CH236 Jan 3:0

Statistical Thermodynamics

Instructor

Sudeep N Punnathanam
Email: sudeep@iisc.ac.in

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 provides an introduction to the field of statistical thermodynamics. Students will be taught the concept of the partition function and its relationship to thermodynamics. The course will also cover applications of statistical thermodynamics to various systems such as imperfect gases, simple liquids, lattice systems and polymer solutions. Through these applications, students will gain familiarity will various topics such as virial coefficients, radial distribution functions, integral equations for liquids, perturbation theories for liquids, etc.

Prerequisites

Any undergraduate course in thermodynamics

Syllabus

Introduction to ensembles, partition functions, relation to thermodynamics; imperfect gases; density distribution functions; integral equations and perturbation theories of liquids; lattice gas; Ising magnets; Bragg Williams approximation; Flory Huggins theory; Molecular modeling of intermolecular forces

Course outcomes

The student will gain an understanding of the principles of statistical thermodynamics and lays the foundation for studying advances topics in statistical mechanics. A successful completion of the course will enable the student to pursue scientific research in the areas of statistical mechanics, physical chemistry and chemical physics.

Grading policy

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

Assignments

Resources

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

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

Chandler, D, Introduction to Modern Statistical Mechanics, Oxford University Press, New York, 1986