

Name of the Programme: M.Sc. Part-I (Chemistry)

Course Code: CHI-522

Title of the course: Practical course in Inorganic Chemistry-II

Number of Credits: 02

Effective from AY: 2022-23

Prerequisites for the course:	Students should have studied chemistry practical courses at graduate level or must have cleared change of discipline entrance test conducted by Goa University.	
Course Objective:	<ol style="list-style-type: none">1. Students shall acquire skills in synthetic inorganic chemistry.2. Students will learn to prepare coordination compounds.3. Students will learn how to grow single crystals.4. Students will acquire skills in determination of metal present by gravimetric and titrimetric method.5. Students shall acquire skills in determining the metal content at very low concentrations (ppm) using colorimetry / spectrophotometry.	
Content	<p><i>Minimum 13 experiments from the list shall be conducted.</i></p> <p>1. Preparations / Estimation of Inorganic Compounds: (Any Nine)</p> <ol style="list-style-type: none">i. Preparation of hexaamminecobalt(III) nitrate.ii. Estimation of cobalt in hexaamminecobalt(III) nitrate by volumetric titration.iii. Preparation of Potassium Trioxalatoferrate(III) Trihydrateiv. Estimation of iron and oxalate by redox titrationv. Synthesis of metal nanoparticles (Cu, Ag, Au, Ni) and determining the absorption maxima by UV-visible spectrophotometer.vi. Estimation of amount of calcium in given sample by gravimetric method.vii. Estimation of amount of nickel in given sample by gravimetric method.viii. Estimation amount of zinc present in given sample by gravimetric method.ix. Estimation of iron by colorimetric / spectrophotometry method.x. Estimation of barium by complexometric titration method.xi. Estimation of manganese in presence of iron by complexometric titration method.	No of hours 40
	<p>2. Semi-micro qualitative analysis of cation and anion in a given inorganic mixture: (Any four mixture)</p> <p>Mixture containing total six cations and/or anions.</p> <p>Cations : Pb^{2+}, Cu^{2+}, Cd^{2+}, Sn^{2+}, Fe^{2+}, Fe^{3+}, Al^{3+}, Cr^{3+}, Zn^{2+}, Mn^{2+}, Ni^{2+}, Co^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+}, Mg^{2+}, $(\text{NH}_4)^+$, K^+</p> <p>Anions: Cl^-, Br^-, I^-, NO_2^-, NO_3^-, SO_3^{2-}, CO_3^{2-}, SO_4^{2-}, PO_4^{3-}, S^{2-}</p>	20

Pedagogy	Students will be given pre-lab and post-lab assignments on theoretical aspects of laboratory experiments prior to the conduct of each experiment. Exams will be in the form of ISA, SEA which will involve performing given experiments and conduct of viva, systematic reporting of experiments, results and observations in laboratory report. Sessions should be interactive in nature to enable peer group learning.
References / Readings	<ol style="list-style-type: none"> 1. G. Brauer, Handbook of Preparative Inorganic Chemistry, Vol. 1 & 2, 1963. 2. G. Pass & H. Sutcliffe, Practical Inorganic Chemistry, Preparations, Reactions and Instrumental Methods, 2nd Ed.; Chapman & Hall, 1974. 3. S. De Meo, J. Chem. Ed., Vol 80, Pg.No.796-798, 2003. 4. W. L. Jolly, The Synthesis & Characterization of Inorganic Compounds, Prentice-Hall, INC, 1970. 5. A. J. Elias, General Chemistry Experiments, Revised Ed.; University Press, 2008. 6. J. Mendham, R.C. Denney, J.D. Barnes, M.J. K. Thomas, Vogel's Text Book of Quantitative Chemical Analysis, 6th Ed.; Pearson, 2002. 7. G. Svehla, Vogel's Text Book of Qualitative Inorganic Analysis, 7th Ed, Pearson, 2011. 8. G. Marr & B. W. Rockett, Practical Inorganic Chemistry, Van Nostrand Reinhold Company, London, 1972.
Course outcomes:	<ol style="list-style-type: none"> 1. Students will be in a position to synthesize coordination compounds with different metals and ligands. 2. Students will be able to grow single crystal. 3. Students will be able to determine metal content in the given sample. 4. Students will be in position to apply diverse methods available for estimation of the metals and can use colorimeters and spectrometers. 5. Students will be able to detect cations and anions in the given salt.