

## CURRICULUM PLAN

(Odd Semester, 2024-2025)

B.Sc. (P) Life Science: Chemistry, II Year (Semester III), NEP-

UGCF 2022 Name of the teacher: Dr. Upasana Issar

Name of Paper: DISCIPLINE SPECIFIC CORE COURSE -7: Chemistry -III

Chemical Energetics and Equilibria

UPC: 2172512302

One Lecture Per Week

Contents	Allocation of Lectures	Month wise schedule to be followed	Tutorial/Assignments /Presentation etc
<p><b>UNIT-1: Chemical Energetics</b></p> <p>Recapitulation of Intensive and extensive variables; state and path functions; Isolated, closed</p> <ul style="list-style-type: none"><li>• and open systems</li><li>• <b>First law</b></li><li>• Concept of heat (Q), work (W), internal energy (U), and statement of first law; enthalpy (H),</li><li>• relation between heat capacities for ideal gas, Joule's experiment, calculations of Q, W, <math>\Delta U</math></li><li>• and <math>\Delta H</math> for reversible expansion of ideal gases under isothermal conditions.</li><li>• <b>Thermochemistry</b></li><li>• Enthalpy of reactions: standard states; enthalpy of neutralization, enthalpy of ionization</li></ul>	08	1 <sup>st</sup> August 2024 – 30 <sup>th</sup> September 2024	<ul style="list-style-type: none"><li>• Syllabus Overview</li><li>• Books Suggestions</li><li>• Related Examples and Problem solving session</li></ul>
<p><b>Unit 1 (Continued)</b></p> <p><b>Thermochemistry</b></p> <ul style="list-style-type: none"><li>• enthalpy of hydration, enthalpy of formation and enthalpy of combustion, Integral enthalpy of solution, bond dissociation energy and bond enthalpy; Hess's law, Born Haber's cycle (NaCl/</li><li>• KCl).</li></ul> <p><b>Second Law</b></p> <ul style="list-style-type: none"><li>• Concept of entropy; statements of the second law of thermodynamics (Kelvin and Clausius).</li></ul>	08	1 <sup>st</sup> October 2024 – 20 <sup>th</sup> November 2024	<ul style="list-style-type: none"><li>• Numerical Solving</li><li>• Doubt Session</li><li>• Test</li><li>• Assignment</li><li>• Previous university papers discussion</li></ul>

<ul style="list-style-type: none"><li>• Calculation of entropy change for reversible processes (for ideal gases). Free Energy Functions:</li><li>• Gibbs and Helmholtz energy (Non-PV work and the work function); Free energy change and</li><li>• concept of spontaneity (for ideal gases).</li></ul> <p><b>Third Law</b></p> <ul style="list-style-type: none"><li>• Statement of third law, qualitative treatment of absolute entropy of molecules (examples of NO, CO),</li><li>• concept of residual entropy</li></ul>			
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**Dr. Upasana Issar**

**Department of Chemistry**