



課 綱 Course Outline

自然資源與環境學系碩士班

中文課程名稱 Course Name in Chinese	應用化學				
英文課程名稱 Course Name in English	Applied Chemistry				
科目代碼 Course Code	NRES53870	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					
<p>一、本課程介紹在地球科學與環境科學中所涵蓋的化學知識。</p> <p>二、課程內容包含化學熱力學、化學動力學、分子結構與作用理論（鍵結理論、量子化學理論等）、分子光譜和化學反應（酸鹼、氧化還原等）的介紹與回顧。另將以多觀點（社會、政治、經濟、倫理）論述之議題為例，介紹其中涵蓋的化學原理和知識，嘗試結合生活中的科技議題與化學原理的關連性。</p> <p>三、課程重點為協助學生建立在研究議題時應具備的化學認知，發展批判思考能力，並作為學習相關課程的基礎知識。</p>					
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 principles	
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

一 化學熱力學回顧

Review of Chemical Thermodynamics, including Concepts and Applications

二 化學動力學回顧 (例如: 酵素動力學)

Review of Chemical Kinetics, including Concepts and Applications (e.g. Enzyme Kinetics)

三 分子結構與作用回顧: 理論篇

Review of Molecular Structures and Interactions: Theory, including Concepts and Applications

四 分子結構與作用回顧: 光譜篇

Review of Molecular Structures and Interactions: Spectroscopy, including Concepts and Applications

五 化學反應 (酸鹼、氧化還原反應等)

Acid-base, and Redox Chemistry etc.

六 多觀點 (社會、政治、經濟、倫理) 論述之議題實例

Examples within a contextual framework of significant social, political, economic, and ethical issues.

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.)

需投影機

課程要求和教學方式之建議

Course Requirements and Suggested Teaching Methods

課程講授與討論、文獻閱讀與報告(含口頭及書面)等。

其他

Miscellaneous

一、指定書目:

(1) Peter Atkins and Julio de Paula, (Atkins 的物理化學) Atkins' Physical Chemistry, 8th ed., 2006, Oxford University Press. ISBN: 9780198700722.

(2) Lucy Pryde Eubanks, Catherine H. Middlecamp, Carl E. Heltzel, and Steven W. Keller. (議題的化學背景) Chemistry in Context, 6th ed., 2009, American Chemical Society (ACS). ISBN: 0073048763.

二、參考書目:

Laidler, Keith James and John H. Meiser. (物理化學) Physical Chemistry. 2003, Boston : Houghton Mifflin. ISBN: 0618123415.

三、實際上課內容將視學生程度與需求略為調整。