PHYS334: Thermal Physics
Spring 2012

Teacher: Dr. Kelly Krieble Office: Room 109, Collier Hall of Science Phone: ext. 1437 e-mail: krieblek@moravian.edu	Class: CHS 107 M,W,F 8:55-9:45am Lab: CHS 108 T 1:15-4:15pm Office Hours: MWF 8-9am

Course objectives: Students will develop an understanding of the concepts of work, heat, and energy and apply these ideas to various thermodynamic processes and systems. Students will study the fundamental basis for various forms of statistics and will be able to make connections between microscopic systems and macroscopic measurements. Students will develop a number of computer techniques for describing systems with large numbers of particles.   Students will also experience a wide variety of experiments throughout the course which will further strengthen the concepts outlined in class.

Required course text: **An Introduction to Thermal Physics**, Schroeder.
Supplemental text: **Thermal Physics**, 2nd ed., Kittel and Kroemer

Topic	Time Span	Schroeder
1. Energy in Thermal Physics	2 weeks	Chap. 1
a. Ideal Gas		
b. Kinetic Theory		
c. Heat & Work		
2. The Second Law	2 weeks	Chap. 2
a. Einstein Model		
b. Entropy		
c. Large Systems		
3. Interactions & Implications	2 weeks	Chap. 3
a. Equilibria		
b. Third Law		
4. Engines & Refrigerators	1 week	Chap. 4
5. Free Energy & Classical Thermodynamics	2 weeks	Chap. 5
a. Helmholtz Free Energy		
b. Gibbs Free Energy		
c. Phase Transformations		
6. Boltzmann Statistics	2 weeks	Chap. 6
a. Boltzmann Factor		
b. Maxwell Distribution		
7. Quantum Statistics	2 weeks	Chap. 7
a. Fermi-Dirac Statistics		
b. Bose-Einstein Statistics		
c. Blackbody Radiation		
8. Computer techniques	1 week	Chap. 8

Grading Policy:
A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = below 60%

Note: It is within the rights of the instructor to apply qualitative judgment in determining grades for an individual assignment or for the course.

Assessment:	Weight
Homework Problems	25%
Exams	30%
Labs	25%
Final Exam	20%

Homework Problems:

As illustrated above, the problem sets constitute a significant portion of your grade. Your work on these problem sets (and the labs) will be bound by the Moravian College Policy on Academic Honesty found in the Student Handbook. Thus, it is imperative that you work out the problem solutions yourself. You may not work on problem solutions together.

Due dates and late policy: problem sets handed in prior to the review of solutions will receive no deduction for tardiness. There will be a 50% deduction for tardy work up until solutions to the homework are posted. Work submitted after that time will receive a zero.

Academic Honesty Policy: All material that you turn in should be your own work, unless specific assignments such as lab reports are designated as group projects. Like all courses at Moravian College, the College's policy on academic honesty will be enforced. Refer to the Student Handbook and the Policy on Academic Honesty and Guidelines for Honesty.

Exams:

There will be several exams given throughout the semester. Topics and material on the exam will be discussed and determined before each exam.

Labs:

To augment your overall learning experience and provide an experimental aspect to the course, you will be required to perform and write reports for approximately 10 labs during the term (due dates for write-ups will be scheduled). Outlines, briefs, lab notes, and references for the experiments will be provided by the instructor.

BlackBoard (internet class site):

Link: http://blackboard.moravian.edu/

Homework assignments, solutions, and grades will be posted on this site, as well as other information and announcements. Please endeavor to log in and check this site daily.

Final comprehensive exam:
        An exam on all material covered in this course during the semester.

Attendance Policy:
        Students are expected to come to class. To that end, I WILL take attendance, and reserve the right to raise/lower your grade based on your attendance.

Good luck in the coming year. Should you have any comments about the class during the semester, please feel free to discuss them with me, I will welcome any suggestions for improving the course. Since I am looking for you to do your best work, you should demand excellence from me as well.

Students who wish to request accommodations in this class for a disability should contact Mr. Joe Kempfer, Assistant Director of Learning Services for Disability Support, 1307 Main Street (extension 1510). Accommodations cannot be provided until authorization is received from the office of Learning Services.

The Writing Center is located in a building that is not accessible to persons with mobility impairments. If you need the services of the Writing Center, please call 610-861-1392.

Subject to revision