



SECOND SEMESTER 2022-23
Course Handout (Part II)

Date: 16.01.2023

In addition to Part-I (General Handout for all courses appended to the Timetable) this portion gives further specific details regarding the course.

Course No. : CHEM F241
Course Title : Inorganic Chemistry-II
Instructor-in-charge : Himanshu Aggarwal
Instructor : Sounak Roy and Himanshu Aggarwal

1. Scope and Objective of the Course: Theories of coordination chemistry, electronic spectroscopy and magnetism of complexes, organometallic chemistry and chemistry of lanthanides and actinides.

2. Text Book: T1. "Inorganic Chemistry" Huheey J. E., Keiter, Ellen A., Keiter, Richard L., Medhi, O.K.; 4th ed., Pearson.

Reference Books: R1. "Concise Inorganic Chemistry", Lee, J.D. 5th Edition, Wiley, India Edition.

R2 "Inorganic Chemistry", Shriver, D.F.; Atkins, P.W.; Overton T. L., Rourke, J. P., Weller, M. T., Armstrong, F. A. 4th edition, Oxford.

R3 "Concepts & Models of Inorganic Chemistry" B. Douglas, D. McDaniel and J. Alexander 3rd Edn, Wiley India.

3. Course Plan:

Lecture No.	Learning Objectives	Topics to be covered	Chapter in the Text Book
1-10	Organometallic chemistry	The 18-electron rule Metal-carbonyl complexes Nitrosyl complexes Dinitrogens Alkyls Carbenes, Carbynes, Carbides Alkenes Alkynes Metallocenes	T1:Chapter 18 and Lecture notes
11-18	Catalysis and reaction mechanisms.	Catalysis by organometallic compounds	T1:Chapter 19 (634-661)

		Stereo chemically non-rigid molecules	T1:Chapter 6 (196-202)
19-20	Lanthanide and actinide chemistry	Descriptive chemistry of metals - The Lanthanides and Actinides	T1:Chapter 13 (407- 419) Lecture notes
21-22	Coordination chemistry	Coordination chemistry: Bonding VB theory applied to coordination compounds	T1:Chapter14: 424-428
23-25	Crystal Field Theory (CFT)	Crystal Field Theory (CFT): Crystal field splitting; d orbitals in different crystal fields; applications of CFT	T1:Chapter 14: 428-444
26-28	Molecular orbital theory	Molecular orbital theory	T1:Chapter 14: 444-459
29-32	Electronic spectra of complexes, Magnetic properties of complexes	Electronic spectra of complexes, Magnetic properties of complexes	T1:Chapter 15: 461-492
33-35	Structure Nomenclature	Structure – Nomenclature, Coordination numbers 1, 2, 3, 4, 5, 6, 7 Generalization about coordination numbers Isomerism: Linkage and other types of isomerism Chelate effect	T1:Chapter 16: 495-539 Lecture notes
36-40	Reactions of coordinated complexes	Reactions – Nucleophilic substitution reactions, Kinetics, Mechanisms	T1:Chapter 17 (542-569) and Lecture notes

4. Evaluation Schedule:

Component	Duration	Weighting (%)	Date and Time	Nature of Component
Class tests, Assignments and presentations	-	30	Continuous	Open Book
Mid Semester Test	90 min	30	17/03 2.00 - 3.30PM	Closed Book
Comprehensive Examination	180 min	40	18/05 FN	Closed Book

5. **Chamber consultation hour:** To be announced in the class.
6. **Make-up for tests:** May be granted only for genuine cases only.
7. **Notices:** All notices for this course will be displayed on the CMS and Chemistry Notice Board.
8. **Academic Honesty and Integrity Policy:**
Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge

CHEM F241

