

Tsuyama College		Year	2021		Course Title	Chemistry II
Course Information						
Course Code	0044		Course Category	General / Compulsory		
Class Format	Lecture		Credits	School Credit: 2		
Department	Department of Integrated Science and Technology Communication and Informations System Program		Student Grade	3rd		
Term	Year-round		Classes per Week	2		
Textbook and/or Teaching Materials	Chemistry (Tokyo Shoseki)					
Instructor	MORITOMO Hiroki,TAKAGI Kenji,YAMAMOTO Yoshimi					
Course Objectives						
Learning purposes : To understand the three states of matter, the forces acting on matter, the structure and reaction of organic matter, and the properties of solutions, and to develop a view of matter that will enable us to respond appropriately to the serious environmental problems we are facing today.						
Course Objectives : 1) To explain the change of state. 2) To explain and calculate the equation of state for gases. 3) To explain the kinetic properties of colloids (e.g., Brownian motion). 4) To explain the structure and functional groups of organic compounds, and the synthesis methods of these compounds. 5) To perform experiments using equipment and reagents according to the purpose and to prepare reports.						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	Students can explain about the state change in their own words, giving specific examples with state diagrams.	Student can explain the state change by using the state diagram as well.	Student can explain briefly about the state change with the help of the state diagram.	Students did not understand about state change.		
Achievement 2	Students can explain the principles and benefits of spectroscopic measurements with specific examples.	Students can explain and calculate the phenomena described by the equation of state for gases.	Students can briefly describe the phenomena described by the equation of state for gases.	Students cannot calculate the equation of state of a gas.		
Achievement 3	Students can explain specifically the kinetic properties of colloids in relation to the phenomena around them.	Students can explain the kinetic properties of colloids in detail.	Students can give examples of the kinetic properties of colloids.	Students cannot explain the kinetic nature of colloids.		
Achievement 4	Students can explain the bonding, structure and functional groups of organic compounds and the synthesis of typical compounds with specific examples.	Students can explain the structure and functional groups of organic compounds and the synthesis of typical compounds with specific examples.	Students can Explain the structures and functional groups of organic compounds and the synthesis of typical compounds.	Students cannot explain the structures and functional groups of organic compounds, and the synthesis of typical compounds.		
Achievement 5	Students can select instruments and reagents for their own purposes and conduct appropriate experiments. In addition, students are able to write reports in their own words and in a logical manner.	Students can perform experiments using instruments and reagents as instructed. In addition, students are able to write reports in their own words and in a logical manner.	Students can perform experiments using instruments and reagents as instructed. In addition, students can write reports as instructed.	Students cannot perform and complete experiments and reports as directed.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : General Field of learning : Common and Basic natural science Required, Elective, etc. : Must complete subjects Foundational academic disciplines : Inorganic chemistry, physical chemistry, organic chemistry Relationship with Educational Objectives : This class is equivalent to (2) Acquire basic science and technical knowledge. Relationship with JABEE programs : The main goals of learning / education in this class is"(A)". Course outline : This course follows on from Chemistry I. It teaches basic knowledge for understanding various chemical phenomena. This course covers chemical bonds, organic compounds closely related to life, and properties of gases and solutions.					

