V.V. SANGHA'S
Smt. A.S.M. COLLEGE FOR WOMEN, BALLARI
DEPARTMENT OF PHYSICS

TEACHING PLAN

Academic Year: 2022-23 Semester: I
Course: B.Sc
Name of the Faculty:Smt. H. RATNA

Unit No.	Title of the Chapter& Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit 3	**Elasticity: Hooke's law** - Stress-strain diagram, elastic moduli-relation between elastic constants	Sep 11th to Oct 19th	03	04	Black Board
Unit 3	Poisson's Ratio-expression for Poisson's ratio in terms of elastic constants. Work done in stretching	Oct 20th to Nov 20th	03	06	Black Board
Unit 3	work done in twisting a wire-Twisting couple on a cylinder. Beams, bending of beams, expression for bending moment, theory of single cantilever.	Nov 21st to Dec 20th	04	04	Black Board
Unit 3	Torsional pendulum, expression for time-period of torsional oscillations, determination of rigidity modulus (static and dynamic methods) and moment of inertia, determination of q, η and σby Searle's double bar with necessary theory.	Dec 21st to Jan 20th	04	04	Black Board

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TEACHING PLAN

Academic Year: 2022-23 **Semester: III**
Course: B.Sc
Name of the Faculty: SMT.H RATNA

Unit No.	Title of the Chapter & Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit – 4	**Fraunhofer diffraction:** Introduction- Fraunhofer diffraction- Single slit diffraction pattern-position of Maxima and Minima (Qualitative arguments)- Two slit diffraction pattern-position of Maxima and minima- Theory of plane diffraction Grating-Grating spectrum- normal and oblique incidence Resolving power and dispersive power of a grating Single slit; Double Slit. Multiple slits & Diffraction grating.	Nov 18th to Dec 18th	04 Hrs	6 Hrs	Black Board
Unit – 4	**Fresnel Diffraction-** Fresnel half period zones-Diffraction by a circular aperture-diffraction by an opaque disc-The zone plate -comparison between zone plate and convex lens.	Dec 19th to Jan 19th	03 Hrs	4 Hrs	Black Board
Unit – 4	**Polarization:** Introduction-Production of polarized light- The wire Grid polarizer and Polaroid Superposition of two disturbances-Phenomenon of double refraction-Quarter wave plates and half wave plates- Analysis of polarized light-optical activity.	Jan 20th to Feb 20th	04 Hrs	5 Hrs	Black Board

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TEACHING PLAN

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Academic Year: 2022-23 **Semester: V**
Course: B.Sc
Name of the Faculty: SMT.H RATNA

Unit No.	Title of the Chapter& Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit I	**Elements of Quantum Mechanics:** Failure of classical mechanics – origin of quantum theory – particle nature of waves – Compton scattering (theory) – wave nature of particle – experiment of Davisson and Germer, Concept of matter waves – Uncertainty principle – Illustrations by gamma ray microscope and Diffraction at a single slit.	Oct 20th to Nov 20th	10 Hrs	10 Hrs	Black Board
Unit I	Schrodinger's wave equation (time dependent and independent), Interpretation of wave function. Application of Schrodinger's equation – particle in a box – solution for one dimension – extension to three dimensions – degeneracy – Harmonic Oscillator (Qualitative) – zero point energy.	Nov 20th to Dec 20th	10 Hrs	10 Hrs	Black Board
Unit VII	**Nuclear Energy:** Concept of nuclear fission – Q value of nuclear reaction(derivation) Controlled and uncontrolled chain reactions. Types of nuclear reactors Power reactor (Construction and working) , concept of nuclear fusion, thermo nuclear reaction, C-N cycle and P-P cycle, Magnetic confinement of Plasma.	Dec 20th to Jan 20th	08 Hrs	08 Hrs	Black Board
Unit VII	**Alternate energy source:** Energy source: Energy crisis,				
Unit VI	conventional and nonconventional energy sources Brief description and utilization of other sources of energy : solar energy, Wind energy, Tidal energy and Bio energy.	Jan 20th to Feb 20th	04 Hrs	04 Hrs	Black Board

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DEPARTMENT OF PHYSICS

TEACHING PLAN

Academic Year: 2022-23 **Semester: II**
Course: B.Sc
Name of the Faculty: SMT.H RATNA

Unit No.	Title of the Chapter& Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit – 3	**Chapter No. 7 AC circuits:** RMS and average value of AC, Response of series RL, RC, LC, LCR circuits using j-operator method, quality factor, admittance and impedance, power and energy in AC circuits.	May 2023	06 Hrs	6 Hrs	Black Board
Unit – 3	**Chapter No.6 Magnetism:** Definition of magnetic field, Ampere's law and Biot-Savart law (magnetic force and magnetic flux), Magnetic force on a current carrying conductor, Hall effect in a conductor. Electromagnetic induction, conducting rod moving in a magnetic field, Faraday's laws of induction, Lenz's Law, expression for self-inductance and energy stored in a magnetic field. Mutual inductance.	June 2023	08 Hrs	8 Hrs	Black Board
Unit – 1	**Chapter No. 1 Electric charge and field:** Coulomb's law, electric field strength, electric field lines, point charge in an electric field and electric dipole, work done by a charge (derivation of the expression for potential energy) **Chapter No. 2 Gauss law:** Gauss's law and its applications - electric fields of a (i) spherical charge distribution, (ii) line charge and (iii) an infinite flat sheet of charge.	July 2023	07 Hrs	7 Hrs	Black Board
Unit – 1	**Chapter No. 3 Electrostatic potential** Electric potential, line integral, gradient of a scalar function, relation between field and potential. Potential due to point charge and distribution of charges (Examples: potential associated with a spherical charge distribution, infinite line charge distribution, infinite plane sheet of charges). Constant potential surfaces, Potential due to a dipole and electric quadrupole.	August 2023	07 Hrs	7 Hrs	Black Board

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TEACHING PLAN

Academic Year: 2022-23 **Semester: VI**
Course: B.Sc
Name of the Faculty: SMT.H RATNA

Unit No.	Title of the Chapter& Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit I	**Statistical Physics:** Micro and Macro system. Most probable distribution, Statistical ideas in physics Statistical ideas in physics – phase space, Statistical equilibrium, priori probability and thermodynamical probability. Maxwell – Boltzman, Bose-Einstein and Fermi-Dirac Distribution function and their comparison. Ensemble – Canonical , Mircro canonical, grand canocical.	May 2023	10 Hrs	10 Hrs	Black Board
Unit II	**Astrophysics:** Scope of Astronomy and Astrophysics. Definition of Light year. Luminosity of stars, apparent and absolute magnitudes. Colour and surface temperature of stars. Stellar spectra, spectrum classification of stars, the HR diagram, Milky way galaxy. Study of atomosphere: Variation of temperature with the distance above the earth, Red giant and White dwarf.	June 2023	10 Hrs	10 Hrs	Black Board
Unit III	**Crystal structure:** Concept of lattice, periodic crystal, unit cell, Bravais lattice, Crystal planes and Miller indices. Interplanar spacing interms of miller indices. X-ray diffraction, Bragg's law, Bragg spectrometer (construction and working), powder method. Structure of NaCl and KCL. Crystal binding: Ionic, Covalent, Metalic, Molecular and Hydrogen bonding.	July 2023	10 Hrs	10 Hrs	Black Board
Unit VIII	**Super conductivity:** Elementary ideas of super conductivity and experimental facts, Meissner effect, Critical magnetic field, persistent current, London's equations. Type I and Type II super conductors. Applications of super conductors.	August 2023	05 Hrs	5 Hrs	Black Board

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DEPARTMENT OF PHYSICS

TEACHING PLAN

Academic Year: 2022-23 **Semester: V**
Course: B.Sc
Name of the Faculty: SMT.H RATNA

Unit No.	Title of the Chapter& Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit I	**Elements of Quantum Mechanics:** Failure of classical mechanics – origin of quantum theory – particle nature of waves – Compton scattering (theory) – wave nature of particle – experiment of Davisson and Germer, Concept of matter waves – Uncertainty principle – Illustrations by gamma ray microscope and Diffraction at a single slit.	Oct 20th to Nov 20th	10 Hrs	10 Hrs	Black Board
Unit I	Schrodinger's wave equation (time dependent and independent), Interpretation of wave function. Application of Schrodinger's equation – particle in a box – solution for one dimension – extension to three dimensions – degeneracy – Harmonic Oscillator (Qualitative) – zero point energy.	Nov 20th to Dec 20th	10 Hrs	10 Hrs	Black Board
Unit VII	**Nuclear Energy:** Concept of nuclear fission – Q value of nuclear reaction(derivation) Controlled and uncontrolled chain reactions. Types of nuclear reactors Power reactor (Construction and working) , concept of nuclear fusion, thermo nuclear reaction, C-N cycle and P-P cycle, Magnetic confinement of Plasma.	Dec 20th to Jan 20th	10 Hrs	10 Hrs	Black Board
Unit VII	**Alternate energy source:** Energy source: Energy crisis,				
Unit VI	conventional and nonconventional energy sources Brief description and utilization of other sources of energy : solar energy, Wind energy, Tidal energy and Bio energy.	Jan 20th to Feb 20th	05 Hrs	05 Hrs	Black Board

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Teaching Plan forODD Semesters w.e.f. October 2022

Name: M Jani Baig Designation: Associate Professor

B.Sc. V Semester Teaching Plan

October 2022 12 hours

1. ***Properties of Atom:*** Properties of Cathode rays, Effect of electric and magnetic field on electrons, Determination of charge of an electron by Millikan's oil drop method, e/m by J. J. Thomson and Dunnington's method. Determination of atomic mass by Dempster's method.

November 2022 16hours

2. ***Atomic Structures:*** Review or Rutherford's model, Rutherford's alpha scattering experiment (qualitative), Bohr's theory Hydrogen atom and its inadequacies, effect of nuclear mass, Sommerfeld model (qualitative study), Excitation and ionization energy and potentials. Frank – Hertz experiment.
3. ***Vector Atom Model:***Space quantization, electron spin, quantum numbers and Paul's exclusion principle. Fine structure of spectral lines.

December 2022 16 hours

Stern-Gerlach experiment: degeneracy associated with magnetic quantum number, selection rules. Coupling schemes, L.S. and J. J. Coupling for two electrons system, Zeeman effect: Normal and anomalous (quantum mechanical explanation). Stark effect (qualitative).

