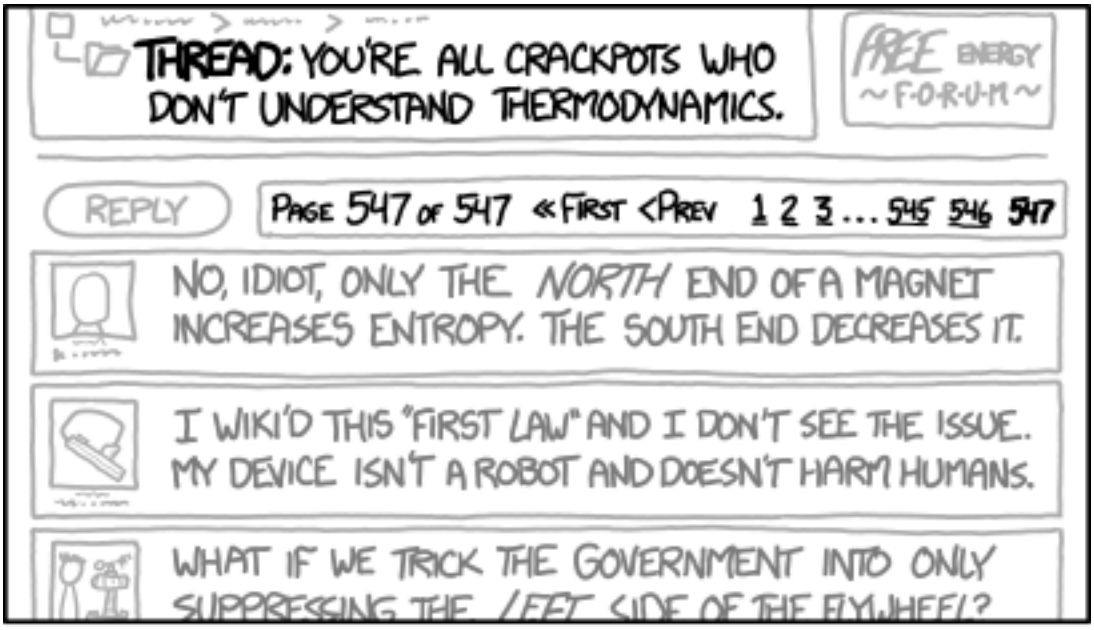
PHYS 535 01W – THERMODYNAMICS FOR EDUCATORS

ONLINE COURSE SYLLABUS: FALL 2017



https://xkcd.com/1166/

Instructor: Dr. William Newton, Assistant Professor
Office Location: STC 236
Office Phone: 903-866-5369
Office Fax: 903-886-5480
University Email Address: William.Newton@tamuc.edu

Course Time Zone: Central Time USA
Online Office Hours Tuesday/Thursday 6:00-7:00pm. I will be active during those times on the discussion threads, and also will start a thread on Live/Chat (accessible from the top menu on LearningStudio) where I can answer any questions live.

In emails, please put "PHYS 535 Online" in the subject header. I will reply to emails within 24 hours (48 at weekends and holidays). ***Note:*** *I will exclusively use your TAMUC university email addresses for email communication.*

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

The required book can be ordered from online retailers for generally less than $100.

Textbooks Required

Schroeder, V. Daniel. (1999), *An Introduction to Thermal Physics,* Addison-Wesley, ISBN-10: 0201380277, ISBN-13: 978-0201380279

Course Prerequisites

Math: Students are required to know mathematics through Calculus 3 or equivalent, or have taken or be currently taking *Mathematical Methods for Educators Course* (PHYS 530). We'll be making extensive use of algebra, basic differentiation and integration, and some partial differentiation and multiple integration. Use of the natural logarithm and exponential functions will be used VERY extensively.

Physics: A course in calculus-based physics (sometimes called University physics) is required.

Course Description

Thermodynamics is the study of the flow of heat between physical systems, and the effects of those flows. It encompasses the variety of ways one can compress, expand, heat and cool fluids and solids and the ways in which one can extract or impart energy to systems. The most immediately practical application of thermodynamics involves the quantification of the amount of useful energy (work) a system can impart, a consequence that led, upon the scientific development of thermodynamics, directly to the industrial revolution and the modern world. In doing so, the far-reaching concept of entropy is introduced, the quantification of the amount of energy not available to do work - the amount of disorder in a physical system.

Kinetic theory and statistical mechanics seek to derive the laws of thermodynamics from more fundamental considerations of the underlying motions and energy states of the microscopic constituents of the system. Due to the fact that most physical systems are made up of far too large a number of constituents to describe each one individually, statistical methods

have to be employed. The distribution of velocities and, more generally, energy states, among the constituents can be described mathematically described and hence the average properties of the constituents as a whole can be derived and macroscopic quantities such as pressure emerge.

