01.07.2019

Bar-Ilan University

Advanced Statistical Mechanics
86-821-01

Lecturer: Prof. Ido Kanter
Course type: Lecture + practice
Date: 2019-2020 **semester:** B **weekly hours:** 2L+2P

Aim of the course:

This course is one of the compulsory graduate courses. It is a natural extension of the compulsory courses of the first degree such as statistical physics and quantum mechanics.

Details of subjects to be covered:

Principles of statistical mechanics
Statistical ensembles
Liouville theorem
Ensembles in equilibrium
Ergodicity and mixing flow
Quantum ensembles and statistics
Phase transition and critical phenomena
Exact solution in one and two dimensions
Landau theory
Mean-field theory and exact solutions
Scaling theory

Course Requirements:

Exercises + Exam.

Prerequisites:

Basic knowledge of programming.

Grading:

The final score: Examination 90%, exercises 10%

Bibliography:

Recommended textbooks:

-Statistical Mechanics, K. Huang (John Wiley, NY)
-A modern course in statistical physics, L. E. Reichl (Univ. of Texas press)
-Statistical Physics, Lifshitz and Pitaevskii
-Phase transition and critical phenomena, S. Ma
-Introduction to phase transition and critical phenomena, H. E. Stanely