

課程簡介 Course Introduction

開課班級 Department	電機工程學系
授課方式 Instructional Method	課堂教學、中文
課程代號 Course Reference Number	182023
課程名稱(中文) Course Title (Chinese)	電磁學(二)
課程名稱(英文) Course Title (English)	Electromagnetics (II)
學分數/時數 Credit Hours	3 / 3
必(選)修 Requirement / Elective Course	必修
授課老師 Instructor	王健仁

課程目標 Learning Objectives

藉由課程內容教授與題目演練，使同學熟悉靜態磁場與電磁波現象與理論，培養同學具有問題分析與解決能力。

先修（前置）課程 Prerequisite

微積分、普通物理、電磁學（一）

課程大綱 Course Syllabus

週次 Week	課程單元大綱 Unit	教學方式 Instructional Method /Teaching Style	參考資料或相關作業 References or Related Materials	評量方式 Grading
1	Static magnetic fields--Introduction, Fundamental Postulates, Vector Magnetic Potential, The Biot-Savart Law and Applications			
2	Static magnetic fields--The Biot-Savart Law and Applications, Demonstration of Magnetic Field			
3	Static magnetic fields--The Magnetic Dipole, Magnetization			
4	Static magnetic fields--Equivalent Current Density, Magnetic Field Intensity, Permeability			
5	Static magnetic fields--Magnetic Circuit, Boundary Condition			

6	Static magnetic fields--Inductance, Inductor, Magnetic Energy
7	Exam (I)
8	Time-varying fields and Maxwell' s equations--Introduction, Faraday's Law of Electromagnetic Induction and Its Experiment
9	Time-varying fields and Maxwell' s equations--Maxwell's Equation, Potential Function
10	Time-varying fields and Maxwell' s equations--Electromagnetic Boundary Condition, Wave Equation
11	Time-varying fields and Maxwell' s equations--Solutions of Wave Equation, Time-Harmonic Fields, Demonstration of Time-Varying Field
12	Exam (II)
13	Plane electromagnetic waves--Introduction, Plane Waves in Lossless Media
14	Plane electromagnetic waves--TEM Wave, Polarization, Demonstration of TEM Wave
15	Plane electromagnetic waves--Plane Waves Lossy Media:Low-loss, Good Conductors
16	Plane electromagnetic waves--Skin Depth, Flow of Electromagnetic Power

17	Plane electromagnetic waves--Poynting Vector, Instantaneous and Average Power Densities, Experiment of Wave Propagation
18	Exam (III)

單一課程對應校能力指標程度

The Degree to Which Single Course Corresponds to School Competence

編號 No.	校核心能力 School Core Competencies	符合程度 Degree of conformity
1	道德力 (Morality)	2
2	自學力 (Self-learning)	3
3	創造力 (Creativity)	2
4	溝通力 (Communication)	2
5	就業力 (Employability)	3

單一課程對應系能力指標程度

The Degree to Which Single Course Corresponds to Department Competence

代碼 No.	類別 Category	系核心能力 Department Core Competencies	符合程度 Degree of conformity
01	系所	運用數理、邏輯及基本電機之能力	4
02	系所	熟悉電機軟硬體專業技術之能力	2
03	系所	獨立思考、主動求知與研究創新之能力	2
04	系所	培養實作與分析實驗成果之能力	1
05	系所	理解社會責任與學術倫理之能力	2
06	系所	有效溝通表達與團隊合作之能力	2
07	系所	中英文語文及寫作之能力	2
08	系所	資訊蒐集、分析及彙整之能力	2

單一課程對應院能力指標程度

The Degree to Which Single Course Corresponds to College Competence

編號 No.	院核心能力 College Core Competencies	符合程度 Degree of conformity
1	語文能力	3
2	溝通與合作能力	2
3	創新與實踐能力	2
4	專業知能	3

教科書或參考用書(備註) Textbooks or Reference Books(Remarks)

Field and Wave Electromagnetics / David K. Cheng/ Addison-Wesley/台北圖書

教學方法 Teaching Method

教學方法	百分比
Teaching Method	Percentage
講述	80.0
問題導向學習	20.0
總和 Total	100.0

成績評量方式 Grading

評量方式	百分比
Grading	Percentage
小考	30.0
期中考(I)	20.0
期中考(II)	20.0
期末考	30.0
總和 Total	100.0