

**ME 3410 Thermodynamics***Instructor: Muhammad Salman***Grading:**

Grades will be assigned as follows:

A = 90-100

B = 80-89

C = 70-79

D = 60-69

F = 0-59

W = Withdrawal by mid-term

WF = Student-initiated withdrawal after mid-term

Homework assignments will be assigned after certain modules have been completed. The format for the tests and the exams will be proctored and will be announced well before each test and exam.

- Late homework and reports will NOT be accepted for credit. Work turned in late may be evaluated to provide you with feedback, but will not be graded / given credit except in cases of emergency.
- HWs will be collected in the class.
- Show all your work for full credit! Write your name on every page. Present your work neatly!

WEB ACCESSIBILITY:

Kennesaw State University follows the guidelines of the Universal Design for Learning standard of web accessibility. Faculty use Word, PDF, and HTML formats when communicating electronic information to students whenever possible and appropriate in light of the goals of the course. Faculty are trained to use Web Accessibility Evaluation tools, e.g., WAVE (www.wave.webaim.org), and make adjustments as possible and appropriate in light of the goals of the course. For free resources available to students on web accessibility, please visit the Web Accessibility Resources page at the Distance Learning Center: <http://www.kennesaw.edu/dlc/facultyresources/index.php#>

KSU SEXUAL MISCONDUCT POLICY:

Kennesaw State University adheres to KSU's policy prohibiting sexual misconduct both in and out of the classroom. Questions about this policy should be directed to the KSU Equal Employment Opportunity (EEO) and Title IX officer by telephone at (470) 578-2614. You may also visit the University's EEO website <http://www.kennesaw.edu/eoo/index.html> for more information.

COPYRIGHT LAW:



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Kennesaw State University adheres to USG's policy to respect the right of copyright. Holders and comply with copyright laws as set forth in the United States Copyright act. For more information, see the following link to USG's policy: <http://www.usg.edu/copyright/>

STUDENT RECORDS/FERPA:

Kennesaw State University adheres to the Family Educational Rights & Privacy Act of 1974 – FERPA. See the following link for more information:

http://www.usg.edu/information_technology_handbook/section9/tech/9.5_privacy_and_security

ELECTRONIC RECORDING AND SOCIAL MEDIA:

Electronic recording performed without the consent of the people being recorded chills the free exchange of ideas. Academic freedom, free inquiry, and freedom of expression should not be limited by the fear that one's brainstorming, polemic discourse, speculative inquiry, or any other kind of expressed curiosity made within the space of a university classroom will be made public without one's consent. This fear is unacceptable regardless of whether one is in an online, hybrid, or face-to-face classroom setting. Accordingly, no person shall make public any electronically recorded class discussion without the written permission of the instructor. This policy is not intended to discourage electronic recording in the classroom or the use of social media when such actions are performed with the written consent of the instructor, and others as appropriate. Note: Faculty accommodate all reasonable requests to electronically record a class discussion; these requests must be documented by the DisAbled Student Support Services available at: http://www.kennesaw.edu/stu_dev/dsss/prospect.shtml

DISRUPTION OF CAMPUS LIFE STATEMENT:

It is the purpose of the institution to provide a campus environment, which encourages academic accomplishment, personal growth, and a spirit of understanding and cooperation. An important part of maintaining such an environment is the commitment to protect the health and safety of every member of the campus community. Belligerent, abusive, profane, threatening and/or inappropriate behavior on the part of students is a violation of the Kennesaw State University Student Conduct Regulations. Students who are found guilty of such misconduct may be subject to immediate dismissal from the institution. In addition, these violations of state law may also be subject to criminal action beyond the university disciplinary process.



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COURSE ENROLLMENT POLICY:

Students are solely responsible for managing their enrollment status in a class; nonattendance does not constitute a withdrawal.

STUDENT SUPPORT RESOURCES

The following resources and policies are found under this link:
<http://learnonline.kennesaw.edu/resources/index.php>

DISABLED STUDENT SUPPORT SERVICES

In compliance with applicable disability law, qualified students with a disability may be entitled to reasonable accommodation. Any student with a documented disability (hidden or visible) needing academic adjustments, including classroom or test accommodations is requested to notify the instructor within the first two weeks of the course. **Verification from KSU Disabled Student Support Services is required. All discussions and documentation will remain confidential.**

Disabled Student Support Services
James V. Carmichael Student Center Addition – 2nd Floor, Suite 267
470.578.6443
http://www.kennesaw.edu/stu_dev/dsss/prospect.shtml

Please visit the Student Disabilities Services website at
www.kennesaw.edu/stu_dev/sds for more information

Student Rights and Responsibilities

Students of Kennesaw State University are entitled to an environment that is conducive to learning and individual growth. To this end, students enrolling at Kennesaw State University assume a responsibility to abide by the policies and regulations expressed in this section. By doing so, students may fulfill their responsibilities and enjoy the exercise of their own rights while also respecting the rights of others.

All rights and responsibilities may be found in the University Catalog at catalog.kennesaw.edu.

LEARNING OUTCOMES

1. Demonstrate understanding of key thermodynamics concepts.
2. Determine properties of real substances, such as steam and refrigerants and ideal gases from either tabular data or equations of state.
3. Analyze processes involving ideal gases and real substances as working fluids in both closed systems and open systems.



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4. Apply the first and second laws of thermodynamics to perform energy balances and to determine heat and work transfers.
5. Analyze thermodynamic cycles including power (steam, gas) and cooling/heating (refrigerators, heat pumps) systems.

COURSE CONTENT

Introduction and basic concepts

Energy, energy transfer, general energy analysis

Properties of pure substances

Energy analysis of closed system

Conservation of energy First law

Internal Energy, Enthalpy, Specific Heats of Solids and Liquids

Mass Balance for Control Volumes

Flow Work and the Energy of a Flowing Fluid

Energy Balance for Steady-Flow Systems

Some Steady-Flow Engineering Devices

Nozzles, Diffusers, Turbines, Compressors

Throttling valves, Mixing chambers

Heat exchangers, Pipe and Duct Flow

Unsteady-flow process

Introduction to the Second law, Thermal Reservoirs, Heat engines

Refrigerators, Heat Pumps, Perpetual-Motion Machines

Reversible & Irreversible Processes, Carnot cycle,

Carnot Principles, Carnot Heat Engine, Carnot Refrigerator and Heat Pump

Entropy

Basic Otto and Rankine Cycles