

INSTRUCTION DIVISION

FIRST SEMESTER 2016-17

Course Handout (PART II)

01/08/2016

In addition to part I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : CHEMF214
Course Title: Inorganic Chemistry I
Instructor-in-charge : N.Rajesh

1. **Course Description:** Structure of molecules - VSEPR Model, Ionic Crystal Structure, Structure of Complex Solids; Concepts of inorganic chemistry - Electronegativity, Acid-Base Chemistry, Chemistry of Aqueous and Non-Aqueous Solvents; Descriptive Chemistry of some elements - Periodicity, Chemistry of transition metals, Halogens and Noble Gases, Inorganic Chains, Rings, Cages and Clusters.

2. **Scope & Objective of the Course:** The objective of this course is to provide a comprehensive survey of the basic concepts in inorganic chemistry. The scope would cover basic aspects in inorganic chemistry involving bonding, ionic crystal structures, hard-soft acid base concepts, chemistry of halogens, and noble gases. Considerable emphasis would be laid on intercalation compounds (graphite, clays) inorganic chains, rings and cluster compounds such as borazenes, phosphazenes etc.

Text Book: Huheey J. E., Keiter, Ellen A., Keiter, Richard L. Okhil K. Medhi, “**Inorganic Chemistry**”, 4th ed., Pearson Education.

Reference Books: I. Inorganic Chemistry by Shriver & Atkins, (4th edition), Oxford

II. Cotton F.A., Wilkinson G., Murillo, C.A., Bochmann, M. “**Advanced Inorganic Chemistry**”, 6th ed., John Wiley and Sons, New York (2003).

3. Course Plan:

Topics	Text Book Chapter	No. of Lectures
Concepts of inorganic chemistry - Electronegativity	Chapter 5	2
Acid-base chemistry		2
A generalized acid-base concept		1
Measures of acid-base strength	Chapter 8	2
Hard and soft acids and bases		2
Symbiosis		
Chemistry of aqueous and nonaqueous solvents		2
Summary of protonic and aprotic solvents	Chapter 9	1
Molten salts		1
Electrode potentials and electromotive forces		1
The chemistry of halogens and the noble gases		2
Noble gas chemistry: Fluorides, bonding		1
Other compounds of xenon	Chapter 12	
Bond strengths in noble gas compounds		2
Halogens in positive oxidation states		
Polyhalide ions, Fluorine-oxygen chemistry, Oxyacids of		

heavier halogens, Halogen oxides and oxyfluorides Halogen cations, Halides, Pseudohalogens Electrochemistry of the halogens and pseudohalogens	Chapter 12	2
Structure of molecules: VSEPR Model and V B Theory	Chapter 5	2
Ionic Crystal Structure		2
Structure of Complex Solids	Chapter 4	2
Periodicity: First and second row anomalies		1
The use of <i>p</i> orbitals in pi-bonding		
The use of <i>d</i> orbitals by nonmetals	Chapter 10	1
Periodic anomalies of the nonmetals and post-transition metals		1
Inorganic chains: Catenation, Heterocatenation, Silicate minerals, Intercalation chemistry, One dimensional conductors, Isopoly anions, Heteropoly anions		3
Inorganic rings: Borazines, Phosphazenes, Phosphazene polymers, Other heterocyclic inorganic systems, Homocyclic inorganic systems	Chapter 11	3
Inorganic cages: Boron cage compounds-Boranes, Carboranes, Metallocarboranes, Structure prediction for heteroboranes and organometallic clusters		3
Inorganic clusters: Metal clusters, Dinuclear compounds, Trinuclear clusters, Tetranuclear clusters, Hexanuclear clusters, Polyatomic Zintl anions and cations, Chevrel phases, Infinite metal chains		3

4. Evaluation Scheme :

EC NO.	Evaluation Component	Duration	Weightage(%)	Date	Time	Remarks
1,	Test I	60 min.	20	9/9,	4.00--5.00 PM	Closed book
2.	Test II	60 min.	20	24/10,	4.00--5.00 PM	Closed Book
*3.	Assignment		10			Take home
*4	Group discussion		10			Open
5.	Comprehensive. Exam.	3 hrs	40	10/12	AN	Closed book

4. Chamber Consultation hours: To be announced in the class.

***One take home assignment would be given and each student is expected to submit a report on the assigned topic which will be evaluated. Topic for GD based on relevant journal articles would be announced in advance. GD is like an open book component since each group is permitted to bring /refer the journal articles with them during discussion.**

Date for Group discussion (preferably in the last week of November) would be displayed in advance in the class and Chemistry Notice Board. For Group discussion (GD) students would be divided into 5 -6 members per group with duration of about 10min per group. Evaluation for

each member would be done based on their level of participation and knowledge in the particular topic of discussion assigned to each group.

6. **Make-up Policy:** Make-up will be granted for only very genuine and deserving cases.
7. **Notices:** Relevant notices regarding the course will be displayed on Chemistry Notice Board