**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan OddSemester (For Undergraduate Classes - First Year)**

**Session (2022-2023)**

**Class: B.Sc 1st Name of the Teacher:Suresh Kumar**

**Subject: Physics Period : 4th**

**Paper :A Room No : 129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16-08-2022 to 20-08-2022 | Admissions |
| Week 2 | 22-08-2022 to 27-08-2022 | Cartesian and spherical polar coordinate systems |
| Week 3 | 29-08-2022 to 03-09-2022 | two and three-dimensional coordinate systems, Area, volume, displacement, velocity |
| Week 4 | 05-09-2022 to 10-09-2022 | Acceleration in these systems ,Solid angle, centre of mass |
| Week 5 | 12-09-2022 to 17-09-2022 | Linear and angular momentum |
| Week 6 | 19-09-2022 to 24-09-2022 | Torque, potential and kinetic energy of a system of particles |
| Week 7 | 26-09-2022 to 01-10-2022 | Relationship of conservation laws of linear momentum |
| Week 8 | 03-10-2022 to 08-10-2022 | Angular momentum and energy |
| Week 9 | 10-10-2022 to 15-10-2022 | Symmetries of space and time |
| Week 10 | 17-10-2022 to 22-10-2022 | Various forces in nature and relative strengths |
| Week 11 | 25-10-2022 to 27-10-2022 | Spatial dependence, Motion under force obeying inverse square law,Equivalent one body problem |
| **Mid Semester Exam (28th October 2022 – 4th November 2022)** | | |
| Week 13 | 5-11-2022 | Motion under central forces, equation of motion under central force |
| Week 14 | 07-11-2022 to 12-11-2022 | Equation of orbit and turning points, Kepler’s Laws |
| Week 15 | 14-11-2022 to 19-11-2022 | Elastic collision in Lab. and C.M. systems, relationships of velocities, angles & kinetic energies in these two systems |
| Week 16 | 21-11-2022 to 26-11-2022 | Cross section of elastic scattering, Rutherford Scattering |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Undergraduate Classes - First Year)**

**Session (2022-2023)**

**Class: BSc 1stYr (NM,C.Sc,IT) Name of the Teacher: Dr. Harjeet Kaur**

**Subject: Physics Period : 6th (Thu, Fri)**

**Paper : B Room No : 126**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16-08-2022 to 20-08-2022 | Periodic Motion, Define, SHM, Displacement, Velocity, Accel, Projection, Graphical, Diffn. eqn. |
| Week 2 | 22-08-2022 to 27-08-2022 | Energy of SHM, Types of SHM, Eqn of Diffn SHM |
| Week 3 | 29-08-2022 to 03-09-2022 | Compound pendulum, Torsional Pendulum, Transverse Vib Time Period |
| Week 4 | 05-09-2022 to 10-09-2022 | Electrical Oscillations, Energy, Analogy between Mechanical and Electrical Oscillator |
| Week 5 | 12-09-2022 to 17-09-2022 | Composition of two perp SHM of same period , ratio 1:2 |
| Week 6 | 19-09-2022 to 24-09-2022 | Damped Mechanical oscillations equation and its soln, Types of damping |
| Week 7 | 26-09-2022 to 01-10-2022 | Logarithmic Decrement, Relaxation Time, Q factor, Damped Electrical osc, Applications |
| Week 8 | 03-10-2022 to 08-10-2022 | Diffn equation of forced osc, Behavior with frequency |
| Week 9 | 10-10-2022 to 15-10-2022 | Velocity of forced mech osc, Variation with phase and frequency |
| Week 10 | 17-10-2022 to 22-10-2022 | Acceleration and its variation, electrical osc, and its variations |
| Week 11 | 25-10-2022 to 27-10-2022 | Power supplied and its variations, band width, Q factor |
| **Mid Semester Exam (28th October 2022 – 4th November 2022)** | | |
| Week 13 | 5-11-2022 | Relation between Q factor and band width, Amplification factor, ohm law |
| Week 14 | 07-11-2022 to 12-11-2022 | Coupled oscillator and its equations, Normal coordinates, modes, in phase and out phase, shape |
| Week 15 | 14-11-2022 to 19-11-2022 | Exchange of energy, and its equations, Characteristics |
| Week 16 | 21-11-2022 to 26-11-2022 | determination of normal modes, Inductive coupling |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Undergraduate Classes - First Year)**

