MEEN 2210 THERMODYNAMICS I / MEET 3990 APPLIED THERMODYNAMICS

Fall 2023
3 credit hours, Tue Thur 4:00-5:20 p.m. NTDP F175

Instructor Dr. Huseyin Bostanci
Office NTDP F115L
Office Hours Tue 12:30 -2:30PM, Thur 12:30 -2:30PM (other times by appointment)
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MEEN 2210 Course Description
Zeroth, first and second laws of thermodynamics with applications to engineering and energy conversion, open and closed systems, thermodynamic properties of simple substances, equations of state. MATH 1720 with a grade of C or better; PHYS 1710 with a grade of C or better; MEEN 1000 with a grade of C or better. Pre-Requisites: MEEN 2210 is a required course in MEEN program.

MEEN 2210 Course Learning Outcomes (EAC of ABET program outcomes addressed)
Upon successful completion of this course, students will be able to:
1. Demonstrate ability to formulate the first and second law of thermodynamics (1)
2. Demonstrate ability to identify, formulate, and solve engineering problems (1, 4)
3. Understand concepts of the first law of thermodynamics (1)
4. Understand the concept of work and energy transfer by heat (1)
5. Understand concepts of the second law of thermodynamics (1)
6. Demonstrate ability to evaluate and work with thermodynamic properties (1)
7. Demonstrate ability to use control volume analysis for various engineering applications (1).

MEET 3990 Course Description
Principles of energy balance and substance behavior as related to different engineering systems. Topics include gas laws, laws of thermodynamics, relationship between thermodynamics variables, thermodynamic tables and charts, power cycle and various applications. Pre-Requisites: CHEM 1410/1430, MATH 1720, PHYS 1710/1730. MEET 3990 is a required course in MEET program.

MEET 3990 Course Learning Outcomes (ETAC of ABET program outcomes addressed)
Upon successful completion of this course, students will be able to:
1. Understand fundamental thermodynamics properties, and convert different systems of units (1)
2. Calculate properties of pure substances. (1)
3. Conduct energy analysis for closed systems. (1)
4. Conduct mass and energy analysis for control volumes. (1)
5. Describe idealized Carnot heat engines, heat pumps, and refrigerators. (1)
6. Use the concept of entropy to analyze processes. (1)
7. Analyze performance of gas power systems. (1)
8. Analyze performance of vapor power systems. (1)
9. Analyze performance of refrigerators. (1)

Required Text/Associated Software
Course Outline
This is a tentative course outline. Instructor will attempt to follow it closely, and reserves the right to substitute any other relevant material at any point throughout the course.

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Final Exam (all chps.) 12/14/23 Th 1:30 - 3:30 p.m.

Grading Criteria
Two Midterm Exams 60%
Final Exam 30%
Homework 10%
Attendance and Participation up to 5% (Bonus)

Expected Grade Distribution
A: ≥90%, B: 80-89%, C: 65-79%, D: 50-64%, F: <50%

Policies and Procedures
1. This syllabus is subject to change during the semester with changes to be announced in class.
2. This course provides opportunities for students to take advantage of several software packages supported by the department in the classroom or in lab experiments, in simulation studies, homework assignments, or in projects.
3. The course website, Canvas, at https://canvas.unt.edu/ will be used for posting announcements, course materials, assignments, and grades. Students are encouraged to check the course website often.
4. Homework will be assigned regularly including selected problems from the textbook. Homework has to be submitted on time—on the designated class day (Tuesday or Thursday) at the beginning of class (4:00 p.m.)—for grading. Late submissions will get zero grade. The lowest grade from the homework assignment will be dropped when calculating the average grade at the end of the semester.
5. For all classes, cell phones must be silenced. For exams, cell phones must be placed in backpacks and left at the front of the classroom.
6. Exams will be in the open textbook format. Additionally, students can only use a scientific calculator, pencils, and erasers. No other electronics, notes/notebooks are allowed.
7. Grades are based in part on the student’s ability to communicate. You must present your work in a well-organized and well-articulated manner with appropriate depth.
8. Requests for the review of a graded exam/assignment must be made within one week of the grade announcement. Upon review, the exam/assignment score may increase, remain the same, or decrease.

9. There will be no make-up exams or assignments unless you have a documented, university-excused absence. If you know in advance that you will miss an exam, you must contact instructor before the scheduled exam.

10. An “I” (incomplete) grade is given only for extenuating circumstances and in accordance with University and Departmental Policies.

11. The instructor reserves the right to change the grade distribution at the end of the semester. If any changes occur, the changes will be less stringent than the distribution above.

12. Technical Assistance. Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues. UIT Help Desk: UIT Student Help Desk site (http://www.unt.edu/helpdesk/index.htm)

   Email: helpdesk@unt.edu
   Phone: 940-565-2324
   In Person: Sage Hall, Room 130
   Walk-In Availability: 8am-9pm

   Telephone Availability:
   • Sunday: noon-midnight
   • Monday-Thursday: 8am-midnight
   • Friday: 8am-8pm
   • Saturday: 9am-5pm

   Laptop Checkout: 8am-7pm

   For additional support, visit Canvas Technical Help (https://community.canvaslms.com/docs/DOC-10554-4212710328)

13. Rules of Engagement. Rules of engagement refer to the way students are expected to interact with each other and with their instructors. Here are some general guidelines:

   • While the freedom to express yourself is a fundamental human right, any communication that utilizes cruel and derogatory language on the basis of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law will not be tolerated.

   • Treat your instructor and classmates with respect in any communication online or face-to-face, even when their opinion differs from your own.

   • Ask for and use the correct name and pronouns for your instructor and classmates.

   • Speak from personal experiences. Use “I” statements to share thoughts and feelings. Try not to speak on behalf of groups or other individual’s experiences.

   • Use your critical thinking skills to challenge other people’s ideas, instead of attacking individuals.

   • Avoid using all caps while communicating digitally. This may be interpreted as “YELLING!”

   • Be cautious when using humor or sarcasm in emails or discussion posts as tone can be difficult to interpret digitally.

   • Avoid using “text-talk” unless explicitly permitted by your instructor.

   • Proofread and fact-check your sources.

   • Keep in mind that online posts can be permanent, so think first before you type.

   See these Engagement Guidelines (https://clear.unt.edu/online-communication-tips) for more information.

14. Academic Integrity Standards and Sanction for Violations: According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from
admonition to expulsion from the University. Any violation of academic honesty in an exam or assignment will result in a grade of zero and a report to https://facultysuccess.unt.edu/academic-integrity.

15. Acceptable Student Behavior: Student behavior that interferes with an instructor’s ability to conduct a class or other students’ opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student’s conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at deanofstudents.unt.edu/conduct.

16. Access to Information- Eagle Connect: Students’ access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to your Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail: eagleconnect.unt.edu/.

17. ADA Statement: UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one’s specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the ODA website at disability.unt.edu.

18. Attendance Policy: Attendance to the fullest extent possible is highly encouraged as engagement, participation and interaction are important elements of the learning process. Attendance will be taken during lectures, and will be considered as part of the final grade calculation.

19. Emergency Notification & Procedures: UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Blackboard for contingency plans for covering course materials.

20. Retention of Student Records: Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Blackboard online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual record; however, information about students’ records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University’s policy.

21. Student Perceptions of Teaching Effectiveness (SPOT): Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13 and 14 of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from “UNT SPOT Course Evaluations via IASystem Notification” (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the spot website at www.spot.unt.edu or email spot@unt.edu.