Chemistry

Course Code	CYU4300					
Level	04					
Course Title	Inorganic Chemistry					
Credit value	03					
Core/Optional	Core and Optional					
Prerequisites	Pass or Valid OCAM in both CYU3300 and CYU3201					
Hourly breakdown	Theory		Practical hours	Independent Learning	Assessments	Total hrs
	24 Sessions x 02 hrs = 48 hrs	2 DS x 08 hrs +1 DS x 04 hrs = 20 hrs	N/A	24 Sessions x 03 hrs + 8 hrs online = 80 hrs	2 CA x 01 hrs = 02 hrs	150 hrs
Course Aim/s.	Develop a good understanding of coordination chemistry including the nomenclature, isomerism, stability and bonding of coordination compounds, develop a basic knowledge of Radio Chemistry and in solving problems associated with it, develop a theoretical understanding of solids and their structures, develop a good knowledge of Xray diffraction and its application, develop an ability to solve problems associated with the application of Miller indices and learn about symmetry in molecules and their point groups based on symmetry elements					
PLOs addressed by course	**PLO1: Knowledge:** Explain the fundamental, principles and broader knowledge pertaining to the chosen science disciplines offered for the degree. **PLO4: Individual Work, Team Work and Leadership:** Demonstrate the competency in working independently and in groups in addressing issues in multi-disciplinary environments and completing the tasks on time through collaborative learning while exhibiting leadership. **PLO5: Creativity and Problem Solving:** Identify and analyze problems using quantitative and/or qualitative approaches using scientific methodology to provide valid conclusions. **PLO9: Lifelong Learning:** Develop the capacity to foresee new trends and their impacts and continuously update knowledge and develop skills willingly to meet those future challenges.					
Course Learning Outcomes (CLO)	CLO1: Understand the basic concepts of coordination chemistry including associated nomenclature of transition metal complexes, isomerism, metal -ligand interactions, electronic configurations of transition metals, hybridization of orbitals, valence bond theory and crystal field theory to explain physical, magnetic and spectroscopic properties of transition metal complexes, some kinetic and thermodynamics aspects of coordination compounds, important reaction types and the trans effect (PLO1, 5) CLO2: Understand the types of radioactive decay including the derivation of the decay law and solve problems associated with decay energy and radioactive equilibria. Structure of the atomic nucleus, types of nuclides and associated calculations, nuclear reactions and artificial radio activity and terms such as nuclear fission and fusion, nuclear reactions and associated calculations, importance of radionuclides as tracers and radiation source, different analytical methods using radio nuclides, interaction of radiation with matter and its influences on identification and determination, detectors used for counting ionizing radiation (PLO1, 5) CLO3: Understand some basic aspects associated with solids – how the differences in properties [arising out of the nature and arrangement of constituent atoms, ions or molecules] such as mechanical, magnetic, electrical and optical are widely used in a variety of applications of modern technology, use of models to learn about the structure of solids, use of X-rays in structure determination, importance of defects in crystals (PLO1,5, 9) CLO4: Develop and understand the concept of symmetry of molecules for its use in chemistry along with theassociated terms such as symmetry elements and their types, symmetry operations, some simple applications of symmetry (PLO1, 4, 5)					
Content (Main topics, sub topics)	**Coordination Chemistry** concepts and nomenclature, isomerism and bonding in coordination compounds, crystal field theory, stability and reactions of coordination compounds **Introduction to Radiochemistry** Radioactivity, nucleonics, nuclear reactions and artificial radioactivity, radionuclides in Chemistry, Biology and Medicine, Radio method of analysis, effects and measurement of radiation. **Solids and their structures** The nature of crystalline state, structure of some ionic crystalline solids, determination of crystal structure by X-ray diffraction, defects in crystalline state **Symmetry in Molecules** What is symmetry and why do you study symmetry in molecules? Symmetry operations and symmetry elements, Rotations and axes of rotation, reflections and symmetry planes, inversion and inversion centers, improper rotations and improper axes, some simple applications of symmetry of molecules in chemistry					
Teaching Learning methods (TL)	Self-learning: ▪ Instructional material (IL) ▪ Online activities (OL) Non-compulsory contact sessions: ▪ Day school (DS)					
Assessment strategy	Assessments: MCQs (MCQ), structured essay (SEQ)					
	Overall Continuous Assessment Mark (OCAM): 40%			Final Assessment: 60%		
	Continuous Assessment (CA): (60% Best NBT + 40% Other NBT) (02 hrs)			Final Evaluation Theory: 100% (02 hrs)		

Recommended Readings:	• Cotton F. A., Wilkinson G. & Gaus P. L., (1995), Basic Inorganic Chemistry, Wiley, 3rd Ed. • Lee J. D., (2006), Concise Inorganic Chemistry, Blackwell Science 5th Ed • Butler I. S. and Harrod J. F., (1989), Inorganic Chemistry • Malik W. U., Tuli G. D. and Madan R. D., (1991), Selected Topics in Inorganic Chemistry • Prakash S., Tuli G. D., Basu S. K. and Madan R. D., (2005) Advanced Inorganic Chemistry, Vol II