**POST GRADUATE GOVERNMENT COLLEGE FOR GIRLS5**

**SECTOR-42, CHANDIGARH**

**Teaching Plan EvenSemester (UG and PG)**

**Session (2022-2023)**

**Class: B.Sc. 6th / 2nd Sem**  **Name of the Teacher: Suresh Kumar**

**Subject: Physics Period :5th&2nd / 4th**

**Paper :A&B /A Room No : 129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16/01/2023 – 21/01/2023 | Lattice vibrations and phonons/Structure and working of JFET, characteristics, drain and transconductance curve /  Rigid Body motion; Rotational motion |
| Week 2 | 23/01/2023-28/01/2023 | Scattering of photons by phonons / FET amplifier and its voltage gain, structure and working of MOSFET/Principal moments and Axes |
| Week 3 | 30/01/2023- 04/02/2023 | Dynamics of a linear chain of similar atoms and chain of two types of atoms /Feed back in amplifier, voltage gain of negative feedback amplifier/Euler’s equations |
| Week 4 | 06/02/2023-11/02/2023 | Optical and acoustic modes, Density of modes /Advantages of negative voltage feedback, negative feedback current circuit, emitter follower/Precession and elementary gyroscope |
| Week 5 | 13/02/2023-17/02/2023 | Einstein and Debye theories of specific heats of solids /Theory of sinusoidal oscillations, loop gain and phase, lead-lag RC circuit/Galilean transformations and Invariance |
| Week 6 | 20/02/2023-25/02/2023 | Magnetic classification of materials(dia, para, ferro, ferri, antiferro)/Wien bridge oscillator, Barkhausen criterion of sustained oscillations /Transformation equations for inertial frames inclined to each other |
| Week 7 | 27/02/2023-04/03/2023 | Langevin theory of dia and paramagnetism /Positive feedback amplifier LC and Colpitts oscillators/Non-Inertial frames. Fictitious forces in a rotating frames of reference |
| Week 8 | 06/03/2023-11/03/2023 | Quantum theory, Weiss’s theory of ferromagnetism, temperature dependence , Hysteresis of ferromagnetic materials /Hartley oscillator  /Centrifugal and Coriolis forces due to rotation of earth |
| Week 9 | 13/03/2023-18/03/2023 | Dielectric constant & polarizability, electric susceptibility, /OPAMP: characteristics of ideal and practical OPAMP 741, open-loop and close-loop gain, characteristics and application-inverting and non-inverting amplifier, adder, subtractor/Foucault’s pendulum. |
| Week 10 | 20/03/2023-25/03/2023 | Clausius Mosottiequation,/Differentiator and integrator, comparator, timerIC555, pin diagram and its application as astable and monostable multivibrator/Concept of stationery universal frame of reference and ether |
| Week 11 | 27/03/2023-01/04/2023 | Ferroelectrics and Piezoelectrics /Analog and digital circuits, binary numbers, decimal to binary conversions, AND, OR, NOT gate, NAND , NOR gates as universal gates, XOR and XNOR gates/Michelson-Morley experiment and its results. |
| Week 12 | 03/04/2023-08/04/2023 | Liquid crystals, various types and properties. Applications./De Morgan’s theorem, simplification of logic circuits using Boolean algebra, Minterms and Maxterms, conversion of a truth table into an equivalent logic circuit by sum of products method./Postulates of special theory of relativity, Lorentz transformations. |
| Week 13 | 10/04/2023-15/04/2023 | Superconductivity: Meisner effect, London’s equation and penetration depth, critical magnetic field and  temperature/Analog and digital communication systems, Amplitude and Frequency modulation, power in AM wave  /Kinematical consequences of Lorentz transformations – length contraction and time dilation. |
| Week 14 | 17/04/2023-21/04/2023 | DC and AC Josephson effect, BCS theory(formation of cooper pairs), ground state and energy gap/ Generation and detection/Twin paradox, Transformation of  velocities, Simultaneity of relativity, Velocity of light in moving fluid, Relativistic Doppler effect. |
| Week 15 | 24/04/2023-29/04/2023 | Difference from bulk material properties, Nanoparticles, introduction to fabrication and characterization techniques,Carbon Nanostructures - nanotubes, grapheme. Applications of nanotechnology in various fields.  /Brief account of Satellite communication , Sky-wave communication andmobile communication./Variation of mass with velocity, mass-energy equivalence, rest mass in an inelastic collision, Relativistic momentum & energy, their transformation, concepts of Minkowski space, four vector formulation. |