**Session (2022-2023)**

**Class: B.Sc 1st /BTH 1st**  **Name of the Teacher:Rajwinder Singh**

**Subject: Physics Period : 4th /6th (B.Sc 1st), 4th (BTH 1st )**

**Paper :C Room No : 129/110**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16-08-2022 to 20-08-2022 | Admissions |
| Week 2 | 22-08-2022 to 27-08-2022 | \*Basic ideas of Vector Calculus |
| Week 3 | 29-08-2022 to 03-09-2022 | \*Gradient, Divergence, curl in Cartesian coordinates and their useful relations  \*\*Coulomb’s law for point charges; electric field due to point charge |
| Week 4 | 05-09-2022 to 10-09-2022 | \*physical significance of Gradient, Divergence, curl and applications, Conservative field, Greens’s theorem in a plane  \*\*Electric field due to electric dipole (on axial line and equator line) |
| Week 5 | 12-09-2022 to 17-09-2022 | \*Stoke’s theorem, Gauss’s divergence theorem, Laplacian in Rectangular coordinates  \*\*Electric flux; Gauss’s theorem and its applications (line of charge and sheet of charge) |
| Week 6 | 19-09-2022 to 24-09-2022 | \*Coulomb’s Law for point charges and continuous distribution of charges  \*\*Electric potential due to point charge, group of charges and dipole (on axial line and equatorial line ), potential difference as line integral of electric field |
| Week 7 | 26-09-2022 to 01-10-2022 | \*Electric field due to dipole, line charge, charged ring, circular disc and sheet of charge  \*\*Capacitance; series and parallel arrangements, energy stored in the electric field of capacitor |
| Week 8 | 03-10-2022 to 08-10-2022 | \*Gauss’s Law and its differential form, Work and potential difference, Potential difference as line integral of field, Gauss’s law for dielectrics.  \*\*current, current density, equation of continuity, Ohm’s law in vector form |
| Week 9 | 10-10-2022 to 15-10-2022 | \*Electric potential due to dipole and quadrupole and its applications in Electrostatic field  \*\*Quantum theory of light, X-rays diffraction |
| Week 10 | 17-10-2022 to 22-10-2022 | \*Electric potential due to dipole and quadrupole and its applications in Electrostatic field contd., Electric field as gradient of scalar potential, curl E = 0  \*\*Compton effect, Bragg’s law |
| Week 11 | 25-10-2022 to 27-10-2022 | \*Calculation of E due to a point charge and dipole from potential. Poisson and Laplace’s equation  \*\*De Broglie wave equation, phase velocity and group velocity |
| **Mid Semester Exam (28th October 2022 – 4th November 2022)** | | |
| Week 13 | 5-11-2022 | \*Calculation of electric potential and field due to a point charge placed near an infinitely conducting sheet  \*\*Electron microscope, Uncertainty Principle (statement only) |
| Week 14 | 07-11-2022 to 12-11-2022 | \*Polarisation of matter, atomic and molecular dipoles, induced dipole moment and atomic polarizability  \*\*Applications of Uncertainty Principle ( particle in a box, existence of electron in Nucleus and atom ) |
| Week 15 | 14-11-2022 to 19-11-2022 | \*Concept of electrical images Electric susceptibility and polarization vector. Relation K= 1 + χ  \*\*Radioactivity and its laws |
| Week 16 | 21-11-2022 to 26-11-2022 | \*Gauss’s law for dielectrics. Displacement vector, Div. D = 0, Energy stored in dielectric medium  \*\*Half-life and mean life, uses of radioactivity |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Undergraduate Classes - First Year)**

