



教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	相變態導論		學年/學期 Academic Year/Semester	112/1	
課程名稱(英文) Course Name in English	Introduction to Phase Transformation				
科目代碼 Course Code	MS_40500	系級 Department & Year	學四	開課單位 Course-Offering Department	材料科學與工程學系
修別 Type	學程 Program	學分數/時間 Credit(s)/Hour(s)	3.0/3.0		
授課教師 Instructor	/黃士龍				
先修課程 Prerequisite					
課程描述 Course Description					
The purpose of this course is focused in fundamentals of phase transformation in solid materials including phase diagrams, diffusion, crystal interfaces and microstructure, solidification, and diffusional phase transformation.					
課程目標 Course Objectives					
簡介相變態之基礎理論及原理 This course will enable students to gain a thorough knowledge of the theory, mechanism and causes of phase changes in materials for research purposes.					
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物理、化學及數學的知識。Acquire required basic physical, chemical, and mathematic knowledge for materials science and engineering.			●	
B	具備材料科學的專業知識，並能應用於解決工程上之問題。Acquire required professional knowledge for materials science and engineering, applicable in solving engineering problems.			●	
C	具備邏輯思考、實驗執行、報告撰寫與數據解釋之能力。Equipped with capabilities of logic thinking, execution of experiment, and data interpretation.				
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	Thermodynamics and phase diagrams (1)				
3	Thermodynamics and phase diagrams (2)				
4	Thermodynamics and phase diagrams (3)				
5	Diffusion (1)				

6	Diffusion (2)	
7	Diffusion (3)	
8	Crystal interfaces and microstructure (1)	
9	期中考試週 Midterm Exam	
10	Crystal interfaces and microstructure (2)	
11	Crystal interfaces and microstructure (3)	
12	Solidification (1)	
13	Solidification (2)	
14	Solidification (3)	
15	Diffusional transformations (1)	
16	Diffusional transformations (2)	
17	Diffusional transformations (3)	
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:

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	10%		✓						
期中考成績 Midterm Exam	35%	✓							
期末考成績 Final Exam	35%	✓							
作業成績 Homework and/or Assignments	20%		✓						
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.)

D. A. Porter, K. E. Easterling, and M. Y. Sherif, Phase Transformations in Metals and Alloys, 3rd ed., CRC Press, 2009. (高立圖書)

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.)

<http://www.mse.ndhu.edu.tw/files/11-1029-4015.php>

其他補充說明 (Supplemental instructions)