Chemical Engineering Thermodynamics I (155:208) -- Index: 16164

Welcome to 14:155:208 Chemical Engineering Thermodynamics I!

Instructor: Nicholas Corrente
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Email: nicholas.corrente@rutgers.edu

Website: canvas.rutgers.edu

Classroom: ARC-107

Class Time: M/Th 12:10PM - 1:30PM

TA: Rishabh Kumar Singh, rks174@scarletmail.rutgers.edu

Office Hours: W 10:00AM-11:00AM via Zoom, Th 2:30PM-3:30PM in C-115 and via Zoom

LA: Abiezer Santiago, ans230@scarletmail.rutgers.edu

Study Groups: T 10:20AM-11:40PM, F 10:20AM-11:40AM. Sign up here

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This is a 14-week course that meets in-person on Monday and Thursday from January 21 to May 5, 2025. Students are required to attend lecture/discussion sessions and complete all assigned readings.

Course Website:

The course contents are organized as modules on canvas.rutgers.edu. Please check the course website often. Course resources will be posted to the website. There will also be a discussion forum for students to ask questions.

A note about file submissions: it is the responsibility of the student to ensure that their submissions are uploaded correctly. Students should submit all files for an assignment as one submission prior to the deadline. The locking of an assignment is not an excuse for missing files — students should leave ample time to check their submissions.

Email Correspondence:

The instructor will typically respond to emails between 9 am and 6 pm, Monday through Friday. Every effort will be made to reply as quickly as possible, but responses may take up to 48 hours. Emails sent over the weekend may not receive a response until Monday. Please include "155:208" in the subject line of all email correspondences. Note that the messages via Canvas DM will not be answered. Correspondence through email is required.

For questions about grading:

Students must email the TA at rks174@scarletmail.rutgers.edu and CC the instructor at nicholas.corrente@rutgers.edu. Questions posted in the assignment comments or sent through canvas messages will not be answered.

Required Textbook

- Milo D. Koretsky, "Engineering and Chemical Thermodynamics," 2nd Edition, J. Wiley & Sons Inc., (2013). ISBN 978-0470259610

Students must have access to the textbook on the first day of class. This book is also the required textbook for the junior level course 155:309 *Chemical Engineering Thermodynamics II*.

Important Dates:

- **23 January** -- First day of class
- **15 March - 23 March** -- Spring recess
- **24 March** -- Project 1 due
- **27 March** -- Exam 1
- **5 May** -- Last class session, Project 2 due
- **8 May** -- Final Exam, 8:00AM-11:00AM

Course Description

This course introduces the basic concepts of the laws of thermodynamics and their applications to chemical engineering processes. Thermodynamics relates work, heat, temperature, and states of matter to each other. From the laws of thermodynamics, an enormous amount of information about the relationships among equilibrium parameters/properties for a system can be deduced. This information can then be applied to physical, chemical, and biological systems including chemical process design, energy production, materials processing, and cellular processes.

Course Objectives

By the end of this course, you will learn (1) the principles and laws of thermodynamics, (2) how to apply the first and second laws of thermodynamics to solve physical and chemical problems encountered in chemical and energy engineering, (3) methods for analyzing and interpreting thermophysical data, to identify, formulate, and solve engineering problems.

Impact on Subsequent Courses in the Curriculum

This is the first in a sequence of two courses in Thermodynamics (155:208 & 155:309). Chemical engineering students completing 155:208 will take 155:309 in the fall semester of their junior year. The material covered in this course (155:208) forms the basis for the topics of phase equilibria, fugacity, phase equilibrium and chemical reaction equilibria that will be discussed in 155:309. Thermodynamics in general plays an important role in chemical engineering including 155:324 Design of Separation Processes, 155:341 Chemical Engineering Kinetics, and 155:428

Chemical & Biochemical Engineering Design & Economics. Thermodynamics is one of the main pillars of chemical engineering; others include transport phenomena and reaction kinetics.

