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②图玄東華大學

教學計劃表 Syllabus

42.1 -1 =1 12 Syllabate								
課程名稱(中文) Course Name in Chinese	材料結構與顯微分析				學年/學期 Academic Year/Se	114/1		
課程名稱(英文) Course Name in English	Structure and Microsturcture Analysis of Materials							
科目代碼 Course Code	MS51600	系級 Department 碩士 & Year		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	/陳怡嘉							
先修課程 Prerequisite								
課程描述 Course Description								

The purpose of this course is focused in two primary material characterization methods, Scanning Electron Microscope (SEM) and X-ray Diffraction. The content of this course includes lecture and lab work, and both theory and practical applications will be covered in this course.

課程目標 Course Objectives

讓學生在修習此一課程後,能對X光繞射學與電子顯微鏡學有深入的了解,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.	\circ
В	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.	•
С	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.	•
Е	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.	0

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	(SEM) Microscopy with light and electrons (9/10)	
2	(SEM) Optical Arrangement (9/17)	
3	(SEM) Signal detection (9/24)	
4	(SEM) Probe size and current (10/01)	

5	(SEM) Quiz and discussion of Homeworks (10/08)	
6	(SEM) Contrast formation (10/15)	
7	(SEM) Operation variables (10/22)	
8	(SEM) Discussion of Quiz (11/29)	TACT2025 (10/26-29)
9	期中考 Midterm Exam (11/05)	期中考試週 Midterm Exam
10	(11/12)	全校運動會
11	X-ray radiation (11/19)	
12	X-ray absorption (11/26)	
13	Energy-Dispersive X-ray Spectroscopy (EDS) (12/03)	
14	X-ray Diffractometry - Samples and Data Acquisition (12/10)	
15	X-ray Diffractometry - Distortions of Diffraction Spectra (12/17)	
16	Wide Angle X-ray Diffraction and Scattering (12/24)	
17	期末考 Final Exam (2024/12/31)	期末考試週 Final Exam (2025/12/29- 2026/01/02)
18	WDS (01/07)	第18週教師彈性補充教學 (2026/01/05-09)
	教學策略 Teaching Strategies	
✓ 課堂講	授 Lecture	Field Trip
其他Mis	scellaneous:	
	教 學 創 新 自 評 Teaching Self-Evaluation	
創新教學(Innovative Teaching)	
問題導	물習(SBL)	
翻轉教	室 Flipped Classroom	
社會責任(Social Responsibility)	
在地實	踐Community Practice	ion
跨域合作(Transdisciplinary Projects)	
一 跨界教	學Transdisciplinary Teaching	Š
業師合	授 Courses Co-taught with Industry Practitioners	
其它 othe	r: 	

學期成績計算及多元評量方式 Grading & Assessments										
配分項目	配分比例 Percentage	多元評量方式 Assessments								
Items		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(含出缺席) General Performance (Attendance Record)	10%	>								
期中考成績 Midterm Exam	30%	~								
期末考成績 Final Exam	40%	>								
作業成績 Homework and/or Assignments	20%	>								
其他 Miscellaneous										

評量方式補充說明

Grading & Assessments Supplemental instructions

任課教授有依學生與課程高度相關之其他表現調整學期總分數約10 %之權線

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.)

XRD: B. D. Cullity, Elements of X-ray Diffraction (NDHU Lib. QC482.D5/C967/1978)

SEM: Materials Characterization: Introduction to Microscopic and Spectroscopic Methods, Yang Leng,

John Wiley & Sons (Asia) Pte Ltd 2008. (Online ISBN: 9780470823002)

Reference: R.E. Lee, Scanning Electron Microscopy and X-Ray Microanalysis. (NDHU Lib. QH212.S3/L479/1993)

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)