# Lesson Plan

## MCM DAV College for Women, Sector – 36A, Chandigarh
## Monthly Teaching Plans (Odd Semester)
## Session: 2024-25

**Name of the Teacher/s:** Dr Archana

**Department:** Chemistry

**Class:** B.Sc-II (3rd semester) **Subject:** Physical Chemistry

| S.No. | Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
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| | From | To | | |
| 1 | 15-07-2024 | 05-08-2024 | Unit-I: Liquid State<br>Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases. | Lecture and group discussion |
| 2 | 06-08-2024 | 20-08-2024 | Unit-I: Liquid State<br>Liquid Crystals: Difference between liquid crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.<br>UNIT-II: Chemical Equilibrium<br>Equilibrium constant and free energy. Thermodynamic derivation of law of mass of mass action. Le - Chatelier's principle. | Lecture and group discussion |
| 3 | 21-08-2024 | 31-08-2024 | Unit-II<br>Reaction isotherm and Reaction isochore-Clapeyron equation and Clausius –Clapeyron equation, applications.<br>Unit-III: Thermodynamics-II<br>Second Law of Thermodynamics: Need for the law, different statements of the law, Carnot cycle and its efficiency, Carnot theorem. Thermodynamic scale of temperature. | Lecture and group discussion |

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| 4 | 2-09-2024 | 16-09-2024 | Unit-III<br>Concept of Entropy: Entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, Clausius inequality, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases. | Lecture and group discussion |
| 5 | 17-09-2024 | 28-09-2024 | Unit-IV: Thermodynamics-III<br>Third Law of Thermodynamics: Nernst heat theorem, statement. | Lecture and group discussion |
| 6 | 30-09-2024 | 05-10-2024 | Concept of residual entropy, evaluation of absolute entropy from heat capacity data. | Lecture and group discussion |
| 7 | 07-10-2024 | 21-10-2024 | Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz functions (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. | |
| 8 | 22-10-2024 | Till exam | Variation of G and A with P, V and T. and Revision | |

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| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 31st August, 2024 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 30th Sept, 2024 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 26th Oct, 2024 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 14th Nov, 2024 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |

***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

# Lesson Plan

## MCM DAV College for Women, Sector – 36A, Chandigarh
## Monthly Teaching Plans (Even Semester)
## Session: 2024-25

**Name of the Teacher/s:** Dr Archana

**Department:** Chemistry

**Class:** B.Sc-II (4th Semester) **Subject:** Physical Chemistry

| S.No. | Date (Monthly) | | Topics to be Covered | Academic Activity Undertaken* |
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| | From | To | | |
| 1 | 10 .01.2025 | 30.01.2025 | Unit-I: Phase equilibrium:<br>Statement and meaning of the terms – phase, component and degree of freedom, derivation of Gibbs phase rule, phase equilibria of one component system—water, CO2 and S systems. Phase equilibria of two component system –solid –liquid equilibria, simple eutectic – Bi-Cd system, desiliverisation of lead. Solid solutions—compound formation with congruent melting point (Mg-Zn) and incongruent melting point, (NaCl-H2O) system. Freezing mixtures, acetone-dry ice. | Lecture and Group Discussion |
| 2 | 31.01.2025 | 27.02.2025 | Unit-I<br>Partially Miscible Liquids –Phenol-water, trimethylamine – water, nicotine –water systems. Nernst distribution law-thermodynamic derivation, applications.<br>Unit-II: Electrochemistry –I<br>Electrical transport –Conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of equivalent and specific conductance with dilution. Migration of ions and Kohlrausch Law, Arrhennius theory of | Lecture and Group Discussion |

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| | | | electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method. | |
| 3 | 28.02.2025 | 20.03.2025 | Unit-III: Electrochemistry-II<br>Types of reversible electrodes – gas metal – ion, metal –insoluble salt – anion and redox electrodes. Electrode reactions, Nernst equation, derivation of cell E.M.F. and single electrode potential, standard hydrogen electrode – reference electrodes – standard electrode potential, sign conventions, electrochemical series and its significance. | Lecture and Group Discussion |
| 4 | 21.03.2025 | 11.04.2025 | Unit-IV:<br>Electrolytic and Galvanic cells – reversible and irreversible cells, conventional representation of electrochemical cells. E.M.F. of a cell and its measurements. Computation of cell E.M.F. Calculation of thermodynamic quantities of cell reactions ($\Delta G$, $\Delta H$ and K), Polarization, over potential and hydrogen overvoltage. Concentration cell with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient, potentiometric titrations. | Lecture and Group Discussion |
| 5 | 12.04.2024 | Till exam | Previous question papers and doubts sessions | Lecture and Group Discussion |

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| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 31-01-2025 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 28-02-2025 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |

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| 29-03-2025 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |
| **Departmental Meeting to Coordinate and Review the Monthly completion of Syllabus as per lesson plans** | |
| 19-04-2025 | The teachers have completed the scheduled chapters and topics as shown in the lesson plan |

***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