(Lesson Plan)

MCM DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (Odd/Even Semester)
Session – (2023-2024)

Name of the Teacher: Dr. Pallavi and Ms Anu Rathi
Department: Department of Physics

Class: B.Sc. II (Honors)
Subject: Physics of Vacuum and Low Temperature (Paper 1)

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
Odd semester				
1.	24th July 2023	31th August 2023	Various methods for refrigeration, Coefficient of performance, Liquefaction of gases, Joule-Thomson effect, Principle of regenerative cooling, liquefaction of H2 and He. Liquefaction of nitrogen, Solidification of He. Liquid He II, Thermodynamics of λ-transition, Adiabatic demagnetization, Linde's method, Temperatures below 0.01K, Low temperature thermometry and techniques, Use of liquid air and other liquefied gases.	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Numerical Problems
2.	1th Sept. 2023	30th Sept. 2023	Introduction, classification of vacuum ranges, throughput, Pump speed, speed of exhaust, conductance, ultimate pressure, viscous flow, molecular flow.	(i) Lecture method (ii) Group discussion (iii) Notes (v) online material
3.	1st Oct. 2023	31st Oct. 2023	Pump types, Gaede oil-sealed rotating vane pump, Diffusion pump, sputter ion pumps, Gettering, types of getters, Cryogenic pumps. Types of gauges, Mcleod gauge, Pirani gauge, Measurement of ultrahigh vacuum, penning gauge.	(i) Lecture method (ii) PPt (iii) Group discussion (iv) Notes (vi) online material
4.	1st Nov. 2023	18th Nov. 2023	Vacuum system, Materials for vacuum system, cleaning and sealing of vacuum system, Leak detection and its location	(i) Lecture method (ii) PPt (iii) Group discussion (iv) Notes (v) Numerical Problems

(Lesson Plan)

MCM DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (Odd/Even Semester)
Session – (2023-2024)

Name of the Teacher: Dr. Renu Bala
Department: Department of Physics

Class: B.Sc. II (Honors)
Subject: Electronics (Paper II)

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
Odd Semester				
1.	24th July 2023	31st August 2023	**Number systems**: Binary, Hexadecimal and octal number systems, Interconversions and Binary arithmetic, 2's complement arithmetic, Binary fractions and negative binary numbers, floating point representations, Codes, Error detecting and correcting codes. **Digital Principles and Logic:** Digital signals, Positive and Negative Logic, Basic digital circuits, Basic Gates – NOT, OR, AND; Universal Logic gates: NOR, NAND; Exclusive-OR gate. **Combinational Logic Circuits:** Boolean Laws and De Morgan's theorems, Sum of Product method, Product of sums method, Karnaugh map.	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Numerical Problems (v) Class tests (vi) Doubt session (vii) PPT
2.	1st Sept. 2023	30th Sept. 2023	**Sequential circuits**: Flip-flops – RS, JK, D, clocked, race-around conditions in JK flip-flop, master slave JK, Shift registers: serial in serial out, serial in parallel out, parallel in parallel out **Circuit Theory:** Voltage sources, Current sources, Capacitors, Inductors, Linear circuits, KCL, KVL, Mesh and Node analysis	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Numerical Problems
2.	1st Oct. 2023	31st Oct. 2023	Level shifting, Thevenin and Norton equivalent circuits, Power and energy relationships in case of R, L and C, Maximum Power Transfer Theorem, Series and parallel connection of mutually coupled coil, Equivalent circuit of transformer. **Transducers** : Electrical transducers, Resistive transducers – Resistive position transducer, Strain gauge, Resistance thermometer, Platinum thermometer, Thermistor	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Numerical Problems (v) Online material
3.	1st Nov. 2023	18th Nov. 2023	Inductive transducers – Differential output transducers, LVDT, Pressure inductive transducer. Capacitive transducers, Piezo electric load cell, Thermocouple transducers.	(i) Lecture method (ii) Group discussion (iii) Numerical Problems (iv) Revision

(Lesson Plan)

