



教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	質譜技術原理與應用		學年/學期 Academic Year/Semester	112/2
課程名稱(英文) Course Name in English	Mass spectrometry: principle and applications			
科目代碼 Course Code	APH_M0180	系級 Department & Year	碩士	開課單位 Course-Offering Department
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0	
授課教師 Instructor	/彭文平			
先修課程 Prerequisite				
課程描述 Course Description				
Contents: 1. Introduction 2. Ionization: gas phase, solid phase, solution phase 3. Mass Analysis: general, history, ion focusing, ion optics, ion detection 4. Mass Analysis: sectors, tof, icr, quadrupole, ion traps, orbitrap 5. Tandem Mass Spectrometry 6. Internal Energies: collisional processes, energy transfer				
課程目標 Course Objectives				
1. Essential training of professionals for research and development knowledge intensive industries. 2. Professional training for college physics teaching. 3. Promoting the teaching and researching potential of the department and the college. 4. Professional training in mass spectrometry research.				
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	2/22 (Thur.): Introduction 2/23 (Fri.): Introduction	
2	2/29 (Thur.): Introduction 3/1 (Fri.): Ionization: gas phase, solid phase, solution phase	
3	3/7 (Thur.): Ionization: gas phase, solid phase, solution phase 3/8 (Fri.): Ionization: gas phase, solid phase, solution phase	
4	3/14 (Thur.): Ionization: gas phase, solid phase, solution phase 3/15 (Fri.): Ionization: gas phase, solid phase, solution phase	
5	3/21 (Thur.): Ionization: gas phase, solid phase, solution phase 3/22 (Fri.): Mass Analysis: general, history, ion focusing, ion optics, ion detection	
6	3/28 (Thur.): Mass Analysis: general, history, ion focusing, ion optics, ion detection 3/29 (Fri.): Mass Analysis: general, history, ion focusing, ion optics, ion detection	
7	4/4 (Thur.): Holiday 4/5 (Fri.): Holiday	
8	4/11 (Thur.): Mass Analysis: general, history, ion focusing, ion optics, ion detection 4/12 (Fri.): Mass Analysis: sectors, tof, icr, quadrupole, ion traps, orbitrap	
9	期中考試週 Midterm Exam 4/18 (Thur.): Mass Analysis: sectors, tof, icr, quadrupole, ion traps, orbitrap 4/19 (Fri.): MIDTERM EXAM	
10	4/25 (Thur.): Mass Analysis: sectors, tof, icr, quadrupole, ion traps, orbitrap 4/26 (Fri.): Mass Analysis: sectors, tof, icr, quadrupole, ion traps, orbitrap	
11	5/2 (Thur.): Mass Analysis: sectors, tof, icr, quadrupole, ion traps, orbitrap 5/3 (Fri.): Mass Analysis: sectors, tof, icr, quadrupole, ion traps, orbitrap	
12	5/9 (Thur.): Mass Analysis: sectors, tof, icr, quadrupole, ion traps, orbitrap (Online) 5/10 (Fri.): Tandem Mass Spectrometry	
13	5/16 (Thur.): Tandem Mass Spectrometry 5/17 (Fri.): Tandem Mass Spectrometry	
14	5/23 (Thur.): Tandem Mass Spectrometry 5/24 (Fri.): Tandem Mass Spectrometry	
15	5/30 (Thur.): Tandem Mass Spectrometry 5/31 (Fri.): Internal Energies: collisional processes, energy transfer	
16	6/6 (Thur.): Internal Energies: collisional processes, energy transfer (Online) 6/7 (Fri.): Internal Energies: collisional processes, energy transfer (Online)	
17	6/13 (Thur.): Internal Energies: collisional processes, energy transfer 6/14 (Fri.): FINAL EXAM	
18	期末考試週 Final Exam	

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	其他
平時成績(含出缺席) General Performance (Attendance Record)									
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.)

Texts: Handout from Department of Chemistry of Purdue University

Author: Profs. R. G. Cooks/Scott McLuckey

Mass Spectrometry/Principles and Applications; Third Edition

Author: Edmond de Hoffmann and Vincent Stroobant

ISBN 978-0-470-03311-1; Wiley

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)