

Anan College		Year	2024		Course Title	Organic Chemistry 1	
Course Information							
Course Code		1413A01		Course Category		Specialized / Compulsory	
Class Format		Lecture		Credits		School Credit: 2	
Department		Course of Chemical Engineering		Student Grade		3rd	
Term		Year-round		Classes per Week		前期:2 後期:2	
Textbook and/or Teaching Materials		Fundamentals of ORGANIC CHEMISTRY seventh edition					
Instructor		Sugiyama Yuuki,Otani Takashi					
Course Objectives							
1. The students will learn the concept of chemical bonding and basic knowledge of acids and bases. 2. The students will learn basic knowledge of nomenclature. 3. The students will learn the mechanisms of substitution, elimination, and addition reactions. 4. The students will learn aromaticity and learn basic knowledge of the reactions of aromatic compounds.							
Rubric							
		Ideal Level		Standard Level		Minimum Level	
Objective 1		Explain the atomic structure and the mechanisms of covalent and ionic bonding, and the mechanisms of acid/base reactions.		Explain the atomic structure and the mechanism of covalent and ionic bonding and about 70% of the mechanism of acid/base reactions.		Explain the atomic structure and the mechanism of covalent and ionic bonding and about 50% of the mechanism of acid/base reactions.	
Objective 2		Write the structures and nomenclature of compounds.		Write about 70% of the structures and nomenclature of compounds.		Write about 50% of the structures and nomenclature of compounds.	
Objective 3		Logically induce the reaction mechanisms of substitution, elimination, and addition reactions of compounds categorized by functional group.		The reaction mechanism of substitution, elimination, and addition reactions of compounds categorized by the functional group is induced by about 70 %.		The reaction mechanism of substitution, elimination, and addition reactions of compounds categorized by the functional group is induced by about 50 %.	
Objective 4		Explain the properties of aromatic compounds and describe electrophilic substitution reactions and their reaction mechanisms.		Explain the properties of aromatic compounds and electrophilic substitution reactions and their reaction mechanisms by about 70%.		Explain the properties of aromatic compounds and electrophilic substitution reactions and their reaction mechanisms by about 50%.	
Assigned Department Objectives							
学習・教育到達度目標 D-1							
Teaching Method							
Outline		Organic compounds are important constituents of everyday products and living organisms. Learning about the vast number of organic compounds by rote memorization alone is impossible. However, by classifying them as compounds that exhibit similar physical and chemical properties, it is clear that there are few different organic compounds to memorize. This lecture aims to learn the basics of the properties, reactions, and syntheses characteristic of each functional group that exhibits common properties, as well as the differences in functionality at the molecular level.					
Style		The class will follow the order of the lesson plan for the most part. Organic chemistry is not all about memorization, although there is much to learn individually. This lecture will emphasize that chemical phenomena can be explained logically based on electronegativity, resonance, and the three-dimensional structure of compounds.					
Notice		Organic chemistry is a discipline in which accumulation is significant. Students often fail to master new fields of study without understanding the content of each class. Students should focus on reviewing and studying.					
Characteristics of Class / Division in Learning							
<input type="checkbox"/> Active Learning		<input checked="" type="checkbox"/> Aided by ICT		<input checked="" type="checkbox"/> Applicable to Remote Class		<input checked="" type="checkbox"/> Instructor Professionally Experienced	
Course Plan							
			Theme		Goals		
1st Semester	1st Quarter	1st	Guidance / Chapter 1: structure and bonding 1		Explain the electron configuration.		
		2nd	Chapter 1: structure and bonding 2		Explain the atomic structure, ionic bonding, and covalent bonding.		
		3rd	Chapter 1: structure and bonding 3		Explain the formation of formal charges and covalent bonds.		
		4th	Chapter 1: acids and bases 1		Explain atomic and hybrid orbitals (s, p, d orbitals, and shapes).		
		5th	Chapter 1: acids and bases 2		Explain the definitions of pKa and Brønsted-Lowry.		
		6th	Chapter 1: acids and bases 3		Explain the definitions of organic acids, organic bases, and Lewis.		
		7th	Chapter 2: alkanes 1		Name Alkanes and cycloalkanes according to IUPAC rules.		
		8th	Early mid-term examination				
	2nd Quarter	9th	Return and explanation of early mid-term examinations Chapter 2: alkanes 2		Explain the steric conformation of the alkanes.		

2nd Semester		10th	Chapter 2: alkanes 3	Explain the steric conformation of cycloalkanes
		11th	Chapter 6: stereochemistry in tetrahedral centers 1	Explain chiral compounds and enantiomers.
		12th	Chapter 6: stereochemistry in tetrahedral centers 2	Name enantiomers according to the R, S notation. Explain specific rotation.
		13th	Chapter 6: stereochemistry in tetrahedral centers 3	Explain diastereomers, meso compounds, racemic mixture and optical resolution.
		14th	Chapter 3: alkenes and alkynes 1	Name Alkenes and cycloalkanes according to IUPAC rules.
		15th	Chapter 3: alkenes and alkynes 2	Explain alkene structures and cis-trans isomers, and make E, Z notation.
		16th	Return and explanation of term-end examination	
	3rd Quarter	1st	Chapter 3: alkenes and alkynes 4	Name alkynes and cycloalkanes according to IUPAC rules.
		2nd	Chapter 3: alkenes and alkynes 5	Explain electrophilic addition reactions of alkenes.
		3rd	Chapter 3: alkenes and alkynes 6	Explain the addition of HX to alkenes.
		4th	Chapter 4: alkenes and alkynes reactions 1	Explain the addition reactions of water, alcohols, and hydrogen to alkenes.
		5th	Chapter 4: alkenes and alkynes reactions 2	Explain regioselectivity in electrophilic addition reactions of alkenes.
		6th	Chapter 4: alkenes and alkynes reactions 3	Explain the oxidation of alkenes. The polymers can be explained.
		7th	Chapter 4: alkenes and alkynes reactions 4	Explain the addition reaction of hydrogen halides to alkynes and the addition reaction of water to alkynes. The acidity of the hydrogen bonded to the sp carbon can be explained.
		8th	Late mid-term examination	
	4th Quarter	9th	Return and explanation of late mid-term examinations Chapter 4: alkenes and alkynes reactions 5	Explain resonance.
		10th	Chapter 4: alkenes and alkynes reactions 6	Explain the reaction of conjugated dienes.
		11th	Chapter 5: aromatic compounds 1	Explain the structure of benzene. Name aromatic compounds according to IUPAC rules.
		12th	Chapter 5: aromatic compounds 2	Explain aromatic electrophilic substitution reactions.
		13th	Chapter 5: aromatic compounds 3	Explain the Frieden-Crafts reaction. Aromatic oxidation and reduction reactions can be explained.
		14th	Chapter 5: aromatic compounds 4	Explain the effect of substituents on orientation.
		15th	Chapter 5: aromatic compounds 5	Explain the definition of aromatics.
		16th	Return and explanation of final examination	

#### Evaluation Method and Weight (%)

	Examination	Quiz	Portfolio	Presentation and Attitude	Other	Total
Subtotal	70	5	0	0	25	100
Basic Proficiency	40	5	0	0	20	65
Specialized Proficiency	30	0	0	0	5	35
Cross Area Proficiency	0	0	0	0	0	0