

## CURRICULUM PLAN

(Even Semester, 2022-2023)

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

Name of the teacher: Dr. Upasana Issar

Name of Paper: Chemical Thermodynamics and its Applications (DSC-6:  
Physical Chemistry-II)

UPC: 2172011203

Contents	Allocation of Lectures	Month wise schedule to be followed	Tutorial/Assignments /Presentation etc
<ul style="list-style-type: none"><li>• <b>UNIT – 2: First law and Thermochemistry</b></li><li>• Concept of heat, Q, work, W, internal energy, U, and statement of first law; enthalpy, H, relation between heat capacities, Joule Thompson Porous Plug experiment, Nature of Joule Thompson coefficient,</li></ul>	04	4 <sup>th</sup> Week of March- 1 <sup>st</sup> week of April	<ul style="list-style-type: none"><li>• Syllabus Overview</li><li>• Books Suggestions</li><li>• Related Examples and Problem solving session</li></ul>
<ul style="list-style-type: none"><li>• <b>UNIT – 2: First law and Thermochemistry (Continued)</b></li><li>• calculations of Q, W, <math>\Delta U</math> and <math>\Delta H</math> for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions.</li><li>• Enthalpy of reactions: standard states; enthalpy of neutralization, enthalpy of hydration, enthalpy of formation and enthalpy of combustion and its applications, bond dissociation energy and bond enthalpy; effect of temperature (Kirchhoff's equations) on enthalpy of reactions.</li></ul>	10	2 <sup>nd</sup> week of April- 2 <sup>nd</sup> week of May	<ul style="list-style-type: none"><li>• Numerical Solving</li><li>• Doubt Session</li><li>• Assignment allocation</li></ul>
<ul style="list-style-type: none"><li>• <b>UNIT – 3: Second Law</b></li><li>• Concept of entropy; statement of the second law of thermodynamics, Carnot cycle. Calculation of entropy change for</li></ul>	10	3 <sup>rd</sup> week of May – 1 <sup>st</sup> week of June	<ul style="list-style-type: none"><li>• Numerical Solving</li><li>• Doubt Session</li><li>• Previous university papers discussion</li></ul>

reversible and irreversible processes (for ideal gases).			
<ul style="list-style-type: none"> <li>• <b>UNIT – 3: (Continued)</b></li> <li>• Free Energy Functions: Gibbs and Helmholtz energy; variation of S, G, A with T, V, P; Free energy change and spontaneity (for ideal gases). Relation between Joule-Thomson coefficient and other thermodynamic parameters; inversion temperature; Gibbs-Helmholtz equation; Maxwell relations; thermodynamic equation of state.</li> <li>• <b>UNIT – 4: Third Law</b> Statement of third law, unattainability of absolute zero, calculation of absolute entropy of molecules, concept of residual entropy, calculation of absolute entropy of solid, liquid and gases.</li> </ul>	06	2 <sup>nd</sup> week of June-1 <sup>st</sup> week of July	<ul style="list-style-type: none"> <li>• Numerical Solving</li> <li>• Doubt Session</li> <li>• Assignment Collection</li> <li>• Result discussion</li> </ul>

*Upasana*

**Dr.  
Upasana Issar**

**Department of Chemistry**