The purpose of this class is 2-fold:

1) To give you a working knowledge of thermodynamics, kinetic theory and statistical mechanics, and their context and importance.

2) To discuss the teaching of these at a high school level, examine common misconceptions, explore the many tools available on the web that aid us, and to share experiences and resources as a community.

Student Learning Outcomes

At the end of the course:

1. Students will be able to correctly define energy, heat, functions of state and other thermodynamic quantities.
2. Students will be able to correctly apply the first law of thermodynamics in problems, analyze the commonly used intuitive description of the meaning of entropy, and discuss improvements to that description.
3. Students will be able to correctly apply the second law of thermodynamics in problems.
4. Students will be able to apply the statistical description of velocities of atoms and molecules to derive the pressure of a fluid and its effusion, diffusion and viscosity coefficients.
5. Students will be able to construct the simple partition functions of physical systems and use it to derive thermodynamic quantities and analyze physical systems.
6. Students will know the misconceptions encountered when teaching thermodynamics and statistical mechanics, and devise strategies to counter them that can be implemented in lesson plans.

COURSE REQUIREMENTS

Instructional Methods / Activities / Assessments

The details of the course structure are given below. Any changes will be communicated via email and announcements on LearningStudio (eCollege). *Your TAMUC email account will be used at all times*, and it will be your responsibility to check it regularly (at least once every 24 hours).

The course is organized into units, which I sometimes will also refer to as "weeks"; we will usually spend a week on each unit, but sometimes we will spend more time as required. An extra week may be added to a unit when extra time is warranted.

Introductory tasks

The semester starts at **12.01 a.m. Monday, August 28th**. At that point you will have access to the **Course Home** (which appears on the top left bar of LearningStudio) where you can complete the following introductory activities:

(1) Read the "**Start Here"** section near the top of the left side of LearningStudio (eCollege) learn how to access course material and familiarize yourself with the environment.

(2) Complete the **pre-course assessment**. This will be given again at the end of the course, so we can measure your learning gains on Student Learning Outcomes 1-5. This assessment will **not** count towards your class grade. *It can only be taken once* and once you begin the quiz you will have *40 minutes* to complete it. The assessment must be completed before you can gain access to the first week of the class.

(3) Read the **syllabus.**

(4) Take the **syllabus quiz** to make sure you understand the mechanics of the course. This can be taken *any number of times*. The **syllabus quiz** will not be graded, but it must be completed *with 100% correct answers* before you can gain access to the first week of the class.

(5) Introduce yourself on the **"Introductions"** discussion thread.

NOTE: You must complete the pre-course assessment to access the rest of the class, and complete the syllabus quiz with 100% correct answers to access the first, and subsequent, units.

Regular week tasks, material and due dates

The course material will be organized by weeks (which I will refer to interchangeably as units). The week's material will be located under the week's tab in the left hand menu in LearningStudio (eCollege).

Week 1 is available from the first day of the semester, **Aug 28th**, and closes on **Sunday, Sept 10th at 11:59pm.** Every other unit begins on a **Friday at 12.01 a.m.** and ends on the **Sunday either 9 days or 16 days later at 11.59 p.m. (midnight)** depending on whether we need 1 or 2 weeks to cover the material. For example, unit 2 begins on **Friday, Sept 8th at 12:01am** and ends on **Sunday, Sept 17th at 11:59pm.** All of the unit's materials and assignments become available only when the unit stars. There will be up to 12 units in total, plus a week in the middle of the semester devoted to a midterm test and one at the end of the semester for the final.

Note that most weekends, the last two days of the unit overlap with the first two days of the next unit. The purpose is to give you some flexibility when it comes to beginning a unit's material and completing it.

When each week opens, it remains open until the end of the semester. Remember, however, that assignments, quizzes and discussion posts must be completed by their respective deadlines in order to receive credit for them.

Each week, the following tasks must be completed.

(1) Complete the **reading assignments**. These will come from the course textbook or online articles and material available in Document Sharing in LearningStudio (eCollege), located on the top menu bar. The reading material for each week will be announced with the week's material each **Friday** at **12.01 a.m.** Sometimes reading reflections will be set as homework to reflect on the physics education papers assigned.

