



課 綱 Course Outline
物理學系應用物理博士班國際組

中文課程名稱 Course Name in Chinese	電動力學(一)				
英文課程名稱 Course Name in English	Electrodynamics (I)				
科目代碼 Course Code	APH_D0040	班 別 Degree	博士班 Ph. D.		
修別 Type	必修 Required	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					
課程目標 Course Objectives					
<p>1. 延續電磁學的理论基礎，介紹靜電學，邊界值問題，多極問題，介質，靜磁學，時間變化場，馬克士威方程式，守恆定律，磁單極問題，對稱性，平面波等。導波管與共振腔，簡單輻射系統，散射與折射，狹義相對論，電磁場中的帶電粒子，物體內能量損耗，運動電荷的輻射，多極場，輻射阻尼，導波管與共振腔等問題。</p> <p>2. 於理論的形成及解題的運算技巧給予必要的訓練。</p>					
系教育目標 Dept.'s Education Objectives					
1	培養具有研發能力的高科技人才 Essential training of professionals for research and development knowledgeintensive industries.				
2	培養大學物理師資 Professional training for college physics teaching.				
3	厚植本系所及理工學院之教學研究水準 Promoting the teaching and researching potential of the department and the college.				
4	培養物理專業研究人才 Professional training in physics research.				
系專業能力 Basic Learning Outcomes				課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.'s Education Objectives	
A	具備物理與相關應用領域之專業知識 Possessing professional knowledge in physics and related application fields.				●

B	能以物理知識與邏輯推理，分析解決物理問題 Being able to analyze and solve physics problems based on basic knowledge in physics as well as logical reasoning.	●
C	瞭解當代實驗儀器之原理，並具備操作實驗儀器之能力 Understanding the principles of up-to-date equipment and being able to operate them for performing physics experiments.	
D	能利用電腦處理各類物理問題 Being able to use computers for solving various physics problems.	
E	對學術倫理有清楚正確之認知 Properly and clearly acknowledging the academic ethics.	
F	具備以口頭報告及論文寫作發表研究成果之能力 Possessing the skills of oral presentation and scientific writing for publishing research findings.	
G	具備科技發展之國際觀及外語溝通能力 Having an international view of the technology developments and being able to use a foreign language for communications.	○

圖示說明 Illustration : ● 高度相關 Highly correlated ○ 中度相關 Moderately correlated

課程大綱
Course Outline

1. Introduction to Electrostatics
2. Boundary-Value Problems in Electrostatics: I
3. Boundary-Value Problems in Electrostatics: II
4. Multipoles, Electrostatics of Macroscopic Media, Dielectrics
5. Magnetostatics
6. Time-Varying Fields, Maxwell Equations, Conservation Laws
7. Plane Electromagnetic Waves and Wave Propagation
8. Wave Guides and Resonant Cavities

資源需求評估 (師資專長之聘任、儀器設備的配合 . . . 等)
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

具有各領域之專業師資、相關期刊及圖書、影印機、投影機、幻燈機。

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

講授、討論、作業、小考、期中及期末考。

其他
Miscellaneous