4. ***X-ray Spectra:***Production and properties of X-rays using Coolidge tube. Soft and Hard X-rays. Continuous and characteristic X – rays. Dune- Hunt law: Mosely's law and its application.
5. ***Molecular spectra:***Introduction to molecular spectra – classification of molecular spectra – pure rotation and vibration spectra rotation vibration spectra of diatomic molecules Band structure – Fluorescence and phosphorescence.

January 2023 16hours

6.Scattering of Light: Brief discussion on Tyndall, Rayleigh, Brillouin and Raman scatterings. Raman effect – Experiment study of Raman effect – Quantum theory of Raman effect. Intensity of Raman lines – polarization of Raman line (Qualitative study). Determination of molecular structure by using Raman effect.

7. Special Theory of Relativity: Inertial and non-inertial frame of references, Michelson Morely experiment. Postulates of special theory of relativity – Lorentz transformation equation – Length contraction and time dilation – Relativity of simultaneity concept of proper frame, proper length, proper time – relativistic velocity transformation equations – Variation of mass with velocity.Einstein's mass energy relation – (with derivation) Energy momentum relationship – concept of four vectors – Minkowski space.

19/10/2022 19/10/22

Associate Professor **Head of the Department** **Principal**

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Department of Physics

Teaching Plan for EVEN Semesters w.e.f. May 2023

Name: **M Jani Baig** Designation: **Associate Professor**

B.Sc. IV Semester Teaching Plan

May 2023 **Unit: 01** **15 hours**

Laws of Thermodynamics: Review of the concepts of Heat and Temperature. **[1 Hour] First Law of Thermodynamics:** Differential form, Internal Energy. Equation of state for an adiabatic process, Work Done during Isothermal and Adiabatic Processes. **[3 Hours] Second Law of Thermodynamics:** Kelvin-Planck and Clausius Statements and their Equivalence. Reversible and Irreversible processes with examples. Heat Engines: Carnot engine & efficiency (no derivation). Refrigeration & coefficient of performance, Applications of Carnot engine in locomotion, Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. Concept of Entropy, Second Law of Thermodynamics in terms of Entropy **[5 Hours] Third Law of Thermodynamics:** Statement, Significance and Unattainability of Absolute Zero. **[2 Hours] + Activities.**

June 2023 **Unit: 02** **15 hours**

Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Properties and Applications. **[01 hour]. Thermodynamic Potentials:** Derivations and applications of Maxwell's Relations (1) First order Phase Transitions with examples, Clausius-Clapeyron Equation (2) Values of Cp- Cv (3)Joule-Kelvin Effect and Joule- Kelvin coefficient and derive an equation for Vander Walls gas. Attainment of low temperature by liquification of gases and adiabatic demagnetization. **[03 hour]. Kinetic Theory of Gases:** Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas: Mean, RMS and Most Probable Speeds. Degrees of Freedom, Law of Equipartition of Energy. Specific heats of Gases. **[03 hour] Radiations:** Blackbody radiation, spectral distribution, concept of energy density and pressure of radiation, Wein's displacement law, Stefan-Boltzmann law, Rayleigh-Jeans law, ultraviolet radiation catastrophe and Planck's law of radiation **[03] + Activities.**

July 2023 **Unit: 03** **15 hours**

Semiconductor devices: Review of Intrinsic and Extrinsic semiconductors, p-n junction and its characteristics and Parameters, Diode approximations, Half-wave rectifier, Full-wave rectifier, Zener diode voltage regulators: Regulator circuit with no load, Loaded Regulator. **[5 hours] Junction Transistors:** Basics of Bipolar Junction Transistors (BJT), BJT operation, Common Base, Common Emitter and Common Collector Characteristics. Field Effect Transistor (FET) and its characteristics. Transistor as an Amplifier and Oscillator **[06 hour]. + Activities.**

August 2023 **Unit: 04** **15 hours**

Electronics: Integrated Circuits (Analog and Digital), Operational Amplifier, Ideal characteristics of Op-Amp, Inverting and Non-Inverting Configurations. Applications- Voltage Follower, Addition and Subtraction **[04 hour] Digital Electronics:** Switching and Logic Levels, Digital Waveform. Number Systems: Decimal Number System, Binary Number System, Hexadecimal Number System. Conversion of Decimal to Binary & Hexadecimal Number System. Conversion of Binary to Decimal & Hexadecimal number system. Conversion of Hexadecimal to Binary and Decimal number system. **[3 hours] Boolean Algebra Theorems:** De Morgan's theorem. Digital Circuits: Logic gates, NOT Gate, AND Gate, OR Gate, NAND Gate, NOR Gate, Algebraic Simplification, Implementation of NAND and NOR functions **[04 hour] + Activities.**

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TEACHING PLAN

Academic Year: 2022-23 **Semester : I**
Course: B.Sc.
Name of the Faculty: Dr. A.M. KALAMMA

Unit No.	Title of the Chapter & Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit 1	**Chapter No. 1 Units and measurements:** System of units (CGS and SI), measurement of length, mass and time, dimensions of physical quantities, dimensional formulae. Minimum deviation, errors. **Chapter No. 2 Momentum and Energy:** Work and energy, Conservation of linear momentum, Conservation of energy with examples, Motion of rockets	NOV	9 HRS	8 HRS	BLACKBOARD
Unit 2	**Chapter No. 4. Laws of Motion:** Newton's Laws of motion, Dynamics of single particle and a system of particles, Centre of mass. **Chapter No. 5. Dynamics of Rigid bodies:** Rotational motion about an axis, Relation between torque and angular momentum, Rotational energy, Moment of inertia (M.I): M,I of a rectangular lamina and solid cylinders,	DEC	10 HRS	10 HRS	BLACKBOARD
Unit 2	Flywheel,Theory of compound pendulum and determination of g. **Chapter No. 6. Gravitation:** Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's laws (statements). Satellite in a circular orbit.	JAN	5 HRS	10 HRS	BLACKBOARD

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TEACHING PLAN

Academic Year: 2022-23 **Semester : II**
Course: B.Sc.
Name of the Faculty: Dr. A.M. KALAMMA

Unit No.	Title of the Chapter & Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit 4	**Chapter No. 8 Electromagnetic waves:** Equation of continuity, Maxwell's equations, displacement current, equation for propagation of electromagnetic wave, transverse nature of electromagnetic wave, energy transported by electromagnetic waves. Poynting vector,	MAY	6 HRS	5 HRS	BLACKBOARD
Unit 4	magnetic moment of a point charge moving in a circular loop, electric current in atoms, electron spin and magnetic moment, magnetization and magnetic susceptibility.	JUNE	4 HRS	4 HRS	BLACKBOARD
Unit 4	**Chapter No. 9 Magnetic materials:** Magnetic intensity and magnetic induction, Intensity of magnetization, Susceptibility, Permeability, Types of magnetic materials: diamagnetic, paramagnetic and ferromagnetic materials. Classical Langevin's theory of diamagnetism,	JULY	6 HRS	4 HRS	BLACKBOARD
Unit 4	B-H hysteresis curves, Hard and soft magnetic materials.	AUG	3 HRS	5 HRS	BLACKBOARD

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TEACHING PLAN

Academic Year : 2022-23 **Semester: III**

Course: B.Sc.

Name of the Faculty: Dr. A.M. KALAMMA

Unit No.	Title of the Chapter & Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit 1	**Waves and Superposition of Harmonic Waves** **Waves:** Plane and Spherical Waves. Longitudinal and Transverse Waves. Characteristics of wave motion, Plane Progressive (Travelling) Wave and its equation, Wave Equation – Differential form (derivation). Particle and Wave Velocities: Relation between them, Energy Transport – Expression for intensity of progressive wave, Newton's Formula for Velocity of Sound. Laplace's Correction (Derivation). Brief account of Ripple and Gravity Waves.	NOV	5 HRS	5 HRS	BLACKBOARD
Unit 1	**Superposition of Harmonic Waves :** Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats) – Analytical treatment. Superposition of two perpendicular Harmonic Oscillations: Lissajous Figures with equal and unequal frequency- Analytical treatment. Uses of Lissajous' figures.	DEC	6 HRS	4 HRS	BLACKBOARD
Unit 1	Analytical treatment- equal and unequal frequency, Uses of Lissajous' figures and problems.	JAN	3 HRS	6 HRS	BLACKBOARD

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TEACHING PLAN

Academic Year: 2022-23 **Semester : V**
Course: B.Sc.
Name of the Faculty: Dr. A.M. KALAMMA

Unit No.	Title of the Chapter & Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit II	**Properties of nucleus: Constituents of Nucleus** – Proton electron and proton - neutron hypotheses of nucleus – properties (Qualitative) – distribution of mass, charge, size, density, spin and magnetic moment. Binding energy of nucleus (Specific B E). Nuclear forces – characteristics of nuclear forces YUKAWA theory (qualitative).	NOV	10 HRS	7 HRS	BLACKBOARD
Unit II Unit III	Nuclear models – liquid drop model, shell model, (qualitative) – nuclear energy levels and magic numbers. **Radioactivity:** Radioactivity decay law – half life and mean life (derivation) – successive radioactive disintegration. Radioactive equilibria – transient and secular equilibrium. Alpha Rays: Range and energy – determination of range of an α particle by Braggs method. Theory of Alpha decay (Qualitative). Geiger Nuttel law.	DEC	10 HRS	10 HRS	BLACKBOARD
Unit II Unit IV	Beta Rays: Beta ray spectrum continuous and line spectrum. Pauli's Neutrino hypotheses. Gamma Rays: Gamma ray spectra – origin of gamma rays. Applications of nuclear radiations **Nuclear Instruments:** Particle accelerators: Linear accelerators ,Cyclotron, Betatron Detectors: GM counter: Construction, working, dead time, operating voltage, paralysis time, internal quenching. Scintillation counter.	JAN	5 HRS	8 HRS	BLACKBOARD
Unit V	**Elementary Particles:** Classification of elementary particles, particles and anti particles, four basic interaction in nature. Quark model of elementary particles.	JAN	3 HRS	5 HRS	BLACKBOARD

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TEACHING PLAN

Academic Year : 2022-23 **Semester: VI**
Course: B.Sc.
Name of the Faculty: Dr. A.M. KALAMMA

