



Department of Chemistry and Chemical Sciences
CENTRAL UNIVERSITY OF JAMMU
 Rahya-Suchani (Bagla), District-Samba,
 Jammu-181143, (J&K) India

Five-year Integrated M.Sc. Chemistry
Teaching Plan (Feb 2021-May 2021)

Semester: IV
 Course: Inorganic Chemistry (ICCHM4C004T)
 Course Teacher: Dr. Sujata Kundan

Week	Lecture No./Day	Topic to be Taught	No. of Hours	Suggested Readings
1 st Week	1	UNIT – I Chemistry of transition elements-I: General characteristic properties of 3d-block elements	1	1, 2, 3,7
2 nd Week	2	Relative stability of their oxidation states with special reference to electronic configuration, Atomic radii and ionic radii,	1	1, 2, 3,7
	3	Oxidation state, Colour, Ionization enthalpy	1	1, 2, 3,7
	4	Ability to form complexes, Magnetic properties, Catalytic properties	1	1, 2, 3,7
	5	Formation of binary compounds- Oxides, Halides and sulphides	1	1, 2, 3,7
3 rd Week	6	Contd...	1	1, 2, 3,7
	7	Contd...	1	1, 2, 3,7
	8	Contd...	1	1, 2, 3,7
4 th Week	9	Coordination number, Geometry and complex formation	1	1, 2, 3,7
	10	UNIT – II Chemistry of transition elements-II: General characteristic properties of 4d- and 5d-block elements	1	1, 2, 3, 7
	11	Comparative treatment with 3d-analogues with special reference to electronic configuration, Atomic radii and ionic radii	1	1, 2, 3, 7
	12	Colour, Variable valency, Ability to form complexes	1	1, 2, 3, 7
5 th Week	13	Magnetic and catalytic properties	1	1, 2, 3, 7
	14	Difference between 3d-, 4d- and 5d-transition series	1	1, 2, 3, 7
	15	Contd...	1	1, 2, 3, 7
	16	Position of lanthanides and actinides in the periodic table	1	1, 2, 3, 7
6 th Week	17	Lanthanide contraction	1	1, 2, 3, 7
	18	Spectral and magnetic properties of lanthanides	1	1, 2, 3, 7
	19	Separation of lanthanides and actinides	1	1, 2, 3, 7
7 th Week	20	Revision and Class test for Unit-I	1	
	21	UNIT – III Acids and bases: Acid-base theories: Arrhenius Concept of Acid and Bases	1	7, 8, 9
	22	Bronsted-Lowry Concepts of Acid-Bases, Lewis Concept of Acid-bases	1	7, 8, 9



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	23	Lux-Flood Concept of Acid-Bases Usanovich Concept of Acid-Bases	1	7, 8, 9
8 th Week	24	Hard and soft acids and bases (HSAB), Classification of acids and bases as hard and soft	1	7, 8, 9
	25	Contd...	1	7, 8, 9
	26	Pearson's HSAB concept	1	7, 8, 9
	27	Acid-base strength in relation to hardness and softness, Symbiosis	1	7, 8, 9
9 th Week	28	Theoretical basis of hardness and softness	1	7, 8, 9
	29	Relationship between electronegativity and hardness/softness	1	7, 8, 9
10 th Week	30	Revision and Class Test for Unit- II	1	
11 th Week	31	UNIT – IV Chemistry of non-aqueous solvents: Physical properties of a solvent	1	3, 4, 7, 8, 9
	32	Solvent system and its classification	1	3, 4, 7, 8, 9
	33	Reactions in non-aqueous solvents with reference to liquid NH ₃ , H ₂ SO ₄ , liquid HF, liquid SO ₂ . PCl ₅	1	3, 4, 7, 8, 9
	34	Contd...	1	3, 4, 7, 8, 9
12 th Week	35	Contd..	1	3, 4, 7, 8, 9
	36	Contd...	1	3, 4, 7, 8, 9
	37	Contd...	1	3, 4, 7, 8, 9
13 th Week	38	Chemistry of molten salts as non-aqueous solvents: Solvent properties, solution of metals, complex formation	1	3, 4, 7, 8, 9
	39	Contd...	1	3, 4, 7, 8, 9
	40	Contd...	1	3, 4, 7, 8, 9
14 th Week	41	Low temperature molten salts, Super acids	1	3, 4, 7, 8, 9
	42	Supercritical fluids: Properties of supercritical fluids and their uses as solvents	1	3, 4, 7, 8, 9
	43	Contd...	1	3, 4, 7, 8, 9
	44	Revision and Class test for Unit-III	1	
15 th Week	45	UNIT – V Nuclear chemistry and radioactivity-I: Fundamental particles of nucleus	1	8, 10, 11, 12, 13
	46	Basics of different nuclear models (shell model, liquid drop model, fermi gas model, collective model)	1	8, 10, 11, 12, 13
	47	Contd...	1	8, 10, 11, 12, 13
	48	Contd...	1	8, 10, 11, 12, 13
16 th Week	49	Revision and Class Test for Unit-IV	1	8, 10, 11, 12, 13
	50	Isotone, Isobar and Nuclear isomer	1	8, 10, 11, 12, 13
	51	Nuclear reactions, Types of nuclear reactions	1	8, 10, 11, 12, 13
	52	Chemical effects of nuclear transformations, Nuclear fission and nuclear fusion	1	8, 10, 11, 12, 13
17 th Week	53	Contd...	1	8, 10, 11, 12, 13
	54	Fission products and fission yields	1	8, 10, 11, 12, 13



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	55	Isotope Nuclear reactors: Classification of reactors	1	8, 10, 11, 12, 13
	56	Reactor power, Nuclear waste management	1	8, 10, 11, 12, 13
18 th Week	57	Contd...	1	8, 10, 11, 12, 13
	58	Discussion on Unit-I, II, III, IV	1	
	59	Revision and Class test of Unit-V	1	

REFERENCES

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