

課程名稱 (course name)	(中) 奈米材料 (M037)			
	(Eng.) Nanostructured Materials			
開課系所班級 (dept. & year)	材料系研究所	學分 (credits)	3	授課教師 (teacher)
課程類別 (course type)	<input type="checkbox"/> 必修(Mandatory) <input checked="" type="checkbox"/> 選修(Elective)	授課語言 (language)	中文	開課學期 (semester)
課程簡述 (course description)	(中) 本課程講授重點為零維至三維奈米材料合成與製備方法、先進奈米製程與奈米檢測技術，以及探討奈米材料優異的性能在各高科技產業的應用，內容包含奈米粉體、奈米碳管、奈米模板之製備，以及奈米自組裝奈米加工最新技術。			
	(Eng.) The objective of this course is to understand the synthesis, characterization and application of zero to three dimension nanomaterials. And also introduction the unique properties of nanomaterials and their potential applications of different industrial field. Teaching contents including the process of nanopowders, carbon nanotube nano-templates, and technology of the self-assembly and nano-fabrication, etc.			
先修課程名稱 (prerequisites)				
課程目標與核心能力關聯配比(%) (relevance of course objectives and core learning outcomes)			課程目標之教學方法與評量方法 (teaching and assessment methods for course objectives)	
課程目標(中/ Eng.)	核心能力	配比(%)	教學方法	評量方法
<ul style="list-style-type: none"> <li>• 了解先進奈米材料與技術趨勢、以及奈米材料的特殊性質</li> <li>• 學習零維奈米粉體、一維奈米線、奈米碳管的合成方法及應用</li> <li>• 學習奈米模板技術、奈米自組裝技術發展及應用</li> <li>• 學習奈米材料檢測技術</li> <li>• 學習微系統與奈米加工技術與應用</li> <li>• 了解奈米材料在顧領域之應用發展</li> <li>• 培養學生獨立思考、解決問題與創新研究的能力</li> </ul> <p>To introduce the technology trend and unique properties of nanomaterials.</p>	<input checked="" type="checkbox"/> 1. 特定材料之專業知識	35	講授	測驗
	<input checked="" type="checkbox"/> 2. 策劃及執行專題研究之能力	15		
	<input type="checkbox"/> 3. 撰寫專業論文之能力			
	<input checked="" type="checkbox"/> 4. 創新思考、解決問題與終身學習之能力	25		
	<input checked="" type="checkbox"/> 5. 跨領域協調整合之能力	10		
	<input checked="" type="checkbox"/> 6. 國際觀及綠色材料知識	15		
	<input type="checkbox"/> 7. 領導、管理及規劃之能力			
	<input type="checkbox"/> 8. 學術專業倫理			

<ul style="list-style-type: none"> <li>• To introduce the synthesis methods of nanopowders, nanowires, and nanotubes</li> <li>• To train nanotemplate and self assembly technology</li> <li>• To train testing, characterization and nanofabrication of nanomaterials</li> <li>• To train nanotemplate and self assembly technology</li> <li>• To introduce the potential applications of nanomaterials</li> <li>• To train students for ability to think independently and solve problems independent thinking, and innovation skills</li> </ul>				
<b>授課內容(單元名稱與內容、習作/考試進度、備註)</b> <b>(course content and homework/ tests schedule)</b>				
01 Introduction of Nanotechnology & Nanomaterials 02 Properties of Nanomaterials 03 Synthesis of Nanopowders 04 Synthesis of 1-D Nanomaterials/ Carbon Nanotube 05 Self Assembling Methods 06 Template Method 07 Nanofabrication 08 Characterization of Nanomaterials 09 Midterm Report 10 Potential Applications of Nanomaterials 11 Application of TiO <sub>2</sub> Nanopowders/ Photocatalysis 12 Nanomaterial for Display Applications 13 Nanomaterial for Sensor Application 14 Nanomaterial for Energy Storage Applications 15 Nanoelectronics 16 Nano-bio-technology 17 Technology roadmap of Nanotechnology & Nanomaterials 18 Final Report				
<b>學習評量方式</b> <b>(evaluation)</b>				
平常成績 20%，期中報告 40%，期末報告 40%				
<b>教科書&amp;參考書目(書名、作者、書局、代理商、說明)</b> <b>(textbook&amp; other references)</b>				
1. Nanomaterials, Stanislaw Mitura, Pergamon Press, 2000. 2. 圖解奈米科技, 工業技術研究院譯著, 2002。 3. 其它課程補充講義。				

課程教材 (教師個人網址請列在本校內之網址。)  
(teaching aids & teacher's website)

E-campus

課程輔導時間 (office hours)