



課 綱 Course Outline
物理學系物理組

中文課程名稱 Course Name in Chinese	奈米科技概論				
英文課程名稱 Course Name in English	Introduction to Nanotechnology				
科目代碼 Course Code	PHYS21000	班 別 Degree	學士班 Bachelor' s		
修別 Type	學程 Program	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					
課程目標 Course Objectives					
讓學生修習此一課程後，能對奈米科技對有深入了解，以利研究工作的進行。					
系教育目標 Dept.' s Education Objectives					
1	物理科學人才培育，奠定物理及相關科學領域專業知識 To provide integrated education programs in view of fundamental knowledge of physical sciences and associated fields				
2	培養高科技人才 To train the talent for knowledge-intensive industries.				
3	培養繼續進修的理工人才 To train the talent for taking higher educational program in physical sciences.				
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	具備物理之基礎背景知識 Possessing fundamental knowledge in physical sciences.			●	
B	能運用基本物理知識與邏輯推理，分析解決物理問題 Being able to analyze and solve physics problems based on basic knowledge in physics as well as logical reasoning.			●	
C	對目前測量器材有基礎認識，且具有操作物理實驗儀器的能力 Being acquainted with modern equipment and being able to operate them for performing physics experiments.				
D	能使用基礎電腦程式語言解決物理問題 Being able to use basic computer programming for solving physics problems				

E	善用各種資訊平台進行論文資料蒐集的能力 Being able to use various platforms for data collection benefiting a topical research.	
F	具備科技發展的國際視野以及外語溝通的能力 Having an international view of the technology developments and being able to use a foreign language for communications.	
G	能整合物理與其它領域知識 Being able to integrate the knowledge of physics with that of other fields.	○

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

課程大綱 Course Outline

奈米材料科技是一高度跨領域的學門，它的發展需要基礎物理、化學、材料、電機及機械等相關領域做有效之整合。

1. Definition and history of nanoscience & nanotechnology
2. Nature & perspective of nanoscience & nanotechnology
3. Characterization method background & electron microscopy
4. Scanning probe microscopy
5. Spectroscopy method background
6. Fabrication method background
7. Materials, structure, and the nanosurface
8. Energy at the nanoscale
9. Carbon-based nanomaterials
10. Chemical interactions at the nanoscale & supramolecular chemistry
11. Natural nanomaterials
12. Biomolecular nanoscience

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.)

以具有所開課程專長之教師擔任授課；資料整理所需之電腦、影印機；討論所需之電腦、投影機等教學設備。奈米結構材料與奈米科技實驗室之製程、分析、及監控等設備

課程要求和教學方式之建議

Course Requirements and Suggested Teaching Methods

以英文按指定教材按預訂進度進行教學。教學以講授及討論為主，以相關文獻資料加以補充，並有實驗室參觀與實習。

其他 Miscellaneous

Introduction to Nanoscience
Gabor L. Hornyak et al.,
CRC Press, Taylor & Francis Group, NY, 2008