Course Code	PHYS8450 (RPG)		
Title	Graduate Electromagnetic Field Theory		
Offering Department	Physics		
Course Co-ordinator	Prof Z D Wang Physics		
Course Co-ordinator Email	zwang@hku.hk		
Teachers Involved	Name	Department	Percentage
	Prof Z D Wang	Physics	100
Course Objectives	The aim of this course is to provide students with the advanced level of comprehending on the theory of classic electromagnetic field, enabling them to master key analytical tools for solving real physics problems.		
Course Contents & Topics	This course will introduce and discuss the following topics: Boundary-value problems in electrostatics and Green's Function method; electrostatics of media; magnetostatics; Maxwell's equations and conservation laws; gauge transformations; electromagnetic waves and wave guides.		
Course Learning Outcomes (CLO)	On successful completion of this course, students should be able to: CLO 1 analyse and solve various electrostatic and magnetostatic problems with Green's Function CLO 2 comprehend and explain many electromagnetic phenomena CLO 3 recognise and comprehend the important concepts of conservation laws and gauge transformations, which should be very helpful for doing research in future		
Pre-requisites (and Co-requisites and Impermissible combinations)	Nil		
Offer in 2025 - 2026	Y 2nd sem	Examination	May
Course Grade	A+ to F		
Grade Descriptors	A: Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B: Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. C: Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. D: Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.		

	Fail: Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.		
Course Type	Lecture-based elective course		
Course Teaching & Learning Activities	Activities	Details	No. of Hours
	Lectures		36
	Tutorials		12
	Reading/Self study		80
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)
	Assignments		40
	Examination	3-hour written exam	50
	Test		10
Quota	9999 (9999 if no quota)		
Required/recommended reading and online materials	J.D. Jackson: Classical Electrodynamics (John Wiley & Sons, 1999) L.D. Landau and E.M. Lifshitz: Classical Theory of Fields (Pergamon, 1982)		