffraction at straight edge</p>	<p>To study Fresnel's half period zones, Explanation of rectilinear propagation of light, Zone plate,, Fresnel's diffraction at straight edge</p>	<p>Students studied Fresnel's half period zones, Explanation of rectilinear propagation of light, Zone plate,, Fresnel's diffraction at straight edge</p>
<p>Resolving power: 4.1 Geometrical and spectral resolution 4.2 Distinction between magnification and resolution 4.3 Rayleigh's criterion for the limit of resolution 4.4 Modified Rayleigh's criterion 4.5 R.P. of plane diffraction grating 4.6 R.P. of prism</p>	<p>To study Resolving power, Geometrical and spectral resolution, Distinction between magnification and resolution, Rayleigh's criterion for the limit of resolution, Modified Rayleigh's criterion, R.P. of plane diffraction grating, R.P. of prism</p>	<p>Students studied Resolving power, Geometrical and spectral resolution, Distinction between magnification and resolution, Rayleigh's criterion for the limit of resolution, Modified Rayleigh's criterion, R.P. of plane diffraction grating, R.P. of prism</p>
<p>Polarization: 5.1 Double refraction 5.2 Huygen's explanation of double refraction through uni-axial crystals 5.3 Nicols prism 5.4 Phase retardation plates 5.5 Elliptically and circularly polarized light 5.6 Optical rotation 5.7 Laws of rotation of plane of polarization 5.8 Applications a) Polarimeter b) Liquid crystal Displays</p>	<p>To study Polarization, Double refraction Huygen's explanation of double refraction through uni-axial crystals, Nicols prism, Phase retardation plates, Elliptically and circularly polarized light, Optical rotation, Laws of rotation of plane of polarization, Applications</p>	<p>Students studied Polarization, Double refraction Huygen's explanation of double refraction through uni-axial crystals, Nicols prism, Phase retardation plates, Elliptically and circularly polarized light, Optical rotation, Laws of rotation of plane of polarization, Applications</p>
<p>Optical Fibers: 6.1 Structure and types of fibers 6.2 Numerical aperture (definition only) 6.3 Pulse dispersion in step index fiber 6.4 Fiber optic communication system (Qualitative treatment only) 6.5 Advantages of optical fiber</p>	<p>To study structure and types of fibers, Numerical aperture (definition only), Pulse dispersion in step index fiber, Fiber optic communication system Advantages of optical fiber</p>	<p>Students studied structure and types of fibers, Numerical aperture (definition only), Pulse dispersion in step index fiber, Fiber optic communication system Advantages of optical fiber</p>

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COURSE OUTCOME

Name of Department: **Physics**

B.A. / B.Sc. / M.A. / M.Sc. : B.Sc.		
NAME OF SUBJECT : Physics		
SEM I / II / III / IV / V / VI : Sem-V		
COURSE NUMBER (PAPER NUMBER) : Paper IX		
TITLE OF COURSE (NAME OF PAPER): Mathematical Physics and Statistical Physics		
COURSE CONTENT	OBJECTIVES	OUTCOME
Vector theorems and introduction to partial differential equation. 1.1 Gauss's theorem. 1.2 Green's theorem 1.3 Stoke's theorem 1.4 Differential equation 1.4.1 Types of differential equation. 1.4.2 Degree, Order, Linearity, Homogeneity of differential equation. 1.4.3 Concept of singular points of differential equation. 1.5 Frobenius method of solving differential equation. 1.5.1 Legendre differential equation (without solution) 1.5.2 Bessel differential equation (without solution) 1.5.3 Hermite differential equation (with solution)	To Study Gauss's theorem. Green's theorem Stoke's theorem To Study Types of differential equation. Degree, Order, Linearity, Homogeneity of differential equation. To understand concept of singular points of differential equation. Frobenius method of solving differential equation. Legendre differential equation (without solution) Bessel differential equation (without solution) Hermite differential equation (with solution)	Students understood Gauss's theorem. Green's theorem Stoke's theorem Students studied Types of differential equation. Degree, Order, Linearity, Homogeneity of differential equation. To understand concept of singular points of differential equation. Frobenius method of solving differential equation. Legendre differential equation (without solution) Bessel differential equation (without solution) Hermite differential equation (with solution)

