

Thermal & Statistical Physics

Instructor: Alexander Wagner
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Bulletin description: Classical postulates and laws of thermodynamics; cyclic processes and entropy; thermodynamic potentials, equilibrium, stability, and phase transitions; Maxwell-Boltzmann distribution, applications to classical gases and magnets; quantum statistics, Bose-Einstein and Fermi-Dirac distributions, applications to quantum gases.
Prereq: PHYS 350.

Goals: This course provides students with an overview of Thermodynamics and Statistical Mechanics.

Meetings: 2:00pm - 3:15pm Tuesday, Thursday in South Engineering 221

Attendance: According to NDSU policy 333 attendance in classes is expected. Absences for NDSU sponsored extracurricula activities will be excused when appropriate documentation is provided. Online homework should be completed by the stated deadline. For medical reasons or family emergencies homework extensions will be granted on request. It is expected that extensions are requested before the expiration of the deadline whenever possible.

Office hours: 1:00 - 2:00pm Tuesdays, or by arrangement

Text: An Introduction to Thermal Physics, Daniel V. Schroeder, OUP

Schedule: Energy in Thermal Physics
The Second Law
Interactions and Implications
Engines and Refrigerators
Free Energy and Chemical Thermodynamics
Boltzmann Statistics
Quantum Statistics
Interacting Particles
We will cover about one chapter each 2 weeks.

Blackboard: This class does not use an online content management system.

Grading: Problems: 25pts
Test 1, Feb. 17.: 25pts
Test 2, Mar. 31: 25pts
Final, May 11, 8:00am-10:00am: 50pts
Grading scale: A:100-85, B: 84-73, C: 72-61, D:60-50, F: 49-0

Illness: Do not come to class if you are sick. Please protect your health and the health of others by staying home and participate in class remotely. If you are unable to attend class at the regularly scheduled time due to

illness, contact the instructor for alternate arrangements, especially for exams and extensions of homework due dates.

Resources for Students on campus and remotely (telehealth):

- Counseling Services: 701-231-7671; <https://www.ndsu.edu/counseling/>
- Disability Services: 701-231-8463; <https://www.ndsu.edu/disabilityservices/>
- Student Health Service: 701-231-7331; <https://www.ndsu.edu/studenthealthservice/>
- Dean of Students Office: 701-231-7701; <https://www.ndsu.edu/deanofstudents/>

Additional Information:

- *Any students with disabilities who need accommodation in this course are encouraged to speak with the instructor as soon as possible to make appropriate arrangements.*
- *Veterans and student service members with special circumstances or who are activated are encouraged to notify the instructor as soon as possible and are encouraged to provide Activation Orders*
- *All work done in this course must be completed in a manner consistent with NDSU University Senate Policy, section 355: Code of Academic Responsibility and Conduct*
(<http://www.ndsu.nodak.edu/policy/355.htm>)