國立中正大學課程大綱

National Chung Cheng University Syllabus

課號 Course Code	2201016-01	全英文授課 EMI	□是 ■否
課程類別 Course Type	□人文關懷課程 □競賽專題課程 □問題導向課程 □專題導向課程 ■總整課程 □實作課程 □其他		
課程名稱（中文） 	普通物理（一）B [遠距教學課程]		
課程名稱（英文） Course	General Physics (I)B		
學年 Academic Year /Semester	115 第 1 學期	學分 Credits	1
學系（所） Department	物理系	必選修 Compulsory/Elective	■必修 Compulsory □選修 Elective
上課時間 Class Hours	四 13	上課地點 Classroom	物理館 107
教師 Instructor	包健華	教師 Email Instructor’s Email	phychp@ccu.edu.tw
助教 Teaching Assistant		助教 Email TA’s Email	
先修科目或先備能力 Prerequisites	先修科目(2201011)普通物理（一）(曾經修習) (2201021)普通物理（一）(曾經修習)(只要符合任一先修條件)修課及加簽同學務必出席第一堂課。		

課程概述
Course Descriptions

週次	上課內容
1	Introduction: Dimensional Analysis and Order of magnitudes
2	Kinematics in One Dimension
3	Kinematics in Two or Three Dimensions, Relative motion
4	The Law of Motion: Newton’s Laws of motion Applications: Friction, Circular Motion, Drag Force
5	Gravitation and Newton’s Synthesis
6	Work and Energy
7	Conservation Of Energy
8	Linear Momentum
9	Rotational Motion (I)
10	Rotational Motion (II)
11	Angular Momentum and General Rotation (I)
12	Angular Momentum and General Rotation (II)
13	Simple Harmonic Motion
14	Temperature, Thermal Expansion, and Kinetic Theory of Gases
15	Heat and First Law of Thermodynamics (I)
16	Heat and First Law of Thermodynamics (II)
17	Second Law of Thermodynamics

學習目標 Learning Objectives	Students will understand and apply fundamental physical principles—such as Newton's laws, conservation laws, and energy dynamics—to analyze real-world systems. They will develop quantitative problem-solving skills, relate physical concepts to engineering applications, and gain experience in connecting theoretical models with experimental evidence, fostering critical thinking and scientific reasoning essential for their fields.
教科書及參考書 Textbooks And References	1.Sears and Zemansky's University Physics, Young and Freedman, 13th edition, Pearson. 2.Physics for Scientists and Engineers, Giancoli 4th edition, Pearson. 3.Physics for Scientists and Engineers, Serway Jewett, 6th edition, Thomson 4.Fundamentals of Physics, Halliday, Resnick, and Walker, 5th edition, Wiley. 5."University Physics" (Revised edition) Harris Benson (John Wiley & Sons Inc.) 6."Schaum's Outline of Theory and Problems of College Physics" eighth edition. Frederick J. Beuche (McGraw-Hill) 「請尊重智慧財產權，不得非法影印教師指定之教科書籍」

教學要點概述	
教材編選 Teaching Materials	■自製簡報(ppt) □課程講義 □自編教科書 □教學程式 □自製教學影片 □其他(教科書作者提供)
教學方法 Teaching Method	■講述(投影片、板書) □小組討論 □學生口頭報告 □問題導向學習 □個案研究 □其他
評量工具 Evaluation	□期中考 ■期末考 80% □隨堂測驗 □隨堂作業 □課後作業 □期中報告 □期末報告 □專題報告 □評量尺規 ■其他on-line check points 5%, on-line assignments 15%,
教學資源 Teaching Resources	■課程網站 ■教材電子檔供下載 □實習網站
與 SDGs 目標的關聯 Related to Objectives Of SDGs	□SDG 1 終結貧窮 □SDG 2 消除飢餓 □SDG 3 健康與福祉 ■SDG 4 優質教育 □SDG 5 性別平權 □SDG 6 淨水及衛生 ■SDG 7 可負擔的潔淨能源 ■SDG 8 合適的工作及經濟成長 ■SDG 9 工業化、創新及基礎建設 □SDG 10 減少不平等 □SDG 11 永續城鄉 □SDG 12 責任消費及生產 □SDG 13 氣候行動 □SDG 14 保育海洋生態 □SDG 15 保育陸域生態 □SDG 16 和平、正義及健全制度 □SDG 17 多元夥伴關係 □無關聯

教師 相關訊息 Instructor’ s Information	You must attend the first class meeting in person to receive partial credit for the course. Date: September 10, 2025 Time: 18:10 Location: Physics Building, Room 107, This session will address important topics such as how to succeed in the course, TA office hours, and other key information. Attendance is mandatory. 本課程的選修條件為: 曾經選修普通物理物(I), 若欲選課但未能滿足先修條件， 請帶加簽單並出席 9/10(Place phys. room 107, time: 18:10) class meeting.

每週課程內容 Weekly Scheduled Contents
Week 1 Introduction: Dimensional Analysis and Order of magnitudes
Week 2 Kinematics in One Dimension
Week 3 Kinematics in Two or Three Dimensions, Relative motion
Week 4 The Law of Motion: Newton’s Laws of motion ; Applications: Friction, Circular Motion, Drag Force
Week 5 Gravitation and Newton’s Synthesis
Week 6 Work and Energy
Week 7 Conservation Of Energy
Week 8 Linear Momentum, System of particles, and Center of Mass
Week 9 Rotational Motion (I)
Week 10 Rotational Motion (II)
Week 11 Angular Momentum and General Rotation (I)
Week 12 Angular Momentum and General Rotation (II)
Week 13 Simple Harmonic Motion
Week 14 Temperature, Thermal Expansion, and Kinetic Theory of Gases
Week 15 Heat and First Law of Thermodynamics (I)
Week 16 Heat and First Law of Thermodynamics (II)
Week 17 Second Law of Thermodynamics
Week 18

核心能力
Core Competencies

核心能力 Core Competency		本課程與核心能力關聯強度 Degrees of related to core competencies				
		1	2	3	4	5
專業能力 Specific Competency	專業能力 1：具備物理領域之基本知識					
	專業能力 2：具備執行物理及相關領域專題研究之能力					
	專業能力 3：具備閱讀物理相關論文之能力					
	專業能力 4：具備邏輯推理及解決相關問題之能力					

	專業能力 5：具備終身自我學習成長之能力					