TEACHING PLAN: CH-302

SCHOOL: SOBAS		ACADEMIC SESSION: 2023-2024	FOR STUDENTS' BATCH: VI SEMESTER
1	Course code	CH-302	
2	Course Title	INORGANIC CHEMISTRY	
3	Credits		
4	Learning Hours	Contact Hours: 54; Practical Teaching: 27; Project, Tutorial and Assessment: 09; Total hours: 90	
5	Course Objective	The purpose of this course is to provide: 1. Broad and balance knowledge in chemistry in addition to understanding of key chemical concepts, principles and theories. 2. To develop students' ability and skill to acquire expertise over solving both theoretical and applied chemistry problems. 3. To provide knowledge and skill to the students' thus enabling them to undertake further studies in chemistry in related areas or multidisciplinary areas that can be helpful for self-employment/entrepreneurship.	
6	Course Outcomes	1. To get the detailed understanding of Bonding in homonuclear and heteronuclear molecules using the molecular orbital theory. 2. To study the nomenclature, classification, preparation and bonding in organometallic compounds and of metal carbonyls also. 3. To know about basic concepts of bioinorganic chemistry with reference to metal ions present in biological systems. To study the biochemistry of dioxygen carriers especially hemoglobin and myoglobin. 4. To know about various inorganic clusters compounds with special reference to silicones and phosphazenes.	
7	Outline syllabus:		

7.01	Paper Code	Unit	Introduction	Reference number	Teaching methods
7.02	CH-302 UNIT-I MOLECULAR ORBITAL THEORY	(a)	Drawbacks of VBT	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
		(b)	LCAO method	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
		(c)	MO Diagrams	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
7.03	CH-302 UNIT-II ORGANOMETALLIC CHEMISTRY	(a)	Definition, Nomenclature and Classification	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
		(b)	Preparation	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT,

					Discussion
		(c)	Chemical Properties	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
7.04	**CH-302 UNIT-III BIOINORGANIC CHEMISTRY**	(a)	Essential and Trace elements	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
		(b)	Haemoglobin and Myoglobin	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
		(c)	Biological roles of metal ions	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
7.05	**CH-302 UNIT-IV SILICONES AND PHOSPHAZENES**	(a)	Preparations	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
		(b)	Structures	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion
		(c)	Properties	J.D. Lee Puri, Sharma, Kalia	Lecture, Blackboard, PPT, Discussion

8	**Course Evaluation**	
8.10	**CA: 20%**	
8.1	**Attendance**	5%
8.12	**Homework**	-
8.13	**Quizzes**	4 Quizzes, 5%
8.14	**Projects**	1 Project, 5%
8.15	**Presentation**	1 Presentation, 5%
8.16	**Any other**	--
8.2	**MTE(IA)**	20%
8.3	**End-term examination: 60%**	
9	**Text Books & References**	
9.1	**Text books**	Inorganic Chemistry, J.E. Huheey
9.2	**References**	Concise Inorganic Chemistry: J.D. Lee Principles of Inorganic Chemistry: Puri, Sharma, Kalia
9.3	**Video References**	https://www.youtube.com/watch?v=KbKZR-WeLbU https://www.youtube.com/watch?v=WqfVZS_EaIw https://www.youtube.com/watch?v=OkcD7tKre1c https://www.youtube.com/watch?v=WITqeSRKuTg

Mapping of Outcomes v. Topics

Outcome no. →	1	2	3	4

Syllabus topic↓				
Paper Code.Unit I (a)	Y			
Paper Code. Unit I (b)	Y			
Paper Code. Unit I (c)	Y			
Paper Code.Unit II (a)		Y		
Paper Code. Unit II(b)		Y		
Paper Code. Unit II(c)		Y		
Paper Code.Unit III (a)			Y	
Paper Code. Unit III(b)			Y	
Paper Code. Unit III(c)			Y	
Paper Code.Unit IV (a)				Y
Paper Code. Unit IV(b)				Y
Paper Code. Unit IV(c)				Y

QUESTION BANK

Subjective type

UNIT I

1. What is bond order?
2. Discuss the LCAO method.
3. Predict the bond order of C_2 using MO energy level diagram.
4. Draw MO diagram for HF molecule.
5. Explain the magnetic properties of the following molecule with the help of MO diagrams: O_2^-, N_2^+, F_2.

UNIT II

1. What are the organometallic compounds?
2. How the organometallic compounds are classified?
3. What is fluxional molecule?
4. Discuss the bonding of ferrocene.
5. What is meant by the heptacity of ligand? How is it designated?
6. How does the presence of π-acceptor ligands increase the stability of octahedral complexes?

UNIT III

1. Illustrate the structure of myoglobin and haemoglobin.
2. Describe the role of myoglobin and haemoglobin in biological systems.
3. What is Hill Constant?
4. What is the significance of Hill constant?
5. Discuss Bohr Effect.
6. What are metallo-enzymes?
7. What are Sodium pump? Discuss the role of it.
8. Discuss the toxic effects of the following elements: Molybdenum, Nickel, Mercury, Lead.

UNIT IV

1. What are inorganic polymers? Discuss their general properties.
2. Discuss the preparation methods for Silicones.

3. Discuss the properties of silicones.
4. Discuss the different structure of silicon polymers.
5. Distinguish between natural and synthetic polymers.
8. Why Iodine exhibits some metallic character.
9. Account for the following order of the acid strength: HOCl>HOBr>HOI
10. Why does fluorine differs from the rest of the family members?

PROJECTS (To be given to group of students)
