

Thermodynamics Course Syllabus

A Writing Intensive Course

Physics 333

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Current catalogue description Thermodynamics (3-0_) concept of temperature, equations of state; the first and second law of thermodynamics; entropy; change of phase; the thermodynamics functions. Prerequisites --Physics 242-4, Math 333-4 (Calculus III) or approval of department head.

Expanded course Description This course introduces students to the theoretical foundation of classical thermodynamics and also introduces the students to Statistical Mechanics

Intended Student Outcomes

Each student should have an understanding of and be able to work problems at the junior/senior level involving:

- 1 The basic problem and postulates of thermodynamics
- 2 The conditions of equilibrium
- 3 Simple models of thermodynamic systems
- 4 Formal thermodynamic relationships
- 5 Reversible processes and the maximum work theorem
- 6 Alternative formulations and Legendre transformations
- 7 The extreme principle in the Legendre Transformed representation
- 8 Maxwell relations
- 9 Statistical mechanics in the entropy representation: the Microcanonical formalism
- 10 The Canonical Formalism: Statistical mechanics in Helmholtz Representation

Each student is also expected to be able to effectively communicate mathematical and scientific information in written form including, but not limited to, using email to submit written chapter summaries and individual problems. Submitted work has to be in a readable professional form.

Textbook: Thermodynamics and an Introduction to Thermostatistics by Herbert Callen
Second addition ISBN 0-471-86256-8

Grading: The course grade will be determined as follows:

Midterm exam - 25%

Final exam - 25%

Classroom participation - 20%

Notebook which contains homework problems (20%) and sectional summaries (10%)

The notebook is a written document that is submitted one chapter at a time. It is submitted as an email attachment and consists of two parts, each of which must be a readable document that is graded not only for its accuracy, but also for its ability to effectively communicate as a written document. The midterm and final exams are also written documents that are graded for both accuracy and their ability to effectively communicate as a written document.

Academic Honesty:

Cheating, plagiarism (submitting another person's materials or ideas as one's own), or doing work for another person who will receive academic credit are all-impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, or the presentation of unacknowledged material as if it were the student's own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place.

Students with Disabilities Policy:

It is the policy of Tarleton State University to comply with the Americans with Disabilities Act (ADA) and other federal, state, and local laws relative to the provision of disability services. Students with disabilities attending Tarleton State University may contact the Office of Disability Services at (254) 968-9478 to request appropriate accommodation. Furthermore, formal accommodation requests cannot be made until the student has been officially admitted to Tarleton State University.

Contribution of Course to Meeting the Professional Requirement:

Math/Science Topics: 100%

Status of Continuous Improvement Review of this Course:

Prepared by: *Jim McCoy*

Date: *Nov 5, 2007*

Reviewed by: *Daniel K. Marble*

Date:

Revised April 14, 2009

Jimmy McCoy