


LESSON PLAN

 UNESA	UNIVERSITAS NEGERI SURABAYA FACULTY OF MATHEMATICS AND NATURAL SCIENCE UNDERGRADUATE PROGRAMME OF CHEMISTRY	Document Code			
SEMESTER LEARNING ACTIYITY PLAN					
COURSE	CODE	Course Group	Credit Unit	Semester	Date
Coordination Chemistry	3074212034	Inorganic Chemistry	2	-	4 th
AUTHORIZATION CHEMISTRY	Compiler	Coordinator		Head of Study Program	
	Dr. Amaria, M.Si.	Dr. Achmad Lutfi, M.Pd.		Dr. Amaria, M.Si.	
Learning Outcomes	Program Learning Outcomes (PLO)				
	PLO1 (KNO-1)	Capable to demonstrate knowledge related to theoretical concepts about structure, dynamics, and energy, as well as the basic principles of separation, analysis, synthesis and characterization of chemicals			
	PLO5 (COM-1)	Applying logical, critical, systematic and innovative thinking in the context of development or implementation of science, technology, and art that regards and applies humanities in accordance with chemistry education in solving problems			
	Course Learning Outcomes (CLO)				
	CLO1	Understand the concepts of covalent bonds, ligands, stereochemistry, stability, magnetic properties and electronic spectra of coordination compounds.			
	CLO2	Draw structures and predict the properties of coordination compounds			
	CLO3	communicate both verbally and in writing the concept of chemical bonds, stereochemistry, stability, magnetic properties, and electronic spectra of the coordination compound.			
	CLO4	Demonstrate caring attitude and responsibility in applying coordination compounds in the environment			
	Sub CLO				
	Sub-CLO1	Understand the development of bond theory concepts in coordination compounds			
	Sub-CLO2	Apply the various bond theories in coordination compounds			
	Sub-CLO3	Describe the geometry and isomers of coordination compounds			
Sub-CLO4	Understand the stability of the coordination compound complex				

	Sub-CLO5	Understand Term Symbols, Multiplicity, Orgel Diagrams, and Tanabe-Sugano diagrams of coordination compounds					
Brief Description of the Course	The study of the concepts: chemical bonding, stereochemistry, reaction mechanisms, properties, spectra, synthesis and stability of coordination chemistry through discussion, presentation, structured assignments						
Study Materials: Learning Materials	The concept of coordination compounds, bond theories, types of ligands, stereochemistry, stability of complex ions, term symbols, multiplicity, Orgel diagrams, and Tanabe-Sugano diagrams of coordination compounds						
Reference	Main :						
		<ol style="list-style-type: none"> Basolo, F and Johnson, R.C. 1986. Coordination Chemistry, 2nd Edition. New York: W.A. Benjamin, Inc. Sugiarto, Bambang. 2006. Teori Senyawa Koordinasi. Surabaya: Unesa University Press. 					
	Additional :						
		<ol style="list-style-type: none"> Quagliano, J. V. And Vallarino, L. M., 1969. Coordination Chemistry, Massachusetts: D. C. Heath and Company Huheey, E. James, Ellen, A.K, and Richard I.K. 1978. Inorganic Chemistry, Principle of Structure and Reactivity. USA: Harper Collins College Publishers Madan, R.D., 1997. Modern Inorganic Chemistry , S. Chand and Company LTD, New Delhi. 					
Lecturer	Prof. Dr. Sari Edy Cahyaningrum. M.Si., Dr. Amaria, M.Si., Dina Kartika Maharani, S.Si., M.Sc.						
Prerequisite courses	-						
Meeting	The final ability of each activity	Assessment		Learning Forms, Learning Methods, Student Assignment		Reference	Rating Weight (%)
		Indicator	Criteria & Form	Offline	online		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Understand the properties, development and nomenclature of coordination compounds	<ol style="list-style-type: none"> Distinguish between double salt and coordination compound Describe the development and nomenclature of coordination compounds. 	Essay writing test	<ul style="list-style-type: none"> Lecture Discussion Exercises 1x2x50 minutes 	-	Coordination compound concept (Reference number 1, 2 & 5)	10

2	Apply the various bond theories in coordination compounds	1. Apply the concept of electron pair bonding 2. Apply the concept of Effective Atomic Number	Essay writing test	- Lecture - Discussion - Exercises - 1x2x50 minutes	-	Electron pair bonds (Reference number 1 & 2)	20
3-4	Apply the various bond theories in coordination compounds	1. Apply Valence Bond Theory 2. Apply Cristal Field Theory	Essay writing test	- Lecture - Discussion - exercises - 2x2x50 minutes	-	Valence Bond Theory (Reference number 1 & 2)	
5-7	Apply the various bond theories in coordination compounds	1. Explain the advantages of molecular orbital theory over crystal field theory in coordination compounds 2. Apply molecular orbital theory to prove the paramagnetic properties of coordination compounds 3. Apply molecular orbital theory to prove the strength of bonds in coordination compounds	Essay writing test	- Lecture - Direct Instruction Model - Discussion - Exercises - 3x2x50 minutes	-	Molecular Orbital Theory (Reference number 1, 2 & 3)	10
8	Mid-Term Exam						
9	Understand the geometry and isomers of coordination compounds	1. Describe the various type of isomers in coordination compounds 2. Determine the geometrical isomers of coordination compound	Essay writing test	- Lecture - Direct Instruction Model - Discussion - Exercises - 1x2x50 minutes	-	Coordination compounds Isomers (Reference number 1, 2 & 5)	20

		3. Determine the optically active isomers of coordination compound					
10-11	Understand the determinant factors of coordination compound stability	<ol style="list-style-type: none"> 1. Describe the differences of the thermodynamic and kinetic complex stability 2. Write down the reaction steps of formation reaction and writing the stability constant of coordination compound 3. Describe the factors that affect the stability constant 	Essay writing test	<ul style="list-style-type: none"> - Lecture - Cooperatif Learning Model - Discussion - Exercises - 2x2x50 minutes 	-	Stability of coordination compound (Reference number 1, 2 & 3)	20
12	Understand Term Symbols, Multiplicity, Orgel Diagrams, and Tanabe-Sugano Diagrams	Describe the Term Symbols	Essay writing test	<ul style="list-style-type: none"> - Lecture - Cooperatif Learning Model - Discussion - Exercises - 1x 2x50 minutes 	-	Term symbol (Reference number 5)	20
13	Understand Term Symbols, Multiplicity, Orgel Diagrams, and Tanabe-Sugano Diagrams	Describe the multiplicity	Essay writing test	<ul style="list-style-type: none"> - Lecture - Cooperatif Learning Model - Discussion - Exercises - 1x2x50 minutes 	-	Multiplicity (Reference number 5)	
14-15	Understand Term Symbols, Multiplicity, Orgel Diagrams, and Tanabe-Sugano Diagrams	Describe the Orgel Diagrams, and Tanabe-Sugano Diagrams	Essay writing test	<ul style="list-style-type: none"> - Lecture - Cooperatif Learning Model - Discussion 	-	Orgel Diagram & Tanabe-Sugano Diagram	

				- Exercises - 1x2x50 minutes		(Reference number 5)	
16	Final Exams						100