Course name	Physics 219, Statistical Physics
Meeting place, time	ISB 231, Tue,Thu 2–3:45 PM
Instructor	Gey-Hong (Sam) Gweon
Office hours	Tue 10–11 AM, Wed 1–2 PM
Where to find him	ISB 249, gweon@ucsc.edu, http://griffin.ucsc.edu
Textbook	No required textbook
References	*Equilibrium Statistical Physics*, Plischke & Bergersen
	Statistical Mechanics, S. K. Ma
	Statistical Physics of Particles, Mehran Kardar
	Statistical Mechanics, K. Huang
	Statistical Mechanics, Feynman
	Statistical Physics, Landau, Lifshiftz & Pitaevskii
	Fundamentals of Statistical and Thermal Physics, F. Reif
	Statistical Mechanics, J. P. Sethna
	Thermodynamics, Fermi
	Statistical Physics of Fields, Mehran Kardar
Course website	http://griffin.ucsc.edu/teaching/current

Course objectives *Gain very solid understanding of statistical physics* (this will *not* be an easy task for many students, as the statistics on my past courses will tell me). Review thermal physics. Learn to carry out simple and not-so-simple calculations for response functions, practice numerical calculations. Be able to deal with the graduate qualifier level of problems with ease. Be able to understand modern views on the phase transition.

Evaluation The course evaluation will be based roughly half on homework (5 to 7 sets are expected), and the other half on the final exam (no midterm). If you do very poorly in either of these two categories, you may not pass this course, almost regardless of how you do in the other. Some questions will be posted on the on line forum, in addition to homework, to facilitate student understanding. Your participation in on-line discussions (or other discussions) is optional, but is recommended. You will get credit for your on-line activities. There may be simple anonymous quizzes during the lectures; in that case, they (mostly participation points) will be included as small credit, as well.

Emergency If highly unusual personal circumstances arise to prevent you from participating in core course activities, you should communicate with me as soon as you can, so that you will get the best consideration for makeup opportunities.

Get all help you can get. At a graduate level of physics, talking is very important way of communicating physics. So, talk out loud. Get all help you can get from me, your buddies, and yourself, by not being afraid to ask. Also, the web forum will be available for your discussion.

Lecture plan Here is a rough plan for lectures, subject to change.

Lec	Week	Day	Subject
1	1	4-1	Thermodynamics review
2		4-3	Thermodynamics review
3	2	4-8	Probability
4		4-10	Probability
5	3	4-15	Irreversibility, Kinetic theory of gas
6		4-17	Kinetic theory of gas
7	4	4-22	Semi-classical statistical mechanics
8		4-24	Interactions
9	5	4-29	Interactions
10		5-1	Quantum statistical mechanics
11	6	5-6	Quantum statistical mechanics
12		5-8	Quantum particles
13	7	5-13	Quantum ideal gas
14		5-15	Quantum ideal gas
15	8	5-20	Phase transitions
16		5-22	Landau-Ginsburg theory
17	9	5-27	Correlations, Exact solutions
18		5-29	Monte Carlo and renormalization group
19	10	6-3	Renormalization group
20		6-5	Linear response theory or review
		6-12	Final exam (12-3 PM)