

## Lesson Plan

MCM DAV College for Women, Sector – 36A, Chandigarh  
Monthly Teaching Plans (Odd Semester/Even Semester)  
Session – (2022-23)

Name of the Teacher: Dr. Pallavi Gupta

Department: Physics Department

Odd Semester

Physics, Paper A

Class: B.Sc. III(NM, Voc)

Subject: Condensed Matter Physics I

S.No.	Date (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	17/08/2022	31/8/2022	Crystal structure: Symmetry operations for a two-dimensional crystal. Two dimensional Bravais lattices, Three dimensional Bravais lattices, Basic primitive cells, Crystal planes and Miller indices Diamond and NaCl structure.	PPT, Lecture Method
2	1/9/2022	30/9/2022	Crystal diffraction: Bragg's Law, Determination of crystal structure, Reciprocal lattices of SC, BCC and FCC, Bragg's law in reciprocal lattice, Brillouin zones and its derivation in two dimensions, structure factor and atomic form factor	Lecture Method, PPT, Online Sources; Group Discussion
3	01/10/2022	31/10/2022	Free electron theory of metals, effective mass, drift current, mobility and conductivity (carrier concentration and mobility of carriers), variation of carriers with temperature in semi-conductors, Fermi level positions in intrinsic and extrinsic semiconductors, Wiedemann-Franz law	Lecture Method, PPT, Online Sources

4	1/11/2022	25/11/2022	Band Theory of solids, periodic potential and Bloch theorem, Kronig-Penney model, band gaps, band structures in conductors, Direct and indirect semiconductors and insulators, Numerical practice, Hall effect in metals and semiconductors.	Lecture Method, PPT, Online Sources; Group Discussion
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**Even Semester**  
**Paper A**

**Name of the Teacher: Dr. Pallavi Gupta**

**Department: Physics Department**

**Class: B.Sc. III(NM, Voc)**

**Subject: Condensed Matter Physics II**

S.No.	Date** (Monthly)		Topics to be Covered	Academic Activity Undertaken*
	From	To		
1	16/1/2023	31/1/2023	Lattice Dynamics: Lattice vibrations and phonons, Scattering of photons by phonons, Dynamics of a linear chain of similar atoms and chain of two types of atoms, optical and acoustic modes, Density of modes. Einstein and Debye theories of specific heats of solids. Magnetic classification of materials (Dia, para, ferro, ferri, antiferro)	PPT, Lecture Method
2	01/2/2023	28/02/2023	Langevin theory of dia and paramagnetism, Quantum theory, Weiss's theory of Ferromagnetism, temperature dependence, hysteresis of ferromagnetic materials. Dielectric constant & polarizability, electric susceptibility, Clausius Mosotti equation, frequency dependence, ferroelectrics and Piezoelectrics.	Lecture Method, PPT, Online Sources; Group Discussion
3	01/3/2023	31/3/2023	Liquid crystals, various types and properties. Applications. Superconductivity: Meisner	Lecture Method, PPT, Online Sources

			effect, London's equation and penetration depth, critical magnetic field and temperature, DC and AC Josephson effect, BCS theory (formation of Cooper pairs), ground state and energy gap.	
4	01/4/2023	29/4/2023	Nanoparticles, introduction to fabrication and characterization techniques, Carbon Nanostructures - nanotubes, graphene. Applications of nanotechnology in various fields.	Lecture Method, PPT, Online Sources; Group Discussion

**\*Any of these** – (i) Lecture Method; (ii) PPT; (iii) Online Sources; (iv) Group Discussion; (v) Case Studies etc.  
Other Methods adopted by the teacher – Please write the specific teaching method

\*\* Dates for even semester are tentative; they can be varied according to Panjab University Academic Calendar Dates.