**Session (2022-2023)**

**Class: BSc 1st (BTHns)**   **Name of the Teacher:Dr.Harjeet Kaur**

**Subject: Physics Period : 4th (1,4)**

**Paper : Physics Room No : 110**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 16-08-2022 to 20-08-2022 | Laws of radioactivity, decay law, decay constant, half-life, activity |
| Week 2 | 22-08-2022 to 27-08-2022 | Average life, Units, Uses of radio isotopes, Radio carbon dating |
| Week 3 | 29-08-2022 to 03-09-2022 | Science, Physics and Life Sciences, Overlap, Units of measurements |
| Week 4 | 05-09-2022 to 10-09-2022 | Conditions for observing interference fringes, phase and path difference, Young’s double Slit experiment. |
| Week 5 | 12-09-2022 to 17-09-2022 | Lloyd’s mirror and Fresnel’s biprism, Phase change on reflection |
| Week 6 | 19-09-2022 to 24-09-2022 | Diffraction: Fresnel theory of Diffraction. Distinction between Fresnel and Fraunhofer diffraction |
| Week 7 | 26-09-2022 to 01-10-2022 | Fraunhofer diffraction due to single slit, Rayleigh Criteria |
| Week 8 | 03-10-2022 to 08-10-2022 | resolving power of microscope and telescope |
| Week 9 | 10-10-2022 to 15-10-2022 | Compound Microscope |
| Week 10 | 17-10-2022 to 22-10-2022 | Fluorescent Microscope |
| Week 11 | 25-10-2022 to 27-10-2022 | Polarization: Concept |
| **Mid Semester Exam (28th October 2022 – 4th November 2022)** | | |
| Week 13 | 5-11-2022 | analytical treatment of unpolarized, plane polarized |
| Week 14 | 07-11-2022 to 12-11-2022 | elliptically polarized light. |
| Week 15 | 14-11-2022 to 19-11-2022 | Malus Law, Brewsters Law |
| Week 16 | 21-11-2022 to 26-11-2022 | Problems |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Ongoing Classes UG-PG)**

**Session (2022-2023)**

**Class: B.Sc 5th Semester**   **Name of the Teacher: Suresh Kumar**

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

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

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 13-08-2022 | Crystal structure: Symmetry operations for a two dimensional crystal  Concept of current and voltage sources, Thevenin’s theorem |
| Week 2 | 16-08-2022 to 20-08-2022 | Two dimensional Bravais lattices, Three dimensional Bravais lattices, Basic primitive cells  Norton’s theorem, sources conversion |
| Week 3 | 22-08-2022 to 27-08-2022 | Crystal planes and Miller indices  CRO, Block diagram, construction and principle of working |
| Week 4 | 29-08-2022 to 03-09-2022 | Diamond and NaCl structure  Use of CRO for frequency, time period |
| Week 5 | 05-09-2022 to 10-09-2022 | Crystal diffraction : Bragg’s Law, Determination of crystal structure  Special features of dual trace phase measurements |
| Week 6 | 12-09-2022 to 17-09-2022 | Laue equations, Reciprocal lattices of SC, BCC and FCC, Bragg’s law in reciprocal lattice  Energy band diagrams in semiconductors, direct and indirect semiconductors |
| Week 7 | 19-09-2022 to 24-09-2022 | Brillouin zones and its derivation in two dimensions  Formula to calculate position of Fermi level in p and n semiconductors, Barrier formation |
| Week 8 | 26-09-2022 to 01-10-2022 | Structure factor and atomic form factor  Energy band diagram of p-n junction, formula for depletion width, qualitative ideas of current flow mechanism in forward and reverse biased diode |
| Week 9 | 03-10-2022 to 08-10-2022 | Band Theory of solids, periodic potential and Bloch theorem,  V-I characteristics, static and dynamic resistance, depletion and diffusion capacitance, Zener diode, LED, photodiode and solar cell |
| Week 10 | 10-10-2022 to 15-10-2022 | Kronig-Penney model  Diode circuit, clipping circuits |
| Week 11 | 17-10-2022 to 22-10-2022 | Band gaps, band structures in conductors  Rectification: half wave, full wave and bridge rectifiers |
| Week 12 | 25-10-2022 to 27-10-2022 | Direct and indirect semiconductors and insulators  Filter circuits(C, LC and π-filters), rectification efficiency and ripple factor in LC filter, voltage regulation circuit using Zener diode voltage multiplier circuits |
| **Mid Semester Exam (28th October 2022 – 4th November 2022)** | | |
| Week 13 | 5-11-2022 | Free electron theory of metals  BJT structure and working different currents in transistor, switching action, Characteristics of CB, CE and CC configuration, active, cut off and saturation region |
| Week 14 | 07-11-2022 to 12-11-2022 | Effective mass, drift current, mobility  Load line analysis of transistors, Q-point, transistor biasing and stabilization of operating point, fixed bias |
| Week 15 | 14-11-2022 to 19-11-2022 | Conductivity (carrier concentration and mobility of carriers) and their variation with temperature in semi-conductors  Collector to base bias, bias circuit with emitter resistor, voltage divider biasing circuit |
| Week 16 | 21-11-2022 to 25-11-2022 | Fermi level positions in intrinsic and extrinsic semiconductors , Wiedemann-Franz law, Hall effect in metals and semiconductors  Working and analysis of CE amplifier using h-parameters, current, voltage and power gain, input and output impedance, Class A, B and C amplifiers. |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Ongoing Classes UG-PG)**