Unit No.	Title of the Chapter & Description	Period/ Month	No. of Hours Allotted	Hours Taken/ Conducted	Teaching Pedagogy/ Methodology used
Unit V Unit VI	**Electrical and thermal properties:** Free electron theory of metals, expression for electrical and thermal conductivities, Weidmann Franz ratio. Ohm's law, Drude and Lorentz theory. calculation of electron density of states, Concept of Fermi energy, expression for Fermi energy as a function of temperature.(at absolute zero). **Specific heat of solid:** Dulong and Petit's law, Einstein's theory and Debye's theory.(derivation).	MAY	6 HRS	9 HRS	BLACKBOARD
Unit IV	**Band theory of Solids:** Classification of solids into Conductors, Semi conductors and Insulators Intrinsic and extrinsic semi conductors. Derivation of expression for Electron density, hole density and Electrical conductivity in intrinsic semi conductor Experation for Fermi level in intrinsic sand extrinsic semiconductors. PN juncition diode. Hall effect : Expression for Hall co-efficient, Experimental determination of Hall Co-efficient Importance of Hall effect.	JUNE	10 HRS	8 HRS	BLACKBOARD
Unit VII	**Magnetic properties of materials:** Dia, Para and Ferro magnetism - qualitative explanations . Classical (Langvein's theory)and Quantum theory of Paramagnetism (Currie law Currie-Weiss law).	JULY	6 HRS	8 HRS	BLACKBOARD

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Dr. A.M. Kalamma
Sub: Physics

Teaching Plan - 2021-22

B.Sc. V - Semester

October 18th - November 18th — 8 hrs

Proton-Electron hypothesis, proton-neutron hypothesis, distribution of mass, charge, size, density, spin & magnetic moment. Binding energy of nucleus. Specific B.E. Nuclear forces - characteristics of nuclear forces. Yukawa theory.

November 19th to December 18th — 8 hrs

Liquid drop model & shell model of the nucleus, magic number. Radioactive decay law, half life & mean life period. Successive radioactive disintegration. Radioactive equilibria - transient & secular equilibrium. α-rays: Range-energy, determination of range of an α-particle by Bragg's method. Theory of α-decay, Geiger-Nuttall Law.

December 19th to January 18th — 8 hrs.

β-ray Spectrum - Continuous & line, pauli's neutrino hypothesis. γ-ray spectra, origin of γ-rays, applications of nuclear radiations. Problems. Linear accelerator, Cyclotron, Betatron.

January 19th to February 8th — 6 hrs

G.M. counter, Scintillation counter & Elementary particles.

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Sub: Physics Teaching Plan

B.Sc. III Semester 2021-22

October 18th to November 17th 8 hrs.

Aberration, spherical aberration in a lens, reducing spherical aberration (using stops, crossed lens, plano convex lenses, 2 plano convex lenses separated by a distance). Chromatic aberration in a lens ($f_c - b = \omega f$ derivation). Circle of least confusion (derivation: $d\omega_2$, $\Delta\omega$). Minimising chromatic aberration in a lens. Condition for achromatism of 2-thin lenses separated by a finite distance. Problems.

November 18th to December 17th. 8 hrs

Cardinal points: F_1, F_2, P_1, P_2, N_1 & N_2. Expression for equivalent focal length of 2-thin lenses separated by a finite distance & principal points, power of a lens, expression for Newton's formula. Eye piece - Huygen's, Ramsden's & problems.

December 18th to January 17th 8 hrs

Non-steady current & charges, Faraday's laws of electromagnetic induction, concept of dipole, Ampere's circuital law, current loop as a dipole, torque on a dipole, displacement current.

January 18th to February 18th 8 hrs

Maxwell's field equations & Equation of continuity. Equation for plane electromagnetic waves: 1)

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Sub: Physics Teaching plan

B.Sc III Semester 2021-22

1) Electromagnetic waves in free space

2) Electromagnetic waves in isotropic non-conducting medium. Poynting theorem, production of EM waves - Hertz Experiment.

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Smt. H. Ratna

(Even sem)

Teaching plan

Bafna Gold

Date: Page:

May 2022 VI sem (2021-22)

Micro & Macro system; Most probable distribution, statistical ideas in physics phase space.

June 2022

Statistical equilibrium, Prior probability and Thermodynamical probability, Maxwell Boltzmann, Bose Einstein and Fermi-Dirac distribution fn & their comparison, Ensemble - canonical, Micro canonical & grand canonical

Astrophysics; scope of astronomy and Astrophysics; Description of light year,

July 2022

Luminosity of stars; apparent and absolute magnitudes, colour and surface temp of stars, stellar spectra, spectrum classification of stars, the HR diagram, Milky way galaxy, study of atmosphere; variation of temp with the distance above the earth, Red giant and white dwarf.

August 2022

Concept of lattice, periodic crystal, unit cell, Bravais lattice, crystal planes & Miller indices, Interplanar spacing interms of Miller indices, X ray diffraction, Bragg's law, Bragg's spectrometer (cons & working) powder method, structure of NaCl & KCl, crystal binding; Ionic, covalent, metallic molecular & hydrogen bonding.

Elementary ideas of super conductivity and experimental facts, Meissner effect, critical mag field, persistent current,

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Dept. of Physics
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Smt. H. Ratna
Teaching plan (2021-22)
Sub: Physics

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London eqns: Type I & Type II SC, application of SC.

IV Sem

May 2022

Alternating Current; Rms value Response of LR, RC & LRC ckt to sinusoidal Voltages (using j symbol)

June 2022

Parallel resonance, half power frequency, band width, Q factor, Power factor, Maxwell & Anderson bridge, deter of L

July 2022:

Filters: High pass filters Low pass filter, Band pass filter & band stop filter Cut off frequency

August 2022: Half wave, Full wave derivations of expressions for I_{dc} V_{dc} I_{rms} V_{rms}, ripple factor & frequency

September 2022: Study of CRO (construction & working) Measurement of Voltage & frequency.

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D. Abeed Hussain.

Teaching Plan - (Odd Semester)

Sub: Physics I-Semester (2021-22)

October 18th – November ~~18th~~ 17th 4 hrs

Surface Tension: Definition of surface tension, surface energy, relation between surface tension and surface energy.

~~December 18th – January~~

November 18th – December 18th 4 hrs.

pressure difference across a curved surface example, excess pressure inside spherical liquid drop, angle of contact

December 19th – January 18th 4 hrs.

Viscosity: Streamline flow, turbulent flow, equation of continuity.

January 19th – ~~February~~ January 20th ~~4 hrs.~~ 2 hrs.

Determination of coefficient of viscosity by Poiseuille's method, stoke's method problems.

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Teaching Plan (2021-22)

V - Semester. Sub: Physics

October 18th - November 30th

Special theory of Relativity:
Inertial & non-Inertial frames of references, Michelson - Morley experiment. Postulates of special theory of relativity - Lorentz transformation equation - Length contraction & time dilation - Relativity of simultaneity concept of proper frame, proper length, proper time - Relativistic velocity transformation equations - Variation of mass with velocity. Einstein's mass energy relation - (with derivation) Energy momentum relationship - concept of four vectors. - Minkowisky space.

December 1st - January ~~1st~~ 8th 10hrs.

~~properties of~~ atom Model:
Thomson's and Rutherford's atom model (Qualitative account). Bohr's Theory. Hydrogen atom (Discussion on postulates, expression for energy of an electron in nth orbit, spectral series and energy level diagram) Sommerfeld's relativistic atom model. Excitation and ionization ~~ergy~~ energy and potentials Frank - Hertz experiment.

Bafna Gold
Date: Page:
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Teaching plan (2021-22)

Sub: Physics V - Semester

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January 9th – January 19th 10 hrs.

Vector atom model: Space quantization, electron spin, quantum numbers & Pauli's exclusion principle. Fine structure of spectral lines. Stern-Gerlach experiment; degeneracy associated with magnetic quantum number, selection rules, coupling schemes, L-S and J-J coupling scheme for two electron system, zeeman effect - Normal and anomalous (quantum mechanical explanation). Stark effect (qualitative).

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Teaching Plan - Even Semester.

II - Semester: (2021-22)

June 9th to July 18th 7 hrs.

conductors in electrostatic field.

conductors and insulators, conductors in electric field. Capacitance and capacitors, expression for capacitance in a parallel plate capacitor, parallel plate capacitor with dielectric, Dielectrics; an atomic view. Energy stored in capacitor, Dielectric and Gauss's law.

July 19th to August 30th 7 hrs.

DC currents:

Electric currents and current density. Electrical conductivity and Ohm's law. Physics of electrical conduction, conduction in metals and semiconductor, circuit elements and circuits: Transient currents in RC, LR and LCR circuits. Force on a moving charge.

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Sub: physics. Teaching plan (even semester)

IV - semester. (2021-22)

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May 10th to 8 hrs.

Theory of Nature of light: To determine wavelength of light, distance and shapes using Mi

IV - semester

May 10th - June 10th 8 hrs.

Theories of light: Corpuscular theory, Wave theory: Huygen's principle Wave front, Reflection and Refraction of plane wave front at plane surface. Group velocity & wave velocity - relation between them. Quantum nature, concept of photon.

Interference (Division of wave front): Coherent sources interference by division of wavefront, young's double slit - theory and experiment, Fresnel's Bi-prism - theory and experiment. (determination of λ) Lloyd's mirror.

June 11th to July 12th

Interference (Division of Amplitude) Interference at thin film of uniform thickness (both reflected and transmitted) and wedge shaped film, Newton's rings - theory and experiment Experimental determination of refractive

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Sub: Physics Teaching Plan

IV Sem. (2021-22)

Bafna Gold
Date: Page:

inden of liquid. Michelson Interferometer (determination of λ & $d\lambda$ only)

July 13th to August 18th

Polarization: Double refraction in uni-axial crystals. Huygens theory, & positive and negative crystals. Principle refractive indices Huygen's construction of 'O' & 'E' wave in uniaxial crystal for plane wave front (all cases) quarter wave & half wave plate.

production and detection of plane circularly & elliptically polarized light, Babinet compensater, optical activity - Laurent's half shade polarimeter.

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Md. Hasheem

Teaching plan - (odd Semester)

V - Semester (2021-22)

October 18th - ~~November~~ December 18th

unit :- I Properties of atom :- (08 hrs)

Properties of cathod rays, Effect of electric & magnetic field on electrons, Determination of charge of an electron by millikon's oil drop method. e/m by J.J. Thomson and Dunnington's method. Determination of atomic mass Dempster's method.

