

Course number		U-LAS12 10019 LE57					
Course title (and course title in English)		Advanced Course of Electromagnetism-E2 Advanced Course of Electromagnetism-E2		Instructor's name, job title, and department of affiliation		Graduate School of Engineering Senior Lecturer, Lim, Sunghoon	
Group		Natural Sciences		Field(Classification)		Physics(Foundations)	
Language of instruction		English		Old group		Group B	
				Number of credits		2	
Number of weekly time blocks		1		Class style		Lecture (Face-to-face course)	
				Year/semesters		2025 • First semester	
Days and periods		Tue.1		Target year		Mainly 2nd year students	
				Eligible students		For science students	
[Overview and purpose of the course]							
Based on the knowledge you gained from the Fundamental Physics B course, this course will expand your understanding of electromagnetic theory. After a review of the basics of classical electromagnetism up-to Maxwell's equations, we will explore the subjects of electromagnetic wave propagation, interference and diffraction, as well as the derivation of electric and magnetic properties in substances and their boundaries.							
[Course objectives]							
<ul style="list-style-type: none"> - Follow the historical progression in our understanding of electromagnetic laws. - Understand the meaning of physical properties in electromagnetism. - Apply the laws electromagnetism to solve practical problems. 							
[Course schedule and contents)]							
1. Mathematics review: Coordinate systems, fields, gradient, divergence, curl [2 week]. 2. Electrics review: Coulomb's force, dipoles, electric potential, Gauss's law [2 weeks]. 3. Magnetics review: Ampere's law, Faraday's law [2 weeks]. 4. AC circuits: Resistive, inductive, and capacitive load [1 week]. 5. Maxwell's equations: Electromagnetic radiation, interference, diffraction [4 weeks]. 6. Electromagnetic properties in substances and at boundaries [2 weeks]. 7. Finite element analysis for electromagnetism and its applications [1 weeks]. Final examination [1 week]. Feedback session [1 week].							
[Course requirements]							
Fundamental Physics B course.							
[Evaluation methods and policy]							
Evaluation will be based on: - Class Participation (20%): Student participation will be asked in solving problems and discussing theories and their application. - Homework (30%): Typical problems will be assigned, which you can solve by applying the laws and methods learnt during lectures. - Final examination (50%): You will be tested with a series of problems that combine previously studied cases and original cases.							
<div style="text-align: right;">Continue to Advanced Course of Electromagnetism-E2(2)</div>							

Advanced Course of Electromagnetism-E2(2)

[Textbooks]

Study guides will be provided every week, to help you expand your knowledge. The study guides closely match the week's topic, providing in-depth explanations, problem solving strategies, and summaries of key points.

[References, etc.]

(References, etc.)

David Griffiths 『Introduction to Electrodynamics』 (Pearson) ISBN:129-202-142-X (Amazon link: <http://www.amazon.co.jp/Introduction-Electrodynamics-4th-David-Griffiths-ebook/dp/B00HR7MXAY>)

[Study outside of class (preparation and review)]

For smooth progress of the class, I recommend that students refer to the reference book or textbooks on ' Fundamental Physics' to understand the terminologies related to class in advance. Students can review the contents of the class using the lecture notes, and take-home assignments will be given to help them understand.

[Other information (office hours, etc.)]

Questions can be sent by email, and will be answered either electronically or by appointment (depending on the case).