MCM DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (Odd/Even Semester)
Session – (2023-2024)

Name of the Teacher: Ms Anu Rathi
Department: Department of Physics

Class: B.Sc. II (Honors)
Subject: Statistics and Numerical Techniques (Paper III)

S. No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
Even Semester				
1	9th Jan. 2024	31rd Jan. 2024	Measures of central tendency, Arithmetic mean, median, mode, Geometric mean, Harmonic mean, Quartiles, deciles and percentiles, Standard deviation, mean deviation, semi-interquartile range, coefficient of variation, Moments, Skewness and Kurtosis.	(i) Lecture (ii) PPt (iii) Group discussion (iv) Numerical Problems
2.	1rd Feb. 2024	28th Feb. 2024	Linear Correlation and Regression for Two Variables only. Conditional probability, probability distributions, Mathematical expectation, Probability and Combinatorial analysis. Characterization of Data, Binomial, Normal and Poisson distributions and their applications, Estimation of the Precision of a Single Measurement, Measure of consistency of observed fluctuations with expected Statistical fluctuation, chi square, Error Propagation, Distribution of time intervals between successive random events.	(i) Lecture (ii) PPt (iii) Group discussion (iv) Notes (v) Numerical Problems
2.	1st March, 2024	31st March, 2024	Solution of Algebraic and Transcendental Equations: Bisection Method, Secant Method, Newton-Raphson Method. Interpolation, Finite difference interpolation with equal intervals, Newton' Forward and Backward Interpolation Formulae, Interpolation with unequally spaced points, Lagrange's interpolation formula, Extrapolation. Numerical integration by Trapezoidal, Weddle's and Simpson's rules, Romberg integration.	(i) Lecture (ii) PPt (iii) Group discussion (iv) Notes (v) Numerical Problems (vi) online material
3.	1st April, 2024	22nd April, 2024	Numerical differentiation by Newtons's forward and backward difference formulae, divided difference formula. Numerical solution of differential equations, Euler's and Runge-Kutta Method. Method of least-squares fitting of straight line, parabola and exponential curves, least squares fitting for any non-linear function by iterative method.	(i) Lecture (ii) Group discussion (iii) Notes (iv) Numerical Problems

(Lesson Plan)

MCM DAV College for Women, Sector – 36A, Chandigarh
Monthly Teaching Plans (Odd/Even Semester)
Session – (2023-2024)

Name of the Teacher: Dr. Renu Bala
Department: Department of Physics

Class: B.Sc. II (Honors)
Subject: Mathematical Physics (Paper IV)

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
Even Semester				
2.	9th Jan. 2024	31rd Jan. 2024	Methods of separation of variables; separation of Helmholtz equation in Cartesian, spherical and cylindrical coordinates. Laplace equation in various coordinate systems, Ordinary and singular points.	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Numerical Problems
2.	1rd Feb. 2024	28th Feb. 2024	Examples of partial differential equations in physics, Heat Flow in one and two Dimensions, Series solution of differential equations - Power series solution about ordinary point and regular singular point. Dirac delta function, properties of delta function. Gamma function, factorial notation and applications. Beta function.	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Numerical Problems
2.	1st March, 2024	31st March, 2024	Bessel's differential equation, Bessel functions of first kind, generating function, recurrence formulae, plots, zeros of Bessel functions and orthogonality. Legendre's equation, Legendre's polynomials, plots, generating functions, recurrence relations, orthogonality, Series expansion of a function in terms of a complete set of Legendre functions, Rodrigues formula.	(i) Lecture method (ii) Group discussion (iii) Notes (iv) Numerical Problems (v) Online material
3.	1st April, 2024	22nd April, 2024	Laplace transforms, Applications of Laplace transforms to derivatives and integrals, s-domain interpretation of passive circuit elements R, L and C; Analysis of simple circuits in s-domain, Transfer function, poles and zeros, Stability of circuit.	(i) Lecture method (ii) PPT (iii) Group discussion (iv) Notes (v) Numerical Problems (vi) Revision