~~unit VI~~ December 19th to January 20th

unit VI Scattering of light (07 hrs)

Brief discussion on Tyndall, Rayleigh, Brillion and Raman Scattering. Raman effect :- Experimental Study of Raman Effect :- Quantum theory of Raman effet. Intensity of Raman lines" polarisation of Raman lines (Qualitative Study) Determination of molecular Structure by using Raman Effect.

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Md. Hasheem

Teaching Plan - (even Semester)

IV - Semester (2021-22)

May 10th - July 10th (08 hrs)

Unit: III Fresnell's Diffraction :-

Concept of fresnell's & fraunhoffer diffraction, Rectilinear propagation of light, Theory of zone plate, Comparison between zone plate and converging lens, fresnell diffraction at straight Edge band mire.

July 11th to August 18th

unit :- IV Fraunhoffer diffraction :-

fraunhoffer diffraction at a single slit, derivation of intensity expression double slit with theory, transmission grating theory and experiment (determination of wave length of light, dispersion and Resolution of grating. R.P. of telescope, Rayleigh's Criterion

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Md. Hasheem
Teaching plan - (Even Semester)

VI - Semester (2021-22)

May 10th to August 18th

Unit:- VIII Computational Physics:-

Basic Concept of computer, MS power point, Basics of C - language, C - language program structure in C, constants and variables, Input and output statements, arithmetic and conditional operations, Conditional structure, looping structures, one-dimensional arrays, programmes to solve linear and quadratic equations.

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Department of Physics

Teaching Plan forEVEN Semesters w.e.f. May 2021

Name: **M Jani Baig** Designation: Associate Professor

B.Sc. VI Semester Teaching Plan

May 2021 **13 hours**

Optoelectronics: Optical fibres, structure, pulse dispersion and modes of propagation of light through optical fibres, critical angle of propagation, angle of acceptance, expression for numerical aperture and fractional refractive index change, application of optical fibers and advantages. Display devices: Photo diode LED, construction and use of LED in display. Liquid crystal, types of liquid crystals. Basic principle of LCD and its construction, Comparison between LED and LCD.

Network Theorems: Kirchoff's laws, Superposition theorem (proof), Thevenin's and Norton's theorem(only thevinising and nortonising without proof), Maximum power transfer theorem (proof) and its applications.

June 2021 **17hours**

Transistors: Introduction, (types and action) Characteristics and parameters of common emitter configuration, D C load line, operating point. Need for transistor biasing Self biasing of a transistor, JFET Construction, working & characteristics Inter relationship between the parameters. Integrated circuits monolithic IC-description of discrete IC.

Amplifiers: CE amplifier (Quantitative), CE amplifier its equivalent circuit using h-parameters, expression for voltage gain, current gain, power gain, input resistance and output resistances in terms of h parameters. Operational-amplifier Characteristics inverting and non inverting amplifier (Quantitative).

July 2021 **21 hours**

Oscillators: Concept of feed back, positive and negative feedback. Expression for loop gain Barkhausen's criteria, phase shift oscillator and Wein's bridge oscillator Merits and demerits. Types of Negative feed back.(Qualitative) Advantages of negative feed back.

Digital Electronics: Conversion to Binary to decimal and decimal to binary Logic system, Types. Logic gates: AND, OR,(analysis using diodes) NOT, NOR, NAND, (analysis using diodes or transistors) XOR gate Conversion of universal to basic gates Half and full adder.

Nanomaterials: Introduction to nano-particles (zero, one ; two and three dimensional). Synthesis of material Bottom-up approach(Sol-Gel method) Top-down approach (Ballmilling) Properties and applications of Nanomaterials. CNTs Synthesis (CVD), properties and applications. SEM and TEMPrinciple & operation.

August 2021 **09 hours**

Computational Physics: Basic concept of computer, MS power point. Basics of C- language: program structure in C, Constants & Variables, Input and output statements, Arithmetic and conditional operations, conditional structure, Looping structures, one dimensional Arrays, programs to solve linear and quadratic equations.

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Teaching Plan forEVEN Semesters w.e.f. May 2022

Name: **M Jani Baig** Designation: Associate Professor

B.Sc. VI Semester Teaching Plan

May 2022 — 13 hours

Optoelectronics: Optical fibres, structure, pulse dispersion and modes of propagation of light through optical fibres, critical angle of propagation, angle of acceptance, expression for numerical aperture and fractional refractive index change, application of optical fibers and advantages. Display devices: Photo diode LED, construction and use of LED in display. Liquid crystal, types of liquid crystals. Basic principle of LCD and its construction, Comparison between LED and LCD.

Network Theorems: Kirchoff's laws, Superposition theorem (proof), Thevenin's and Norton's theorem(only thevinising and nortonising without proof), Maximum power transfer theorem (proof) and its applications.

June 2022 — 17hours

Transistors: Introduction, (types and action) Characteristics and parameters of common emitter configuration, D C load line, operating point. Need for transistor biasing Self biasing of a transistor, JFET Construction, working & characteristics Inter relationship between the parameters. Integrated circuits monolithic IC-description of discrete IC.

Amplifiers: CE amplifier (Quantitative), CE amplifier its equivalent circuit using h-parameters, expression for voltage gain, current gain, power gain, input resistance and output resistances in terms of h parameters. Operational-amplifier Characteristics inverting and non inverting amplifier (Quantitative).

July 2022 — 15 hours

Oscillators: Concept of feed back, positive and negative feedback. Expression for loop gain Barkhausen's criteria, phase shift oscillator and Wein's bridge oscillator Merits and demerits. Types of Negative feed back.(Qualitative) Advantages of negative feed back.

Digital Electronics: Conversion to Binary to decimal and decimal to binary Logic system, Types. Logic gates: AND, OR,(analysis using diodes) NOT, NOR, NAND, (analysis using diodes or transistors) XOR gate Conversion of universal to basic gates Half and full adder.

Nanomaterials: Introduction to nano-particles (zero, one , two and three dimensional). Synthesis of material Bottom-up approach(Sol-Gel method) Top-down approach (Ballmilling) Properties and applications of Nanomaterials. CNTs Synthesis (CVD), properties and applications. SEM and TEMPrinciple & operation.

August 2022 — 05hours

Nanomaterials (Contd.): Properties and applications of Nanomaterials. CNTs Synthesis (CVD), properties and applications. SEM and TEMPrinciple & operation.

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Department of Physics

Teaching Plan for ODD Semesters w.e.f. October 2021

Name: **M Jani Baig** Designation: Associate Professor

B.Sc. I Semester Teaching Plan (NEP – 2020)

October 2021 **04 hours**

1. Units and Measurements: System of units (CGS and SI), measurement of length, mass and time, dimensions of physical quantities, dimensional formulae.

November 2021 **10 hours**

Minimum deviation, errors.

2. Momentum and Energy: Work and energy, Conservation of linear momentum, Conservation of energy with examples, Motion of rockets.

3. Special Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. length contraction. Time dilation. Relativistic addition of velocities.

December 2021 **10 hours**

4. Laws of Motion: Newton's Laws of motion, Dynamics of single particle and a system of particles, Centre of mass.

5. Dynamics of Rigid Bodies: Rotational motion about an axis, Relation between torque and angular momentum, Rotational energy, Moment of inertia (M.I): M,I of a rectangular lamina and solid cylinders, Flywheel, Theory of compound pendulum and determination of g.

January 2022 **9 hours**

6. Gravitation: Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's laws (statements). Satellite in a circular orbit.

7. Elasticity: Hooke's law - Stress-strain diagram, elastic moduli-relation between elastic constants, Poisson's Ratio-expression for Poisson's ratio in terms of elastic constants.

February 2022 **9 hours**

Work done in stretching and work done in twisting a wire-Twisting couple on a cylinder. Beams, bending of beams, expression for bending oment, theory of single cantilever. Torsional pendulum, expression for time-period of torsional oscillations, determination of rigidity modulus (static and dynamic methods) and moment of inertia, determination of q, η and σ by Searle's double bar with necessary theory.

Associate Professor **Head of the Department.** **Principal**

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B.Sc V Sem (2020-21)

Page No.
Date / /

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2 hr/week Syllabus / Teaching plan

Unit I : 11 hrs sept 20 hrs

Elements of Quantum Mechanics:-

Failure of classical mechanics - origin of quantum theory -

Particle nature of waves - compton scattering (Theory)

Wave nature of particle - expt of Davisson & Gemer.

Concept of matter waves, Uncertainity principle - Illustrations by gamma ray microscope and diffraction at a single slit / schroedingers wave eqn (Time dependent and independent) Interpretation of wave fn. Application of schroedingers eqn - particle in a box - solution for one dimension - extension to three dimensions Harmonic oscillator (qualitative) - zero point energy

Oct 8 hrs

Unit VI : NOV: 5 hrs 4 hrs

Alternate energy source: energy source; energy crisis, resources of energy, conventional and non-conventional energy sources. Brief description and utilisation of other sources of energy; solar energy, wind energy, ~~and~~ tidal energy and Bio energy.

Unit VII :

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Name :

Sub : physics. (2020-21)

Page No.

Date / /

Sem

Dec : 2 hrs

Jan : 3 hr

Unit VII

Nuclear energy: 8 hrs

• Concept of Nuclear fission - Q value of nuclear reaction (derivation) Controlled and uncontrolled chain reactions. Types of nuclear reactors, power reactor (construction and working) Concept of nuclear fusion, Thermo nuclear reaction, C-N cycle and P-P cycle, Magnetic confinement of plasma.

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Vijaya Sangha's, Smt. A.S.M. College for Women BALLARI 583103.

Name of the Subject: physics

Syllabus & Teaching plan

B.Sc III sem (2020-21)

Page No. S.M. College for Women BALLARI 583103.
Date / /

Unit IV (7 hrs) Sept (8 hrs)

Vector analysis: Scalar and vector fields, gradient and curl (qualitative) and their physical significance.

Vector identities.

1) ST $\nabla(\phi+\psi) = \nabla\phi + \nabla\psi$

2) ST $\nabla.(\phi A) = (\nabla\phi).A + \phi(\nabla.A)$

3) ST $\nabla.(A+B) = \nabla\times A + \nabla\times B$

4) ST $\nabla.(\nabla\phi) = \nabla^2\phi$

5) ST $\nabla\times(\nabla\phi) = 0$

6) ST $\nabla.(\nabla\times A) = 0$

7) Prove $\nabla\times(\nabla\times A) = \nabla(\nabla.A) - \nabla^2 A$

8) If r is the position vector of a pt PT curl = 0 & $\nabla.r = 3$

Statement and proof of Gauss divergence theorem & Stokes theorem.

