

課程名稱 (course name)	(中) 奈米製程 (M023)				
	(Eng.) Processing of Nanomaterials				
開課系所班級 (dept. & year)	材料系研究所	學分 (credits)	3	授課教師 (teacher)	何永鈞
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)	上學期 <input type="checkbox"/>
課程簡述 (course description)	(中) 奈米製程是一門包括多種學科的課程。這門課將介紹各種奈米製程技術的能力與極限，每一種用來製作 100 奈米以下結構的製程技術的原理和能力都將清楚的說明。此課程為以課堂的授課為主，並要求學生針對相關題目進行期中報告。				
	(Eng.) Nanofabrication is a multi-disciplinary field. This course will describe not only the nanofabrication capabilities for each of the selected technology, but also their limits. The principle and capability of each technology, specifically for making sub-100 nm structures, is introduced and illustrated. It is a lecture-oriented course, and requires students to give midterm presentations for certain interesting topics related with nanofabrication technologies. <input type="checkbox"/>				
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	
<p>這門課的主要目的是清楚的介紹所有可以用來製作 100 奈米以下結構的製程技術，讓學生對奈米製程技術的原理及應用有基本的認識與了解。</p> <p>This course aims to present a one-stop description at introduction level on most of the technologies that have been developed which are capable of making structures below 100 nm.</p>	<input checked="" type="checkbox"/> 1.特定材料之專業知識	50	討論 習作 講授	出席狀況 口頭報告 測驗	
	<input type="checkbox"/> 2.策劃及執行專題研究之能力				
	<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	30			
	<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	5			
	<input type="checkbox"/> 7.領導、管理及規劃之能力				
	<input checked="" type="checkbox"/> 8.學術專業倫理	5			

**授課內容(單元名稱與內容、習作/考試進度、備註)**  
**(course content and homework/ tests schedule)**

- 01 Preparation and overview
- 02 Introduction
- 03 Nanofabrication by Photons
- 04 Nanofabrication by Photons
- 05 Nanofabrication by Charged Beams
- 06 Nanofabrication by Charged Beams HW#1
- 07 Nanofabrication by Scanning Probes
- 08 Nanofabrication by Scanning Probes
- 09 Midterm Presentation
- 10 Nanofabrication by Replication
- 11 Nanofabrication by Replication HW#2
- 12 Nanofabrication by Pattern Transfer
- 13 Nanofabrication by Pattern Transfer
- 14 Indirect Nanofabrication
- 15 Indirect Nanofabrication HW#3
- 16 Nanofabrication by Self-Assembly
- 17 Nanofabrication by Self-Assembly
- 18 Final Examination□

**學習評量方式**  
**(evaluation)**

- (1) Homework assignment: 30%
- (2) Midterm presentation: 30%
- (3) Final Examination: 30%
- (4) Attendance: 10%

**教科書&參考書目 (書名、作者、書局、代理商、說明)**  
**(textbook& other references)**

- Text book  
Zheng Cui, “Nanofabrication- Principles,CapabilitiesandLimits”, Springer, New York, 2008.  
Reference  
1. Bharat Bhushan Ed., “Springer Handbook of Nanotechnology”, Springer, New York, 2004.  
2. Zhiming M. Wang, “One-Dimensional Nanostructures, Springer, New York, 2008.□

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

**課程輔導時間(office hours)** 2:00~4:00 pm, every Friday