(2) Watch **1-3 Mini-lectures** each week that will cover one or two key concepts at a time, to reinforce reading material, or give examples of problem solving. Mini-lectures for each week will be available with the week's material each **Friday** at **12.01 a.m.**

(3) Most weeks you will complete a tutorial over the unit's material. Tutorials are guided inquiry worksheets that lead you through the main concepts of the week. The ones we'll used have been prepared by my colleague Michael Loverude from Cal State Fullerton. You complete them on your own, and they are not graded; however, a

homework associated with them will be set most weeks that require you to have completed the tutorial. As you work through the tutorials, you should discuss their content on the relevant discussion thread.

(4) Complete the weekly **quizzes** designed to assess students' comprehension of the reading assignments, mini-lectures and basic knowledge of key principles. Quizzes for a week's material will available with the week's material each Friday at **12.01 a.m.** and must be completed by **11.59 p.m. the Sunday 9 days later***.*

(5) Participate in the **discussion threads**. Each week you must make at least 1 substantial post in each of three of the current week's threads, and 2 responses to posts from the previous week's threads. A week's discussion thread opens at **12.01 a.m. each Friday** and remains open throughout the semester.

(6) Complete the **weekly homework**. New homework questions will become available with the week's material at **12.01 a.m. Fridays. Important:** New homework questions are set each week, but they will be due roughly every 3 weeks in **Dropbox**. The intention is to give you some flexibility to cope with busy weeks, but you should try and keep up weekly with the homework. (See the course calendar at the end of this syllabus).

In addition, a Midterm and Final test will be set half way through the semester and at the end.

A complete list of due dates ***for discussion posts, quizzes and homeworks are given on pp. 23, 24 and 25 of this syllabus.***

Learning Activities and Assessments

The following describes the assignments you must complete which will contribute to your progress through the course and to your final grade, together with how they will be assessed.

- **Quizzes** are designed to assess students' comprehension of the reading assignments, mini-lectures and basic knowledge of key principles, often in response to the mini-lectures and reading assignments.

  Quizzes are designed to provide you with assessment of your learning. Half of the quiz grade will be awarded just for completing the quiz; the other half will come from your actual quiz score.

You will only be able to take quizzes once. Once you begin taking the quiz, you will have a time limit of one hour to complete it. Once completed, you cannot return to it and revise your answers. You will see your score, however, and what answers you got wrong.

The quizzes will be found underneath each week's tab on the left side of the LearningStudio window.
Quizzes address: Learning Outcomes 1-5

- **Ongoing Discussions** will be conducted each week on the concepts introduced in the reading material and lectures. A number of threads will be opened, one per topic. Sometimes I will ask a question or pose a problem to get you started.

  Learning and understanding is significantly enhanced by active engagement in the class through continual discussion of topics. All students are required to participate in the discussions with a number of substantive posts. **Students are required to make 3 substantive posts, in three separate threads, giving your thoughts about the reading or answering the opening questions. In addition, students are required to make two posts in the *previous* week's threads, replying to posts of other students or of myself. That makes a total of 5 posts per week that will be graded.**

  The rubric for grading the online discussions is found on pp.19-20 of the course syllabus.

  Of course, continued discussion beyond the minimum posts required is strongly encouraged. I will pitch into the discussion at various times during the week, answering queries and asking new questions to make sure we discuss all the week's material adequately.

  When appropriate, at least one thread will be devoted to discussing how one might teach the week's concepts at the undergraduate level, and for the sharing of your own experiences and resources for the benefit of the teaching community. I hope to make the discussion threads a fun and lively forum throughout the semester!

  The discussion threads will be found underneath each week's tab on the left side of the LearningStudio window.

  Discussions address: Learning Outcomes 1-6

- **Weekly homework** will be set. Homework activities will fall into 3 categories:
    - Quantitative questions from the textbook
    - 250 word Reading reflections on the education literature, graded according to the rubric on page 22.
    - Tutorial homeworks graded according to the rubric on page graded according to the rubric on page 21.

  Full instructions will be provided each week, together with the method of assessment, in the weekly content area.

  Homework questions will be collected in for grading at 4 different dates during the semester (roughly every 3 weeks). Homework can be delivered to to DropBox (under the DropBox tab on the top toolbar) at any time, up to the due date, under the relevant week. Homework questions will be selected for grading at random. *Homeworks address: Learning Outcomes 1-6*

  Homework that involves problem solving, pictures, or other material that is difficult to submit as a Word format or similar, may be submitted as hand written work scanned in or photographed. If you use a camera phone to take pictures of your work, a useful app is CamScanner (https://www.camscanner.com), which compiles multiple pictures into one document for ease of uploading. There is a free version that I encourage you to check out. Make sure that your work is legible in scanned form.

