

CURRICULUM PLAN

(Odd Semester, 2023-2024)

B.Sc. (H) Chemistry, I Year (Semester I), NEP-UGCF 2022

Name of the teacher: Dr. Upasana Issar

Name of Paper: Gaseous and Liquid State (DSC-3: Physical Chemistry-I)

UPC: 2172011103

One Lecture Per Week

Contents	Allocation of Lectures	Month wise schedule to be followed	Tutorial/Assignments /Presentation etc
Unit 1: Gaseous state <ul style="list-style-type: none">• Kinetic theory of gases- postulates and derivation of kinetic gas equation,• Behaviour of real gases- Compressibility factor, Z, Variation of compressibility factor with pressure at constant temperature (plot of Z vs P) for different gases (H_2, CO_2, CH_4 and NH_3), Cause of deviations from ideal gas behaviour and explanation of the observed behaviour of real gases in the light of molecular interactions• van der Waals (vdW) equation of state, Limitations of ideal gas equation of state and its modifications in the form of derivation of van der Waal equation, Physical significance of van der Waals constants, application of van der Waal equation to explain the observed behaviour of real gases.•	08	16 th August 2023 – 30 th September 2023	<ul style="list-style-type: none">• Syllabus Overview• Books Suggestions• Related Examples and Problem solving session
Unit 1 (Continued) <p>Limitations of van der Waals equation, Reduced equation of state and law of corresponding states (statement only). Virial equation of state-Physical significance of second and third virial coefficients, van der Waals equation expressed in virial form, Relations between virial coefficients and van der Waals</p>	04	3 rd week of December- 2 nd week of January	<ul style="list-style-type: none">• Numerical Solving• Doubt Session• Assignment allocation

constants			
<p>Unit 1 (Continued)</p> <ul style="list-style-type: none"> Maxwell distribution of molecular velocities and its use in evaluating average, root mean square and most probable velocities and average kinetic energy. Definition, expression, applications and temperature and pressure dependence of each one of the following properties of ideal gases: Collision frequency, Collision diameter, Mean free path. Coefficient of viscosity, definition, units and origin of viscosity of gases, relation between mean free path and coefficient of viscosity, temperature and pressure dependence of viscosity of a gas, calculation of molecular diameter from viscosity Barometric distribution law, its derivation and applications, alternative forms of barometric distribution law in terms of density and number of molecules per unit volume, effect of height, temperature and molecular mass of the gas on barometric distribution 	06	3 rd week of January – 1 st week of February	<ul style="list-style-type: none"> Numerical Solving Doubt Session Previous university papers discussion

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