Even Semester Lecture Plan

Name of the college: Government College of Arts, Science and Commerce, Sanquelim – Goa**.**

Name of Faculty: Ms. Rosalina Desilva	**Subject:** Chemistry	
Paper code: CHC- 203 Inorganic Chemistry I	**Program/Course: S**.Y. B.Sc.	**Division:** A
Academic year: 2025 - 2026	**Semester: IV**	**Total Lectures: 30**

Course Objectives: Theory

1. To understand the theoretical aspects related to inorganic qualitative analysis.
2. To study the comparative chemistry of s and d block elements.
3. To learn the chemistry of coordination compounds and understand their role in the biological systems.
4. To study the properties, structure and bonding in noble gases compounds**.**

Course Learning Outcome: At the end of this course, students will be able to:

1. explain the principles underlying inorganic qualitative analysis.
2. explain the characteristics of s, p and d-block elements and postulates of Werner's theory of coordination compounds.
3. write IUPAC nomenclature and identify different types of isomers of coordination compounds.
4. describe the structure and bonding in noble gas compounds**.**

Month	**Lectures From: To:**	**No. of lectures allotted**	**Topic, Subtopic to be covered**	**Learning outcome**	**ICT Tools**	**Reference books**
December 2025	01/12/25-06/12/25	02	Introduction: Periodic Table **s - block Elements** Occurrence, extractions (Li and Be only), Electronic configuration Periodic trends in Properties roles.	**At the end of this course, students will be able to:** explain the characteristics of s-block elements	Smart board	1. G. Svehla, Vogel's Qualitative Inorganic Analysis, Pearson Education, (2012). 2. J. Mendham, R. C. Denney, J. D. Barnes, M. Thomas, B. Sivasankar, Vogel's Textbook of Quantitative Chemical Analysis, 6th edn. Pearson Education.

	08/12/25-13/12/25	02	Periodic trends in Properties	Explain the characteristics of s-block elements		3. J.C. Kotz, Paul M. Treichel, Grabriela C. Weaver, Chemistry and Chemical Reactivity, 6th edn. Thomson Books/Cole (2006). 4. P.L. Soni and Mohan Katyal, Textbook of Inorganic Chemistry by, Sultan Chand and Sons, 20th edn. (1997) 5. Puri, Sharma and Kalia, Principles of Inorganic Chemistry, 33rd edn., Vishal Publishing Co. (2018). 6. J.D. Lee, Concise Inorganic Chemistry by, Chaman, and Hall, 5th edn. (1996). 7. F. A. Cotton, G. Wilkinson, P. L. Gauss, Basic Inorganic Chemistry, 3rd edn. Wiley, (Reprint 2008). 8. N. N. Greenwood, A. Earnshaw, Chemistry of the Elements, Pergamon Press, 1st edn. (1984). 9. Glen E. Rodgers, Inorganic Chemistry, 3rd edn. Brooks/Cole (2012). 10. F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, 3rd edn. 11. P. W. Atkins, T. Overton, J. Rourke, M. Weller, F. Armstrong, Shriver & Atkins Inorganic Chemistry, 5th edn.; Oxford Publications, (2009).
	15/12/25-20/12/25	NIL	TARANG			
	22/12/25-23/12/25	01	Periodic trends in Properties			
January 2026	O2/01/26-03/01/26	02	Anomalous behaviour. Diagonal relationship Solubility and hydration, Biologicalroles.			
	O5/01/26-10/01/26	02	**Chemistry of Noble Gases** Introduction, electronic configuration, chemical properties and uses. Clathrates.	Describe the structure and bonding in noble gas compounds**.**		
	12/01/26-17/01/26	02	Chemistry of xenon; preparation, structure and bonding in xenon compounds (XeF2, XeF4, XeO6, XeO4, XeO2F2, [XeO6]-4, XeOF4).			
	19/01/26-24/01/26	02	**Comparative Chemistry of the Transition Metals** Introduction, occurrence, electronic configuration, significance and special stability of empty, half-filled	Explain the characteristics of transition elements elements		

			and completely filled d-orbitals.			12. Geoff Raymer and Tina Overton, Descriptive Inorganic Chemistry, 4th edn. Issued on: 05/03/2025 56 13. J.E. Huheey, E.A. Keiter, R.L. Keiter, U.K. Medhi, Inorganic Chemistry – Principles of structure and reactivity by, 1st impression (2006) Pearson Education Publishers. 14. Neil G. Connelly, Ture Damhus, Richard M. Hartshorn, Alan T. Hutton, Nomenclature of Inorganic Chemistry. IUPAC RECOMMENDATIONS 2005, RSC Publishing. 15. Catherine E. Housecroft and Alan G. Sharpe, Inorganic chemistry 4th edn., Pearsons, 2012.
	27/01/26-31/01/26	02	Complex formation, variable oxidation states, unusual oxidation states and their stabilities in aqueous solutions (w.r.t. vanadium and chromium),			
February 2026	O2/02/26-07/02/26	02	Colour, magnetic and catalytic properties of transition metals and their compounds.			
	O9/02/26-14/02/26	02	Chemistry of titanium and vanadium w.r.t. properties of their oxides and chlorides. Qualitative tests for the ions of the first transition series.			
	16/02/26-21/02/26	Nil				
	23/02/26-28/02/26	02	**Introduction to Coordination Compounds** Molecular compounds: Werner's theory of coordination compounds. Experimental evidences: Precipitation and Molar conductivity measurements.	**At the end of this course, students will be able to:**		

