

## Lesson Plan

**MCM DAV College for Women, Sector – 36A, Chandigarh**  
**Monthly Teaching Plans (Odd Semester/Even Semester)**  
**Session – (2021-22)**

**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	11/08/2021	31/08/2021	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. Crystal diffraction: Bragg's Law,	PPT, Lecture Method, Online Sources
2	01/09/2021	30/09/2021	Determination of crystal structure, Laue equations, 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. Free electron theory of metals, effective mass, drift current, mobility and conductivity (carrier concentration and mobility of carriers)	Lecture Method (Blended From), Online Sources; Group Discussion
3	01/10/2021	31/10/2021	variation of carriers with temperature in semi-conductors, Fermi level positions in intrinsic and extrinsic semiconductors,	Lecture Method(Blended From), PPT, Online Sources

			Wiedemann-Franz law, Hall effect in metals and semiconductors.	
4	01/11/2021	30/11/2021	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 practise	Lecture Method, Online Sources; Group Discussion

**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	03/02/2022	28/02/2022	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.	Lecture Method
2	01/03/2022	31/03/2022	Einstein and Debye theories of specific heats of solids. Magnetic classification of materials (Dia, para, ferro, ferri, antiferro), Langevin theory of dia and paramagnetism, Quantum theory, Weiss's theory of Ferromagnetism, temperature	Lecture Method, Online Sources; Group Discussion

			dependence, hysteresis of ferromagnetic materials.	
3	01/04/2022	30/04/2022	Dielectric constant & polarizability, electric susceptibility, Clausius Mosotti equation, frequency dependence, ferroelectrics and Piezoelectrics. Liquid crystals, various types and properties. Applications. Superconductivity: Meisner effect, London's equation and penetration depth, critical magnetic field and temperature	Lecture Method, Online Source
4	01/05/2022	25/05/2022	DC and AC Josephson effect, BCS theory (formation of cooper pairs), ground state and energy gap. Basic ideas of materials at nanoscale: Difference from bulk material properties, Nanoparticles, introduction to fabrication and characterization techniques, Carbon Nanostructures - nanotubes, grapheme. Applications of nanotechnology in various fields.	Lecture Method, 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.**