<p>Orthogonal Curvilinear Co-ordinate System 2.2 Concept of Orthogonal Coordinate system 2.3 Gradient in Orthogonal Coordinate system 2.4 Divergence in Orthogonal Coordinate system 2.5 Curl in Orthogonal Coordinate system 2.6 Laplacian Operator in Orthogonal Coordinate system 2.7 Extension of Orthogonal Coordinate system in Cartesian, Spherical polar and Cylindrical Coordinate system</p>	<p>To understand Concept of Orthogonal Coordinate system. Gradient in Orthogonal Coordinate system Divergence in Orthogonal Coordinate system Curl in Orthogonal Coordinate system Laplacian Operator in Orthogonal Coordinate system. Extension of Orthogonal Coordinate system in Cartesian, Spherical polar and Cylindrical Coordinate system</p>	<p>Students understand Concept of Orthogonal Coordinate system. Gradient in Orthogonal Coordinate system Divergence in Orthogonal Coordinate system Curl in Orthogonal Coordinate system Laplacian Operator in Orthogonal Coordinate system. Extension of Orthogonal Coordinate system in Cartesian, Spherical polar and Cylindrical Coordinate system</p>
<p>Basic Concepts in Statistical Physics 3.2 Micro canonical and Canonical Ensemble 3.3 Phase Space 3.4 Accessible microstates 3.5 A Priory Probability 3.6 Thermodynamic Probability 3.7 Probability Distribution 3.8 Entropy and Probability</p>	<p>To understand Basic Concepts in Statistical Physics, Micro canonical and Canonical Ensemble Phase Space, Accessible microstates , A Priory Probability, Thermodynamic Probability, Probability Distribution, Entropy and Probability</p>	<p>Students understand Basic Concepts in Statistical Physics, Micro canonical and Canonical Ensemble Phase Space, Accessible microstates , A Priory Probability, Thermodynamic Probability, Probability Distribution, Entropy and Probability</p>
<p>Maxwell-Boltzmann Statistics 4.2 Evaluation of constants α and β 4.3 Molecular Speeds 4.4 Thermodynamic functions in terms of partition function</p>	<p>To understand Maxwell-Boltzmann Statistics, Evaluation of constants α and β, Molecular Speeds , Thermodynamic functions in terms of partition function</p>	<p>Students understood concepts of Maxwell-Boltzmann Statistics, Evaluation of constants α and β, Molecular Speeds , Thermodynamic functions in terms of partition function</p>

<p>Bose Einstein Statistics</p> <p>5.2 Bose Einstein Distribution Law</p> <p>5.3 Experimental study of black body radiation</p> <p>5.4 Derivation of Plank's radiation formula</p> <p>5.6 Deduction of Wein's Formula from Plank's radiation formula</p> <p>5.7 Deduction of Rayleigh's Jeans Law from Plank's radiation formula</p> <p>5.8 Deduction of Wein's Displacement Law from Plank's radiation formula</p> <p>5.9 Stefan's Law from Plank's radiation formula</p>	<p>To study basic concepts in Bose Einstein Statistics and derive distribution law.</p> <p>To understand the black body radiation problem on the basis of Planck's quantum theory.</p> <p>To derive the Rayleigh's Jeans Law, Wein's Displacement Law , Stefan's Law from Plank's radiation formula</p>	<p>Students understood basic concepts in Bose Einstein Statistics and derive distribution law.</p> <p>To understand the black body radiation problem on the basis of Planck's quantum theory.</p> <p>To derive the Rayleigh's Jeans Law, Wein's Displacement Law , Stefan's Law from Plank's radiation formula</p>
<p>Fermi Dirac Statistics</p> <p>6.2 Application to free electrons in metals</p> <p>6.3 Electron energy Distribution</p> <p>6.4 Fermi Energy</p> <p>6.5 Comparison of M.B., F.D. and B.E. statistics</p>	<p>To study Fermi Dirac Statistics Application to free electrons in metals ,Electron energy Distribution, Fermi Energy, Comparison of M.B., F.D. and B.E. statistics</p>	<p>Students understood Fermi Dirac Statistics Application to free electrons in metals ,Electron energy Distribution, Fermi Energy, Comparison of M.B., F.D. and B.E. statistics</p>

