# PHYS 412 – MAT 502 Statistical Mechanics

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**Schedule:**
Tuesday, 13:40 – 14:30 at FENS L058
Thursday, 9:40 – 11:30 at FENS L058

**Recommended Books**
Statistical Physics by F. Mandl
Fundamentals of Statistics and Thermal Physics by F. Reif

**Contents:**
- Basic probability concepts in statistical mechanics:
    - random walk, mean values, probability distributions
- Statistical description of systems of particles:
    - state of a system, statistical ensemble, basic postulates, probability calculations, density of states
- The statistical basis of thermodynamics
    - equilibrium conditions, reversible and irreversible processes, the laws of thermodynamics, the maximum entropy
- Basic methods of statistical mechanics:
    - Ensemble representations, approximation methods, the partition function, the equipartition theorem,
- Quantum statistics of ideal gases:
    - Maxwell- Boltzmann Fermi-Dirac, Bose-Einstein statistics; Blackbody radiation

**Grading:**
Homework (one in two weeks, 5 total): 30%
Midterm: 30%
Final: 40%