

Viterbi School of Engineering

AME 310 – Engineering Thermodynamics

Units: 3

Term: Spring 2016

Days: Tuesday, Thursday

Time: 12:30 – 1:50

Location: GFS 101

Instructor: Fokion Egolfopoulos

Office: OHE 400B

Office Hours: T 2-4, W 1-3

Contact Info: (213) 740-0480, egolfopo@usc.edu

Teaching Assistant: Hugo Burbano

Office: VHE 202

Office Hours: T 5-6, Th 5-6

Contact Info: burbano@usc.edu

Discussion Sessions:

Wednesday, 5:00-5:50, SLH 100

Course Description

The fundamentals of conversion of thermal to mechanical energy and vice versa will be presented based on the first and second law of thermodynamics. Additionally, methodologies will be developed to allow for the evaluation of physical properties of the matter. Emphasis will be given to the concepts of energy and entropy and their relevance to engineering applications and to a wide range of physical phenomena.

Learning Objectives

To understand in depth the basic physics and mathematical formulations relevant to the conversion of thermal to mechanical energy and vice versa.

Prerequisite(s): MATH 226

Co-Requisite (s): None

Concurrent Enrollment: None

Recommended Preparation: Basic knowledge of Physics and high-level programming language.

Required Readings and Supplementary Materials

Required textbook: Fundamentals of Thermodynamics, by Borgnakke & Sonntag (8th edition).

Description and Assessment of Assignments

The assignments will include weekly homework, a computational problem, two midterm examinations, and a final examination with variable weighting factors.

Grading Breakdown

Assignment	% of Grade
Homework	10
Computational Problem	10
Midterm Examination #1	20
Midterm Examination #2	20
Final Examination	40
TOTAL	100

Assignment Schedule and Submission Policy

1. Homework assignments will be given every Thursday and will be due the following Thursday; late work will not be accepted.
2. The computational problem will be assigned in early April and will be due in early May.
3. The Midterm Examination #1 will take place on Thursday **February 25**, 12:30-1:30.
4. The Midterm Examination #2 will take place on Thursday **April 7**, 12:30-1:30.
5. The Final Exam will take place on Wednesday **May 11**, 2:00-4:00.
6. All examinations will be open book (including e-books) but only one sheet of paper will be allowed written on both sides. Homework and other written material will not be allowed.

Additional Policies

1. The use of laptops or cell phones to access the internet/e-mail during class and/or exams is not allowed. In case that e-book is used then the use of one electronic device will be allowed.

Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	Readings and Homework	Deliverable/ Due Dates
Week 1 1/11-1/18	Introduction and Preliminaries		
Week 2 1/18-1/25	Introduction and Preliminaries	HW#1	January 28
Week 3 1/25-2/1	Properties of Pure Substance	HW#2	February 4
Week 4 2/1-2/8	Properties of Pure Substance	HW#3	February 11
Week 5 2/8-2/15	1 st Law of Thermodynamics	HW#4	February 18
Week 6 2/15-2/22	1 st Law of Thermodynamics	HW#5	February 25
Week 7 2/22-2/29	1 st Law of Thermodynamics	HW#6	March 3
Week 8 2/29-3/7	1 st Law of Thermodynamics	HW#7	March 10
Week 9 3/7-3/14	1 st Law of Thermodynamics	HW#8	March 24
Week 10 3/21-3/28	1 st Law of Thermodynamics	HW#9	March 31
Week 11 3/28-4/4	1 st Law of Thermodynamics – 2 nd Law of Thermodynamics & Entropy	HW#10	April 7
Week 12 4/4-4/11	2 nd Law of Thermodynamics & Entropy	HW#11	April 14
Week 13 4/11-4/18	2 nd Law of Thermodynamics & Entropy	HW#12	April 21
Week 14 4/18-4/25	2 nd Law of Thermodynamics & Entropy	HW#13	April 28
Week 15 4/25-4/29	2 nd Law of Thermodynamics & Entropy	Computational problem	May 3
FINAL 5/11			Date: For the date and time of the final for this class, consult the USC <i>Schedule of Classes</i> at www.usc.edu/soc .

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety of the whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage <http://sarc.usc.edu> describes reporting options and other resources.

Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.