

## PHYS 4300/6300: Thermodynamics and Statistical Physics

- Instructor: Dr. M. Bachmann  
Room: Physics Bldg. 309  
Email: [bachmann@smsyslab.org](mailto:bachmann@smsyslab.org)  
Course website: [www.smsyslab.org/teaching.html](http://www.smsyslab.org/teaching.html)
- Topics: This course covers general theoretical concepts of thermodynamics and statistical physics. The macroscopic description of thermal behavior by means of a few state variables such as temperature, pressure, free energy, entropy, etc. is based on the Thermodynamic Laws, whereas its microscopic justification is provided by the statistical analysis of the system's individual degrees of freedom. The course reviews the historic foundation of thermodynamics and introduces probability and ensemble theory for the appropriate treatment of the typically huge number of configurational and kinetic degrees of freedom in a macroscopic system.
- References: There is a large number of textbooks about this subject and the course material will not be based on a specific one. Recommendations include: *Theoretical Physics 5: Thermodynamics* and *Theoretical Physics 8: Statistical Physics* by W. Nolting; *Statistical Physics* by L. D. Landau and E. M. Lifshitz; *A Modern Course in Statistical Physics* by L. E. Reichl; *Fundamentals of Statistical and Thermal Physics* by Frederick Reif.
- Class: Tuesday and Thursday, 1:15pm–2:35pm in room 254
- Office Hours: You can contact me at any time.
- Exams: Midterm and Final (take-home). The midterm exam will be in early March; the final exam in early May. In both exams, only lecture notes and homework solutions are admitted. An exam that was missed without documented reason is assigned the grade F. If the instructor decides that missing an exam was excusable, an oral make-up exam will be set up. If you should be unable to take an exam for medical reasons, you must inform me before the exam starts and send me a copy of the original medical visit verification provided by your doctor by end of the exam day.
- Homework: There will be graded assignments on a regular basis (typically bi-weekly) with strict deadlines. Late homework will not be accepted. Do not submit homework via email (unless directed otherwise).
- Grade:  $\text{Total Grade} = (\text{Homework} + \text{Midterm} + \text{Final})/3$
- Grading: [100,85]: A; (85,82.5]: A<sup>-</sup>; (82.5,80]: B<sup>+</sup>; (80,70]: B; (70,67.5]: B<sup>-</sup>; (67.5,65]: C<sup>+</sup>; (65,55]: C; (55,52.5]: C<sup>-</sup>; (52.5,40]: D; (40,0]: F
- Academic Honesty: All members of the academic community are committed to honesty. The academic honesty policy statement of UGA can be viewed online at [www.uga.edu/honesty](http://www.uga.edu/honesty).