ME 0051: Introduction to Thermodynamics

FALL, 2025

INSTRUCTOR: Dr. Shijing Luo

OFFICE: Room 522 (New Building)

EMAIL: shijing.luo@scupi.cn

LECTURES: Wednesday 13:50-16:25
Room N212, New Building

OFFICE HOURS: Wednesday: 16:30-18:30, Thursday & Friday: 13:30-17:30, or by appointment

EACHING ASSISTANT: Zixi Xu **xzx1529598198@163.com**

QQ GROUP: 1058939480

COURSE NUMBER: 312045030

CREDITS: 3-credits

TEXTBOOK:

Thermodynamics an Engineering approach, 5th Edition, Yunus Cengel, Michael A Boles.

Reference Book: Fundamentals of Thermodynamics, 9th Edition, Borgnakke, Sonntag. International Student Version.

PREREQUISITE:

PHYS 0174, CHEM 0960

DESCRIPTION:

This course is an introduction to classical thermodynamics, covering the basic concepts governing thermodynamic systems. Key topics include the First and Second Laws of Thermodynamics, energy analysis of closed and open systems, power systems, and the concept of enthalpy and entropy.

COURSE OBJECTIVES:

This course aims to provide students with a comprehensive understanding of classical thermodynamics and the basic concepts that relate to thermodynamic systems. Topics covered will include conservation of energy, work, heat, power systems, energy analysis of closed systems, energy analysis of open systems, introduction to thermos-cycles, and entropy.

LEARNING OUTCOMES FOR THIS COURSE:

After the successful completion of this course, students should develop:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. an ability to communicate effectively with a range of audiences.

3. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

4. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

GRADE DETERMINATION:

5%: participation (bonus)

10%: in-class assignments

20%: homework

30%: midterm exam

35%: final exam

EXAMS:

There will be one midterm exam and one final exam.

PARTICIPATION:

On-time attendance at all class activities is expected. Meanwhile, students are encouraged to join all kinds of class activities, including attending each class, asking/answering questions in classes, and making presentations, etc. If you must miss a class due to illness or other reasons, you should take a leave from the instructor at least one day before the class.

IN-CLASS ASSIGNMENTS:

In-class assignments will be assigned to students during class hours; the topics are usually related to the latest class or new theories/techniques introduced in the same class to check students' understanding of the basic knowledge. Generally, **NO** make-up quizzes will be allowed for absences from the class, unless prior approval has been granted by the instructor or a valid emergency, supported by appropriate documentation, is provided.

HOMEWORK:

To be assigned after the lectures. Submission requirements (including due dates) for all assessments will be announced to students in class or on Blackboard. Late assignments will be deducted 30% per day and will not be accepted after 4 days (including the 4th day) or after the solutions are distributed, whichever is earlier.

All homework and assignments must be **handwritten**, the submissions that fails the requirements will not be accepted otherwise.

GRADE Policy:

A: 90 – 100	B+: 80 – 84	B−: 73 – 75	C: 66 – 69	D: 60 – 62

A−: 85 – 89	B: 76 – 79	C+: 70 – 72	C−: 63 – 65	F: < 60

If students have any concerns regarding their grades, they may submit a rebuttal within **5 days** of the grade announcement. No rebuttals will be accepted after this period.

MATERIAL COVERED:

The intended sequent content covered in this class is shown in the following table and might be adjusted according to the class schedule.

Week	Contents	Descriptions
1 (09/10)	Introduction	Course syllabus & general introduction
2 (09/17)	Chp. 1	Introduction and basic concepts
3 (09/24)	Chp. 2	Energy conversion and general energy analysis
4 (10/01)	No class	Public Holiday
5 (10/11)	Chp. 2	First law of thermodynamics & energy efficiency
6 (10/15)	Chp. 3	Properties of pure substance and phase -change process
7 (10/22)	Chp. 3	Property tables & Enthalpy & Ideal gas equation of state
8 (10/29)	Chp. 4	Energy Analysis of Closed Systems
9 (11/05)	Chp. 4	Internal energy, enthalpy, and specific heat
10 (11/12)	Review	Midterm Exam Week
11 (11/19)	Chp. 5	Mass and Energy Analysis of Control Volumes
12 (11/26)	Chp. 6	2nd Law of Thermodynamics
13 (12/03)	Chp. 7	Entropy
14 (12/10)	Chp. 9	Gas Power Cycles
15 (12/17)	Chp. 9	Gas Power Cycles
16 (12/24)	Review	Final review
17 (12/31)		Final Exam Week

The instructor reserves the right to extend credit for alternative assignments, projects, or presentations, and to make changes to this syllabus as needed. All changes will be announced via Blackboard and/or in class.

Copyrights:

Academic Integrity:

All students are expected to adhere to the standards of academic honesty. Any student engaged in cheating, plagiarism, or other acts of academic dishonesty would be subject to disciplinary action. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include but is not limited to the confiscation of the examination of any individual suspected of violating the University Policy.