



教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	計算物理(一)			學年/學期 Academic Year/Semester	113/1			
課程名稱(英文) Course Name in English	Computational Physics (I)							
科目代碼 Course Code	APH_50200	系級 Department & Year	碩士	開課單位 Course-Offering Department	物理學系			
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0					
授課教師 Instructor	/陳企寧							
先修課程 Prerequisite								

課程描述 Course Description

教授 python 程式語言與現代演算法，以電腦代替數學計算各類物理問題。

課程目標 Course Objectives

介紹計算物理各種方法，使學生具備以計算機處理物理問題之知識基礎。

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	具備物理與相關應用領域之專業知識 Possessing professional knowledge in physics and related application fields.	●
B	能以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	瞭解當代實驗儀器之原理，並具備操作實驗儀器之能力 Understanding the principles of up-to-date equipment and being able to operate them for performing physics experiments.	
D	能利用電腦處理各類物理問題 Being able to use computers for solving various physics problems.	●
E	對學術倫理有清楚正確之認知 Properly and clearly acknowledging the academic ethics.	
F	具備以口頭報告及論文寫作發表研究成果之能力 Possessing the skills of oral presentation and scientific writing for publishing research findings	
G	具備科技發展之國際觀及外語溝通能力 Having an international view of the technology developments and being able to use a foreign language for communications.	

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	
2	Python Programming I	
3	Python Programming II	
4	Python Programming III	

5	國慶日	
6	Numerical Analysis I	
7	Numerical Analysis II	
8	Numerical Analysis III	
9	期中模擬考 Midterm	
10	Ordinary Differential Equations I	
11	Ordinary Differential Equations II	
12	Ordinary Differential Equations III	
13	Examples in Classical Physics	
14	Examples in Quantum Physics	
15	Monte Carlo Simulation I	
16	Monte Carlo Simulation II	
17	期末考 Final Exam	
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:

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
平時成績(含出缺席) General Performance (Attendance Record)	5%		✓					
期中考成績 Midterm Exam	10%	✓						
期末考成績 Final Exam	25%	✓						
作業成績 Homework and/or Assignments	60%		✓					
其他 Miscellaneous (project (加分))	0%				✓			

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.)

Computational Physics, Mark Newman, CreateSpace Independent Publishing Platform (2012)

An Introduction to Computational Physics, 2nd ed. Tao Pang, Cambridge University Press (2006)

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.)

google meet 線上課程網址:

meet.google.com/asa-zfnh-jso

其他網路資源上課公佈

其他補充說明 (Supplemental instructions)