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COURSE OUTCOME

Name of Department _____ **Physics** _____

B.A. / B.Sc. / M.A. / M.Sc.		
NAME OF SUBJECT : Physics		
SEM I / II / III / IV / V / VI		
COURSE NUMBER (PAPER NUMBER) : X		
TITLE OF COURSE (NAME OF PAPER) : Solid State Physics		
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Crystallography: (09) 1.1 Lattice and Basis 1.2 Unit cell 1.3 Bravais lattices (2-D, 3-D), 1.4 Inter-planer spacing, 1.5 Miller indices, 1.6 Packing fraction and co-ordination number for BCC, SC, FCC & HCP structures.		
2. X- ray. Diffraction by crystals (07) 1.1 production of X-rays and its properties 2.2 Reciprocal Lattice and its properties, 2.3 Bragg's Law in reciprocal lattice, 2.4 Powder method of X-ray diffraction for crystal structure		
3. Free electron theory (08) 3.1 Properties of metals 3.2 Free electron model (Drude & Lorentz model). 3.3 Electrical, thermal conductivity of metals and Wiedmann-Franz relation 3.4 Sommerfeld's theory. 3.5 Fermi-Dirac distribution. 3.6 Fermi energy, degeneracy and non-degeneracy of metals.		
4. Band Theory of Solids (08) 1.1 Formation of bands in solids (PE, KE and total energy of electron in isolated atom), 4.2 Formation of energy bands (Valence band, conduction band and forbidden energy gap),		

COURSE OUTCOME Physics B.Sc. III SEM V PAPER X: Solid State Physics

4.3 Motion of electron in one dimensional periodic potential (Kronig Penny model), 4.4 Effective mass of electron, 4.5 Difference between metals semiconductors and insulators, 4.6 Hall Effect. And its applications		
5. Magnetic Materials (07) 5.1 Magnetic Terminology 5.2 Classification of magnetic materials, 5.2.1 Diamagnetic material 5.2.2 Paramagnetic material 5.2.3 Ferromagnetic material 5.2.4 Anti-ferromagnetic material 5.2.5 Ferri-magnetic and ferrites, 5.3 Energy loss in the hysteresis,		
6 Superconductivity (06) 6.1 Superconductor 6.2 Type I and Type II superconductors 6.3 Critical temperature, 6.4 Effect of magnetic field 6.5 Meissner effect, 6.6 Josephson effect, 6.7 Application of superconductor		

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COURSE OUTCOME

Name of Department: **Physics**

B.A. / B.Sc. / M.A. / M.Sc.: B.Sc.		
NAME OF SUBJECT: Physics		
SEM I / II / III / IV / V / VI: Sem-V		
COURSE NUMBER (PAPER NUMBER) : XI		
TITLE OF COURSE (NAME OF PAPER): Classical Mechanics		
COURSE CONTENT	OBJECTIVES	OUTCOME
Mechanics of a particle and system of particles 1.1 Mechanics of a particle using vector algebra and vector calculus 1.2 Conservation theorems for linear momentum, angular momentum and energy of a particle 1.3 Mechanics of a system of particles, concept of centre of mass 1.4 Conservation theorems for linear momentum, angular momentum and energy of a system of particles 1.5 Application of Newton's law of motion - Projectile motion in resistive medium 1.6 Problems	To understand Mechanics of a particle and system of particles, Conservation laws and applications.	The students understand Mechanics of a particle and system of particles, Conservation laws and applications.
Lagrangian Formulation 2.1 Limitations of Newtonian Formulation 2.2 Introduction of Lagrangian Formulation 2.3 Constraints 2.4 Degrees of freedom 2.5 Generalised coordinates 2.6 Principle of virtual work 2.7 D'Alembert's Principle 2.8 Lagrange's equation from D'Alembert's Principle	To get knowledge of Constraints, Degrees of freedom, Generalised coordinates, Principle of virtual work, D'Alembert's Principle and Lagrangian Formulation and Applications of Lagrange's equation.	The students get knowledge of Constraints, Degrees of freedom, Generalised coordinates, Principle of virtual work, D'Alembert's Principle and Lagrangian Formulation and Applications of Lagrange's equation.

