

Anan College		Year	2024		Course Title	Chemical Engineering 1	
Course Information							
Course Code		1413E03		Course Category		Specialized / Compulsory	
Class Format		Lecture		Credits		School Credit: 1	
Department		Course of Chemical Engineering		Student Grade		3rd	
Term		Second Semester		Classes per Week		後期:2	
Textbook and/or Teaching Materials		ベーシック化学工学（化学同人）橋本健治著					
Instructor		Ueda Kohei					
Course Objectives							
1. Understand fluid dynamics and apply it to the design of fluid transport devices. 2. Understand the basic principles of distillation and apply them to the design of distillation towers.							
Rubric							
		Ideal Level		Standard Level		Minimum Level	
Achievement 1		Understand fluid dynamics and apply it to the design of fluid transport devices.		Understand fluid dynamics and solve basic problems		Understanding the fundamentals of fluid dynamics	
Achievement 2		Understand the basic principles of distillation and apply them to the design of distillation towers.		Understand the basic principles of distillation and solve basic problems		Understand the basic principles of distillation	
Assigned Department Objectives							
学習・教育到達度目標 D-1							
Teaching Method							
Outline		Chemical engineering is a field of engineering that deals with the operation and design of chemical plants. This course introduces the unit operations of (1) transport phenomena involving fluid dynamics, material balance, and energy balance, and (2) the distillation process through gas-liquid equilibrium.					
Style		Assignments will be given for each lecture. The assignments will help you review and prepare for the lecture. Short exercises will be given during the class. Please remember to bring your calculator.					
Notice		If you have any questions, please ask them in class. No questions will be accepted during the exam period.					
Characteristics of Class / Division in Learning							
☐ Active Learning		☐ Aided by ICT		☐ Applicable to Remote Class		☐ Instructor Professionally Experienced	
Course Plan							
			Theme		Goals		
2nd Semester	3rd Quarter	1st	Fluid transfer principles and equipment		Understand fluid properties and the structure of pumps.		
		2nd	Equation of continuity		Apply the equation of continuity.		
		3rd	Bernoulli's principle		Apply Bernoulli's principle.		
		4th	Viscosity		Understand fluid viscosity.		
		5th	Reynolds number		Calculate the Reynolds number.		
		6th	Friction losses in pipe flow		Determine the friction losses in the pipe flow.		
		7th	Power requirements for fluid transport.		Determine power requirements for fluid transport.		
		8th	Midterm examination				
	4th Quarter	9th	Distillation principles and equipment		Understand the structure of distillation equipment.		
		10th	Vapor-liquid equilibrium 1		x-y diagram		
		11th	Vapor-liquid equilibrium 2		Antoine equation		
		12th	Simple distillation		Rayleigh's equation for single distillation.		
		13th	Continuous distillation 1		Determine the theoretical plate number of a distillation tower using the McCabe-Thiele method.		
		14th	Continuous distillation 2		Understand the principle of theoretical plate number determination.		
		15th	Continuous distillation 3		Understand the principle of theoretical plate number determination.		
		16th	Final examination				
Evaluation Method and Weight (%)							
	Examination		Quiz	Portfolios	Other	Total	
Subtotal	70		10	20	0	100	
Basic Proficiency	0		0	0	0	0	
Specialized Proficiency	70		10	20	0	100	
Cross Area Proficiency	0		0	0	0	0	