Unit V (8 hrs) October (8 hrs)

Electrostatics and Magnetostatics:

Electrostatics: Static electric charges, Coulombs law, the electrostatic field and Gauss law, the electric potential, Poisson and Laplace equation (vector notation)

Application of Gauss Law: Field outside a charged sphere and cylinder.

Magnetostatics: Steady current, Biot-Savart law, Magnetic field at a point due to straight current carrying conductor, magnetic field at any point on the axis of a circular coil carrying current, field at the centre of the coil, and magnetic field on the axis of solenoid (at the centre of at one end)

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Name: H. Ratna Sub: physics
Nov: 6 hrs
Dec: 1 hr (2020-21)

Page No.
Date / /

Unit III

Lasers: General principles of lasers, properties of lasers, spontaneous and stimulated emission of radiation, population inversion, optical pumping, He-Ne laser (principle and working) Semi-conductor laser, Laser applications, Holography. (8 hrs)

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Name: H. Ratna Sub: physics
Syllabus & Teaching plan
B.Sc I Semester

Page No.
Date / /

2020-21

Unit VI 2 hrs / October Nov: 9 hrs

Elasticity: Introductory, Stress, Strain Hooke's law, Moduli of elasticity for isotropic materials, relation betn elastic constants [with derivation] poisson ratio, expression for work done per unit volume in three type of strain (with derivation) Bending of Beam: Neutral axis, expression for bending moment, theory of light cantilever [wt of the beam is not taken into account) Torsion: Torsional pendulum, Expression for couple per unit twist.

Unit VII Dec: 2 hrs

Surface Tension: cohesive and adhesive forces, surface tension explanation on the basis of molecular theory, surface energy, angle of contact, pressure within a curved surface (with derivation) interfacial tension drop weight method with necessary theory, Factor affecting surface tension.

Viscosity: Steamline and turbulent motion: Derivation of poiseuille's equation, stoke's law, effect of temperature on viscosity.

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Sub: physics
SYLLABUS ALLOTED and Teaching plan

Page No.
Date

B.Sc. V - Semester:

Sept: 5 hrs Oct: 8 hrs

Unit-II Properties of nucleus 10 hrs.

Constituents of nucleus: Proton-electron and proton-neutron hypothesis of nucleus. Properties (qualitative) - distribution of mass, charge, size, density, spin and magnetic moment. Binding energy of nucleus (Specific B.E.). Nuclear forces - characteristics of nuclear forces, YUKAWA theory (qualitative). Nuclear models - liquid drop model, shell model (qualitative) - nuclear energy levels and magic numbers.

Unit - III Radioactivity Nov: 5 hrs 10 hrs.

Radioactive decay law - half life and mean life (derivation). Successive radioactive disintegration. Radioactive equilibria - transient and secular equilibrium. α-Rays: Range & energy - determination of range of an α-particle by Bragg's method. Theory of α-decay (qualitative). Geiger-Nuttal law. β-rays: β-ray Spectrum - continuous & line spectrum. Pauli's neutrino hypothesis. γ-rays: Gamma ray Spectra - origin of γ-rays. Applications of nuclear radiations.

Dec: 4 hrs

Unit - IV Nuclear instruments 05 hrs.

Particle accelerators: Linear accelerators, Cyclotron, Betatron. Detectors: G.M. Counter - construction, working, dead time, operating voltage, paralysis time, internal quenching. Scintillation Counter.

Jan: 4 hrs

Unit - V Elementary particles 03 hrs

Classification of Elementary particles, particles and

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(2020-21)
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Sub: physics
Syllabus & Teaching plan

Page No.
Date
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antiparticles, four basic interaction in nature. Quark model of elementary particles.

B. Sc. III - Semester

Sept : 8 hrs

Unit - I. Optical Instruments 8 hrs.

Aberration, spherical aberration in the lens, Reducing spherical aberration (using stops, crossed lens, plano convex lenses, 2 plano convex lenses separated by distance). Chromatic Aberration in a lens (Derivation: $f_r - f_b = \omega f$), Circle of least confusion (Derivation: $d = \frac{1}{2}\Delta\omega$). Minimising chromatic aberration in lens; condition for a achromatism of two lenses placed in contact (Method of Calculus), condition for achromatism of 2-thin lenses separated by a finite distance. Problems.

Unit - II Cardinal points Oct: 9 hrs 8 hrs

Cardinal points (Focal points, principal points, Nodal points). Expression for equivalent focal length of 2-thin lenses separated by a finite distance and principal points, power of a lens, expression for Newton's formula. Eye piece - Hugens and Ramsdens. Problems.

Nov: 10 hrs

Unit - VI Electromagnetism - I 8 hrs

Non-steady current and charges., Faraday's laws of electromagnetic induction, concept of dipole, Ampere's circuital law, current loop - as a dipole, torque on a dipole, displacement current

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Sub: Physics
Syllabus & Teaching plan

R.O | Page No.

Unit - VII : Electromagnetism - II 8 hrs

Dec: 8 hrs Jan: 5 hrs

Maxwell's field equations (derivation), Equation of continuity, Equation for plane electromagnetic waves: 1) Electromagnetic waves in free space 2) Electromagnetic waves in isotropic non-conducting medium (dielectric), Poynting theorem, production of EM waves - Hertz Experiment.

Feb: 2 hrs

B. Sc. I - Semester

October 3 hrs, Nov: 4 hrs

Unit - I Frames of References 8 hrs.

Inertial frame, Galilean principle of relativity, Galilean transformation equation: Transformation of position, distance, velocity and acceleration Invariance of laws of conservation of momentum and energy. Non-inertial frames, fictitious force, rotating frame of reference, concept of Coriolis force and effect of Coriolis force (Derivation), Centre of mass, motion of centre of mass, Centre of mass as a frame of reference.

Dec: 7 hrs

Unit - V Rigid bodies 8 hrs

Moment of inertia, theorems on moment of inertia: Examples of MI: Circular disc, annular ring, rectangular bar, hollow and solid cylinders (all cases). Theory of Compound pendulum (Expression for time period). Enter Changeability of Center of Suspension

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Name : A. M. Kalamma (2020-21)

Sub : physics

Syllabus & Teaching plan

Jan : 7 hrs

and oscillation. Four collinear point about which periods are same. Condition for maximum and minimum time period. Determination of 'g' using bar pendulum. L vs T and L^2 vs LT^2 graph.

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Smt. A.M. Kalamma

Sub: Physics Teaching plan (2019-20)

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B.Sc. V Sem

June: 02 hrs

Proton-Electron & Proton neutron hypothesis, charge, mass, density of the nucleus.

July: 09 hrs

Size, Spin & mag. moment, nuclear forces, B.E, $\bar{B}$, $\bar{B}$ Vs A curve; liquid drop & shell model, magic numbers. Problems.

~~August~~ 07 hrs

Radioactivity :- Decay law to Bragg's Expt.

~~August~~: September: 08 hrs.

α-decay theory, β-rays, γ-rays, Problems. Linear Accelerator, Cyclotron, Betatron Problems.

October: 04 hrs.

GM Counter, Scintillation Counter, Elementary particles.

B.Sc. III Sem.

June: 02 hrs.

Non-steady Currents & charges, Farday's laws of Electromagnetic induction. Concept of dipole.

July: 04 hrs.

Ampere's Circuital law, Current loop as a dipole, torque on dipole.

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Sub: Physics 2019-20

Page No.
Date / /

August: 05 hrs. B.Sc V Sem

Displacement current, Maxwell's eqns to $v = \frac{1}{\sqrt{\mu_0 \varepsilon_0}}$.

September: 03 hrs.

$v = \frac{c}{\sqrt{\mu_r \varepsilon_r}}$, Poynting vector

October: 02 hrs

Hertz Expt, Problems.

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Sub: Physics

Page No.
Date / /

Teaching Plan - (2019-20)

B. Sc. II - Semester

December - 2 hrs.
Equation for wave in one dimension, differential equation for wave motion, relation between amplitude & intensity.

January - 4 hrs.
Expression for velocity of progressive wave in a medium, Newton's formula for velocity of sound in air, Newton-Laplace formula for v. Problems

February - 4 hrs.
Expression for stationary vibrations in a rod: Free-free rod & Fixed-Fixed rod. velocity of transverse waves ($v = 2fl$), Lissajous's figures, problems.

March - 4 hrs.
Analytical treatment of Beats, free vibration, damped vibrations, forced vibrations, Resonance & problems.

April - 1 hr.
Discussion of old question papers.

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Sub: Physics

Page No.

Date

Teaching Plan (2019-20)

B.Sc. IV Semester

December - 02 hrs

Double refraction in uni-axial crystals

Huygen's theory of O-ray & E-ray.

January - 04 hrs

Positive and negative crystals, Huygen's constructions of O & E wave in uniaxial crystals for plane wavefront (all cases)

February - 04 hrs

Quarter wave plate, half wave plate, production & detection of plane, circularly & Elliptically polarized light. Babinets compensator, optical activity.

March - 04 hrs

Laurent's half-shade polarimeter, problems C.R.O.

April - 01 hr.

Discussion of old question papers.

Kal

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Sub: Physics (2019-20)
B.Sc. VI Semester, Paper: 6.1

Page No.
Date / /

December: 3 hrs
Free electron of metals, Expression for Electrical & thermal Conductivity.

January: 7 hrs
ohm's, density of states of electrons, Fermi energy at 0K, problems.

February: 9 hrs. + 2 hrs Extra classes needed

Sp. heat of solids, Einstein's & Debye's theory with derivation. Classification of solids into conductors, Semi. conductors & insulators, Intrinsic & Extrinsic Semiconductors, density of Electrons & holes, Electrical Conductivity in intrinsic & Semiconductor, Expression for Fermi level in intrinsic & Extrinsic semiconductor, P-n junction diode, Zener diode. Hall Effect

March: 9 hrs.
Magnetic properties of dia, para & ferromagnetic materials, Classical & quantum theory of paramagnetism (Curie & Curie-weiss law) Ionic, covalent, metallic, molecular & hydrogen bonding

April: 2 hrs.
Discussion of old question papers

Hal

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Teaching Plan (2019-20)

Page No.