Course Requirements and Assessments

- Quizzes 15%
- Projects 20%
- Homework 15%
- Exams 50%

Grading Scheme:

A	90 %
B+	85 %
B	80%
C+	75%
C	70%
D	60%
F	60%

This grading scheme is subject to alteration at the instructor's discretion

Attendance:

Attendance for this course in mandatory. Students must attend ≥75% of course sessions to achieve a passing grade, regardless of whether the absences are excused or unexcused**. Students are also encouraged to participate and ask questions during lectures, and to attend office hours. Students who do not attend lectures will have difficulty keeping up with the course material. It is the responsibility of the student to catch up on the work if they miss a class. The instructor will not provide individual updates or an individual review of the material. Excused absences will be granted on a case-by-case basis depending on the circumstances of the absence; students should consult the policy for excused absences here: https://soe.rutgers.edu/absence-exams. Prior notice must be given to the instructor of an anticipated absence. No make-up quizzes or exams will be given. In the case of an excused absence, any missed quiz or exam will also be excused. Students who miss quizzes or exams due to an unexcused absence will receive a grade of 0. Homework assignments must be submitted to canvas by the due date, regardless of any excused absences.** It is up to the instructor to determine whether an absence is excused, and how to handle your absence from classes.

Lecture Notes:

Lecture notes will be uploaded to the course website following each session. Students are expected and encouraged to take their own notes during each lecture. **Students are responsible for alerting the instructor if course notes or materials are inaccessible on the course website.**

Assigned Reading:

Students will be given assigned reading before each lecture. It is imperative that students complete the assigned readings prior to the next scheduled class session.

Quizzes:

Students will be given one quiz per week to test their comprehension of the course material. The quizzes will be announced and will usually take place at the end of each Thursday session. Students must be present in class to attempt the quizzes.

Homework Assignments:

Students will be given weekly practice problems to attempt that will supplement the readings. The homework assignments will proceed in **two phases**:

1. Homework assignments will be distributed on canvas on Monday evenings. Students will have until the night of the next Sunday to submit their original solutions. **Students will be graded on the completeness of their original submission. All problems should be attempted.**
2. On the following Tuesday morning, the solutions for the homework problems will be posted. Students will then correct their original submissions. These corrected submissions will be due the following Sunday along with that week's original submission. **All students are *required* to submit corrections. If a problem was completed correctly, students should write "correct" next to the problem number. The corrected submissions will be graded on the quality of the original submission and the effort taken to make corrections. Corrections should be made directly on the original submission in a different color ink.**

Projects:

Two projects will be given during the course. These assignments will be completed at home and submitted to the course website by the due date listed. One or both of the assignments will require the use of the MATLAB software. Resources for the use of the MATLAB software are posted to the Canvas site.

Exams:

A midterm and final exam will be given during the course. These exams will test all information covered during the lecture as well as the assigned readings, homework assignments, and quizzes. Students must be present in class to attempt the Exams. Exams will be closed-book, closed-note, closed-computer. Students may bring one 8.5" x 11" (US letter) sized note sheet, with notes on the front and back.

Academic Integrity:

Rutgers University takes academic dishonesty very seriously. By enrolling in this course, you assume responsibility for familiarizing yourself with the Academic Integrity Policy and the possible penalties (including suspension and expulsion) for violating the policy. As per the policy, all suspected violations ***will be reported*** to the Office of Student Conduct.

Academic dishonesty includes (but is not limited to):

- cheating
- plagiarism
- aiding others in committing a violation or allowing others to use your work
- failure to cite sources correctly
- fabrication
- using another person's ideas or words without attribution
- re-using a previous assignment
- unauthorized collaboration
- sabotaging another student's work

If in doubt, please consult the instructor. Please review the Academic Integrity Policy at: https://nbacademicintegrity.rutgers.edu/.

Students with Disabilities:

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you and your instructor with a Letter of Accommodations. Please discuss the accommodations with your instructors as early in your courses as possible. To begin this process, please complete the registration form (https://webapps.rutgers.edu/student-ods/forms/registration).

RUTGERS RESOURCES:

The following resources can also be found at https://success.rutgers.edu/

- Academic Integrity - https://academicintegrity.rutgers.edu/
- Self-Reporting Absence Application - https://sims.rutgers.edu/ssra/
- Absence Verification & Student Support - https://studentsupport.rutgers.edu/
- Academic Advising & Policies - https://soe.rutgers.edu/academic-advising-and-policies/advising-resources
- University Policies on Final Exams - https://scheduling.rutgers.edu/final-exam-policies
- Tutoring, Academic Coaching, Learning Support - https://learningcenters.rutgers.edu/
- Counseling (CAPS) - https://health.rutgers.edu/medical-and-counseling-services/counseling-services
- Violence Prevention & Victim Assistance (VPVA) - https://vpva.rutgers.edu/
- Disability Services - https://ods.rutgers.edu

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