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**SECTOR-42, CHANDIGARH**

**Teaching Plan Even Semester (UG and PG)**

**Session (2022-2023)**

**Class: Bsc II sem(NM, CSc, IT) Name of the Teacher: Dr. Harjeet Kaur**

**Subject: Physics Period : 6th**

**Paper : B Room No : 126**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16/01/2023 – 21/01/2023 | Wave motion and its characteristics |
| Week 2 | 23/01/2023-28/01/2023 | Wave equation |
| Week 3 | 30/01/2023- 04/02/2023 | Solution of wave equation, Energy of progressive wave |
| Week 4 | 06/02/2023-11/02/2023 | Velocity and characteristic impedance |
| Week 5 | 13/02/2023-17/02/2023 | Reflection and transmission coefficients |
| Week 6 | 20/02/2023-25/02/2023 | Matching of impedance, Standing wave, Wave velocity and group velocity |
| Week 7 | 27/02/2023-04/03/2023 | Maxwell's equations, em wave with conductivity zero |
| Week 8 | 06/03/2023-11/03/2023 | Refractive index, Transverse nature of em wave |
| Week 9 | 13/03/2023-18/03/2023 | **MID SEMSETER** |
| Week 10 | 20/03/2023-25/03/2023 | Poynting vector and theorm |
| Week 11 | 27/03/2023-01/04/2023 | Em wave for conducting medium, Skin depth |
| Week 12 | 03/04/2023-08/04/2023 | skin depth ctd. |
| Week 13 | 10/04/2023-15/04/2023 | Dispersion, Impedance of conducting medium |
| Week 14 | 17/04/2023-21/04/2023 | Reflection and transmission of em waves at boundary |
| Week 15 | 24/04/2023-29/04/2023 | Impedance and Refractive Index |

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**SECTOR-42, CHANDIGARH**

**Teaching Plan Even Semester (UG and PG)**

**Session (2022-2023)**

**Class: Bsc IV sem(NM, CSc,IT) Name of the Teacher: Dr. Harjeet Kaur**

**Subject: Physics Period : 1st (Mon), 3rd (Sat)**

**Paper : B Room No : 126**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16/01/2023 – 21/01/2023 | Interaction of Light with Matter, Absorption, Emission |
| Week 2 | 23/01/2023-28/01/2023 | Laser, Principal, characteristics of laser |
| Week 3 | 30/01/2023- 04/02/2023 | Coherence, Einstein Coefficients |
| Week 4 | 06/02/2023-11/02/2023 | Population Inversion, Optical Absorption |
| Week 5 | 13/02/2023-17/02/2023 | Components of Laser, Pumping Schemes |
| Week 6 | 20/02/2023-25/02/2023 | Broadening, Threshold Condition |
| Week 7 | 27/02/2023-04/03/2023 | Luminescence, Modes |
| Week 8 | 06/03/2023-11/03/2023 | Three and Four level Schemes |
| Week 9 | 13/03/2023-18/03/2023 | **MID SEMSETER** |
| Week 10 | 20/03/2023-25/03/2023 | Types of laser, Ruby laser Nd-Yag laser, He-Ne Laser |
| Week 11 | 27/03/2023-01/04/2023 | Dye and CO2 Laser |
| Week 12 | 03/04/2023-08/04/2023 | Applications of Laser, Fibre Optics |
| Week 13 | 10/04/2023-15/04/2023 | Construction, Acceptance Angle, Skip Distance |
| Week 14 | 17/04/2023-21/04/2023 | Step index Fibre, Losses, Scattering, Dispersion |
| Week 15 | 24/04/2023-29/04/2023 | Splicing techniques, Applications |

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**SECTOR-42, CHANDIGARH**

**Teaching Plan Even Semester (UG and PG)**

**Session (2022-2023)**

**Class: Bsc VI sem(NM, Csc, IT) Name of the Teacher:Dr. Harjeet kaur**

**Subject: Physics Period : 5th**

**Paper : C Room No : 129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16/01/2023 – 21/01/2023 | Bohr's formula |
| Week 2 | 23/01/2023-28/01/2023 | Bohr's formula, Range , Interaction of light charged particle, Bremsstrahlung |
| Week 3 | 30/01/2023- 04/02/2023 | Multiple Coulomb Scattering, Straggling , Interaction of gamma rays |
| Week 4 | 06/02/2023-11/02/2023 | Absorption of gamma rays, Pair Production, |
| Week 5 | 13/02/2023-17/02/2023 | Gas filled detectors, ionization chamber |
| Week 6 | 20/02/2023-25/02/2023 | proportional counter, GM counter |
| Week 7 | 27/02/2023-04/03/2023 | Scintillation counter, Semi conductor detectors |
| Week 8 | 06/03/2023-11/03/2023 | Cerenkov counter, Cockroft accelerator, Van de graff generator |
| Week 9 | 13/03/2023-18/03/2023 | **MID SEMSETER** |
| Week 10 | 20/03/2023-25/03/2023 | Tandem accel., Linear accelerator |
| Week 11 | 27/03/2023-01/04/2023 | Betatron, Cyclotron, Synchrotrons |
| Week 12 | 03/04/2023-08/04/2023 | Origin and composition of cosmic rays, Properties of cosmic rays |
| Week 13 | 10/04/2023-15/04/2023 | Elementary particles, Classification |
| Week 14 | 17/04/2023-21/04/2023 | Fundamental Interactions, Charge conjugation, Quantum numbers |
| Week 15 | 24/04/2023-29/04/2023 | Conservation laws, Quark Theory |

