



教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	物理冶金(二)			學年/學期 Academic Year/Semester	113/2
課程名稱(英文) Course Name in English	Physical Metallurgy (II)				
科目代碼 Course Code	MS__30300	系級 Department & Year	學二	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	/陳俊良				
先修課程 Prerequisite					

課程描述 Course Description

物理冶金是探討金屬材料結構與其物理性質之關係的基礎材料領域，尤其著重在各種控制金屬材料物理性質之理論闡釋，為材料系重要的一門核心課程，對往後在先進材料(半導體材料，光電材料)之研習有極大的助益。物理冶金(I)教授關於金屬晶體構造與差排理論等內容。然而，物理冶金(II)承續了先前相關知識，並進一步涵蓋金屬退火過程，固溶方式，相圖，原子擴散，金屬固化過程，成長動力學，析出硬化，鐵碳合金系統與非鐵金屬等，培養學生物理冶金之基礎概念並將所學與未來相關研究結合。

課程目標 Course Objectives

讓學生在修習此一課程後，能對物理冶金的基本理論有全面的了解，以利材料科學知識的建立

This course will enable students to gain a comprehensive understanding of the basic theories of physical metallurgy for the building of knowledge in materials science.

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	Annealing (I)	
2	Annealing (II)	
3	Solid Solutions	

4	Phase	
5	Binary Phase Diagrams	
6	Diffusion in Substitutional Solid Solutions (I)	
7	Diffusion in Substitutional Solid Solutions (II)	
8	Interstitial Diffusion	
9	期中考試週 Midterm Exam	
10	Solidification of Metals (I)	
11	Solidification of Metals (II)	
12	Nucleation	
13	Growth Kinetics	
14	Precipitation Hardening	
15	The Iron-Carbon alloy system	
16	The hardening of steel	
17	Selected Nonferrous Alloy System	
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	15%		✓						
期中考成績 Midterm Exam	30%	✓							
期末考成績 Final Exam	30%	✓							
作業成績 Homework and/or Assignments	25%		✓						
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.)									
Physical Metallurgy Principles 4th Edition by Reza Abbaschian (Author), Robert E. Reed-Hill (Author), 2008									
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)									