Date / /

Sub: Physics B.Sc IV Sem

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December:

Introduction to alternating current, Rms value

January:

Response of L, C, R, RC & RL to sinusoidal voltages

February:

LCR circuits, series and parallel, half power frequency, band width & factor. Powers in electrical circuits Power factor

March:

Maxwells bridge determination of L, Anderson's bridge determination of L Filters: high pass and low pass filters with RL & RL combinations cutoff frequency, Band pass, band stop filters Rectifiers.

April:

Half wave, Full wave - derivation of expression for I_{dc} I_{rms} V_{dc} V_{rms} ripple factor & efficiency.

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Sub: Physics Teaching plan

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B.Sc VI Sem (2019-20)

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December:

Statistical ideas in physics, Phase space.

January

Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac distribution fn. and their Comparison Ensembles - canonical, Micro-canonical & grand canonical ensemble.

February:

Scope of Astronomy and Astrophysics Defn. of light year, Luminosity of stars, apparent & absolute magnitude, colour and surface temp. of stars, stellar spectra, spectrum classification of stars, HR diagram, Milky way galaxy.

March:

Concept of lattice, Periodic crystal, unit cell, Bravais lattice, crystal planes & Miller indices, Interplanar spacing in terms of Miller Indices x ray diffraction, Bragg's law, Bragg spectrometer (consn. and working) Powder method

Super conductivity; elementary ideas of super conductivity and experimental facts, Meissner effect. critical magnetic field, persistent current.

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B.Sc VI Sem (2019-20)

Page No.

Date / /

April : Londons equations Type I and Type II & c applications of Superconductivity.

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Department of Physics

Teaching Plan for ODD Semesters from June 2019

Name: **M Jani Baig** Designation: Associate Professor

B.Sc. III Semester Teaching Plan

June 2019 04 hours

Optical Instruments: *Aberration: Spherical aberration in the lens, Reducing Spherical aberration (Using stops, crossed lens, Plano convex lenses, 2 Plano convex lenses separated by distance).*

July 2019 08 hours

Chromatic Aberration in a lens (Derivation: fr - fb= of) circle of least confusion (Derivation : d = ½ Dω) Minimising chromatic aberration in lens; condition for a achromatism of two lenses placed in contact(Method of calculus) condition for Achromatism of 2 thin lenses separated by a finite distance problems.

Cardinal Points: Cardinal points (Focal points, principal points, Nodal points).

August 2019 08 hours

Expression for equivalent focal length of 2 thin lenses separated by a finite distance and principal points, power of a lens, expression for Newton's formula.Eye piece- Huygens & Ramsdens,. problems. ***LASERs:*** *General principles of laser, properties of lasers spontaneous and stimulated emission of radiation, population inversion, optical pumping. He-Ne laser (Principle and working).*

September 2019 08 hours

Semiconductor laser, laser application, Holography. ***Electrostatics:*** *Static electric charges, Columbs law, the electrostatic field and Gauss's law, the electric potential, Poison and Laplace equation (vector notation). Application of Gauss law: Field outside a charged sphere and Cylinder.*

B.Sc. V Semester Teaching Plan

June 2019 06 hours

Properties of Atom: *Properties of Cathode rays, Effect of electric and magnetic field on electrons, Determination of charge of an electron by Millikon's oil drop method, e/m by J.J.Thomson method*

July 2019 08 hours

and Dunnington's method. Determination of atomic mass by Dempster's method. **Atomic Structures:** *Review or Rutherford's model, Rutherford's alpha scattering experiment (qualitative), Bohr's theory Hydrogen atom and its inadequacies, effect of nuclear mass,*

August 2019 08 hours

Sommerfield model (qualitative study), Excitation and ionization energy and potentials. Frank – Hertz experiment.

Vector Atom Model: *Space quantization, electron spin, quantum numbers and Paul's exclusion principle. Fine structure of spectral lines. Stern-Gerlach experiment:*

September 2019 08 hours

degeneracy associated with magnetic quantum number, selection rules. Coupling schemes, L. S. and J. J. Coupling for two electrons system, Zeeman effect: Normal and anomalous (quantum mechanical explanation). Stark effect (qualitative)..

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M. JANI BAIG
Associate Professor of Physics
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Department of Physics

Teaching Plan for EVEN Semesters w.e.f. December 2019

Name: **M Jani Baig** Designation: Associate Professor

B.Sc. IV Semester Teaching Plan

December 2019 **03 hours**

Corpuscular theory, Wave theory: Huygens' principle, explanation of laws of reflection & refraction. (plane wave front at plane surface).

January 2020 **10 hours**

Group velocity & wave velocity - relation between them. Quantum nature, concept of Photon. **Interference (Division of Wavefront):** Coherent sources interference by division of wave front, Young's double slit-theory and experiment, Fresnel's Bi-prism – theory and experiment (determination of λ) Lloyd's mirror. **Interference by division of amplitude,** thin film of uniform thickness (both reflected and transmitted).

February 2020 **10 hours**

wedge-shaped film, Newton's ring – theory and experiment. Experimental determination of refractive index of liquid. Michelson Interferometer (determination of wave length λ and dλ only). **Fresnel's Diffraction:** Concepts of Fresnel and Fraunhofer diffraction. Rectilinear propagation of light, theory of Zone plate, comparison between zone plate and converging lens.

March 2020 **9 hours**

Fresnel's diffraction at straight edge and wire. **Fraunhofer Diffraction:** Fraunhofer diffraction at a single slit, derivation of intensity expression double slit with theory. Transmission grating theory and experiment (determination of wave length of light) dispersion and resolution of grating. R.P. of telescope, Rayleigh's criterion.

B.Sc. VI Semester Teaching Plan

December 2020 **03 hours**

Network Theorems: Determination of atomic mass by Dempster's method. Kirchoff's laws -Proof (Mesh analysis), Super position theorem(proof), Thevenin's and Norton's theorem(only thevinising and nortonising without proof),

January 2020 **08 hours**

Maximum power transfer theorem (proof) and its applications. **Optoelectronics:** Optical fibers, structure, pulse dispersion and modes of propagation of light through optical fibers, critical angle of propagation, angle of acceptance, expression for numerical aperture and fractional refractive index change, application of optical fibers and advantages..

February 2020 **09 hours**

Digital Electronics: Conversion to Binary to decimal and decimal to binary Logic system, Types. Logic gates: AND, OR,(analysis using diodes) NOT, NOR, NAND, (analysis using diodes or transistors) XOR gate Conversion of universal to basic gates Half and full adder, flip-flop, RS, JK and master slave flip-flop.

March 2020 **10 hours**

Bipolar Junction Transistors: Introduction, (types and action) Characteristics and parameters of common emitter configuration, D C load line, operating point. Need for transistor biasing Self biasing of a transistor, JFET Construction, working & characteristics Inter relationship between the parameters and MOSFET (E & D).Construction

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Teaching Plan forEVEN Semesters w.e.f. September 2020

Name: **M Jani Baig** Designation: Associate Professor

B.Sc. VI Semester Teaching Plan

September 2020 **15 hours**

Properties of Atom: Properties of Cathode rays, Effect of electric and magnetic field on electrons, Determination of charge of an electron by Millikan's oil drop method, e/m by J. J. Thomson and Dunnington's method. Determination of atomic mass by Dempster's method. **Atom Model:** Thomson's and Rutherford's atom model (Qualitative account) Bohr's theory Hydrogen atom (Discussion on postulates, expression energy of an electron in nth orbit, spectral series and energy level diagram).

October 2020 **15hours**

Sommerfeld's relativistic atom model Excitation and ionization energy and potentials. Frank – Hertz experiment. **Vector Atom Model:** Space quantization, electron spin, quantum numbers and Paul's exclusion principle. Fine structure of spectral lines. Stern-Gerlach experiment: degeneracy associated with magnetic quantum number, selection rules. Coupling schemes, L.S. and J. J. Coupling for two electrons system, Zeeman effect: Normal and anomalous (quantum mechanical explanation). Stark effect (qualitative).

November 2020 **15 hours**

X-Ray Spectra: Production and properties of X-rays using Coolidge tube. Soft and Hard X-rays. Continuous and characteristic X – rays. Dune- Hunt law: Mosely's law and its application.**Molecular Spectra:** Introduction to molecular spectra – classification of molecular spectra – pure rotation and vibration spectra rotation vibration spectra of diatomic molecules Band structure – Fluorescence and phosphorescence.**Scattering of Light:** Brief discussion on Tyndall, Rayleigh, Brillouin and Raman scatterings. Raman effect – Experiment study of Raman effect – Quantum theory of Raman effect. Intensity of Raman lines – polarization of Raman line (Qualitative study).

December 2020 **15 hours**

Determination of molecular structure by using Raman effect.**Special Theory of Relativity:** Inertial and non-inertial frame of references, Michelson Morely experiment. Postulates of special theory of relativity – Lorentz transformation equation – Length contraction and time dilation – Relativity of simultaneity concept of proper frame, proper length, proper time – relativistic velocity transformation equations – Variation of mass with velocity. Einstein's mass energy relation – (with derivation) Energy momentum relationship – concept of four vectors – Minkowski space.

January 2021(Repetition) **15 hours**

Properties of Atom: Properties of Cathode rays, Effect of electric and magnetic field on electrons, Determination of charge of an electron by Millikan's oil drop method, e/m by J. J. Thomson and Dunnington's method. Determination of atomic mass by Dempster's method. **Atom Model:** Thomson's and Rutherford's atom model (Qualitative account) Bohr's theory Hydrogen atom (Discussion on postulates, expression energy of an electron in nth orbit, spectral series and energy level diagram).

February 2021 (Repetition) **15 hours**

Sommerfeld's relativistic atom model Excitation and ionization energy and potentials. Frank – Hertz experiment. **Vector Atom Model:** Space quantization, electron spin, quantum numbers and Paul's exclusion principle. Fine structure of spectral lines. Stern-Gerlach experiment: degeneracy associated with magnetic quantum number, selection rules. Coupling schemes, L.S. and J. J. Coupling for two electrons system, Zeeman effect: Normal and anomalous (quantum mechanical explanation). Stark effect (qualitative).

