

課程名稱 (course name)	(中) 光資訊儲存技術 (M060)				
	(Eng.) Optical Storage Technology				
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
課程簡述 (course description)	(中) 光資訊儲存技術是一門結合光學、資訊、電機、材料等領域的統整性學科。其目的在於使學生瞭解光資訊儲存技術的基本原理，包括光碟的讀取與寫入機制、資料編碼的方式、錯誤偵測及校正的方法、防拷的機制、以及資料壓縮的方法。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.) Optical data storage technology is an interdisciplinary course involving optics, data process, electrical engineering, materials, etc. The objective of this course is to understand the principle of optical storage technology including the readout and recording mechanisms of various optical disks, data encoding, error detection and corrections, copy protection, and data compression technologies. It is a lecture-oriented course, and requires students to give midterm and final presentations for certain interesting topics related with optical storage technology.				
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	
1.了解光儲存技術的基本原理	<input checked="" type="checkbox"/> 1.特定材料之專業知識	50	講授	作業 口頭報告 書面報告	
2.了解資料編碼與除錯的原理	<input type="checkbox"/> 2.策劃及執行專題研究之能力				
3.了解資料壓縮的方法與原理	<input checked="" type="checkbox"/> 3.撰寫專業論文之能力	10			
4.了解防拷技術與機制	<input checked="" type="checkbox"/> 4.創新思考、解決問題與終身學習之能力	20			
5.了解光資訊儲存技術如何應用於多媒體世界中	<input checked="" type="checkbox"/> 5.跨領域協調整合之能力	10			
6.了解相變化紀錄材料與磁光紀錄材料	<input checked="" type="checkbox"/> 6.國際觀及綠色材料知識	5			
7.了解未來高密度光儲存技術的發展	<input type="checkbox"/> 7.領導、管理及規劃之能力				
8.培養學生解決問題的能力					
9.培養學生收集資料的能力					
10.培養同學書面和口頭報告的能力	<input checked="" type="checkbox"/> 8.學術專業倫理	5			
11.能透過小組活動展現					

團隊合作能力

1. Understand the fundamental principles for optical data storage
2. Understand the methods and principles for data encoding and error correction
3. Understand the methods and principles for data compression
4. Understand the technologies and principles for copy protection
5. Understand the applications of optical data storage for multimedia
6. Understand phase change and optical magnetic recording materials
7. Understand the future developments of high density optical storage technology
8. Develop student's capability for solving problems
9. Develop student's capability of data collection
10. Develop student's capability of writing and oral presentation
11. Develop student's capability for team work

**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 Optical Disc Storage Technology
- 03 The Compact Disc - Modulation and Encoding
- 04 The Compact Disc - Fabrication and Data Format
- 05 The Compact Disc - CD-R/RW / Homework #1
- 06 DVD-Video / Midterm presentation Group #1
- 07 DVD-ROM, DVD-Audio / Midterm presentation Group #2
- 08 DVD-R/RW, DVD+R/RW, DVD-RAM / Homework #2 / Midterm presentation Group #3
- 09 Copy protection / Midterm presentation Group #4
- 10 MPEG data compression / Midterm presentation Group #5 / Homework #2
- 11 Error Correction / Midterm presentation Group #6
- 12 Magneto-optical Disc & Mini Disc / Midterm presentation Group #7
- 13 Blue-ray disk / Midterm presentation Group #8
- 14 Phase Change Materials for Optical Recording / Midterm presentation Group #9
- 15 Magneto-optical Recording Materials / Midterm presentation Group #10
- 16 Future development for optical storage / Homework #3

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 1. Ken Pohlmann, (2000), Principles of Digital Audio, 4th Ed, McGraw-Hill Inc. 2. Yung-Chiun, Her, (2005), Lecture Notes. 課程有關光資訊儲存技術的基本原理將取自於” Principles of Digital Audio”。不過，光資訊儲存是一門進步相當迅速的技術，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. Masud Mansuripur, (1995), The Physical Principles of magneto-optical Recording, Cambridge. 2. Terry W. McDaniel and Randall H. Vitora, (1996), Handbook of Magneto-optical Data recording, Noyes.
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)