<p>2.9 Application of Lagrange's equation to</p> <p>i) A particle in space (Cartesian coordinates)</p> <p>ii) Atwood's Machine and</p> <p>iii) A bead sliding on uniformly rotating wire</p> <p>iv) Simple Pendulum</p> <p>v) Simple harmonic Oscillator</p> <p>2.10 Problems</p>		
<p>Moving Coordinate systems</p> <p>3.1 Moving origin of coordinates</p> <p>3.2 Pseudo forces</p> <p>3.3 Rotating coordinate systems</p> <p>3.4 Coriolis force</p> <p>3.5 Foucault's pendulum</p> <p>3.6 Effects of Coriolis force in nature</p> <p>3.7 Effect of Coriolis force on freely falling body</p> <p>3.8 Promlems</p>	<p>To get knowledge of Moving Coordinate systems, Coriolis force, Foucault's pendulum, Effects of Coriolis force in nature and freely falling body</p>	<p>The students get knowledge of Moving Coordinate systems, Coriolis force, Foucault's pendulum, Effects of Coriolis force in nature and freely falling body</p>
<p>Techniques of Calculus of Variation</p> <p>4.1 Hamilton's principle</p> <p>4.2 Deduction of Lagrange's equations from Hamilton's principle</p> <p>4.3 Applications:</p> <p>i) Shortest distance between two points in a plane</p> <p>ii) Brachistochrone problem</p> <p>iii) Minimum surface of revolution</p>	<p>To get knowledge of Hamilton's principle, its derivation from Lagrange's equations and applications of Hamilton's principle.</p>	<p>The students get knowledge of Hamilton's principle, its derivation from Lagrange's equations and applications of Hamilton's principle.</p>
<p>Coupled Oscillations</p> <p>5.1 Frequencies of coupled oscillatory system</p> <p>5.2 Normal modes and normal coordinates</p> <p>5.3 Energy of coupled oscillations</p> <p>5.4 Energy transfer in coupled oscillatory system</p> <p>5.5 Problems</p>	<p>To get knowledge of coupled oscillatory system, Normal modes and normal coordinates, energy and energy transfer coupled oscillatory system</p>	<p>The students get knowledge of coupled oscillatory system, Normal modes and normal coordinates, energy and energy transfer coupled oscillatory system</p>
<p>Motion of rigid body</p> <p>6.1 Motion of rigid body in space</p> <p>6.2 Euler's theorem</p> <p>6.3 Angular momentum and energy</p> <p>6.4 Euler's equations of motion</p>	<p>To get knowledge of Motion of rigid body in space, Euler's theorem, Angular momentum and energy, Euler's equations of motion</p>	<p>The students get knowledge of Motion of rigid body in space, Euler's theorem, Ang. Mom. and energy, Euler's equations of motion</p>

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COURSE OUTCOME

Name of Department Physics

B.A. / B.Sc. / M.A. / M.Sc.		
NAME OF SUBJECT		
SEM I / II / III / IV / V / VI		
COURSE NUMBER (PAPER NUMBER) XII		
TITLE OF COURSE (NAME OF PAPER) NUCLEAR PHYSICS		
COURSE CONTENT	OBJECTIVES	OUTCOME
Nuclear structure and properties 1.1 Composition of nucleus 1.2 Nuclear radius 1.3 Nuclear spin 1.4 Nuclear magnetic moment 1.5 Electric quadrupole moment 1.6 Mass defect 1.7 Binding energy 1.8 Packing fraction 1.9 Liquid drop model of nucleus 1.10 Semi-empirical mass formula	To study- Nuclear structure and properties included Composition of nucleus ,Nuclear radius, Nuclear spin,Nuclear magnetic moment Electric quadrupole moment,Mass defect, Binding energy,Packing fraction,Liquid drop model of nucleus,Semi-empirical mass formula.	Students studied Nuclear structure and properties included Composition of nucleus ,Nuclear radius, Nuclear spin,Nuclear magnetic moment Electric quadrupole moment,Mass defect, Binding energy,Packing fraction,Liquid drop model of nucleus,Semi-empirical mass formula
Nuclear reactions 2.2 Q value of nuclear reactions 2.3 Threshold energy 2.4 Cross section of nuclear reactions (qualitative) 2.5 Stripping reactions 2.6 Pick-up reactions	To study Nuclear reactions include Q value of nuclear reactions, Threshold energy. Cross section of nuclear reactions (qualitative), Stripping reactions, Pick-up reactions.	Students studied Nuclear reactions include Q value of nuclear reactions, Threshold energy.Cross section of nuclear reactions (qualitative),Stripping reactions,Pick-up reactions.
Particle Accelerators 3.2 Cyclotron 3.3 Limitations of cyclotron 3.4 Phase stable orbit	To study Particle Accelerators Such as Cyclotron, With the Limitations of cyclotron,	Students studied Particle Accelerators Such as Cyclotron, With the Limitations of cyclotron,

