



## 教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	奈米材料科技		學年/學期 Academic Year/Semester	113/1	
課程名稱(英文) Course Name in English	Nanomaterials and Nanotechnology				
科目代碼 Course Code	MS_D0120	系級 Department & Year	博士	開課單位 Course-Offering Department	材料科學與工程學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/傅彥培				
先修課程 Prerequisite					

### 課程描述 Course Description

本課程目的是讓學生對最新奈米科技有所理解。課程的內容包括奈米尺寸效應、奈米材料分析、奈米的應用等。本課程也將介紹特定奈米材料系統及其背景原理。

The purpose of this course is an overview of the up-to-date nanotechnology. The effect of nano-size, the characterization tools for the nanomaterials, and the application of nanotechnologies will be introduced. Several nanomaterial systems and background theories will be reviewed and discussed.

### 課程目標 Course Objectives

讓學生修習此一課程後，能對奈米結構材料與奈米科技對有深入了解，以利研究工作的進行

	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	具備材料科學所需的進階物理、化學及數學的知識。Acquire required advanced physical, chemical, and mathematic knowledge for materials science and engineering.	●
B	具備材料科學的進階專業知識，並能應用於解決工程上之問題。Acquire required advanced professional knowledge for materials science and engineering, applicable in solving engineering problems.	●
C	具備獨立研究之能力。Equipped with capabilities of independent research.	○
D	具備專業道德及責任感，與良好的溝通及團隊合作的能力。Acquire professional morality and responsibility, and capability of quality communication and team cooperation.	○
E	具備適當的英文能力，應用於學習與交流。Acquire English capability used for learning and interaction.	○

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

### 授課進度表 Teaching Schedule & Content

週次 Week	內容 Subject/Topics	備註 Remarks
1	Introduction	
2	Physics of Solid State - Crystalline Structure	
3	Physics of Solid State - Energy Bands	
4	Characterization - Structure	

5	Characterization - Microscopy and Spectroscopy	
6	Individual Nanoparticles	
7	Carbon Nanostructures	
8	2-D Nanomaterials	
9	期中考試週 Midterm Exam	
10	Bulk Nanostructured Materials - Polycrystalline and Layered	
11	Bulk Nanostructured Materials - Crystallized Nanostructure	
12	Nanostructured Ferromagnetism	
13	Quantum Wells Wires and Dots	
14	Self-Assembly and Catalysis	
15	Organic Compounds and Polymers	
16	Biological Materials	
17	Buffer week	
18	期末考試週 Final Exam	

教學策略 Teaching Strategies

- 課堂講授 Lecture
  分組討論 Group Discussion
  參觀實習 Field Trip
  其他 Miscellaneous:

教學創新自評 Teaching Self-Evaluation

創新教學 (Innovative Teaching)

- 問題導向學習 (PBL)
  團體合作學習 (TBL)
  解決導向學習 (SBL)
  翻轉教室 Flipped Classroom
  磨課師 Moocs

社會責任 (Social Responsibility)

- 在地實踐 Community Practice
  產學合作 Industry-Academia Cooperation

跨域合作 (Transdisciplinary Projects)

- 跨界教學 Transdisciplinary Teaching
  跨院系教學 Inter-collegiate Teaching

- 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

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學期成績計算及多元評量方式 Grading & Assessments

配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績 General Performance	20%		✓						
期中考成績 Midterm Exam	30%	✓							
期末考成績 Final Exam	40%	✓		✓					
作業成績 Homework and/or Assignments	10%		✓						
其他 Miscellaneous (_____)									

評量方式補充說明

Grading & Assessments Supplemental instructions

教科書與參考書目 (書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

課程教材網址(含線上教學資訊, 教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.  
Personal website can be listed here.)

其他補充說明 (Supplemental instructions)