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B. Shanthi Tabitha (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B. Sc. V Sem

Hours	Topic to be covered	Remarks
9 hrs	June & July: Sp. Theory of Relativity.	
→	Inertial & Non-Inertial frame of Reference.	
→	Michelson Morley Expt	
→	Postulates of Sp. Theory of Relativity Lorentz Transfm Equation.	
→	Length contraction & Time Dilation	
→	Relativity of Simultaneity & problems	
→	Concept of Proper frame, length & time — Problems.	
→	Variation of Mass with Velocity	
→	Einsteins Mass-Energy relation & Problems.	
→	Energy Momentum Relationship Concept of 4 Vectors & M. Space.	
→	Problems.	
6 hrs	August: Scattering of light.	
→	Brief discussion on T, R, B & R.S	

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B. Shanthi Tabitha (2018-19)

Sub: Physics **TEACHING PLAN** **Class : B.Sc V Sem**

Hours	Topic to be covered	Remarks
→	Raman effect, Explan Study of R.E.	
→	Quantum theory of R.E.	
→	Intensity of Raman lines.	
→	Polarization of Raman lines.	
→	Determination of Molecular Structure by using Raman lines & Effect.	
Sept	Molecular Spectra.	
Thrs		
→	Introduction to Molecular Spectra	
→	classification of M. Spectra	
→	Electronic Spectra	
→	Pure Rotation Spectra	
→	Vibration Spectra	
→	Fluorescence & Phosphorescence	
4hrs.	October X-ray Spectra.	
→	Continuous Spectra.	
→	Ch's Spectra.	
→	Mosley's law.	
→	Duane Hunt limit	

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B. Shanthi Tabitha (2018-19)

Sub: PHYSICS **TEACHING PLAN** **Class :** B.Sc VI Paper 6.2

Hours	Topic to be covered	Remarks
	Dec: Display Devices 3 hrs	
	* LED construction & use in display	
	* LCD types of liq crystal & Basic principle	
	* construction & Comparison betn LED & LCD.	
	Jan: Radio communication 13 hrs.	
	* Modulation	
	* Modes of Radio wave Propagation	
	* Need for Modulation	
	* AM & Modulation factor.	
	* Voltage eqn for P_T & P_S	
	* Side bands, BW & spectrum	
	* FM, spectrum of FM.	
	* Demodulation and Essentials of Demodulation	
	* Diode Detector ckt.	
	* Superheterodyne receiver.	
	* Block diagram for AM	
	* Block diagram for FM	
	* Advantages of FM & AM & Applications.	
	Feb: Amplifier. 10 hrs	
	* Intro to Amplifier	
	* CE amplifier	

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B. Shanthi Tabitha (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B.Sc (6.2) VI Sem

Hours	Topic to be covered	Remarks
	* CE Eq ckt using h parameters	
	* Expn for current gain	
	* Expn for Av & Ap	
	* Expn for i/p & o/p resis	
	* Op amp - ckt	
	* Inv Op-amp	
	* Non Inv Op amp	
	* Appln of Inv & Non-In Op Amp	
	March: Oscillators 4hrs	
	* Concept of F/B, + & - F Back Expn for loop gain, Barkhausen's criteria.	
	* Phase shift Oscillator - M & Demerits	
	* Wein Bridge Oscillator M & Demerits.	
	* Types of F/B, Advantages of Negative F/B	

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B. Shanthi Tabitha (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B.Sc II Paper 2.1

Hours	Topic to be covered	Remarks
	Unit 2: Thermodynamics 8 hrs	
	* Intro to Th. Dy.	
	* I law of Thy. Dy, isothermal & Adiabatic changes	
	* W.D in isothermal & Adiabatic changes PV diagram.	
	* II law of thermodynamics	
	* Heat Engine, carnot cycle & efficiency.	
	* Principle of refrigeration	
	* Carnot's Theorem	
	* Slopes of Isothermal & Adiabatic curves & Appln of I law.	
	Unit 3: Entropy 8 hrs.	
	* Reversible & Irreversible process	
	* Entropy & Perfect gas	
	* change of entropy in reversible cycle	
	* Increase of entropy in irreversible cycle	
	* Entropy of Universe	
	* Temp - Entropy diagram	
	* Entropy of Perfect gas	
	* III law of Th. Dynamics	
	* clausius - clayperon equation for Vap in M.P & B.P.	

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ANITHA KRISHNA (2018-19)

July Sub: Physics **TEACHING PLAN** **Class :** I Semester (B.Sc)

Hours	Topic to be covered	Remarks
7 Hr	(a) Inertial frame, Galilean transformation equations;	
July	(b) Transformation of position, distance, velocity & acceleration (c) Galilean Principle of relativity (d) Conservation of momentum & energy (e) Non-inertial frames, fictitious force (f) Rotating frame of reference - Coriolis force.	
August	(g) Centre of mass, motion of centre of mass, centre of mass as a frame reference (h) Problems.	
8 Hrs	ELASTICITY:	
August	(a) Modulii of elasticity for isotropic materials (b) Relation bw elastic consts (derivation); Poisson Ratio.	
	(c) Expression for work done per unit volume in three types of strain.	
Sept	(d) Bending of Beam: Neutral axis, Expression for bending moment.	
	(e) Theory of light cantilever.	
	(f) Torsion: Torsional pendulum.	
	(g) Expression for Couple per unit twist.	
	(h) Problems.	

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Anitha Krishna B.Sc III Semester (2018-19)

sub: Physics **TEACHING PLAN** **Class :**

Hours	Topic to be covered	Remarks
July (4 Hrs)	1) ELECTROSTATICS:	
	(a) Static electric charge, Coloumbs law	
	(b) Electrostatic field & Gauss Law.	
July	(c) Gauss Law.	
	(d) Poisson & Laplace equation.	
	(e) Applications	
Aug	(e) Applications of Gauss Law.	
(10 Hrs)	2) OPTICAL INSTRUMENTS:	
	(a) Cardinal points of a lens system	
	(b) Two thin lenses separated by a distance (derivation)	
	(c) Spherical Aberration	
	(d) Reducing spherical aberration.	
	(e) Chromatic aberration in lens.	
Septembe	(f) Achromatic combination of lenses in contact	
	(g) Achromatic confirmation - Separated by a distance.	
	(h) Huygen's & Ramsden eye pieces.	
	(i) Resolving power of telescope & microscope.	

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Anitha Krishna (2018-19)

b: Physics **TEACHING PLAN** **Class :** B.Sc IV Sem.

ours	Topic to be covered	Remarks
m	(a) Introduction, Newton's Corpuscular theory, Huygen's wave theory, Concepts of (b) Fresnel & Fraunhofer diffraction. Introduction of Rectilinear propagation of light. (theory)	
hrs	(c) Rectilinear propagation of light, deviation.	
	(d) Theory of Zone plate, Comparison,	
b	(e) Comparison of Zone plate & Converging lens, Fresnel's diffraction at st: edge.	
	(f) Fresnel's diffraction at narrow wire &	
hrs	(g) theory behind Fraunhofer diffraction at a single slit.	
	(q) Derivation for Intensity of diffraction at a single slit & theory of Fraunhofer diffraction at double slit.	
	(h) Derivation for I of diffraction at double slit.	
March	(i) Transmission grating theory & experiment.	
3 hrs	(j) Dispersion & Resolution of grating	
	(k) Problems.	

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Smt. A.M. Kalamma (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B.Sc. III Semester

Hours	Topic to be covered	Remarks
	June: B.Sc. III Semester	
02 hrs	Steady current, Biot-Savart law, Mag. field at a point due to straight current carrying Conductor.	
04 hrs	July: Mag. field at any point on the axis of Circular coil, field at the centre of the coil, Mag. field on the axis of Solenoid. Problems. Lasers – Principle & Properties.	
	August:	
04 hrs.	Spontaneous & Stimulated emission of radiation, population inversion, optical pumping.	
	September	
05 hrs	He-Ne laser Semiconductor lasers, Laser applications, Holography	

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Smt. A.M. Kalamma (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B.Sc. V Semester

Hours	Topic to be covered	Remarks
	June	
06 hrs	Constituents of nucleus - Proton electron and proton - neutron hypothesis of nucleus. Distribution of mass, charge, size, density, spin & magnetic moment. Binding energy of nucleus, Sp. B.E.	
	July	
09 hrs.	Nuclear forces - characteristics of nuclear forces Yukawa theory. Nuclear models - Liquid drop model, shell model, nuclear energy levels & magic numbers. Problems. Radioactive decay law, half life, mean life Successive radioactive disintegration. Radioactive equilibria - transient & Secular equilibrium. Range & energy of α - rays	
	August	
07 hrs.	Bragg's Expt. α-decay theory, Geiger-Nuttal law. β-ray spectra continuous & line spectrum, Pauli's neutrino hypothesis. γ-rays - attenuation of γ-rays. Applications of nuclear radiations: industrial, medical & agricultural applications. Problems.	
	September	
08 hrs	Linear accelerator, Cyclotron, Betatron G.M. Counter, Scintillation Counter. Problems Classification of elementary particles.	

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Smt. A.M. Kalamma (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B.Sc IV Semester

Hours	Topic to be covered	Remarks
02	October: Particles & antiparticals. 4- basic interactions in nature, Quark model of elementary particles.	

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Smt. A.M. Kalamma (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B.Sc. II Semester

Hours	Topic to be covered	Remarks
	2019	
	January :	
04	Low temperature Physics · Ideal and real gases, Andrew's experiment & porous plug experiment, Expression for temperature of inversion	
	February	
	Waves and oscillations : Progressive wave -	
04	Eqn for wave in one dimension (general form), differential equation for wave motion. Expression for relation between amplitude and intensity. Expression for velocity of progressive wave in a medium.	
	March	
05	Newton's formula with derivation. Laplace's Correction. Expression for stationary longitudinal vibration in a rod. Expression for harmonics in fixed at both ends and free at both ends of the rod.	
	Vibrations of stretched strings — Super-position of SHM's. Lissajous figure, composition of two SHM of equal periods at right angles (Analytical treatment)	
	April	
01	Beats, Expression for beat frequency.	

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Smt. A.M. Kalamma (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B.Sc II Sem

Hours	Topic to be covered	Remarks
Extra Needed	Forced vibrations : Equation for damped vibrations, forced vibration solutions in	to be Engaged on Sunday
6 hrs	exponential form. Resonance expression for amplitude & phase at resonance. Problems.	holidays.

