

Anan College		Year	2024		Course Title	Electromagnetic Waves and Propagation
Course Information						
Course Code		1394301		Course Category	Specialized / Elective	
Class Format		Lecture		Credits	Academic Credit: 2	
Department		Course of Electrical Engineering		Student Grade	4th	
Term		Second Semester		Classes per Week	後期:2	
Textbook and/or Teaching Materials		Basics of Electromagnetic Wave Engineering (Mathematical Engineering) / Optical / Electromagnetic Wave Engineering (Corona Publishing)				
Instructor		Komatsu Minoru				
Course Objectives						
1. Understand the characteristics of electromagnetic waves through general-purpose technologies and products in daily life. 2. Understand Maxwell's equations and analyze basic electromagnetic wave propagation characteristics. 3. A basic analysis of electromagnetic wave radiation from an antenna can be performed.						
Rubric						
		Ideal achievement level	Standard achievement level		Minimum achievement level (possible)	
Achievement 1		Able to understand and explain the characteristics of electromagnetic waves through general purpose technologies and products in daily life.	Able to understand the characteristics of electromagnetic waves through general-purpose technologies and products in daily life.		Able to understand only a part of the characteristics of electromagnetic waves through general-purpose technologies and products in daily life.	
Achievement 2		Able to understand Maxwell's equations and analyze the propagation characteristics of various electromagnetic waves.	Able to understand the basic Maxwell's equations and analyze the propagation characteristics of electromagnetic waves.		Able to understand Maxwell's equations, and can analyze only a part of the propagation characteristics of electromagnetic waves.	
Achievement 3		Able to perform various analyses on the electromagnetic wave radiation from the antenna.	Able to analyze electromagnetic wave radiation from a basic antenna.		Able to analyze only a part of the electromagnetic wave radiation from the antenna.	
Assigned Department Objectives						
学習・教育到達度目標 D-1						
Teaching Method						
Outline		In this lecture, based on the Maxwell equation, you will learn the basics, including basic physical properties of electromagnetic waves, and understand the radio wave propagation in transmission lines and the radiation phenomenon from antennas. At the same time, you will also learn about high frequency application technology.				
Style		This lecture allows you to systematically understand electromagnetic waves. Make full use of the basic knowledge of electromagnetism and electric circuits that you have already acquired, and strive to acquire specialized knowledge about radio wave propagation. Acquire the ability to understand technological trends in high-frequency application fields where new products and new technologies are being developed one after another. Since this subject is a study unit, a report will be given as pre- and post-study. [Class time 31 hours + self-study time 60 hours]				
Notice		This subject is a required subject to be certified as a second-class land special radio engineer's license.				
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
Course Plan						
			Theme		Goals	
2nd Semester r	3rd Quarter	1st	Overview of electromagnetic wave engineering		Understand the characteristics of electromagnetic waves through general purpose technologies and products in daily life.	
		2nd	Overview of electromagnetic wave engineering		Understand the characteristics of electromagnetic waves through general purpose technologies and products in daily life.	
		3rd	Basic physics of electromagnetic waves		Understand Maxwell's equations and analyze basic electromagnetic wave propagation characteristics.	
		4th	Basic physics of electromagnetic waves		Understand Maxwell's equations and analyze basic electromagnetic wave propagation characteristics.	
		5th	Mathematical expression of electromagnetic waves		Understand Maxwell's equations and analyze basic electromagnetic wave propagation characteristics.	
		6th	Mathematical expression of electromagnetic waves		Understand Maxwell's equations and analyze basic electromagnetic wave propagation characteristics.	

		7th	Mathematical expression of electromagnetic waves	Understand Maxwell's equations and analyze basic electromagnetic wave propagation characteristics.
		8th	Late midterm exam	
	4th Quarter	9th	Electromagnetic wave propagation in a transmission line	Can analyze electromagnetic wave propagation on transmission lines.
		10th	Electromagnetic wave propagation in a transmission line	Can analyze electromagnetic wave propagation on transmission lines.
		11th	Radiation and reception of electromagnetic waves	A basic analysis of electromagnetic wave radiation from an antenna can be performed.
		12th	Radiation and reception of electromagnetic waves	A basic analysis of electromagnetic wave radiation from an antenna can be performed.
		13th	Waveform, frequency and noise measurements	Explain oscilloscopes and spectrum analyzers.
		14th	Waveform, frequency and noise measurements	Explain oscilloscopes and spectrum analyzers.
		15th	Waveform, frequency and noise measurements	Explain oscilloscopes and spectrum analyzers.
		16th	Late final exam	

Evaluation Method and Weight (%)

	Routine Exam	Little Test	Portfolio	Announcement / approach attitude	Others		Total
Subtotal	80	0	20	0	0	0	100
Basic Proficiency	20	0	5	0	0	0	25
Specialized Proficiency	60	0	15	0	0	0	75
Cross Area Proficiency	0	0	0	0	0	0	0