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**SECTOR-42, CHANDIGARH**

**Teaching Plan EvenSemester (UG and PG)**

**Session (2022-2023)**

**Class: B.Sc. 4th / 2nd Sem**  **Name of the Teacher:Rajwinder Singh**

**Subject: Physics Period :1st&3rd / 4th** &6th

**Paper :A&C /C Room No : 126/129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16/01/2023 – 21/01/2023 | Statistical definition of entropy, change of entropy of a system  /Bohr model of atom, Hydrogen atom spectrum, energy level diagram of hydrogen, excitation and ionization potential  /Current and current density, Equation of continuity, Microscopic form of Ohm’s law |
| Week 2 | 23/01/2023-28/01/2023 | Additive nature of entropy, law of increase of entropy,  /Electron spin, spin magnetic moment, orbital angular momentum, orbital magnetic moment, space quantization of orbital and spin angular momentum, Larmor’s frequency  /Conductivity ,Failure of ohm’s law,Invariance of charge, E in different frames of reference |
| Week 3 | 30/01/2023- 04/02/2023 | Reversible and irreversible processes with examples. Work done in a reversible process.  /Vector atom model,total angular momentum, Stern Gerlach expt., spin orbit interaction  /Field of a point charge moving with constant velocity, force between parallel currents. |
| Week 4 | 06/02/2023-11/02/2023 | Examples of increase of entropy in natural processes. Entropy and disorder.  /Fine structure of hydrogen,Lande g-factor for electron, Degenerace, numericals  /Behaviour of various substances in magnetic field, |
| Week 5 | 13/02/2023-17/02/2023 | Brief review of the terms and Laws of Thermodynamics,  /Zeeman effect and experiment, classical theory of normal Zeeman effect,quantum theory .Zeeman shift  /Definition of M and H and their relation to free and bound currents.Permeability and susceptibility and their interrelationship. |
| Week 6 | 20/02/2023-25/02/2023 | Carnot’s Cycle. Entropy changes in Carnot’s Cycle.  /Anomalous Zeeman effect, Quantum mechanical theory of Anomalous Zeeman effect, Anomalous Zeeman effect in Na  /B-H curve and energy loss in hysterisis. |
| Week 7 | 27/02/2023-04/03/2023 | Applications of thermodynamics to thermoelectric effect, entropy along a reversible path in a P.V. diagram, entropy of a perfect gas  /Interaction of radiation with matter,transitionprobability, radiative transition  /Langevin theory of diamagnetism |
| Week 8 | 06/03/2023-11/03/2023 | Equation of state of ideal gas from simple statistical consideration. Heat death of the universe  /Selection rules, life time,Paschen-Back Effect, stark effect, numericals,class test  /Lorentz’s force, Definition of B, Biot savart’s law. Application ofBiot Savart’s law to long straight wire,circular current loop and solenoid. |
| Week 9 | 13/03/2023-18/03/2023 | Derivation of Maxwell’s thermodynamical relations and applications  /Identical particles, symmetric and antisymmetricwavefunctions,Pauli exclusion principle, exchangeforce,shells and subshells in atom  /Ampere’s circuital law and its application |
| Week 10 | 20/03/2023-25/03/2023 | Cooling produced by adiabatic stretching  /Coupling scheme-LS coupling,jjcoupling,spectral terms for LS coupling, Slater determinant, Hund’s rule  /Divergence & curl of B |
| Week 11 | 27/03/2023-01/04/2023 | Adiabatic compression, change of internal energy with volume  /Atomic spectra of H,Na,He,Hg,, Production of X-ray, Properties, applications of X-rays, diffraction of Xays, Bragglaw,  /Hall effect, expression & coefficient. |
| Week 12 | 03/04/2023-08/04/2023 | Expression for (Cp-Cv), /Absorption of X-rays, X-ray spectrum-origin of continuous spectrum, origin of characteristics spectrum,Moseley law  /Vector potential, Definition and derivation |
| Week 13 | 10/04/2023-15/04/2023 | Change of state and Clayperon Equation.  /Auger effect,molecularbonding,Hion,Hmolecule,complexmolecules,types of molecular spectra Equation.  /Current density-definition,its use in calculation of change in magnetic field at a current sheet Energy stored in magnetric field, |
| Week 14 | 17/04/2023-21/04/2023 | Use of Joule-Thomson effect for liquification of helium.  /Symmetric structures, rotational energy leyels, rotational spectrum, Vibrational energy levels,vibrationalspectrum  /Faraday’s law of EM induction, Displacement current, Mutual inductance |
| Week 15 | 24/04/2023-29/04/2023 | Production of very low temperature by adiabatic demagnetisation.  /Vib.-rotational spectrum, Electronic spectrum,Ramaneffect, classicaltheory, Quantumtheory,experimental study, Franck Condon principle,fluorescence and phosphorescence  /Reciprocity theorem ,Self inductance for solenoid. |