PHYSICS 341-THERMODYNAMICS
FALL 2008

INTRODUCTORY INFORMATION

Objectives: To learn the basic concepts and principles of macroscopic thermal physics and to be able to apply the principles to solving and analyzing practical problems.

Prerequisite: Physics 213 and Math 225

Textbooks: Intro to Thermal Science by Schmidt, Henderson, and Wolgemuth, 2nd Edition
Thermal Physics by Ralph Baierlein, Cambridge University Press

Instructor: Dr. A. G. Petukhov

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Office Hours: M, W 1:00 - 2:30 pm; other times by appointment

Meeting: EP 253, 4:00-5:50 pm, T, Th

Students are responsible for taking the exams when scheduled. Anyone missing an exam without prior approval and arrangement with Dr. Petukhov, or certifiable medical reasons, will be assigned a zero grade for the exam in question.

Any violation of the academic integrity policy, such as **cheating and plagiarism**, will not be tolerated in this course. Penalties may range from a failing grade for the work in question to failure in the course.

Students with special needs or requiring special accommodations should contact the instructor, Dr. Petukhov, at 394-1227 and/or the campus ADA coordinator, Ms. Jolie McCoy, at 394-1924 at the **earliest** opportunity.

Grading Basis:		
	Three one hour exams	300
	Homework	100
	Final Exam	200
	Total	600

Grading Scale:		
	≥85%	A
	84 - 70%	B
	69 - 55%	C
	54 - 50%	D
	< 50%	F

Homework problem should contain:

1. Problem number and brief title.
2. Statement of what is given.
3. Statement of what is to be found.
4. The solution with appropriate equations.
5. The necessary steps to show how the problem is solved.
6. If it is a numerical answer, it should be marked with appropriate units.

TENTATIVE LECTURE TOPICS

WEEK OF	TUESDAY	THURSDAY
September 1 - 7	**Registration**	Chapters 1,2 *
September 8 -14	Chapter 2	Chapters 2
September 15 – 21	Chapter 2	Chapter 3
September 22 – 28	Chapter 3	Chapter 3
September 29 - October 5	**Exam I**	Chapter 3
October 6 – 12	**Holiday**	Chapter 4
October 13 – 19	Chapters 4	Chapter 4
October 20 – 26	Chapter 4	Chapter 4
October 27 - November 2	Chapter 5	**Exam II**
November 3 – 9	Chapter 5	Chapter 5
November 10 – 16	**Holiday**	Chapter 5
November 17 – 23	Chapter 8	Chapter 8
November 24 - 30	Chapter 8	Chapter 8
December 1 – 7	Chapters 6	**Exam III**
December 8 - 14	Chapter 6	Chapter 6
December 15 - 21	**FINAL EXAM WEEK**	**FINAL EXAM WEEK**

*Chapters from Intro to Thermal Science by Schmidt, Henderson, and Wolgemuth

Upon completion of this course, students should demonstrate the ability to:

1. Convert the SI units into the English units and vice versa
2. Relate different thermodynamic properties of pure substances by using the equations of state, in particular to solve problems involving liquid and vapor in the liquid-vapor transition region.
3. Find the work done by or on a system and/or the heat transfer for a given process.
4. Calculate different thermodynamic properties by using an equation of state.
5. Solve problems involving liquid and vapor in the liquid-vapor transition region.
6. Apply the first and the second laws of thermodynamics in both the system and control volume analyses.
7. Calculate thermal efficiency of a heat engine and coefficient of performance of both a refrigerator and heat pump.
8. Apply the conservation of mass, momentum and energy laws in the control volume analysis.
9. Solve both the steady state and transient heat conduction problems.
10. Analyze viscous and thermal effects due to external fluid flow.
11. Determine drag forces associated with the flow of a fluid.
12. Calculate the rate of heat transfer by convection.

Students are expected to spend a **minimum of six hours** per week studying for every three hours spent in class. Students who spend the minimum time studying usually get the minimum grade.

Assessment statement

Students will be able to:
- critically evaluate given data with proper accuracy using appropriate laws and formulas of thermodynamics for scientifically sound presentation of homework assignments and of solutions on quizzes and exams;
- identify and apply basic concepts and appropriate laws of thermodynamics in order to solve assigned problems in homework, quizzes, exams, and in oral presentation;
- explain how thermodynamics concepts, laws, and phenomena relate to contemporary engineering and science in classroom discussions and written assignments.

Freedom in learning. Under Board of Regents and University policy student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Students who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should contact the dean of the college which offers the class to initiate a review of the evaluation.