

PHYS F451X Statistical Physics

Spring 2017

Credits: 2.0

Lectures: REIC 204 MW 3:30-4:30 pm

Instructor: Dr. Roman Makarevich
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Office Hours: REIC 116 (tba), ELVE 708B by appointment

Course Content: The canonical ensemble, maximizing entropy, the partition function and Helmholtz free energy, the harmonic oscillator, Einstein and Debye solids, classical systems and the ideal gas, diatomic molecules, equipartition theorem, the photon gas and the blackbody spectrum, the grand canonical ensemble, quantum statistics, Fermion and Boson systems.

Prerequisites: PHYS 342, PHYS 351, PHYS 421.

Materials Needed:

Required Text: An Introduction to Thermal Physics by D. V. Schroeder,
Pearson/Addison-Wesley, 2000 (ISBN 0-201-38027-7)

Instructor's lecture notes: Provided via Blackboard as pdf files.

Grading: The course grade will consist of the following components (though I reserve the right to make grade adjustments based on performance trends):

Homework	40 %
Midterm Exam	20 %
Final Exam	40 %

Homework: There will be approximately one homework assignment per week. The assignment will be posted by Monday on the Blackboard and will be due on the following Wednesday by 3:30 pm. **All homework assignments must be turned in directly to me in class. No emailed or otherwise electronically-submitted assignments will be accepted.** Late assignments will be generally marked down as follows: late up to 1 day minus 10%, late up to 7 days minus 10% per one day late, after 7 days late minus 100%. The exceptions will be assignments due on March 1 and April 26 that will **not** be accepted late.

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Midterm Exam: An hour-long midterm exam will be given on March 8, 2017 during the regular lecture time. The exam will be closed-book, but you will be given most of the needed equations. The exam will be graded and handed back as soon as possible.

Final Exam: The final exam will be at 3:15-5:15 pm, Friday, May 5, 2017. It will cover the entire course, with some emphasis on the more recent material. The final will be closed-book, but you will be given most of the needed equations.

Every student will obtain a raw score out of 100%. I assign letter grades based on raw scores and a curve developed for this class. A raw score above 90% will be at least an A, above 80% will be at least a B, above 70% will be at least a C, above 60% will be at least a D. No +/- grades will be given with a possible exception of A+, A-, B+, and B-.

Instructor-Initiated Withdrawals: Any time from Wednesday, February 15, 2017 through Friday, March 31, 2017 the instructor will exercise the right to withdraw a student from PHYS F451X for any of the following reasons: (1) Midterm exam is missed without an excused absence, or (2) the current cumulative homework grade is less 50%, or (3) the current cumulative overall grade is less 50%. This is this class's definition of "...has not participated substantially in the course."

Absences and Make-Up Tests and Assignments:

Make-up tests will be allowed for legitimate reasons, which you **must discuss** with the professor. An unexplained absence from a test will result in a zero. If you anticipate an absence (intercollegiate sports, travel on military or University business), talk to your professor before the test to make arrangements. If the absence is unexpected (illness, family or personal calamity, cold weather transportation difficulty), talk with the professor at the earliest possible opportunity. Come prepared to document your particular calamity. In any case, you must take the make-up test as soon as possible of your return to health. If you are to take a make-up test/assignment, we expect that you have no knowledge of the original test/assignment.

Homework: No make-up assignments will be given. You will be required to submit a homework solution **on or earlier than** the due date in any case. Late assignments will be marked down as described above.

Midterm Exam: Talk to the professor to make the necessary arrangements if you miss a test for a legitimate reason.

Final Exam: An incomplete grade may be given in some situations as governed by the University regulations. You will be required to take a final test at the time agreed.

Special Needs: The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. We will work with the Office of Disabilities Services to provide reasonable accommodation to students with disabilities.

Plagiarism: Plagiarism and cheating are matters of serious concern for students and academic institutions. This is true in this class as well. The UAF Honor Code (or Student Code of Conduct) defines academic standards expected at the University of Alaska Fairbanks which will be followed in this class. (Taken from the [UAF plagiarism web site](#), which has many links with good information about this topic)

Complaints and Concerns: You are always welcome to talk to me about anything, however, if you have a non-subject matter question or concern that cannot be resolved by me, contact the department chair, Dr. Renate Wackerbauer, Physics Department Office, Room REIC 106.