

**Programme: M. Sc. Part-I (Chemistry)****Course Code: PCC-402 Title of the Course: Laboratory Course in Physical Chemistry****Number of Credits: 02****Effective from AY: 2018-19**

<b>Prerequisites for the course:</b>	Should have studied the courses in Chemistry at F Y B Sc, S Y B Sc & T Y B Sc levels so as to have basic knowledge of Physical Chemistry and basic principles.	
<b>Course Objectives:</b>	1. Introduction of various concepts on thermodynamics. 2. Introduction of electro chemistry and kinetics.	
<b>Course Outcomes:</b>	1. Students should be in a position to understand various concepts in physical chemistry by conducting experiments. 2. Students should be in a position to apply these concepts during the lab course in physical chemistry.	
<b>Content:</b>	<ol style="list-style-type: none"><li>1. To study the kinetics of hydrolysis of ethyl acetate and to determine a) Energy of activation b) Entropy of activation and c) Free energy change.</li><li>2. To study the kinetics of the reaction between Potassium persulphate (K<sub>2</sub>S<sub>2</sub>O<sub>8</sub>), and Potassium iodide (KI), and to determine a) Energy of activation b) Entropy of activation and c) Free energy change.</li><li>3. To determine the order of reaction between potassium persulphate and potassium iodide by graphical, fractional change and differential methods.</li><li>4. To determine the degree of hydrolysis of salt of weak base and strong acid using conductometer.</li><li>5. To determine the composition of a mixture of acetic acid, dichloroacetic acid and hydrochloric acid by conductometric titration.</li><li>6. To determine the dissociation constants of a dibasic acid and obtain derivative plot to get equivalence point.</li><li>7. To determine the dissociation constants of a tribasic acid (Phosphoric acid) obtain derivative plot to get equivalence point.</li><li>8. To determine formal redox potential of Fe<sup>2+</sup>/Fe<sup>3+</sup> and Ce<sup>3+</sup>/Ce<sup>4+</sup> system obtain derivative plot to get equivalence point.</li><li>9. To study the three component system such as toluene, ethanol and water.</li><li>10. To study the three component system such as acetic acid, chloroform; and water and obtain tie line.</li><li>11. To determine the molecular weight of polyvinyl alcohol by viscosity measurement.</li><li>12. To determine the molecular weight of polystyrene by viscosity measurement.</li></ol>	48 hrs
<b>Pedagogy:</b>	Lectures / tutorials / seminars / term papers / assignments / presentations / self-study or a combination of some of these. Sessions shall be interactive in nature to enable peer group learning.	
<b>References/ Readings</b>	<ol style="list-style-type: none"><li>1. A. Finlay &amp; J.A. Kitchener, "Practical Physical Chemistry", Longman</li><li>2. F. Daniels &amp; J.H. Mathews, "Experimental Physical Chemistry", Longman.</li><li>3. A.M. James, "Practical Physical Chemistry",</li><li>4. D.P. Shoemaker &amp; C.W. Garland, "Experimental Physical Chemistry", McGraw-Hill.</li></ol>	