

Updated: January 4, 2021

2021 Syllabus - Statistical Mechanics PHY6536

General Information

Instructor: P. Ramond, e-mail: pramond@ufl.edu

Class times: MWF 9:35 a.m. to 10:25 a.m.

Classes begin January 8, and end April 21- There is NO Spring Break!

All Procedures and Communications proceed through Canvas:

- upload “file of the day” before each Zoom session

- share iPad screen and discuss “file of the day”

Class Text: “Thermodynamics and Statistical Mechanics”, W. Greiner, L. Neise, H. Stöcker, Springer-Verlag, 1995.

Secondary Text: “Statistical Mechanics”, Kerson Huang, Wiley.

- weekly homework will be assigned and uploaded to Canvas

- examinations: one-hour midterm, and two-hours final

- grades: homework 25%, midterm 25%, final 50%

Schedule and Topics

Thermodynamics

Equilibrium and State Quantities
The Laws of Thermodynamics
Phase Transitions and Chemical Reactions
Thermodynamics Potentials

Classical Statistical Mechanics

Microstates Ω and Entropy S
Ensemble Theory
Canonical Ensemble
Applications of Boltzmann Statistics
Macrocanonical Ensemble

Quantum Statistical Mechanics

Density Operators Symmetry
Grand Canonical Description
Ideal Bose Gas
Ideal Fermi Gas
Applications
Ising Model