



課 綱 Course Outline
化學系一般組

中文課程名稱 Course Name in Chinese	軟物質材料				
英文課程名稱 Course Name in English	Soft Matter Materials				
科目代碼 Course Code	CHEM56100	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>1. 介紹軟物質材料，包含膠體、高分子、界面活性劑、生物高分子，及界面科學。Introduce soft matter materials, including colloids, polymers, surfactants, biopolymers, and interface science.</p> <p>2. 膠體材料的製備方法和結構-性質關係。Preparation methods of colloidal materials and structure-property relationships.</p> <p>3. 高分子的合成、鑑定與溶解高分子在溶液中的行為。Synthesis, identification, and behavior of polymers in solution.</p> <p>4. 分子自組裝軟材料。Molecular self-assembly of soft materials</p> <p>5. 軟物質材料技術，包括製備、鑑定表面活性劑、高分子溶液和膠體分散系統。Soft matter material techniques, including preparation and characterization of surfactants, polymer solutions, and colloidal dispersions.</p> <p>6. 軟物質材料在生物技術、奈米科技和材料科學等領域的應用。Applications of soft matter materials in biotechnology, nanotechnology, and materials science.</p>					
系教育目標 Dept.'s Education Objectives					
1	培育化學專業人才				
2	培育化學相關領域人才				
3	培育具國際視野之科技人				
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	具備化學專業知識				●
B	具備獨立思考及分析解決問題之能力				●

C	具備設計與執行化學實驗之能力	○
D	具備國際視野與外語能力	○
圖示說明Illustration：● 高度相關 Highly correlated ○ 中度相關 Moderately correlated		
課程大綱 Course Outline		
<p>1. Introduction of soft matter materials - Definition and classification.</p> <p>2. Chemistry of Interfaces - Brownian motions, surface energy, adsorption, the solid-gas interface, the solid-liquid interface, the liquid-gas interface</p> <p>3. Molecular self-assembly - Amphiphilic molecules, micelle formation, Cellular and biomolecular assemblies, Biomimetic materials</p> <p>4. Colloid Chemistry - classification and preparation of colloidal materials, theory and control of colloid stability</p> <p>5. Introduction of Polymers - polymer synthesis, polymerization kinetics and copolymerization</p> <p>6. Polymer Solutions - thermodynamics of polymer dissolution, polymer conformation, and size in solution</p> <p>7. Polymer and Colloid Characterization - characterization of polymer solutions and colloidal dispersions - size, shape and structural analysis</p> <p>8. Soft Matter in Technology- liquid crystals, structured gels and particles, formulations and applications</p>		
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.)		
課程要求和教學方式之建議 Course Requirements and Suggested Teaching Methods		
<p>1. 學生必須全程參與課程，請假不得超過三次。Students are required to attend all classes. No more than three excused absences are permitted.</p> <p>2. 學生須完成指定功課，並按時繳交作業。Late assignments will not be accepted.</p> <p>3. 學生須參與團體討論與課堂練習。Active participation in class discussions is required.</p> <p>4. 課程不開放旁聽。This course is not open to auditors</p>		
其他 Miscellaneous		