

MEC 521 – Thermodynamics (Spring 2022)

Course description: This course begins with a review of the fundamental concepts and laws of classical thermodynamics. Then the thermostatic theory of equilibrium states and phase transitions is treated, followed by the thermodynamic theory of processes of simple systems and composite systems, including heat engines. Special topics may include kinetic theory, statistical thermodynamics, irreversible thermodynamics, radiation and photovoltaic energy conversion, biological thermodynamic processes, and other topics of current interest. 3 credits. Letter graded (A, A-, B+, B, B-, etc.)

Instructor information: Dr. Jie Gao

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Class schedule: Monday and Wednesday, 2:40–4:00pm, 222 Frey Hall

Office hours: M/W 4:00pm – 4:30pm, or by email appointment

Textbook: Advanced Engineering Thermodynamics 4th ed. by Adrian Bejan, Wiley (2016)

Grading:	Midterm	30%
	Final	40%
	Homework	<u>30%</u>
		100%

Course policy:

- Class attendance is required. If there are some specific reasons for you to miss the class, it is necessary for the student to contact the instructor and explain the situation clearly with signed official document.
- Homework will be posted on blackboard with due date. Problems should be neat, in order, written on the letter-size paper and submitted online as a single pdf document.
- The midterm exam will be held in-class. The final exam will be administered during the regularly scheduled exam period. Questions regarding exams/homework grades must be submitted in writing within three days of their distribution.
- No late homework will be accepted.
- An unexcused absence will result a zero for that exam. If it is impossible for you to be present due to illness, emergency or other reasons, you must ask my permission before the exam and provide official documents to explain the situation as soon as possible. The instructor has the final authority to determine whether a student will be given a make-up exam.

LECTURE SCHEDULE¹

Dates	Description
1/24, 1/26	Introduction/ Basic Concepts/ The First Law
1/31, 2/2	The First Law/The Second Law
2/7, 2/9	The Second Law
2/14, 2/16	Entropy Generation/Exergy Destruction
2/21, 2/23	Entropy Generation/Exergy Destruction
2/28, 3/2	Simple Systems and The Fundamental Relation
3/7, 3/9	Thermodynamic Potentials
—	Spring Recess
3/21, 3/23	Review and Midterm Exam (in class, details to be announced)
3/28, 3/30	Property Relationship
4/4, 4/6	Property Relationship/Energy Minimum Principle
4/11, 4/13	Gas mixture
4/18, 4/20	Exergy
4/25, 4/27	Mixtures of Air and Water Vapor
5/2, 5/4	Special topic – kinetic theory of gases
—	Final Exam (5/18, details to be announced)

1– These topics and their timing are tentative.

Student Accessibility Support Center Statement

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631)632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: <https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities> and search Fire Safety and Evacuation and Disabilities.

Academic Integrity Statement

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook. Until/unless the latest COVID guidance is explicitly amended by SBU, during Spring 2022 "disruptive behavior" will include refusal to wear a mask during classes. For the latest COVID guidance, please refer to: <https://www.stonybrook.edu/commcms/strongertogether/latest.php>