March 2026	O2/03/26-07/03/26	02	Terminology and nomenclature of coordination compounds. Coordination numbers geometries, Effective atomic number Rule.	write IUPAC nomenclature		
	O9/03/26-14/03/26	02	Structural isomerism: Stereoisomerism w.r.t. C.N. = 4 and 6 only Stereoisomerism w.r.t. C.N. = 4 and 6 only.	identify different types of isomers of coordination compounds.		
	16/03/26-21/03/26	02	Role of coordination compounds in biology and medicine w.r.t. Chlorophyll, Haemoglobin and cisplatin.	Understand bio-inorganic molecules		
	23/03/26-28/03/26	02	Theoretical Basis for the Qualitative Inorganic Analysis Common ion effect, solubility product. Complex ion formation, buffers,			
	30/03/26-31/03/26	NIL				

Even Semester Lecture Plan

Name of the college: Government College of Arts, Science and Commerce, Sanquelim – Goa**.**

Name of Faculty: Ms. Rosalina Desilva	**Subject:** Chemistry

Paper code: CHC- 203 Inorganic Chemistry I	**Program/Course: S**.Y. B.Sc.	**Division:** A

Academic year: 2025 - 2026	**Semester: IV**	**Total Lectures: 30**

Course Objectives: Practical1. To apply the fundamental theoretical aspects of qualitative inorganic analysis.2. To use various titrimetric techniques to estimate the analytes. 3. To use gravimetric methods to estimate metal ions.4. To prepare inorganic coordination compounds.

Course Learning Outcome:

At the end of this course, students will be able to:.

1. Perform a qualitative analysis of inorganic mixtures.
2. Prepare coordination compounds of transition elements.
3. Determine unknown concentration of analytes using volumetric and gravimetric procedures

Month	**Lectures From: To:**	**No. of lectures allotted**	**Topic, Subtopic to be covered**	**Learning outcome**	**ICT Tools**	**Reference books**
December 2025	01/12/25-06/12/25	02	General Instructions Theoretical aspects related to practicals Safety measures-dos and donts	At the end of this course, students will be able to: maintain caution and take safety Measures.	Chalk and Talk Demonstration	1. G. Svehla, Vogel's Qualitative Inorganic analysis, 7th edn. Pearson Education Ltd. 2. V. Alexeyev. Quantitative Analysis. 2nd edn. Mir Publishers. 1969.

	08/12/25-13/12/25	02	**Volumetric Analysis** 1. Estimation of the amount of nickel	Determine unknown concentration of analytes using volumetry		3. J. Derek Woollins, Inorganic experiments, WILEY-VCH, 4. George Brauer, Handbook of Preparative Inorganic Chemistry Vol. 2, 2nd edn., Academic Press (1964)
	15/12/25-20/12/25	NIL	Tarang			
	22/12/25-23/12/25					
January 2026	O2/01/26-03/01/26	02	2. Estimation of Fe (II) ions	Determine unknown concentration of analytes using volumetry		
	O5/01/26-10/01/26	02	**Gravimetric Analysis** 1. Estimation of Ni as Nidmg using counter poise method.	Determine unknown concentration of analytes using gravimetry		
	12/01/26-17/01/26	02	Estimation of Ni			
	19/01/26-24/01/26	02	**Gravimetric Analysis 2.** Estimation of Mn as manganese pyrophosphate	Determine unknown concentration of analytes using gravimetry		
	27/01/26-31/01/26	02	Estimation of Mn			
February 2026	O2/02/26-07/02/26	02	**Inorganic Preparation** of tris-(ethylenediamine)nickel(II)chloride	Prepare coordination compounds		

	O9/02/26-14/02/26	02	**Inorganic Preparation** of Chrome red.			
	16/02/26-21/02/26	02	**Semi-micro qualitative analysis** of water soluble mixtures- two cations and two anions. Cations: Ba2+, Cu2+, Fe2+, Ni2+, K+, NH4 + Anions: CO3 2-, NO3-, Cl-, SO4 2-, S2-	Demonstration		
	23/02/26-28/02/26	02	Qualitative analysis:	Perform qualitative analysis of inorganic mixtures		
March 2026	O2/03/26-07/03/26	02	Qualitative analysis:			
	O9/03/26-14/03/26	02	Qualitative analysis			
	16/03/26-21/03/26	02	Qualitative analysis:			
	23/03/26-28/03/26	02	Repetition			
	30/03/26-31/03/26	NIL				