**Session (2022-2023)**

**Class: B.Sc 5th Semester**  **Name of the Teacher: Dr. Harjeet Kaur**

**Subject: Nuclear Physics Period : 5th (2,3)**

**Paper : C Room No : 129**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 13-08-2022 | Introduction, Rutherford scattering Expt., Distance of closest approach |
| Week 2 | 16-08-2022 to 20-08-2022 | Constituents of nuclei, p-e theory, p-n theory, Nuclear Size, Nuclear Shapes, Nuclear mass, Nuclear Energy, Nuclear Density, Charge, Wave Mechanical properties, Parity, statistics, Angular Momentum, Magnetic Moment |
| Week 3 | 22-08-2022 to 27-08-2022 | Quadrupole moment, Isotopes, Isotones, Isobars, Nuclear Forces and its Properties, Mass defect, Packing Fraction, Binding energy and its curve |
| Week 4 | 29-08-2022 to 03-09-2022 | Analogy between drop of a liquid and nucleus, Fission Model, Liquid Drop Model, Assumptions, Binding Energy Terms |
| Week 5 | 05-09-2022 to 10-09-2022 | Failures and Success of LDM, Experimental evidence of Magic numbers. |
| Week 6 | 12-09-2022 to 17-09-2022 | Shell Model, Energy Level Diagram, Success and Failure of LDM, Nuclear Stability |
| Week 7 | 19-09-2022 to 24-09-2022 | Natural Radioactivity, Properties of alpha, beta and gamma rays, Difference between gamma and X rays |
| Week 8 | 26-09-2022 to 01-10-2022 | Fundamental laws and Rutherford law of decay, decay constant, half-life, average life, Activity, Units, Series, Branching |
| Week 9 | 03-10-2022 to 08-10-2022 | Laws of Successive disintegration, Radiation damage, velocity, range, Geiger Nuttal law, energetics, Nuclear potential, Gammow theory, Alpha spectra |
| Week 10 | 10-10-2022 to 15-10-2022 | Beta decay, neutrino postulate, Energy conditions, Inverse beta decay, Internal conversion |
| Week 11 | 17-10-2022 to 22-10-2022 | Types of nuclear rxns, Conservation laws, Kinematics, Physical significance of Q value, Nuclear cross-section |
| Week 12 | 25-10-2022 to 27-10-2022 | Compound Nucleus, Artificial radioactivity, radio isotopes, radio carbon dating, Geological dating |
| **Mid Semester Exam (28th October 2022 – 4th November 2022)** | | |
| Week 13 | 5-11-2022 | Rutherford scattering, impact parameter, Distance of closest approach, Coulomb scattering, |
| Week 14 | 07-11-2022 to 12-11-2022 | Neutron, energy classification, mass of neutron, Nuclear fission |
| Week 15 | 14-11-2022 to 19-11-2022 | Nuclear chain reaction, nuclear reactor, Reactor Facilities, Nuclear Fusion |
| Week 16 | 21-11-2022 to 25-11-2022 | Revision tests, Numericals |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Ongoing Classes UG-PG)**

**Session (2022-2023)**

**Class: B.Sc 3th Semester Name of the Teacher:Dr. Harjeet Kaur**

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

**Paper : B Room No : 126**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 13-08-2022 | Concept of coherence, spatial and temporal coherence, coherence time, coherence length, area of coherence. |
| Week 2 | 16-08-2022 to 20-08-2022 | Conditions for observing interference fringes, Interference by wavefront division and amplitude division. Young’s double Slit experiment. |
| Week 3 | 22-08-2022 to 27-08-2022 | Lloyd’s mirror and Fresnel’s biprism, Phase change on reflection |
| Week 4 | 29-08-2022 to 03-09-2022 | Newton’s rings, Michelson interferometer- working, principle and nature of fringes |
| Week 5 | 05-09-2022 to 10-09-2022 | Interference in thin films, Role of interference in anti-reflection. |
| Week 6 | 12-09-2022 to 17-09-2022 | Multiple beam interference. Fabry – Perot Interferometer, nature of fringes |
| Week 7 | 19-09-2022 to 24-09-2022 | Diffraction: Huygen - Fresnel theory of Diffraction. Fresnel’s half period zones, zone plates. Distinction between Fresnel and Fraunhofer diffraction. |
| Week 8 | 26-09-2022 to 01-10-2022 | Fraunhofer diffraction due to single slit and intensity distribution, double slits and multiple slits (qualitative). |
| Week 9 | 03-10-2022 to 08-10-2022 | Fraunhofer diffraction at rectangular (qualitative discussion) and circular apertures. |
| Week 10 | 10-10-2022 to 15-10-2022 | Resolving Power of a diffraction grating, its use as a spectroscopic element |
| Week 11 | 17-10-2022 to 22-10-2022 | resolving power of microscope and telescope, prism |
| Week 12 | 25-10-2022 to 27-10-2022 | Polarization: Concept and analytical treatment of unpolarized, plane polarized  and elliptically polarized light. |
| **Mid Semester Exam (28th October 2022 – 4th November 2022)** | | |
| Week 13 | 5-11-2022 | Malus Law, Brewsters Law |
| Week 14 | 07-11-2022 to 12-11-2022 | Polarization by Reflection, Scattering, Dichorism |
| Week 15 | 14-11-2022 to 19-11-2022 | Double refraction, Nicol prism, Sheet polarizers, retardation plates. |
| Week 16 | 21-11-2022 to 25-11-2022 | Production and analysis of polarized light (quarter and half wave plates) |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Odd Semester (For Ongoing Classes UG-PG)**

