

SUBJECT CODE:1SC2030101	TITLE OF PAPER: INORGANIC CHEMISTRY-I
COURSE TYPE: CORE COURSE	

Course Objective: To impart knowledge and training in chemistry at advanced level, make aware with recent analytical technique, use of reagents and reactions in laboratory, synthesis and study of materials, the exploration of their properties and development of ways to use them in real life.

Teaching scheme (hours) per week		Credit			Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	Total	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
4	2	4	2	6	60	40	30	20	150

UNIT	DISCRIPTION IN DETAIL	WEIGHTAGE	Hrs
I	Stereochemistry and bonding in main group compounds VSEPR, Walas diagrams (tri and penta - atomic molecules), $d\pi-p\pi$ bonds, Bent rule and energetic of hybridization, some simple reactions of covalently bonded molecules	25%	12
II	Electronic spectra and magnetic properties of transition metal complexes Spectroscopic ground state, correlation, tanabesuganodiagramme for transition metal complexes (d^1-d^9) state, calculation of Dq , B and β parameters, charge transfer spectra, spectroscopic assignment of absolute configuration in optically active metal chelates and there spectrochemical information, anomalous magnetic moment, magnetic exchange coupling and spin cross over.	25%	12
III	Group theory and its application Symmetry elements and symmetry operation, definition of group, subgroup, relation between orders of a finite group and its sub groups, conjugacy relation and classes, point symmetry group, schonfiles symbols, representation of group by matrices, (representation for the $C_n, C_{nv}, C_{nh}, D_{nh}$ etc group to be workout explicitly)	25%	12

	Character of a representation, The great orthogonality theorem and its importance, character table and there use; Spectroscopy.		
IV	Metal-Ligand Bonding Limitation of crystal field theory, molecular orbital theory, octahedral, tetrahedral and square planar complexes, π -bonding and molecular orbital theory.	25%	12

LEARNING OUTCOMES

- ❖ To provide the basic knowledge of very important concepts of the inorganic chemistry (group theory, organometallics, and reagents in inorganic chemistry and reaction mechanism of transition metal complexes). To provide overview of the applications of the concepts in applied field. Students will be able to understand the geometry and structure of different molecules.
- ❖ They can understand bonding nature of different compound.
- ❖ How to make reagents and its properties also can understand reaction mechanisms.

Practicals

M. Sc. Semester I

Inorganic Chemistry

Semester –I Practical's (Inorganic Chemistry)

Semi-microqualitative analysis of 15 mixtures, each having six radicals including less familiar elements (Mo, W, Li, Th, V, Zr, Ce, Be, Ti) and one insoluble compounds.

REFERENCES:

1. Group theory and symmetry in chemistry, L. H. Hall(McGraw Hill)
2. F. A. Cotton, Chemical Applications of Group theory, Wiley Eastern 2nd Edn.1992
3. V. Ramkrishnan& M. S. Gopinadhan, Group theory in Chemistry Vishal Pub.1996.
4. Group Theory and its Chemical Applications P.K.Bhattacharya, Himalaya Publishing House
5. Advanced inorganic chemistry F.A. Cotton
6. Mechanism of Inorganic Reactions, F. Basolo and R. G. Persons, Wiley Pub
7. Inorganic chemistry by J.D.Lee
8. Advanced in inorganic chemistry by Puri, Sharma and Kaliya
9. Inorganic chemistry, principal of structure and reactivity, 4th Edition; James E.Huheey: Elleu A. Keiter: Richard L. Keiter.
10. Advanced Inorganic Chemistry; F.A.Cotton and G. Wilkinson