



## 教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	近代物理AA		學年/學期 Academic Year/Semester	112/1
課程名稱(英文) Course Name in English	Modern Physics			
科目代碼 Course Code	PHYS2110AA	系級 Department & Year	學二	開課單位 Course-Offering Department
物理學系				
修別 Type	學程 Program	學分數/時間 Credit(s)/Hour(s)	3.0/3.0	
授課教師 Instructor	/張俊明			
先修課程 Prerequisite				
課程描述 Course Description				
<p>Introduction of special relativity. Description of nature for motions near the speed of light. Student will learn basic principles and concepts of special relativity and will develop physical intuition for high speed physical phenomena.</p> <p>Introduction of quantum physic. Quantum theory can be described as the study of phenomena involving small length scale (e.g., atomic size). It provides concepts for understanding the microscopic world. Students will learn basic principles of quantum mechanics, such as the wave-particle duality, the uncertainty principle, and Schrodinger equation for its application in a variety of simple application, such as Energy Levels of Electrons in a atom, molecules, solids and others.</p>				
課程目標 Course Objectives				
介紹近代物理學的基本觀念與其應				
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	具備物理之基礎背景知識 Possessing fundamental knowledge in physical sciences.			●
B	能運用基本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	對目前測量器材有基礎認識，且具有操作物理實驗儀器的能力 Being acquainted with modern equipment and being able to operate them for performing physics experiments.			
D	能使用基礎電腦程式語言解決物理問題 Being able to use basic computer programming for solving physics problems.			
E	善用各種資訊平台進行論文資料蒐集的能力 Being able to use various platforms for data collection benefiting a topical research.			
F	具備科技發展的國際視野以及外語溝通的能力 Having an international view of the technology developments and being able to use a foreign language for communications			
G	能整合物理與其它領域知識 Being able to integrate the knowledge of physics with that of other fields.			
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 & Special Relativity (time & length) (Chapter 1)			

2	Special Relativity (time & length) (Chapter 1)	
3	Special Relativity (momentum & energy) (Chapter 1)	
4	Particle Properties of waves (Chapter 2)	
5	Wave properties of particles (Chapter 3)	
6	Atomic structure (Chapter 4)	
7	Quantum Mechanics (Chapter 5)	
8	TEST & REVIEW	
9	期中考試週 Midterm Exam 近代物理期中考	
10	Quantum Mechanics (Chapter 5)	
11	Quantum theory of the hydrogen atom (Chapter 6)	
12	Quantum theory of the hydrogen atom (Chapter 6)	
13	Many-electron atoms (Chapter 7)	
14	Many-electron atoms (Chapter 7)	
15	TEST & REVIEW	
16	FINAL EXAM of Modern Physics 近代物理期末考	
17	學校期末考試週	
18		

### 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:

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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									
期中考成績 Midterm Exam	35%	✓							
期末考成績 Final Exam	35%	✓							
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: "Concepts of Modern Physics" (Asia Adaptation), Arthur Beiser, (McGraw-Hill)

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)