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Sub: Physics **TEACHING PLAN** **Class :** B. Sc. VI Semester

Hours	Topic to be covered	Remarks
	January	
08	Electrical & thermal properties: Free electron theory of metals, expression for electrical and thermal conductivities, Ohm's law, calculation of electron density of states, Concept of Fermi energy, expression for Fermi energy as a function of temperature (at 0K). Problems	
	February	
08	Specific heat of solid – Dulong & Petit's law, Einstein's theory & Debye's theory (Derivations) Band theory of solids – Classification of solids into conductors, semiconductors & insulators. Intrinsic and Extrinsic Semiconductors Derivation of expression for electron density, hole density & Electrical conductivity in intrinsic Semiconductor.	
	March	
07	Expression for Fermi level in intrinsic and extrinsic Semiconductors. PN junction diode & zener diode. Hall effect: Expression for Hall co-efficient. Expt'l determination of Hall co-efficient, importance of Hall effect - Magnetic properties of dia, para & Ferro magnetism.	
	April	
06	Classical & quantum theory of Paramagnetism.	

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Smt. A. M. Kalamma (2018-19)

Sub: Physics **TEACHING PLAN** **Class :** B.Sc VI Sem

Hours	Topic to be covered	Remarks
	Crystal binding – Ionic, Covalent, Metallic & Molecular & Hydrogen bonding	

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Sub: Physics **TEACHING PLAN** **Class : B.Sc VI Sem**

Hours	Topic to be covered	Remarks
	B, Sc VI Sem	
	Jan : Statistical ideas in physics - Statistical equilibrium, phase space a priori Probability, Thermodynamical Probability, Maxwell - Boltzmann statistics, Bose-Einstein distribution, Fermi-Dirac statistics.	
	February :- Ensemble, Astrophysics, Scope of Astronomy and Astrophysics, Defn of light year, Luminosity of stars, apparent and absolute magnitudes, Colour and surface temp of stars stellar ~~spectra~~, Spectrum classification of stars, HR diagram, Milky way galaxy.	
	March Concept of Lattice, periodic Crystal, unit cell, Bravais lattice, Crystal planes and Miller Indices. Interplanar spacing interms of miller indices, X ray diffraction, Bragg's law, Bragg Spectrometer (construction & working) powder method, Structure of NaCl &	

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Sub: Physics **TEACHING PLAN** Class : B.Sc VI Sem

Hours	Topic to be covered	Remarks
	April	
	Super conductivity	
	Elementary ideas of Super conductivity and experimental facts Meissner effect, critical mag field, persistent current, London's eqns Type I & Type II SC, Applications of super conductors.	

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Sub: Physics **TEACHING PLAN** **Class :** B.Sc VI Sem

Hours	Topic to be covered	Remarks
	B.Sc II Sem	
	January and February	
	Kinetic theory: (8 hrs)	
	Postulates of kinetic theory of gases, pressure exerted by gas, Maxwell's law for distribution of of molecular velocity, mean free path, rms velocity, degrees of freedom, Principle of equipartion of energy, application to the specific heat of gases.	
	March 4 hrs	
	Black body radn, Stefan's law (derivation) distribution of energy in black body spectrum statement of Wein's & Rayleigh-Jeans law.	
	April 4 hrs	
	Plank's quantum theory of radn, derivation of planks law, Weins and Rayleigh-Jeans law from plank law, Radiation mtm & Pre, Crokes radiometer	

Asst./Asso. Professor

Shanti
H.O.D.

Principal

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V. V. Sangha, Bellary
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Department of Physics

Teaching Plan for EVEN Semesters w.e.f. January 2018

Name: M Jani Baig Designation: Associate Professor

B.Sc. II Semester Teaching Plan

January 2017 04 hours

Waves, Oscillations & Sound: Progressive wave: Equation for wave in one dimension (general form), differential equation for wave motion. Expression for relation between amplitude and intensity. Expression for velocity of progressive wave in a medium,

February 2017 04hours

Newton's formula with derivation. Leplace's correction. Expressin for stationary longitudinal vibration in a rod. Expression for harmonics in fixed at both ends and free at both ends of the rod.

March 2017 04 hours

Vibration of a stretched string harmonics. Super position of SHM's Lissajou's figure, composition of two SHM of equal periods at right angle (Analytical treatment) beats, Expression for beat frequency.

April 2017 03 hours

Forced Vibration: Equation for damped vibrations, forced vibration solutions in exponential form. Resonance expression for amplitude and phase at resonance.

B.Sc. VI Semester Teaching Plan

January 2017 07 hours

Network Theorems: Kirchoff's laws -Proof (Mesh analysis), Super position theorem(proof), Thevenin's and Norton's theorem(only thevinising and nortonising without proof), Maximum power transfer theorem (proof) and its applications. **Optoelectronics:** Optical fibers, structure,

February 2017 08 hours

pulse dispersion and modes of propagation of light through optical fibers, critical angle of propagation, angle of acceptance, expression for numerical aperture and fractional refractive index change, application of optical fibers and advantages..**Digital Electronics:** Conversion to Binary to decimal and decimal to binary Logic system, Types. Logic gates: AND, OR,(analysis using diodes) NOT, NOR, NAND, (analysis using diodes or transistors)

March 2017 08 hours

XOR gate Conversion of universal to basic gates Half and full adder, flip-flop, RS, JK and master slave flip-flop. **Bipolar Junction Transistors:** Introduction, (types and action) Characteristics and parameters of common emitter configuration,

April 2017 07 hours

D C load line, operating point. Need for transistor biasing Self biasing of a transistor, JFET Construction, working & characteristics Inter relationship between the parameters and MOSFET (E & D).Construction

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TEACHING PLAN Class :

V. V. Sangha, Bellary
Smt ASM College for Women, Bellary
Department of Physics

Teaching Plan for ODD Semesters from June 2018

Name: **M Jani Baig** Designation: Associate Professor

B.Sc. I Semester Teaching Plan

June 2018 02 hours

Rigid Bodies *Introduction to moment of inertia. Theorems of moment of inertia.*

July 2018 04hours

Examples of MI: circular disc, annular ring, rectangular rod, hollow and solid cylinders (all cases). Theory of compound pendulum (Expression for time period). Inter changeability of center of suspension and oscillation. Four collinear point about which periods are same.

August 2018 04 hours

Condition for maximum and minimum time period. Determination of 'g', using bar pendulum.L Vs T and L^2 Vs LT^2 graph. ***Elements of Satellite Motion:*** *Expression for orbital velocity, and time periodescape velocity of a satellite.*

September 2018 02 hours

Expression for closed and open orbits, Geo-stationary satellite, Weightlessness, artificial Gravity in space station.

B.Sc. V Semester Teaching Plan

June 2018 06 hours

Properties of Atom: *Properties of Cathode rays, Effect of electric and magnetic field on electrons, Determination of charge of an electron by Millikon's oil drop method, e/m by J.J.Thomson method*

July 2018 08 hours

and Dunnington's method. Determination of atomic mass by Dempster's method. ***Atomic Structures:*** *Review or Rutherford's model, Rutherford's alpha scattering experiment (qualitative), Bohr's theory Hydrogen atom and its inadequacies, effect of nuclear mass,*

August 2018 08 hours

Sommerfield model (qualitative study),Excitation and ionization energy and potentials. Frank – Hertz experiment.

Vector Atom Model: *Space quantization, electron spin, quantum numbers and Paul's exclusion principle. Fine structure of spectral lines. Stern-Gerlach experiment:*

September 2018 08 hours

degeneracy associated with magnetic quantum number, selection rules. Coupling schemes, L.S. and J.J.Coupling for two electrons system,Zeeman effect: Normal and anomalous (quantum mechanical explanation). Stark effect (qualitative)..

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Department of Physics

Teaching Plan forEVEN Semesters w.e.f. December 2018

Name: **M Jani Baig** Designation: Associate Professor

B.Sc. IV Semester Teaching Plan

December 2018 03 hours

Alternating Currents: RMS value, response of LR, CR Circuits

January 2019 12hours

LCR circuits to sinusoidal voltages (using j symbols) series and parallel resonance, half power frequency, band width, Q-factor, power in electrical circuits, power factor. Maxwell's bridge determination of L and C. Anderson's bridge, determination of L. Filters: High pass and Low pass filters with LR and CR combinations, cutoff frequency, Band pass filter and band stop filter. **Rectifiers:** Half wave, Full wave – derivation of expression for I_{dc}, V_{dc}, I_{rms}, V_{rms}& hence ripple factor and efficiency.

February 2019 12 hours

CRO: Study of CRO (construction and working) Measurement of voltage, and frequency.

Theories of Light: Corpuscular theory, Wave theory: Huygens' principle, explanation of laws of reflection & refraction. (plane wave front at plane surface) Group velocity & wave velocity - relation between them. Quantum nature, concept of Photon.

March 2019 13 hours

Interference: Coherent sources interference by division of wave front, Young's double slit-theory and experiment, Fresnel's Bi-prism – theory and experiment (determination of λ) Lloyd's mirror. Interference by division of amplitude, thin film of uniform thickness (both reflected and transmitted) and wedge-shaped film, Newton's ring – theory and experiment. Experimental determination of refractive index of liquid. Michelson Interferometer (determination of wave length λ and $d\lambda$ only).

B.Sc. VI Semester Teaching Plan

December 2018 03 hours

Network Theorems: Determination of atomic mass by Dempster's method. Kirchoff's laws -Proof (Mesh analysis), Super position theorem(proof), Thevenin's and Norton's theorem(only thevinising and nortonising without proof),

January 2019 08 hours

Maximum power transfer theorem (proof) and its applications. **Optoelectronics:** Optical fibers, structure,pulse dispersion and modes of propagation of light through optical fibers, critical angle of propagation, angle of acceptance, expression for numerical aperture and fractional refractive index change, application of optical fibers and advantages..

February 2019 09 hours

Digital Electronics: Conversion to Binary to decimal and decimal to binary Logic system, Types. Logic gates: AND, OR,(analysis using diodes) NOT, NOR, NAND, (analysis using diodes or transistors)XOR gate Conversion of universal to basic gates Half and full adder, flip-flop, RS, JK and master slave flip-flop.

MARCH **~~April~~ 2019** 10 hours

Bipolar Junction Transistors: Introduction, (types and action) Characteristics and parameters of common emitter configuration,D C load line, operating point. Need for transistor biasing Self biasing of a transistor, JFET Construction, working & characteristics Inter relationship between the parameters and MOSFET (E & D).Construction

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