

Anan College		Year	2024		Course Title	Fundamental Experiments in Materials Chemistry 2	
Course Information							
Course Code		1412T21		Course Category		Specialized / Compulsory	
Class Format		Experiment / Practical training		Credits		School Credit: 2	
Department		Course of Chemical Engineering		Student Grade		2nd	
Term		Second Semester		Classes per Week		後期:4	
Textbook and/or Teaching Materials		Handout (Fundamental Experiments in Materials Chemistry 1), Fundamentals of Chemistry (Daiichi Gakushu-sha), Chemistry (Daiichi Gakushu-sha)					
Instructor		Sugiyama Yuuki,Otani Takashi					
Course Objectives							
1. The students will learn how to prepare reports using experimental data. 2. The students will use experimental methods to synthesize organic compounds (assembly of experimental apparatus, weighing and mixing of reagents, adjustment of reaction conditions, post-reaction treatment, isolation and purification of products). 3. The students will use methods to confirm (identify) products of organic compounds.							
Rubric							
		Ideal Level		Standard Level		Minimum Level	
Objective 1		The student will prepare a logical and appropriate report using the experimental data.		The student will prepare a logical report using the experimental data.		The student will prepare a report using the experimental data.	
Objective 2		The student will properly perform synthetic experiments on organic compounds.		The student will perform synthetic experiments on organic compounds.		The student will conduct synthetic experiments of organic compounds with instructions.	
Objective 3		The students will adequately identify the products of organic compounds.		The students will identify the products of organic compounds.		The students identify the products of organic compounds with instructions.	
Assigned Department Objectives							
学習・教育到達度目標 D-2 学習・教育到達度目標 D-4							
Teaching Method							
Outline		To understand and master chemistry as an academic discipline, it is essential to take classes in each specialized subject and conduct experiments in chemistry. This course is the first experimental course for students after they are assigned to the Chemistry Course. It aims to provide basic knowledge of chemistry experiments (experimental techniques, rules of chemistry laboratories, how to prepare laboratory notebooks, how to discuss experimental results, etc.). To learn basic organic chemistry experimental operations (assembly of experimental apparatus, weighing and mixing of reagents, adjustment of reaction conditions, post-treatment of reactions, isolation, and purification of products) and methods to check products by performing typical organic chemistry reactions. Understand the meaning of experimental manipulations and reaction mechanisms, and be able to prepare logical reports of experimental results.					
Style		Experiments are the foundation of chemistry, and mastery of basic techniques is essential. Students will first consider the purpose of the experiment, learn experimental methods and concepts in the preliminary study, and then confirm them in the experiment to experience and deepen their understanding of the laws of chemistry. After the experiments, students analyze the experimental data obtained through accurate measurements and compile them into a report. If this report writing phase is considered a review, the students will learn the experiment in depth by repeating the chemistry experiment's preparation, experiment, and review phases. Students must complete the experimental plan in the experimental notebook before the experiment begins. At the end of the experiment, students must submit the notebook and report the results and experimental data to the instructor in charge to complete this experiment.					
Notice		The following precautions must be taken to ensure the experiment is carried out safely. 1. Eating and drinking are strictly prohibited in the laboratory. 2. Students must wear the prescribed white lab coat and jacket when entering the laboratory. Students with long hair must tie it back. 3. Before starting experiments, students must wear safety glasses and gloves. 4. Students must promptly follow any instructions given by the teacher. 5. Reports must be submitted by the due date. 6. In case of absence, notify the teacher immediately. No credit will be given for any unexperienced work or reports that have yet to be submitted. 7. Grades will be based on reports, notes, examinations, and attitude.					
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 checked="" type="checkbox"/> Instructor Professionally Experienced	
Course Plan							
			Theme		Goals		
2nd Semester r	3rd Quarter	1st	Guidance				
		2nd	Separation and purification of organic compounds (1)		Purify by recrystallization		
		3rd	Synthesis of superabsorbent polymer (1)		Synthesize cross-linkable polymer.		
		4th	Synthesis of superabsorbent polymer (2)		Evaluate the water absorption of synthesized polymers.		
		5th	Synthesis of ethyl acetate (1)		Synthesize ester.		
		6th	Synthesis of ethyl acetate (2)		Perform fractional distillation, GC, and NMR measurements to identify ethyl acetate.		
		7th	IR, NMR analysis method		Explain and analyze the principles of IR and NMR.		

		8th	Separation and purification of organic compounds (2)	Extraction is performed using a separatory funnel.
	4th Quarter	9th	Synthesis of acetanilide (1)	Synthesize amide.
		10th	Synthesis of acetanilide (2)	IR, NMR, and melting point measurements are performed to identify acetanilide.
		11th	Report coaching and lectures	
		12th	Interfacial polycondensation reaction	Synthesize 66 nylon.
		13th	Synthesis of azo dyes (1)	Synthesize azo compound by azo coupling.
		14th	Synthesis of azo dyes (2)	Identify compounds by TLC.
		15th	Instrument Check, examination, submission of notes, and summary of experiments	
		16th	Preliminary Experiment Day/Instrument Check	

#### Evaluation Method and Weight (%)

	Examination	Quiz	Portfolio	Presentation and Attitude	Other	Total
Subtotal	0	0	0	0	100	100
Basic Proficiency	0	0	0	0	60	60
Specialized Proficiency	0	0	0	0	40	40
Cross Area Proficiency	0	0	0	0	0	0