Style	<p>Course method : Two credit hours per week, two consecutive periods, in principle, at each home room. The lectures are mainly board-based, but students are required to conduct chemical experiments as needed, summarize the results of the experiments, and submit reports on their observations. Students are required to submit reports and quizzes on basic problems as necessary.</p> <p>Grade evaluation method : The scores of the four regular examinations are evaluated equally (70%), and the quizzes, reports, and class attitudes are taken into account (30%). In principle, the first semester's grades are a simple average of the midterm grades and the grades are a simple average of all the results. Only a calculator is allowed to be taken into the test. Those who have scored less than 60 points in the examination may be re-tested for a maximum score of 60. Follow the given instructions for re-taking a test.</p>
Notice	<p>Precautions on the enrollment : Students must take this class (no more than one-third of the required number of class hours may be missed) in order to complete the 3rd year course.</p> <p>Course advice : Think about the phenomena that occur around you from the perspective of "matter". Learn to have an image of the structure of matter. Always ask questions, and try to solve the problems you don't understand. Don't rely on rote memorization; it is important to understand, not just to remember.</p> <p>Related subjects : Chemistry I (2nd years), General Chemistry (3rd), Organic Chemistry I (4th), Organic Chemistry II (5th), Inorganic Chemistry (4th), Biochemistry (4th), Experiments in Chemistry (4th), Physical Chemistry (5th)</p> <p>Attendance advice : Students should memorize the basic items such as elemental symbols, chemical formulas, units of measure and so on, as instructed by the instructor. It is necessary to make an effort to develop the ability to apply the knowledge and understanding of the material, rather than relying on memory. Be sure to submit your reports on time and be consistent. If you are late for class, you will be considered absent after 15 minutes from the start of the class. Failure to attend a lecture may be counted as an absence.</p>

#### Characteristics of Class / Division in Learning

<input type="checkbox"/> Active Learning	<input type="checkbox"/> Aided by ICT	<input type="checkbox"/> Applicable to Remote Class	<input type="checkbox"/> Instructor Professionally Experienced
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#### Course Plan

			Theme	Goals
1st Semester	1st Quarter	1st	Guidance, The Three States of Matter	To understand the three states of matter.
		2nd	Change of state between gas/liquid	To be able to interpret the state diagram.
		3rd	Properties of gases (1)	To be able to explain Boyle-Charles' law.
		4th	Properties of gases (2)	To be able to explain and calculate the equation of state of a gas.
		5th	Properties of gases (3)	To understand the difference between an ideal gas and a real gas.
		6th	Properties of the solution	To understand the general properties that solutions exhibit.
		7th	Properties of Colloids	To understand what a colloid is.
		8th	【1st semester mid-term exam】	
	2nd Quarter	9th	Return and commentary of exam answers	
		10th	Reaction kinetics (1)	To understand the definition of reaction rate.
		11th	Reaction kinetics (2)	To understand the meaning of the reaction rate equation.
		12th	Chemical equilibrium (1)	To understand the concept of chemical equilibrium.
		13th	Chemical equilibrium (2)	To be able to use the law of mass action to calculate the amount of matter in equilibrium.
		14th	Ionization equilibrium	To be able to calculate the ionization degree of weak acids and weak bases.
		15th	【1st semester final exam】	
		16th	Return and commentary of exam answers	
2nd Semester	3rd Quarter	1st	Late guidance, characteristics and classification of organic compounds	To understand what an organic compound is.
		2nd	Aliphatic hydrocarbons (saturated hydrocarbons)	To understand the structure and properties of typical hydrocarbons.
		3rd	Aliphatic hydrocarbons (unsaturated hydrocarbons)	same as above
		4th	Organic compounds containing functional groups and oxygen (alcohols and ethers)	To understand properties of alcohol and ether and their reactions.
		5th	same as above	same as above
		6th	Organic compounds containing functional groups and oxygen (carboxylic acids and esters)	To understand properties and reactions of carboxylic acids.
		7th	same as above	same as above
		8th	【2nd semester mid-term exam】	
	4th Quarter	9th	Return and commentary of exam answers	
		10th	Aromatic compounds [aromatic hydrocarbons]	To understand the structure and reactivity of aromatic compounds.
		11th	polymer chemistry	Learn the basics of polymeric organic chemistry.

		12th	Chemistry Experiment 1	To be able to perform experiments safely and correctly and write reports on the experiments performed.
		13th	Chemistry Experiment 2	same as above
		14th	Chemistry Experiment 3	same as above
		15th	【2nd semester final exam】	
		16th	2nd semester final exam	

Evaluation Method and Weight (%)							
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	Examination	Presentation	Mutual Evaluations between students	Behavior	Portfolio	Other	Total
Subtotal	70	0	0	0	0	30	100
Basic Proficiency	70	0	0	0	0	30	100
Specialized Proficiency	0	0	0	0	0	0	0
Cross Area Proficiency	0	0	0	0	0	0	0