

## ESS240001 熱力學 (清班)

Fall, 2014

任課老師：陳紹文教授 (工科舊館 208 室，分機：34169)

E-mail：chensw@mx.nthu.edu.tw

上課時間：M7 M8 R6

上課地點：工科館 503 室

助教：

劉芳琴: h0952849972@hotmail.com

蔣 宇: s101013702@m101.nthu.edu.tw

工科舊館 519E 室，分機：34299

助教值勤時間：週 PM 7:00–9:00, 工科 519E

教科書：Michael.J. Moran, Howard.N. Shapiro, "Principles of Engineering Thermodynamics", 7th Edition, John Wiley & Sons, Inc.

參考書：R.E. Sonntag, C. Borgnakke, G.J. Van Wylen, "Fundamentals of Thermodynamics", 6th Edition, John Wiley & Sons, Inc.

Yunus A. Cengel, Michael A. Boles, "Thermodynamics; An Engineering Approach", 4th Edition, 2002, WCB McGraw-Hill

成績計算方式：

1st Examination	25%
2nd Examination	25%
Final Examination	25%
Homework	10%
Quiz	15%

教學方式：

1. 課堂講授 (中文/英文)

2. Power point 投影片與寫黑板方式，投影片將放在 iLMS 網頁上自由 download

章節	課程內容	授課週數
Chapter 1	Introductory concepts and definition (T, P, units, etc. ....)	1
Chapter 2	Energy & First law of Thermodynamics (Work, heat, energy transfer etc.)	2
Chapter 3	Properties of a pure, simple compressible substance (State principle, p-v-T relation, thermodynamics properties, ideal gas model etc.)	3
Chapter 4	Control volume energy analysis(Conservation of mass, conservation of energy, steady state, transient state etc..)	2
Chapter 5	Second law of thermodynamics (Second law, reversible, irreversible, maximum performance measures for power, refrigeration, and heat pump cycles operating between two reservoirs, Carnot cycle etc...)	3
Chapter 6	Entropy(Clausius inequality, definition, isentropic processes, isentropic efficiencies of turbines, nozzles, compressors and pumps, and heat transfer and work in internal reversible, steady state flow processes etc..)	3
Chapter 11	Thermodynamic relations for a simple compressible substance, Equation of state, Maxwell relation, constructing table of thermodynamics properties, generalized charts for enthalpy and entropy, p-v-T relations for gas mixture	4

總計: 大約 60 小時

**Tentative outline:** (The following outline and dates are subject to change due to unexpected events or other issues.)

1. Chapter 1 (3 hours)
2. Chapter 2 (8 hours)
3. Chapter 3 (6 hours)

**1<sup>st</sup> Midterm Exam, 10/24, 7:00pm, ESS503 (Expected)**

4. Chapter 3 (3 hours)
5. Chapter 4 (6 hours)
6. Chapter 5 (6 hours)
7. Chapter 6 (3 hours)

**2<sup>nd</sup> Midterm Exam, 12/5, 7:00pm, ESS503 (Expected)**

8. Chapter 6 (6 hours)
9. Chapter 11 (12 hours)

**Final Exam, 1/16, 7:00pm, ESS503 (Expected)**