Semester	5
Paper Number	C3CH230522T/ C3CH230522P
Paper Title	Inorganic Chemistry 4
No. of Credits	4
Theory/Composite	Composite
No. of periods assigned	Th: 3; Pr: 3
Name of Faculty member(s)	Dr. Sanjib Ganguly, Dr. Debanjan Dhar
Course description/objective	**Theory:** 1.To understand the basic bonding principles in coordination complexes. 2.To have basic idea of the spectra and magnetism in the complexes 3.To appreciate the general trends in the f-block metals/ metal ions.
Syllabus	Annexure Core Course
Reading/Reference Lists	Theory: 1. Douglas, B.E. and McDaniel, D.H. Concepts & Models of Inorganic Chemistry Oxford, 1970. 2. Atkin, P. Shriver & Atkins' Inorganic Chemistry, 5th Ed., Oxford University Press (2010). 3. Cotton, F.A., Wilkinson, G. and Gaus, P.L., Basic Inorganic Chemistry 3rd Ed.; Wiley India. 4. Sharpe, A.G., Inorganic Chemistry, 4th Indian Reprint (Pearson Education) 2005. 5. Huheey, J. E.; Keiter, E.A. &Keiter, R.L. Inorganic Chemistry, Principles of Structure and Reactivity 4th Ed., Harper Collins 1993, Pearson,2006. 6. Mingos, D.M.P., Essential trends in inorganic chemistry. Oxford University Press (1998). 7. Winter, M. J., The Orbitron, http://winter.group.shef.ac.uk/orbitron/ (2002). An illustrated gallery of atomic and molecular orbitals.

	8. Burgess, J., Ions in solution: basic principles of chemical interactions. Ellis Horwood (1999). 9. Pfennig, B. W. (2015), Principles of Inorganic Chemistry. John Wiley & Sons. 10. Housecraft, C. E.; Sharpe, A. G., (2018), Inorganic Chemistry, 5th Edition, Pearson. 11. Wulfsberg, G (2002), Inorganic Chemistry, Viva Books Private Limited. 12. Magnetochemistry – A. Selwood 13. Introduction to Magnetochemistry Earnshaw 14. Elements of Magnetochemistry – R. L. Dutta & A. Shyamal Practical: 1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009. 2. Harris, D. C.; Lucy,C. A.(2016), Quantitative Chemical Analysis, 9th Edition, Freeman and Company	
Evaluation	Theory: 60 Internal: 15 (CIA: 10; Other form of Assessment: 2; Attendance: 3) Semester Exam: 45	Practical: 40 CA: 38; Attendance:2
Paper Structure for Theory Semester Exam	Answer THREE out of FOUR questions of 15 marks each.	

Module 1: Main Group Chemistry- 1

Concepts and explanation of variation in catenation properties along the period and down the group; variation in formulations of oxides, oxoacids, halides in Groups 13, 14, 15, 16 and 17; variation in structures and redox properties of hydrides, oxides and oxoacids.

Module 2: Main Group Chemistry- 2

Structure and Bonding in B_2H_6, Al_2Cl_6, $P_3N_3Cl_6$, O_2F_2, S_2N_2, S_4N_4, polythiazyl, XeF_2, XeF_4, XeF_6, Xenate and perxenate, Borazine, Boron nitride.

Module 3: Organometallic Chemistry-1

Definition and classification of organometallic compounds on the basis of bond type; Concept of hapticity of organic ligands. General methods of preparation of mono and binuclear carbonyls of 3d series. Structures of mononuclear and binuclear carbonyls. pi-acceptor behaviour of CO, synergic effect and use of IR data to explain extent of back bonding.

Practical: Redox Titrations

1. Estimation of Fe(II) using standardized $KMnO_4$ solution

2. Estimation of Fe(III) and Ca(II) in a given mixture using standardized $KMnO_4$ solution

3. Estimation of Fe(II) and Fe(III) in a given mixture using $K_2Cr_2O_7$ solution.

4. Estimation of Fe(III) and Mn(II) in a mixture using standardized KMnO4 solution

5. Estimation of Fe(III) and Cu(II) in a mixture using $K_2Cr_2O_7$.

6. Estimation of Fe(III) and Cr(III) in a mixture using $K_2Cr_2O_7$.