

# MEC 521 – Thermodynamics

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Spring 2016

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Meets: Tuesdays and Thursdays, 8:30–9:50pm, 305 Frey Hall

Office hours: <TBD>

**Summary:** 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. Special topics may include kinetic theory, an overview of statistical thermodynamics, radiation and photovoltaic energy conversion, and other topics of current interest.

## LECTURE SCHEDULE<sup>1</sup>

Week	Description
1	Introduction/Definitions/Basic Concepts/First Law
2	The First Law
3	The Second Law – Part 1
4	The Second Law – Part 2
5	Entropy
6	Exergy – Part 1
7	Exergy – Part 2
8	Simple Systems and The Fundamental Relation
9	Thermodynamic Potentials
10	Property Relationships / Maxwell Relationships
11	Gas mixtures – the chemical potential
12	Air-water vapor mixtures - Psychometrics
13	Kinetic theory of gases
14	Special Topic –TBD (if time)
—	<b>Final Exam Period</b> (Exam time to be announced)

<sup>1</sup>These topics are tentative, as this is the first time teaching the course with the current text book.

**Texts:**

1. *Advanced Engineering Thermodynamics 4<sup>th</sup> ed.*  
by Adrian Bejan, Wiley (2016) [**required**]
2. *Thermodynamics and an Introduction to Thermostatistics, 2<sup>nd</sup> ed.*  
by Herbert Callen (1985), Wiley [suggested]

**Grading:**

Midterm	35%
Final	40%
Homework	<u>25%</u>
	100%

**Make-up classes:**

I may be travelling somewhat during the semester, and will not be able to attend a few of our regularly scheduled classes. My goal will be to either make these classes up at a mutually convenient time or I will prepare a video lecture of the missed class(es). I will announce suggested make up times well in advance, and make sure that they are reasonable for everyone.

**Americans with Disabilities Act:** If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC(Educational Communications Center) Building, Room 128, [\(631\)632-6748](tel:(631)632-6748). They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. <http://studentaffairs.stonybrook.edu/dss/index.shtml>.

**Academic Integrity:** 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](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 University 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.

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