

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	2026 • 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]								
- 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.								
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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』 (Cambridge University Press) ISBN:1009397753 (Amazon link: <https://www.amazon.co.jp/Introduction-Electrodynamics-David-J-Griffiths/dp/1009397753>)

[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).

[Essential courses]

Faculty of Science