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②图玄束至大學

教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	材料機械性質				學年/學期 Academic Year/Se	114/1		
課程名稱(英文) Course Name in English	Mechanical Behaviors of Materials							
科目代碼 Course Code	MS_50300	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	/陳俊良							
先修課程 Prerequisite								

課程描述 Course Description

Courses in the mechanical behavior of materials are standard in both mechanical engineering and materials science/engineering curricula. These courses are taught, usually, at the junior or senior level. This course provides an introductory treatment of the mechanical behavior of materials with a balanced mechanics—materials approach, which makes it suitable for both mechanical and materials engineering students. It covers metals, polymers, ceramics, and composites and contains more than sufficient information for a one-semester course. It therefore enables the instructor to choose the path most appropriate to the class level (junior—or senior—level undergraduate) and background (mechanical or materials engineering).

課程目標 Course Objectives

This course equips students with a comprehensive understanding of the mechanical properties of materials, preparing them for future careers and research.

	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.	0
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.	0
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	Introduction	
2	Materials: Structure, Properties, and Performance	
3	Elasticity and Viscoelasticity	

4	Plasticity
5	Imperfections: Interfacial and Volumetric Defects
6	Stress-Strain Relationships and Behavior
7	Geometry of Deformation and Work-Hardening
8	High-Temperature Deformation of Crystalline Materials
9	期中考試週 Midterm Exam
10	Mechanical Testing: Tension Test and Other Basic Tests
11	Fracture: Macroscopic Aspects
12	Fracture: Microscopic Aspects
13	Solid Solution, Precipitation, and Dispersion Strengthening
14	Creep and Superplasticity (I)
15	Creep and Superplasticity (II)
16	Fatigue
17	Special Materials: Intermetallics and Foams
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Mis	scellaneous:
	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
社會責任(Social Responsibility)
在地實	踐Community Practice 產學合作 Industy-Academia Cooperation
跨域合作(Transdisciplinary Projects)
	學Transdisciplinary Teaching 跨院系教學Inter-collegiate Teaching
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	多元評量方式 Assessments							
Items	Percentage	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)	20%		~						
期中考成績 Midterm Exam	30%	>							
期末考成績 Final Exam	30%	~							
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.)

- 1. Marc Andre Meyers, Krishan Kumar Chawla: "Mechanical Behavior of Materials", Cambridge University Press; 2nd edition, 2009.
- 2. Thomas H. Courtney: "Mechanical Behavior of Materials", Waveland Pr Inc; 2 edition, 2005. (reference)

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)