國立東華大學

教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	材料光譜學			學年/學期 Academic Year/Semester	112/2
課程名稱(英文) Course Name in English	Spectroscopy for Material Science				
科目代碼 Course Code	MS__55500	系級 Department & Year	碩士	開課單位 Course-Offering Department	材料科學與工程學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/陳素華				
先修課程 Prerequisite					

課程描述 Course Description

材料的性質與結構分析所相關的電子光譜與震動光譜等之原理與應用。
1. 紅外線光譜 (Infrared spectroscopy)
2. 拉曼光譜 (Raman spectroscopy)
3. 紫外-可見光吸收光譜 (UV-visible absorption spectroscopy)
4. 螢光光譜 (photoluminescence spectroscopy)
5. X光光電子發射能譜 (x-ray photo emission spectroscopy)
6. 歐捷光譜 (Auger electron spectroscopy)
7. X光近緣吸收光譜 (Near-edge x-ray absorption fine structure)
8. X光外延吸收光譜 (Extended X-ray absorption fine structure)

課程目標 Course Objectives

材料的性質與結構分析所相關的電子光譜與震動光譜等之原理與應用。

	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	具備材料科學所需的進階物理、化學及數學的知識。Acquire required advanced physical, chemical, and mathematic knowledge for materials science and engineering.	○
B	具備材料科學的進階專業知識，並能應用於解決工程上之問題。Acquire required advanced professional knowledge for materials science and engineering, applicable in solving engineering problems.	●
C	具備獨立研究之能力。Equipped with capabilities of independent research.	○
D	具備專業道德及責任感，與良好的溝通及團隊合作的能力。Acquire professional morality and responsibility, and capability of quality communication and team cooperation.	○
E	具備適當的英文能力，應用於學習與交流。Acquire English capability used for learning and interaction.	○

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	Atomic structure and molecular orbita	

3	Infrared spectroscopy	
4	Infrared spectroscopy	
5	Raman spectroscopy	
6	Raman spectroscopy	
7	Uv-vis absorption spectroscopy	
8	Photoluminescence spectroscopy	
9	期中考試週 Midterm Exam	
10	Photoluminescence spectroscopy	
11	Photoluminescence spectroscopy	
12	Electron analysis for chemical analysis/ X-ray photoelectron spectroscopy	
13	Electron analysis for chemical analysis/ X-ray photoelectron spectroscopy	
14	Auger electron spectroscopy	
15	X-ray absorption spectroscop	
16	Extended X-ray absorption fine structure	
17	Near-edge x-ray absorption fine structur	
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 Industy-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 General Performance	40%	✓							
期中考成績 Midterm Exam	30%	✓							
期末考成績 Final Exam	30%	✓							
作業成績 Homework and/or Assignments									
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.)

1. A. Ellis, M. Feher, and T. Wright “Electronic and Photoelectron Spectroscopy” Cambridge (ISBN 0-521-81737-4)
2. A. Cotton “Chemical Applications Of Group Theory”, 3rd Ed., Wiley (ISBN 0-471-51094-7)
3. R. M. Silverstein, F. X. Webster, and D. J. Kiemle “Spectrometric Identification of Organic Compounds” 7th Ed., Wiley (ISBN 0-471-39362-2)

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)