



教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	電磁學(一)		學年/學期 Academic Year/Semester	114/2	
課程名稱(英文) Course Name in English	Electromagnetism(I)				
科目代碼 Course Code	OE_10080	系級 Department & Year	學二	開課單位 Course-Offering Department	光電工程學系
修別 Type	學程 Program	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/徐裕奎				
先修課程 Prerequisite					
課程描述 Course Description					
介紹電磁學中靜電、靜磁與動態電磁波的基本觀念					
課程目標 Course Objectives					
本課程內容包括簡介三維空間中的向量場概念，以向量場概念，重新檢視靜電學、靜磁學及法拉第定律，最後並將詳述電磁互感與馬克斯威爾方程式，重新理解電磁波與光波。					
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	具有光電相關的物理、化學、材料及數學的知識。Physics, chemistry, material, and math knowledge related to opto-electronic engineering				●
B	具有光電工程的專業知識及應用能力。Professional knowledge and application ability of opto-electronic engineering				●
C	具有設計與執行實驗、報告撰寫與數據解釋之能力。Abilities to design and execute experiment, write reports, and explain data				
D	使用儀器進行物件的分析及測試。Analysis and test of devices by instruments				
E	具備適當的英文能力，應用於學習與交流。English language ability to study and interact				●
F	具有良好的溝通與團隊合作的能力。Ability to communicate and teamwork				
G	具有創新思維及終身學習的能力。Creative thinking and life-long learning ability				○
圖示說明 Illustration : ● 高度相關 Highly correlated ○ 中度相關 Moderately correlated					
授課進度表 Teaching Schedule & Content					
週次 Week	內容 Subject/Topics				備註 Remarks
1	Introduction of Electromagnetics				
2	Introduction of Electromagnetics Vector Addition and Subtraction Orthogonal Coordinate Systems				
3	Integrals Containing Vector Function Gradient of a Scalar Field				

4	Divergence of a Vector Field Divergence Theorem Curl of a Vector Field	
5	Stokes' s Theorem Two Null Identities Helmholtz' s Theorem	
6	Coulomb' s Law Gauss' s Law and Application Electric Potential	
7	Conductors in Static Electric Field Dielectrics in Static Electric Field Electric Flux Density and Dielectric Constant	
8	Electric Flux Density and Dielectric Constant Boundary Conditions for Electrostatic Fields	
9	期中考試週 Midterm Exam	
10	Capacitance and Capacitors Electrostatic Energy and Forces	
11	Poisson' s and Laplace' s Equations Uniqueness of Electrostatic Solution	
12	Method of Images	
13	Boundary-value Problems (I)	
14	Boundary-value Problems (II)	
15	Current Density and Ohm' s Law Electromotive Force and Kirchhoff' s Voltage Law and Current Law	
16	Power Dissipation and Joule' s Law Boundary Conditions for Current Density Resistance Calculations	
17	期末考試週 Final Exam	
18	教師彈性補充教學	

教學策略 Teaching Strategies

- 課堂講授 Lecture
 分組討論 Group Discussion
 參觀實習 Field Trip
 其他 Miscellaneous:

教學創新自評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

- 問題導向學習(PBL)
 團體合作學習(TBL)
 解決導向學習(SBL)
 翻轉教室 Flipped Classroom
 磨課師 Moocs

社會責任(Social Responsibility)

- 在地實踐 Community Practice
 產學合作 Industry-Academia Cooperation

跨域合作(Transdisciplinary Projects)

- 跨界教學 Transdisciplinary Teaching
 跨院系教學 Inter-collegiate Teaching

- 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

學期成績計算及多元評量方式 Grading & Assessments

配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)	10%								
期中考成績 Midterm Exam	30%								
期末考成績 Final Exam	30%								
作業成績 Homework and/or Assignments	30%								
其他 Miscellaneous (_____)									

評量方式補充說明

Grading & Assessments Supplemental instructions

教科書與參考書目 (書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

Textbook:

" Field and Wave Electromagnetics "
(Second Edition)
David K. Cheng
ADDISON-WESLEY Publishing Company.

課程教材網址(含線上教學資訊, 教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.
Personal website can be listed here.)

其他補充說明 (Supplemental instructions)