PHYSICS 730
STATISTICAL PHYSICS I
FALL 2021 / ON-LINE / WRITTEN LECTURE NARRATIVES
No In-Person Meetings
Monday, August 23 – Friday, December 17
Last Day of Instruction: Thursday, December 9

Instructor
Dr. Chester Vause
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Prerequisites (UHM Catalog)
Physics 670

Textbook
"Statistical Physics" (3rd English ed., Part 1) Landau and Lifshitz Course of Theoretical Physics, Volume 5, E. M. Lifshitz and L.P. Pitaevskii (Pergamon Press, Oxford, 1980)

Student Learning Outcomes
Among the student learning outcomes of this course are to:

(a) Understand the fundamental principles of equilibrium Statistical Mechanics as a microscopic theory, and how this theory provides the foundation of macroscopic Thermodynamics ("Laws of Thermodynamics").

(b) Develop and use various statistical equilibrium distributions, micro-canonical, canonical, and grand canonical, formulated by Gibbs.

(c) Derive the connection between statistical correlations (fluctuations) and thermodynamic response functions, and thermodynamic extremum principles of various thermodynamic potentials.

(d) Apply the theory to various macroscopic phenomena, from microscopic models of many-particle microscopic systems of macroscopic extent.

(e) Applications include the Fermi, Bose, photon, and phonon ideal quantum gases, the classical ideal Boltzmann gas, paramagnetism, and elementary interacting systems (such as the non-ideal gas, van der Waals theory), thermodynamic theory of phase transitions.

Assignments
Assignments are "take-home" and will be given from "time-to-time" as needed, typically to fill-in some gaps, or as an extention of the material covered. There is no Final Exam.

Grade Scale
The Letter Grade is determined from the average of the Assignment Scores:

A- (86%-90%)	A (91%-95%)	A+ (96%-100%)
B- (61%-70%)	B (71%-80%)	B+ (81%-85%)
C- (31%-40%)	C (41%-50%)	C+ (51%-60%)
	F (0%-20%)	D (21%-30%)

NO INCOMPLETE GRADE GIVEN

NOTICE