



Department of Physics
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August 8, 2012

Course Syllabus for Physics 340, Fall 2012

Instructor: Yong W. Kim, Professor of Physics (ywk0@lehigh.edu; 610-758-3922; Lewis Lab, Rm 403)

Textbook:

Thermal Physics, Ralph Baierlein, Cambridge University Press (1999)

Supplemental Textbook:

Thermal Physics, David Schroeder, Addison Wesley Longman (2000)

Concepts in Thermal Physics, 2nd ed., Blundell and Blundell, Oxford University Press (2010)

Course Content

Introduction

State of Equilibrium

Temperature

Equation of State

Kinetic Theory

First Law of Thermodynamics

Adiabatic versus Isothermal Processes

Heat and Work

Second Law of Thermodynamics

Entropy

Efficiency of Thermodynamic Cycles

Quantum Mechanical Description

Canonical Distribution

Probabilities at Fixed Temperature

Partition Function

Photons and Phonons

Black Body Radiation

Free Energy and Chemical Potential

Quantum Ideal Gas

Occupation Numbers

Spin Statistics

Fermions and Bosons

Quantum Gases at Low Temperature

Fermions

Bosons

Bose-Einstein Condensation

Phase Equilibria

Van der Waals Equation of State

Critical Point

Transport Processes

Tests and Assignment

Two Hour Exams and Final

Weekly Homework Assignments

Special Topics Term Paper (to count as an Hour Exam)

Accommodations for Students with Disabilities: *If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.*