

PY 541 Problem Set 8: HW Exercises Due on Dec 1st

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Read the assigned material before class. Pre-class questions are due midnight the night before before Tuesday and Thursday classes and noon on Wednesdays when homeworks are not due (usually Thursdays), and otherwise should be turned in with the homeworks.

Welcome to PY 541 Statistical Physics. This is a graduate course that assumes you have taken an undergrad course on these topics (e.g. Thermal Physics, Statistical Physics, etc.). It also assumes some basic familiarity with core mathematical areas: probability, linear algebra, vector calculus as well as rudimentary programming skills (Python, Mathematica, etc.). If you do not feel comfortable with these concepts, please come talk to me.

All exercises are from the second edition of Jim Sethna's book available at:

<https://www.lassp.cornell.edu/sethna/StatMech/index.html>.

There are also hints and code for computational exercises at this website.

Readings and Pre-class questions

Tuesday:

Read: 10.6-10.9

Pre-class question: 10.12 Liquid Free Energy

In-class: 10.13, 10.15

Wednesday:

Read: Chapter 10

Pre-class question: None

In-class: 10.16, 10.18

Thursday:

Read: Chapter 7 Sethna; Chapter 6 Gould

In-class question: Review of density matrices, SVD and entropies, bosons and fermions, Landau potential

Homework Exercises

10.1 CMB

10.5 Telegraph noise and nanojunctions

10.7 Noise and Langevin.

10.8 Magnet Dynamics.

10.9 Quasiparticle poles and Goldstone's theorem.

Honor Code

All students are expected to follow the [BU Honor Code](#). While collaboration is allowed and encouraged on HWs, each student should write up their own solutions. Copying HW is strictly forbidden. The students are allowed to consult all resources and books. However, students are NOT allowed to consult problem solutions from previous years or as found on the web.