3.5 Betatron	Phase stable orbit and Betatron	Phase stable orbit and Betatron
Nuclear Radiation Detectors 4.2 Geiger Muller counter i. Construction and working ii. Dead time, recovery time and resolving time iii. Self quenching mechanism 4.3 Wilson Cloud chamber 4.4 Scintillation counter	To study Nuclear Radiation Detectors such as Geiger Muller counter, Wilson Cloud chamber and Scintillation counter.	Students studied Nuclear Radiation Detectors such as Geiger Muller counter, Wilson Cloud chamber and Scintillation counter.
Nuclear Energy Levels 5.2 α particle spectra 5.3 Nuclear energy levels 5.4 β - decay- Experimental study of β - decay 5.5 Continuous β - ray spectrum 5.6 Pauli's Neutrino Hypothesis 5.7 Nuclear Energy Levels from β - decay	To study Nuclear Energy Levels with α particle spectra, Nuclear energy levels, β - decay- Experimental study of β - decay, Continuous β - ray spectrum, Pauli's Neutrino Hypothesis, Nuclear Energy Levels from β - decay.	Students studied Nuclear Energy Levels with α particle spectra, Nuclear energy levels, β - decay- Experimental study of β - decay, Continuous β - ray spectrum, Pauli's Neutrino Hypothesis, Nuclear Energy Levels from β - decay.
Elementary Partials 6.2 Types of interactions, 6.3 Classification of elementary particles, 6.4 Properties of particles 12 6.5 Introduction of quarks, 6.6 Different types of quarks	To study Elementary Partials with Types of interactions, Classification of elementary particles, Properties of particles Introduction of quarks,	Students studied elementary Partials with Types of interactions, Classification of elementary particles, Properties of particles Introduction of quarks

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D.B.F. Dayanand College of Arts & Science, Solapur**COURSE OUTCOME**Name of Department _____ **Physics** _____

B.A. / B.Sc. / M.A. / M.Sc.		
NAME OF SUBJECT : Physics		
SEM I / II / III / IV / V / VI		
COURSE NUMBER (PAPER NUMBER) : XIII		
TITLE OF COURSE (NAME OF PAPER) : Electrodynamics		
COURSE CONTENT	OBJECTIVES	OUTCOME
1. Electrostatics and Charged particle dynamics: (8) 1.1 Coulomb's Law. 1.2 Gauss law in differential form. 1.3 Poisson's and Laplace's equations. 1.4 Applications of Poisson's and Laplace's equation to spherical systems. 1.5 Motion of charged particles in constant uniform electric (E) field. 1.6 Motion of charged particles in constant uniform magnetic (B) field. 1.7 Motion of charged particles in constant uniform crossed electric and magnetic fields.		
2. Time varying (7) 2.1 Electro force 2.2 Electromagnetic induction - Faraday's law. 2.3 Lenz's law. 2.4 Integral and differential forms of Faraday's law. 2.5 Self inductance. 2.6 Application of Self inductance to solenoid. 2.7 Mutual inductance. 2.8 Application of Mutual inductance to transformer.		
3. Maxwell's Equations(9) 3.1 Magnetic Susceptibility and permeability.		

<p>3.2 Biot-Savart's law 3.3 Derivation of $\nabla \cdot \mathbf{B} = 0$ 3.4 Ampere's law. 3.5 Derivation of $\nabla \times \mathbf{B} = \mu_0 \mathbf{J}$ OR Differential form of Ampere's law. 3.6 Equation of continuity. 3.7 Displacement Current density. 3.8 Maxwell's correction to Ampere's law. 3.9 Maxwell's equations for time dependent electric and magnetic fields in vacuum. 3.10 Maxwell's equations for time dependent electric and magnetic fields in material medium. 3.11 Physical significance (Integral form) of Maxwell's Equations</p>		
<p>4. Electromagnetic waves. (8) 4.1 Conservation of energy in electromagnetic fields and Poynting's theorem. 4.2 Conservation of momentum in electromagnetic fields. 4.3 Wave equations for electric and magnetic fields in vacuum 4.4 Plane wave solutions, orthogonality of E, B and propagation vector K 4.5 Plane E. M. waves in Dielectric 4.6 Plane E. M. waves in conductors Attenuation of wave in metal (skin depth)</p>		
<p>5. Reflection and Refraction of E. M. waves: (8) 5.1 Boundary conditions for e. m. field vectors D, B, E & H 5.2 Reflection and refraction of e. m. waves at a boundary of two dielectrics (Normal incidence only) 5.3 Reflection from a conducting plane-normal incidence. 5.4 Total Internal Reflection</p>		
<p>6. Radiation from electric dipole (5) 6.1 Electric dipole 6.2 Retarded time and retarded potential 6.3 Electric dipole radiation 6.4 Radiation reaction for Electric dipole</p>		

