## **ME/MS 505 Materials Thermodynamics**

Lectures	Lecture Topic	
1	Introduction (First Law)	Chapter 1
2	First Law (Continued)	Chapter 2
3	Second Law, Statistics of Entropy I	Chapters 3
4	Statistics of Entropy II	Chapter 4
5	Auxiliary Thermodynamic Functions Chemical Potential, Maxwell's Relations	Chapters 5
6	Heat Capacity, Enthalpy, Entropy and 3 <sup>rd</sup> Law I	Chapter 6
7	Heat Capacity, Enthalpy, Entropy and 3 <sup>rd</sup> Law II	Chapter 6
8	One Component Phase Diagrams I	Chapter 7
9	One Component Phase Diagrams II	Chapter 7
10	Treatment of Gas Mixtures I	Chapter 8
11	Treatment of Gas Mixtures II	Chapter 8 and Notes
12	Treatment of Condensed Systems I	Chapter 9
13	Treatment of Condensed Systems II	Chapter 9 and Notes
14	Binary Phase Diagrams I	Chapter 10
15	Multi-component Phase Diagrams II	Chapter 10 and Notes
16	Gas Reactions	Chapter 11
17	Gas-Condensed Phase Reactions	Chapter 12
18	Multi-component reaction equilibria I	Chapter 13
19	Multi-component reaction equilibria II	Chapter 13
20	Binary Phase Diagrams (Composition- Temperature-Pressure Space)	Chapter 14
21	Electrochemistry	Chapter 15

Required Text: Introduction to the Thermodynamics of Materials by David R. Gaskell, Prentice Hall (5<sup>th</sup> edition).

## Reference Texts:

- 1. C.H.P. Lupis, Chemical Thermodynamics of Materials, Prentice-Hall, Englewood Cliffs, NJ.
- 2. D. Tabor, Gases, liquids, and solids and other states of matter, Cambridge University Press Syndicate, Cambridge
- 3. David Chandler, Introduction to Modern Statistical Mechanics, Oxford University Press, Oxford, New York.