



課 綱 Course Outline
自然資源與環境學系碩士班一般組

中文課程名稱 Course Name in Chinese	拉曼光譜分析技術				
英文課程名稱 Course Name in English	Analytical Methods of Raman Spectroscopy				
科目代碼 Course Code	ES_50600	班 別 Degree	碩士班 Master' s		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					
課程目標 Course Objectives					
顯微拉曼光譜儀是一種正在快速發展的分析研究工具，非常值得應用在各學科的研究題材上。本課程希望透過課程的講授及實際的儀器操作，使學生瞭解拉曼光譜的原理及實務的應用					
系教育目標 Dept.' s Education Objectives					
1	培養兼具國際視野與本土關懷的學生 To develop students who care about local issues and have an international perspective				
2	培養具備自然科學與社會科學知識的人才 To educate students to have knowledge of both the natural and social sciences				
3	培養具備環境倫理與人文素養的環境公民 To teach students to be environmental citizens (i.e., knowledgeable about environmental ethics and human issues)				
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	能覺知多元的自然科學與社會科學理論並具備研究能力 To have knowledge of natural and social science theories				
B	具備自然資源與人類社會議題之調查分析、規劃與經營之能力 To be able to investigate, analyze, plan, and manage both natural resource and human social issues				○

C	具備將環境倫理與生態思想落實於永續性生活型態的能力 To implement sustainable lifestyles based on environmental ethics and ecological principle	
D	能以整全式的觀點來解析環境問題，並具備發展系統性解決方案的能力 To resolve environmental issues and develop systematic solutions with a global perspective	
E	具備系統分析、未來思考、溝通協調與團隊合作的能力 The ability to analyze, plan, communicate, and coordinate with others (teamwork)	●
F	具備終身學習、國際視野與外語溝通的能力 To instill the values of lifelong learning, an international perspective, and the ability to communicate in a foreign language	●

圖示說明 Illustration : ● 高度相關 Highly correlated ○ 中度相關 Moderately correlated

課程大綱
Course Outline

1. 拉曼光譜基本原理介紹
2. 拉曼光譜的應用簡介
3. 拉曼光譜案例分析
4. 拉曼光譜儀實務操作
5. 分析結果報告

資源需求評估 (師資專長之聘任、儀器設備的配合...等)
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

本系自有的顯微拉曼光譜儀(型號: HORIBA JOBIN YVON HR-800)

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

- 課堂講授 Lecture
- 實驗操作

其他
Miscellaneous

教科書與參考書目:

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

1. Ewen Smith and Geoffrey Dent. (2005) Modern Raman Spectroscopy. John Wiley & Sons, Ltd.
2. Howell G.M. Edwards and John M. Chalmers (2005) Raman Spectroscopy in Archaeology and Art History. The Royal Society of Chemistry, Cambridge UK.
3. Colombari, Ph. (2008) On-site Raman identification and dating of ancient glasses: A review of procedures and tools: Journal of Cultural Heritage, 9, Supplement 1, e55-e60.