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COURSE OUTCOME

Name of Department: **Physics**

B.A. / B.Sc. / M.A. / M.Sc.: B.Sc.		
NAME OF SUBJECT: Physics		
SEM I / II / III / IV / V / VI: Sem-VI		
COURSE NUMBER (PAPER NUMBER) : XIV		
TITLE OF COURSE (NAME OF PAPER): Materials Science		
COURSE CONTENT	OBJECTIVES	OUTCOME
Materials and their properties 1.1 Classification of materials 1.2 Organic, inorganic and biological materials 1.3 Properties of materials 1.3.1 Mechanical properties 1.3.2 Thermal properties 1.3.3 Optical properties 1.3.4 Electrical properties 1.3.5 Magnetic properties	To study Classification of materials and their Mechanical, Thermal properties, Optical properties, Electrical properties, Magnetic properties.	The students understand Classification of materials and their Mechanical, Thermal properties, Optical properties, Electrical properties, Magnetic properties.
Polymer materials 2.1 Polymers 2.2 Polymerization mechanism 2.2.1 Additional polymerization 2.2.2 Condensation polymerization 2.2.3 Homo-polymer 2.2.4 Co-polymer 2.3 Degree of polymerization 2.4 Defects in the polymers 2.5 Mechanical properties of polymers, deformation, reinforced polymers 2.6 Applications of polymers.	To understand Polymerization mechanism, their types, degree, defects in polymerization, applications and properties of polymers.	The students understand Polymerization mechanism, their types, degree, defects in polymerization, applications and properties of polymers.
Ceramic Materials 3.1 Classification of ceramic materials 3.2 Structure of ceramics 3.3 Ceramic processing 3.4 Properties of Ceramics 3.5 Applications of Ceramics	To get knowledge of Classification of ceramic materials, their Structure, processing, Properties and Applications.	The students get knowledge of Classification of ceramic materials, their Structure, processing, Properties and Applications.
Composite Materials 4.1 Fabrication of composites 4.2 Mechanical properties of composites	To get knowledge of Fabrication of composites, their properties and applications	The students get knowledge of Fabrication of composites, their properties and applications

4.3 Particle-Reinforced Composites 4.4 Fiber-Reinforced composites 4.5 Applications of composites		
Biomaterials 5.1 Bio-Mechanism 5.2 Classification of Biomaterials 5.3 Processing of Biomaterials 5.4 Properties of Biomaterials 5.5 Applications of Biomaterials	To get knowledge of Classification of Biomaterials, their processing, properties and applications.	The students get knowledge of Classification of Biomaterials, their processing, properties and applications.
Nanomaterials 6.1 Introduction to nano-sized materials and structures 6.2 Brief history of nanomaterials and challenges in nanotechnology 6.3 Significance of nano-size and properties 6.4 Classification of nano structured materials 6.5 Methods of synthesis of nanomaterials 6.5.1 Bottom-up and Top-down approaches 6.5.2 Physical methods: High energy ball milling, Physical vapour deposition, Ionized cluster beam deposition, sputter deposition, Ultrasonic spray pyrolysis etc. 6.5.3 Chemical methods: colloidal method, co-precipitation and sol-gel method 6.5.4 Hybrid method: Electrochemical and chemical vapour deposition.	To get knowledge of history, Classification, Significance, Methods of synthesis, Bottom-up and Top-down approaches of nanomaterials. Physical, chemical and hybrid methods of nanomaterials synthesis.	The students get knowledge of history, Classification, Significance, Methods of synthesis, Bottom-up and Top-down approaches of nanomaterials. Physical, chemical and hybrid methods of nanomaterials synthesis.

