CH204 Aug 3:0

Thermodynamics

Instructor

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Teaching Assistant

Email:

Department: Chemical Engineering

Course Time:

Lecture venue: Chemical Engineering Class Room

Detailed Course Page:

Announcements

Brief description of the course

The course is designed for graduate students in chemical engineering. Starting from the postulates of

thermodynamics, a rigorous derivation of the laws of thermodynamics is presented followed by application of

these laws to both closed and open systems.

Students will gain an in-depth understanding of various topics such as Legendre Transforms, thermodynamic

equilibrium, thermodynamic stability, solution thermodynamics, phase equilibria and equations of state.

Finally a brief introduction to statistical thermodynamics is presented towards the end of the course.

Prerequisites

Any undergraduate course in thermodynamics

Syllabus

Classical thermodynamics: first and second laws, Legendre transforms, properties of pure substances and

mixtures, equilibrium and stability, phase rule, phase diagrams, and equations of state, calculation of VLE and

LLE, reaction equilibria, introduction to statistical thermodynamics.

Course outcomes

A student who has successfully completed the course should be able to preform thermodynamic analysis of real-world systems, irrespective of the number of phases or components in the system. The student will gain expertise in computing phase equilibria, as well as modelling thermodynamics of solutions. He/She will also gain an understating of statistical thermodynamics at the introductory level such as the concept of partition functions and its relationship to thermodynamics.

Grading policy

20 % for assignments, 30% for mid-terms and 50% for finals

Assignments

Resources

Tester, J.W., and Modell, M., Thermodynamics and its Applications, Third Edn, Prentice Hall, 1997.

Callen, H.B., Thermodynamics and an Introduction to Thermostatics, John Wiley & Sons, 1985.

McQuarrie, D.A., Statistical Mechanics, University Science Books, 2000.

Hill, T.L., An Introduction to Statistical Thermodynamics, Dover Publications, 1960