

Tsuyama College		Year	2022		Course Title	Inorganic Chemistry	
Course Information							
Course Code	0070		Course Category		Specialized / Elective		
Class Format	Lecture		Credits		Academic Credit: 2		
Department	Department of Integrated Science and Technology Communication and Informations System Program		Student Grade		4th		
Term	Year-round		Classes per Week		1		
Textbook and/or Teaching Materials	Inorganic Chemistry, 2nd ed. Its modern approach (Kazuyuki Hirao, et al., Tokyo Kagaku Dojin)						
Instructor	MORITOMO Hiroki						
Course Objectives							
Learning purposes : To acquire the basics of complex chemistry, solution and solid state chemistry.							
Course Objectives : 1. To understand and explain about various properties of solutions and solids. 2. To understand and be able to explain about various properties of transition metal complexes.							
Rubric							
	Excellent	Good	Acceptable	Not acceptable			
Achievement 1	Students can explain the properties of solutions and solids with specific examples.	Students can explain the properties of solutions and solids.	Students understand the properties of solutions and solids.	Students do not understand the properties of solutions and solids.			
Achievement 2	Students can explain the properties and characteristics of transition metal complexes in their own words, giving concrete examples.	Students can explain the properties and characteristics of transition metal complexes in their own words.	Students can describe the properties and characteristics of transition metal complexes.	Students cannot describe the nature and characteristics of the transition metal complexes.			
Achievement 3							
Assigned Department Objectives							
Teaching Method							
Outline	General or Specialized : Specialized Foundational academic disciplines : Inorganic chemistry, physical chemistry, organic chemistry Relationship with Educational Objectives : This class aims to (3) Acquire deep foundation knowledge of the major subject area. Course outline : Chemistry can be broadly classified into the fields of inorganic chemistry, organic chemistry, and physical chemistry, with inorganic chemistry being one of the major areas of study. Specifically, this course focuses on solutions, complexes and solids, and aims to understand their various properties, making use of thermodynamics and quantum theory.						
Style	Course method : All lectures will be given using a projector. It is planned that the lectures will proceed at a pace of approximately one chapter per week. Grade evaluation method : Evaluation will be based on the examinations only. A simple average of the midterm and final examinations will be the grade point. Resits will be announced as soon as possible, and students should follow the instructions.						
Notice	Precautions on the enrollment : Students must take this class (no more than one-fifth of the required number of class hours missed) and earn the credit in order to complete the 4th year course. This is a "class that requires study outside of class hours". Classes are offered for 15 hours per credit, but 30 credit hours are required in addition to this. Follow the instructions of your instructor for these studies. Course advice : This is a specialized subject. Students will not learn anything if they attend lectures in a passive attitude. Students are required to read the designated sections of the textbook before each lecture. Do not rely on rote memorization. Students are encouraged to think logically in order to understand the essence of chemistry. Attendance advice : • This is a subject related to the development of human resources for the environment and energy. • Students are expected to read at least three textbooks describing the same thing in order to learn things. • Students will be considered absent 15 minutes after the start of class. Foundational subjects : Chemistry I (2nd year), Chemistry II (3rd), General chemistry (3rd), Related subjects : Organic chemistry I (4th year), Organic chemistry II (5th), Chemistry experiment (4th), Physical Chemistry (5th)						
Characteristics of Class / Division in Learning							
☐ Active Learning		☐ Aided by ICT		☐ Applicable to Remote Class		☐ Instructor Professionally Experienced	
Elective must complete subjects							
Course Plan							
			Theme			Goals	

1st Semester	1st Quarter	1st		
		2nd		
		3rd		
		4th		
		5th		
		6th		
		7th		
		8th		
	2nd Quarter	9th		
		10th		
		11th		
		12th		
		13th		
		14th		
		15th		
		16th		
2nd Semester	3rd Quarter	1st	Guidance, Solution Chemistry 1: Acids and bases	To understand the definitions of acids and bases.
		2nd	Solution chemistry 2 : Oxidation and reduction	To understand the definitions of oxidation and reduction.
		3rd	Coordination Chemistry 1: Coordination Compounds and Coordination Binding, Nomenclature	To understand coordination bonds based on quantum theory and to correctly name coordination compounds based on nomenclature.
		4th	Coordination Chemistry 2: Crystal Field Theory and Ligand Field Theory	To be able to explain various properties of complexes based on crystal and ligand field theories.
		5th	Coordination Chemistry 3: Electronic State of Complexes	To be able to interpret the optical absorption spectra of the complexes.
		6th	Coordination Chemistry 4: Structure of complexes	To understand the three-dimensional structure of the complexes.
		7th	Coordination Chemistry 5: Stability of Complexes	To be able to discuss the stability of the complexes on the basis of thermodynamics.
		8th	【Mid-term exam】	
	4th Quarter	9th	Solid State Chemistry 1: Crystal Structure	To understand crystal structure and symmetry.
		10th	Solid State Chemistry 2: Single crystal and polycrystal, Amorphous solid	To understand the properties of single crystals, polycrystals, and amorphous materials.
		11th	Solid state chemistry 3: Lattice vibrations and thermal properties	To understand the concept of lattice vibrations and to be able to explain the thermal properties of solids (heat capacity and heat transfer).
		12th	Solid state chemistry 4: Electronic structure and electrical conductivity of solids	To learn band theory.
		13th	Solid State Chemistry 5 : Dielectric properties and dielectric materials	To understand what a dielectric is and to know typical dielectric materials.
		14th	Solid State Chemistry 6: Magnetic properties and magnetic materials	To Understand the magnetic properties of solids.
		15th	【Final exam】	
		16th	Return and commentary of exam answers	

Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	100	0	0	0	0	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	100	0	0	0	0	0	100
Cross Area Proficiency	0	0	0	0	0	0	0