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COURSE OUTCOME

Name of Department: Physics

B.A. / B.Sc. / M.A. / M.Sc.: B.Sc.		
NAME OF SUBJECT: Physics		
SEM I / II / III / IV / V / VI: Sem-VI		
COURSE NUMBER (PAPER NUMBER) : XV		
TITLE OF COURSE (NAME OF PAPER): Atomic Physics, Molecular Physics and Quantum Mechanics		
COURSE CONTENT	OBJECTIVES	OUTCOME
Atomic Spectra 1.1 Review of quantum numbers 1.2 Electronic configuration of alkali metals 1.3 Spectral notations 1.4 Alkali spectra 1.5 Doublet fine structure of alkali metals 1.6 Spectrum of Sodium 1.7 Selection rules 1.8 Intensity rules	To get knowledge of Spectral notations, Alkali spectra, Doublet fine structure of alkali metals, Spectrum of Sodium, Selection rules, Intensity rules	The students get knowledge of Spectral notations, Alkali spectra, Doublet fine structure of alkali metals, Spectrum of Sodium, Selection rules, Intensity rules
Effects of Magnetic and Electric fields on Atomic Spectra 2.1 Anomalous Zeeman effect and its explanation from vector atom model 2.2 Paschen Back effect 2.3 Paschen Back effect in principal series doublet 2.4 Selection rules for Paschen Back effect 2.5 Stark effect of hydrogen 2.6 Weak field Stark effect in hydrogen 2.7 Strong field Stark effect in hydrogen	To study Effects of Magnetic and Electric fields on Atomic Spectra from Anomalous Zeeman effect, Paschen Back effect and stark effect.	The students understand the Effects of Magnetic and Electric fields on Atomic Spectra from Anomalous Zeeman effect, Paschen Back effect and stark effect.
Molecular Spectra and Raman Effect 3.1 Molecular bond 3.2 Rotational energy levels and Rotational spectra 3.3 Vibrational energy levels and Vibrational spectra 3.4 Vibration-Rotation spectra 3.5 Electronic spectra of a diatomic molecule 3.6 Franck-Condon principle 3.7 Raman effect	To get knowledge of Molecular bond, Rotational spectra, Vibrational spectra, Vibration-Rotation spectra, Electronic spectra, Franck-Condon principle and Raman effect.	The students get knowledge of Molecular bond, Rotational spectra, Vibrational spectra, Vibration-Rotation spectra, Electronic spectra, Franck-Condon principle and Raman effect.

3.8 Characteristic properties of Raman lines 3.9 Classical theory of Raman effect		
Quantum Mechanics 4.1 Heisenberg's uncertainty principle (Statement) and its similarity with concept of matter waves 4.2 Physical significance of ψ 4.3 Time dependent and time independent Schrödinger wave equations 4.4 Eigen values and Eigen functions 4.5 Probability current density	To understand Heisenberg's uncertainty principle, Physical significance of ψ , to derive Time dependent and time independent Schrödinger wave equations, Eigen values and Eigen functions and Probability current density	The students understand Heisenberg's uncertainty principle, Physical significance of ψ , to derive Time dependent and time independent Schrödinger wave equations, Eigen values and Eigen functions and Probability current density
Application of Schrodinger's time independent wave equation 5.1 Particle in a Box (one and three dimensional cases), its Eigen values and Eigen functions. 5.2 Step Potential (Statement, boundary conditions, Schrodinger's equations in different regions and Discussion of results) 5.3 Potential Barrier (Statement, boundary conditions, Schrodinger's equations in different regions and Discussion of results) 5.4 Potential Well (Statement, boundary conditions, Schrodinger's equations in different regions and Discussion of results) 5.5 Linear Harmonics Oscillator – Eigen values and Eigen functions 5.6 Zero point energy	To study applications of Schrodinger's time independent wave equation to Particle in a Box, Step Potential, Potential Barrier, Potential Well, Harmonics Oscillator and Zero point energy.	To students can apply Schrodinger's time independent wave equation to Particle in a Box, Step Potential, Potential Barrier, Potential Well, Harmonics Oscillator and Zero point energy.
Operators 6.1 Operators in quantum mechanics 6.2 Expectation values and properties 6.3 Angular momentum operators 6.4 Commutation properties for components L_x, L_y, L_z 6.5 Commutation for L^2 and L_z operators and their Eigen values 6.6 Schrodinger's equation for hydrogen atom 6.7 Separation of radial and angular parts	To get knowledge of Operators in quantum mechanics their types, commutation properties. Also Schrodinger's equation for hydrogen atom and Separation of radial and angular parts.	The students get knowledge of Operators in quantum mechanics their types, commutation properties. Also Schrodinger's equation for hydrogen atom and Separation of radial and angular parts.