**Session (2022-2023)**

**Class: B.Sc 3rd Semester**   **Name of the Teacher:Rajwinder Singh**

**Subject: Physics Period :1st /3rd**

**Paper :\*A/\*\*C Room No : 126**

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 13-08-2022 | \*Basic ideas of Statistical Physics, Scope of Statistical Physics, basic ideas about probability,  \*\*Plancks’s formula of Black body radiation. |
| Week 2 | 16-08-2022 to 20-08-2022 | \*Distribution of four distinguishable particles in two compartments of equal size.  \*\*Black body radiation and energy quantization |
| Week 3 | 22-08-2022 to 27-08-2022 | \*Concept of macrostates, microstates, thermodynamic probability, effects of constraints on the system,  \*\*Wave-particle duality – Photoelectric effect, X-ray diffraction, Compton effect, Pair production, Photon and gravity |
| Week 4 | 29-08-2022 to 03-09-2022 | \*Distribution of n particles in two compartments,  \*\*De Brogile waves, wave packet, Phase velocity and Group velocity, Electron microscope, Particle in a box |
| Week 5 | 05-09-2022 to 10-09-2022 | \*Deviation from the state of maximum probability, equilibrium state of dynamic system,.  \*\*Particle diffraction, Davisson-Germer experiment, Interferometry with particles. |
| Week 6 | 12-09-2022 to 17-09-2022 | \*Distribution of distinguishable n particles in k compartments of unequal sizes  \*\*Uncertainty principle with illustrations, Principle of complementarity |
| Week 7 | 19-09-2022 to 24-09-2022 | \*Phase space and its division into elementary cells  \*\*Wave equation, Plausible arguments leading to time-dependent Schrodinger equations, Born’s interpretation of Wave function |
| Week 8 | 26-09-2022 to 01-10-2022 | \*Three kinds of statistics. The basic approach in the three statistics.  \*\*complex character, continuity and boundary conditions, probability interpretation, normalization, |
| Week 9 | 03-10-2022 to 08-10-2022 | \*Maxwell-Boltzman statistics applied to an ideal gas in equilibrium  \*\*Operator formalism, Position, momentum and energy operators, expectation values, Ehrenfest theorem, Hermitian operators. |
| Week 10 | 10-10-2022 to 15-10-2022 | \*Experimental verification of Maxwell-Boltzman’s law of distribution of molecular speeds.  \*\*Steady-state Schrodinger equation . |
| Week 11 | 17-10-2022 to 22-10-2022 | \*Need of quantum statistics--B.E. statistics  \*\*Potential step. potential barrier, Tunnel effect examples |
| Week 12 | 25-10-2022 to 27-10-2022 | \*Derivation of Planck’s law of radiation  \*\*Application to stationary states for one dimension Scanning Tunneling microscope, rectangular potential well, Linear harmonic oscillator. |
| **Mid Semester Exam (28th October 2022 – 4th November 2022)** | | |
| Week 13 | 5-11-2022 | \*Deduction of Wien’s displacement law and Stefan’s law from Planck’s law  \*\*SchrÖdinger equation for spherically symmetric potential, spherical harmonics |
| Week 14 | 07-11-2022 to 12-11-2022 | \*F.D. statistics  \*\*hydrogen atom energy levels and eigenfunctions, |
| Week 15 | 14-11-2022 to 19-11-2022 | \*Fermi dirac distribution law  \*\*Principal, Orbital and Magnetic quantum numbers , |
| Week 16 | 21-11-2022 to 25-11-2022 | \*Comparison of M.B., B.E. and F.D. statistics  \*\*Electron probability density |