

Instructor: Zhi-Feng Huang, 356 Physics Building
Tel: (313) 577 2791; Email: huang@wayne.edu
Office hours: Tue & Thurs 3:00pm – 4:00pm, or by appointment

Lecture time and location: T Th 12:50pm – 2:50pm, 185 Physics Building

Textbook: “Statistical Physics of Particles”, by M. Kardar, Cambridge University Press

Supplementary text: “Statistical Physics of Fields”, by M. Kardar, Cambridge Univ. Press;
“Statistical Mechanics”, 2nd or 3rd edition, by P. K. Pathria, Academic Press.

Homework: Posted in Blackboard course website; Collected in class at due date.
Late solutions will NOT be accepted; The lowest homework score will be dropped.
You must show your own work and solution steps to receive credits, although
group discussions are allowed. Any copy from other sources (such as from other
students, internet, or elsewhere) is prohibited and will be given 0 credit.

Exams: Two midterm exams: to be announced at least 1 week in advance (NO make-up exams);
Final exam (Cumulative): December 17 (Tuesday), 10:40am – 1:10pm.

Grading: 1st exam: 20%
2nd exam: 20%
Final exam: 35%
Homework: 25%

A: 90 – 100%; A-: 85 – 89%
B+: 80 – 84%; B: 75 – 79%; B-: 70 – 74%
C+: 65 – 69%; C: 60 – 64%; C-: 55 – 59%
D+: 50 – 54%; D: 45 – 49%; D-: 40 – 44%
F: 0 – 39%

Course content and learning outcomes

This course covers the concepts and methods of statistical physics, including both classical and quantum statistical mechanics. Students will learn and understand the following topics:

- Review of thermodynamics.
- Probability and random variables; Kinetic theory of gases.
- Classical statistical mechanics; Ensembles: Microcanonical, Canonical, Gibbs Canonical, and Grand Canonical.
- Interacting particles.
- Quantum statistical mechanics; Ideal quantum gases.
- Phase transition and critical behavior.
- Statistical fields: Landau-Ginzburg Hamiltonian; Non-equilibrium dynamics.

Additional resources and help

Student Disability Services: If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.