

課程名稱 (course name)	(中) 非晶形材料 (M045)				
	(Eng.) Amorphous Materials				
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)	下學期
課程簡述 (course description)	(中) 非晶形材料具有特殊的結構與性質，在光電領域的應用非常廣泛。本課程將介紹玻璃、非晶形半導體與金屬玻璃等非晶形材料的結構、光學性質、電性、機械性質，以及這些材料的應用。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與期末報告。□				
	(Eng.) Non-crystalline materials exhibiting special structures and properties have been widely used for optoelectrical applications. This course will introduce the structures of various non-crystalline materials including glass, amorphous semiconductors, and metallic glasses, and discuss the optical, electrical, and mechanical properties of these materials and their applications. It is a lecture-oriented course, and requires students to give midterm and final presentations for certain interesting topics related with non-crystalline materials.				
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	
本課程的目的是讓學生對玻璃、非晶形半導體與金屬玻璃等非晶形材料的結構有基本的認識與了解，並探討其光學、電性與機械等特性，以及這些材料的應用。 The objective of this course is to understand the structures of various non-crystalline materials including glass, amorphous semiconductors, and metallic glasses, and study the optical, electrical, and mechanical properties of these materials.	<input checked="" type="checkbox"/> 1. 特定材料之專業知識	50	講授 討論	作業 書面報告 口頭報告	
	<input type="checkbox"/> 2. 策劃及執行專題研究之能力				
	<input checked="" type="checkbox"/> 3. 撰寫專業論文之能力	10			
	<input checked="" type="checkbox"/> 4. 創新思考、解決問題與終身學習之能力	20			
	<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 Overall Introduction
- 02 Amorphous materials - Overview
- 03 Glass - Structure and fabrication
- 04 Glass - Optical and mechanical properties
- 05 Glass - Electrical properties and chemical resistance / Homework #1
- 06 Glass - Applications Midterm presentation
- 07 Glass - Applications Midterm presentation
- 08 Amorphous semiconductors - Growth process
- 09 Amorphous semiconductors - Structure properties
- 10 Amorphous semiconductors - Optical and electrical properties / Homework #2
- 11 Amorphous semiconductors - Applications Midterm presentation
- 12 Amorphous semiconductors - Applications Midterm presentation
- 13 Metallic glass - Theories of metallic glass formation
- 14 Metallic glass - Preparations of metallic glass / Homework #3
- 15 Metallic glass - Magnetic and mechanical properties Midterm presentation
- 16 Metallic glass - Applications Midterm presentation
- 17 Final presentation
- 18 Final presentation

**學習評量方式
(evaluation)**

- (1) Homework assignment: 30%
- (2) Midterm presentation: 30%
- (3) Final presentation: 20%
- (4) Term paper: 20%

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

教科書

Yung-Chiun, Her, (2005), Lecture Notes.

非晶形材料的範圍相當廣泛，相關技術的進步也非常快速，除必須從不同的書籍截取上課的資料外，還必須不斷補充新的教材，因此，大部分授課內容將取自於授課老師自行編寫的講義。

參考書目

1. Horst Scholze, "Glass - Nature, Structure, and Properties", Springer-Verlag, New York, 1991.
2. J. Hlavac, "The Technology of Glass and Ceramics - An Introduction", 1983
3. A. Madan and M.P. Shaw, "The Physics and Applications of Amorphous Semiconductors", 1988,
4. K. Tanaka, E. Maruyama, T. Shimada, and H. Okamoto, "Amorphous Silicon", 1999.
5. F.E. Luborsky, "Amorphous Metallic Alloys", 1983.

課程教材 (教師個人網址請列在本校內之網址。)

(teaching aids & teacher's website)

Power point files.

課程輔導時間 (office hours) 週一下午 pm 3:00 ~ pm 5:00