國立東華大學

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	113/2
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 Industy-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 General Performance	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)