

Anan College		Year	2024	Course Title	Electrical Machinery 2
Course Information					
Course Code	1314E01		Course Category	Specialized / Compulsory	
Class Format	Lecture		Credits	Academic Credit: 2	
Department	Course of Electrical Engineering		Student Grade	4th	
Term	First Semester		Classes per Week	前期:2	
Textbook and/or Teaching Materials	Electrical equipment lecture notes that can be understood from the basics (Ohmsha) / None				
Instructor	Park Youngsoo				
Course Objectives					
1. Explain the characteristics of the transformer and calculate the voltage volatility and equivalent circuit constants 2. Explain the characteristics of the synchronous machine and calculate the synchronous impedance and output 3. Explain the characteristics of the inducer in synchronous watts and calculate controlled rotation speed 4. Explain the types and characteristics of speed control methods 5. Explain the stability conditions of electric motor operation, and calculate the rotation speed and torque in the balanced state.					
Rubric					
	Ideal achievement level		Standard achievement level		Minimum achievement level
Achievement Goal 1	Able to calculate equivalent circuit constants from various characteristic tests of transformers		Able to calculate the voltage volatility of a transformer		Able to explain the equivalent circuit of a transformer
Achievement Goal 2	Able to calculate the voltage fluctuation rate using the phasor diagram of the output voltage and induced electromotive force of the synchronous machine.		Able to explain the armature reaction of the synchronous machine and explain the effect on the characteristics.		Able to explain the synchronous impedance and short circuit ratio of the synchronous machine
Achievement Goal 3	Able to calculate the magnitude of synchronous wattage and maximum torque for induction motors		Able to explain synchronous watts		Able to explain the relationship between the input / output power of an induction motor and the magnitude of loss
Achievement Goal 4	Able to explain the relationship between frequency and voltage in primary frequency control		Able to explain the proportional transition		Able to explain the types and principles of speed control methods for rotating machines
Achievement Goal 5	Able to calculate the rotation speed and torque in the equilibrium state of motor operation.		Able to explain the stable conditions for motor operation.		Able to explain the difference between motor torque and load torque.
Assigned Department Objectives					
学習・教育到達度目標 D-1					
Teaching Method					
Outline	The purpose is to understand the principle, structure, and various characteristics of transformers, which are AC power converters as well as static power converters. Basic characteristics of typical induction motors (mainly three-phase induction motors) and synchronous machines (mainly synchronous generators and synchronous motors) among AC rotating equipment based on the principle / structure and equivalent circuit of each rotating machine. Furthermore, the purpose is to understand how to operate these rotating machines.				
Style	In this class, we will deepen learning through group discussions. The goal is to acquire the ability to advance learning, discuss, and collaborate with others from different disciplines. Since this subject is a study unit, reports and online tests will be conducted as pre- and post-study. [Class time 30 hours + self-study time 60 hours]				
Notice	Be sure to prepare and review to improve your understanding.				
Characteristics of Class / Division in Learning					
☐ Active Learning		☐ Aided by ICT		☐ Applicable to Remote Class	
				☐ Instructor Professionally Experienced	
Course Plan					
			Theme	Goals	
1st Semester r	1st Quarter	1st	AC circuit of electrical equipment engineering	Can draw a phasor diagram of an RLC AC circuit	
		2nd	Transformer characteristic test	Equivalent circuit constants can be obtained from transformer characteristic tests	
		3rd	Transformer voltage volatility	Can calculate the voltage volatility of a transformer	
		4th	Transformer connection	Can calculate the amount of transformers connected in three phases	
		5th	Synchronous impedance and short circuit ratio	Synchronous impedance and short circuit ratio can be calculated	
		6th	Synchronous generator voltage volatility	Can calculate the voltage volatility of a synchronous generator	
		7th	Synchronous motor output	Can calculate the output and torque of a synchronous motor	
		8th	Induction machine output	The input and output of the induction motor can be calculated from the formula of the ratio.	
	2nd Quarter	9th	Induction machine loss	The loss of the induction motor can be calculated from the formula of the ratio	

		10th	Mid-term exam	
		11th	Induction machine torque and slip	Can calculate torque and slip when changing speed
		12th	Induction machine speed control	Explain various speed control methods
		13th	Power electronics	Explain the inverter circuit
		14th	Small machines	Explain the features and usage examples of small machines
		15th	Electrical equipment application	Explain the application of electrical equipment
		16th	Final exam	

Evaluation Method and Weight (%)

	Routine Exam	Little Test	Portfolio	Announcement /approach attitude	Others	Total
Subtotal	60	20	20	0	0	100
Basic ability	10	0	0	0	0	10
Professional ability	50	20	10	0	0	80
Cross-disciplinary ability	0	0	10	0	0	10