教學計畫書 Syllabus

課號	**EM2610**	學分 credit	2	時數 hour	2
中文課名	材料科學	Course	Material Science		
授課教師 instructors	張介民(Chang, Chieh-Min)	選/必修 Selection	必修 Required course		

類別	中文	英文
學校教育使命與本課目的關係	1. 工程專業知識 2. 明晰的思維邏輯 3. 思考創造能力	1. Professional engineering knowledge 2. Clear reasoning logics 3. Creative thinking
本課程可培養學生之核心能力	1. 具備艦船工程及動力系統基礎學理 2. 理解艦船工程及動力系統相關數學、基礎科學及工程知識的能力 3. 運用艦船工程及動力系統相關知識，發掘、分析與解決問題的能力	1. Acquiring an understanding of the disciplines on naval architecture and power system 2. Understanding naval architecture and power system on a foundation of math, science and engineering knowledge 3. Applying knowledge of naval architecture and power system to identify, formulate and solve problems
課程目標	1. 使學生瞭解晶體結構與原子鍵結。 2. 使學生瞭解金屬相變化、金屬材料與複合材料性質及其工程方面之應用。 3. 使學生具有團隊合作及寫作和口語表達能力。	1. Understanding of atomic and crystal structure and chemical bond types 2. Understanding of the characteristics of metallic and composite materials with an emphasis on their engineering applications 3. Professional development through working on group project and practicing written and oral communication skills

先修科目	物理、化學		Physics & Chemistry
課程大綱	晶體結構 金屬材料之機械性質 金屬相變化 金屬合金的製造加工 複合材料		Crystal Structure Mechanical Properties of Metals Phase Transformations in Metals Processing of Metal Alloys Composites
指定用書	Materials Science and Engineering, An Introduction, 6th Edition, by Callister, John Wiely & Sons, Inc. 2003		Materials Science and Engineering, An Introduction, 6th Edition, by Callister, John Wiely & Sons, Inc. 2003
參考書籍	The Science and Engineering of Materials, 4th Edition, by Askeland and Phule, Thomson Books, 2003		The Science and Engineering of Materials, 4th Edition, by Askeland and Phule, Thomson Books, 2003
教學方式	課堂授課、小組專題報告、課堂小考與課後作業		Class instruction, group project and presentation, quiz and homework
教學進度	1週	概論 原子結構	Introduction Atomic Structure
	2週	原子鍵結	Atomic Bonding
	3週	晶體結構	Crystal Structure
	4週	結晶幾何學	Crystallographic System
	5週	結晶缺陷	Imperfection in Solid
	6週	固體擴散	Diffusion in Solid
	7週	金屬材料之機械性質 決定專題題目	Mechanical Properties of Metals Selection of Group Project Topic

	8 週	差排理論與破壞原理	Dislocation and Failure Mechanism
	9 週	期中考	Midterm examination
	10 週	相圖基本概念 檢討期中考題	Basic Concepts of Phase Diagrams Review mid-term exam problems
	11 週	相平衡 面談專題進度	Equilibrium Phase Diagrams Report the progress of group project
	12 週	金屬相變化	Phase Transformations in Metals
	13 週	金屬相變化	Phase Transformations in Metals
	14 週	金屬相變化	Phase Transformations in Metals
	15 週	金屬合金的製造加工	Processing of Metal Alloys
	16 週	複合材料	Composites
	17 週	專題報告	Final group project report due and presentation
	18 週	期末考	Final examination
成績評核方式 assessment		期中考 30% 期末考 30% 專題報告 20% 小考與作業 15% 上課表現狀況 5%	Midterm exam 30% Final exam 30% Project report & presentation 20% Quiz and Assignment 15% Learning attitude 5%
教學評量工具 Assessment Tools		評量工具說明： 由授課教師訂定。	Assessment Tools description: To be determined by each professor
諮詢時間 office hour		教師們在課堂上自行宣佈之	Declared by each professor