

Course No	Course Name	L-T-P-Credits
<b>CY 482</b>	<b>Inorganic Chemistry Laboratory</b>	<b>0-0-6: 3</b>
Prerequisite: NIL		
<b>Course Objectives:</b>	The main objective of the laboratory course is to provide students with necessary skills of synthesis and characterization of inorganic materials, hands on experience with modern instrumentation, basic concepts of the underlying chemical and physical of instrumental methods of analysis including electronic and vibrational spectroscopy, reaction kinetics formulating, and solving problems in the laboratory.	
<b>Course Outcomes:</b>	After the successful completion of the laboratory the students will be able to	
	<ol style="list-style-type: none"> <li>1. Synthesise single step and multi-step inorganic complexes and nano materials.</li> <li>2. Understand basic characterization techniques of inorganic materials.</li> <li>3. Apply instrumentation techniques to detect conversion of <i>trans-cis</i> and linkage isomers, and redox reactions.</li> <li>4. Apply various quantitative estimation techniques.</li> </ol>	
<b>SYLLABUS</b>		
Module	Contents	Hours
I	<b>Preparation and characterization of the following compounds:</b> (a)Tris(oxalato) manganese(III) (b)Tris(acetylacetonato) manganese(III) (c)Tris(acetylacetonato) iron(III) (d)Tris(ethylenediamine)cobalt(III) chloride (e)Tris(thiourea)copper(I) sulphate (f)Tetraminecopper(II) sulphate (g) Hexamine nickel(II) chloride (h)Tetrapyridinesilver(II) peroxidisulphate (i) Reinecke's salt (j) Schiff base complexes	06 h per laboratory experiment
II	Preparation and study of geometrical isomerism in dichlorobis(ethylenediamine)cobalt(III) chloride.	
III	Preparation and study of linkage isomerism in pentaminenitrocobalt(III)chloride complex.	
IV	Cyclic Voltammogram for a reversible reaction.	
V	Synthesis and characterization of Silver and Gold nanoparticles.	
VI	Potentiometric titration of $\text{Fe}^{2+}$ with $\text{Cr}_2\text{O}_7^{2-}$ .	
VII	<b>Quantitative estimation:</b> (a) Estimation of calcium in milk powder by complexometric titration (b) Estimation of iodine in iodized common salt using iodometric titration (c) Estimation of phosphoric acid in cola drinks by molybdenum	

	<p>blue method</p> <p>(d) Estimation of calcium and magnesium by complexometric titration in different ores/hard water</p> <p>(e) Spectrophotometric estimations of (i) Fe(III) as <math>[\text{Fe}(\text{SCN})]^{2+}</math> complex; (ii) Mn as <math>\text{MnO}^{4-}</math>; (iii) Fe(III) and Fe(II) in a mixture as <math>[\text{Fe}(1,10\text{-phenanthroline})_3]^{2+}</math> complex.</p> <p>(f) Analysis of kidney stones by permanganometric titration</p>	
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**Essential Readings:**

1. J. Mendham, R. C. Denney, M. Thomas, B. Sivasankar and D. J. Barnes, "Vogel's Quantitative Chemical Analysis", Pearson, 6<sup>th</sup> Edition, 2009.
2. G. Marr and B. W. Rockett, Practical Inorganic Chemistry, Van Nostrand, 1<sup>st</sup> Edition, 1972.

**Supplementary Readings:**

1. Departmental laboratory manuals.