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COURSE OUTCOME

Name of Department Physics

B.A. / B.Sc. / M.A. / M.Sc.		
NAME OF SUBJECT PHYSICS		
SEM I / II / III / IV / V / VI		
COURSE NUMBER (PAPER NUMBER) XVI		
TITLE OF COURSE (NAME OF PAPER) ELECTRONICS		
COURSE CONTENT	OBJECTIVES	OUTCOME
Operational Amplifier: 1.1 Block diagram of OP AMP 1.2 Characteristics of OP - AMP 1.3 OP -AMP parameters 1.4 OP- AMP as inverting amplifier 1.5 OP- AMP as non-inverting amplifier 1.6 Applications of OP- AMP 1.6.1 Adder 1.6.2 Subtractor 1.6.3 Differentiator 1.6.4 Integrator 1.6.5 Comparator 1.6.6 Schmitt's trigger	To study Operational Amplifier with Block diagram of OP AMP, Characteristics of OP – AMP, OP -AMP parameters, OP- AMP as inverting amplifier, OP- AMP as non-inverting amplifier, Applications of OP-AMP Such as Adder, Subtractor Differentiator, Integrator, Comparator, Schmitt's trigger	
Timer: 2.1 Functional Block diagram of IC 555, its Pin connections (06) 2.2 Operating modes 2.2.1 Monostable 2.2.2 Astable 2.3 Applications of timer IC 555 as 2.3.1 Linear ramp generator 2.3.2 Square wave generator 2.3.3 Voltage to frequency converter	To study Timer with Functional Block diagram of IC 555, its Pin connections, Operating modes, Monostable, Astable, Applications of timer IC 555 as Linear ramp generator, Square wave generator and Voltage to frequency converter	

<p>Silicon Controlled Rectifier (SCR) 3.2 SCR construction and working 3.3 Characteristics of SCR, 3.4 Turn ON and Turn OFF methods of SCR, 3.5 Applications of SCR to control the speed of DC motor</p>	<p>To study Silicon Controlled Rectifier (SCR) with SCR construction and working ,Characteristics of SCR, Turn ON and Turn OFF methods of SCR, Applications of SCR to control the speed of DC motor</p>	
<p>Diac and Triac 4.2 Applications of Diac 4.2.1 Lamp dimmer 4.2.2 Heat control 4.3 Construction, working and characteristics of Triac 4.4 Applications of Triac 4.4.1 High power lamp switch 4.4.2 Electronic change over power transformer</p>	<p>To study Diac and Triac With Applications of Diac Such as Lamp dimmer, Heat control,Construction, working and characteristics of Triac, Applications of Triac such as High power lamp switch and Electronic change over power transformer.</p>	
<p>Display Devices 5.2 Light emitting Diode displays 5.3 Liquid Crystal Displays and its Important Features 5.4 Gas Discharge plasma Displays 5.5 Segmented gas discharge displays 5.6 Segmental displays using LEDS</p>	<p>To study Display Devices such as Light emitting Diode displays. Liquid Crystal Displays and its Important Features, Gas Discharge plasma isplays, Segmented gas discharge displays, Segmental displays using LEDS</p>	
<p>Field Effect Transistor 6.1 Review of JFET 8) 6.2 Metal Oxide Semiconductor FET (MOSFET) 6.2.1 Schematic symbols and Types of MOSFET-a) D-MOSFET and b) E-MOSFET 6.3 D-MOSFET 6.3.1 Circuit Operation 6.3.2 Transfer Characteristic 6.3.3 Transconductance and input impedance 6.4 E-MOSFET 6.4.1 Circuit Operation</p>	<p>To study Field Effect Transistor with Review of JFET, MOSFET, Schematic symbols and Types of MOSFET-a) D-MOSFET and b) E-MOSFET, D-MOSFET, Circuit Operation, transfer Characteristic, Transconductance and input impedance, E-MOSFET, Circuit Operation</p>	

6.4.2 Transfer Characteristic 6.4.3 Transconductance and input impedance		
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