



課 綱 Course Outline
材料科學與工程學系學士班

中文課程名稱 Course Name in Chinese	材料熱力學（一）				
英文課程名稱 Course Name in English	Thermodynamics of Materials （I）				
科目代碼 Course Code	MS__20500	班 別 Degree	學士班 Bachelor' s		
修別 Type	學程 Program	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					
課程目標 Course Objectives					
熟悉熱力學的基本原理，與其在材料反應、製程上的應用。 To be familiar with the basic principles of thermodynamics and its application to material reactions and processes.					
系教育目標 Dept.' s Education Objectives					
1	奠定理論基礎 Set the theoretical foundation				
2	訓練實用技能 Train the practical skill				
3	培養優質人格 Form the positive cher				
4	啟發創新思 Promote creative thinking				
5	開展國際視野 Develop global vision				
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

課程大綱 Course Outline

1. 熱力學系統與平衡
2. 熱力學第一定律
3. 熱力學第二定律
4. 亂度及其統計上的意義
5. 輔助函數
6. 熱容量焓與熵
7. 相平衡與單一組成物系統
8. 氣體的行爲
1. Thermodynamic systems and equilibrium
2. The first law of thermodynamics
3. The second law of thermodynamics
4. Entropy and its statistical meanings
5. Auxiliary functions
6. Heat capacity, enthalpy and entropy
7. Phase equilibrium and single-component systems
8. The behavior of gases

資源需求評估（師資專長之聘任、儀器設備的配合．．．等）
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

具材料熱力學專長之師資，一般教室及教具即可
Teachers with expertise in thermodynamics, general classrooms and teaching aids are sufficient.

課程要求和教學方式之建議 Course Requirements and Suggested Teaching Methods

課堂講授為主、習題演算為輔。
Classroom lectures are the main focus, supplemented by problem solving and exercises.

其他 Miscellaneous