- **Midterm/Final** tests will consist of questions similar to the textbook problems and tutorial questions you have been doing. It is open book, you will have a week to complete each test, and you will be free to discuss the questions in the discussion threads those weeks. The completed tests must be scanned and uploaded to Dropbox by the deadline given closer to the time. *Homeworks address: Learning Outcomes 1-5*

GRADING

Full completion of quizzes (worth 1% each week)	12%
Performance on Quizzes (worth 1% each week)	12%
Discussion (worth roughly 2.5%/week)	30%
Homework (roughly 2.5% per week)	30%
Midterm/Final	16%

Current scores will be available for students to see in the Gradebook on LearningStudio (eCollege), or by email.

Grading Scale:

90-100%	A
80-89.99%	B
70-79.99%	C
60-69.99%	D
<59.99%	F

TECHNOLOGY REQUIREMENTS

- To fully participate in online courses, you will need to use a current, Flash enabled browser. For PC users, the suggested browser is Internet Explorer 9.0 or 10. For Mac users, the most current update of Firefox is suggested.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
    - 512 MB of RAM, 1 GB or more preferred
    - Broadband connection required courses are heavily video intensive
    - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:
    - sound card, which is usually integrated into your desktop or laptop computer
    - speakers or headphones.

- Depending on your course, you might also need a:
    - webcam
    - microphone

  For courses where interactive tools are used, like VoiceThread or Class Live Pro, headphones are suggested for use with recording and playback. We recommend a webcam with an integrated microphone, such as the Microsoft LifeCam Cinema. All devices should be installed and configured before class begins.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. Java can be downloaded at: http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

- You will need some additional free software for enhanced web browsing. Ensure that you download the free versions of the following software:
    - Adobe Reader
    - Adobe Flash Player

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

- For additional information about system requirements, please see: https://secure.ecollege.com/tamuc/index.learn?action=technical

- If you use a camera phone to take pictures of your work, a useful app is CamScanner (https://www.camscanner.com), which compiles multiple pictures into one document for ease of uploading. There is a free version that I encourage you to check out.

ACCESS AND NAVIGATION

Pearson LearningStudio Access and Log in Information

Note: eCollege has recently changed its name to LearningStudio.

This course will be facilitated using Pearson LearningStudio, the learning management system used by Texas A&M University Commerce. To get started with the course, go to: https://leoportal.tamuc.edu.

You will need your CWID and password to log in to the course. If you do not know your CWID or have forgotten your password, contact Technology Services at 903.468.6000 or helpdesk@tamuc.edu**.**
It is strongly recommended that you perform a "Browser Test" prior to the start of your course. To launch a browser test, login to Pearson LearningStudio, click on the 'myCourses' tab, and then select the "Browser Test" link under Support Services.

Pearson LearningStudio Student Technical Support

Texas A&M University Commerce provides students technical support in the use of Pearson LearningStudio.

Technical assistance is available 24 hours a day/ 7 days a week.

If at any time you experience technical problems (e.g., you can't log in to the course, you can't see certain material, etc.) please contact the Pearson LearningStudio Help Desk, available 24 hours a day, seven days a week.

The student help desk may be reached by the following means 24 hours a day, seven days a week.

- **Chat Support:** Click on *'Live Support'* on the tool bar within your course to chat with an Pearson LearningStudio Representative.

- **Phone:** 1-866-656-5511 (Toll Free) to speak with Pearson LearningStudio Technical Support Representative.

- **Email:** helpdesk@online.tamuc.org to initiate a support request with Pearson LearningStudio Technical Support Representative.

Accessing Help from within Your Course: Click on the *'Tech Support'* icon on the upper left side of the screen inside the course. You will then be able to get assistance via online chat, email or by phone by calling the Help Desk number noted below.

Note: Personal computer problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, an Internet cafe, or a bookstore, such as Barnes & Noble, etc.

Policy for Reporting Problems with Pearson LearningStudio

Should students encounter Pearson LearningStudio based problems while submitting assignments/discussions/comments/exams, the following procedure **MUST** be followed:

1. Students must report the problem to the help desk. You may reach the helpdesk at
2. helpdesk@online.tamuc.org or 1-866-656-5511
3. Students **MUST** file their problem with the helpdesk and obtain a helpdesk ticket number
4. Once a helpdesk ticket number is in your possession, students should email me to advise me of the problem and to provide me with the helpdesk ticket number
5. At that time, I will call the helpdesk to confirm your problem and follow up with you

PLEASE NOTE: Your personal computer/access problems are not a legitimate excuse for filing a ticket with the Pearson help desk. You are strongly encouraged to check for compatibility of your browser **BEFORE** the course begins and to take the Pearson LearningStudio tutorial offered for students who may require some extra assistance in navigating the Pearson LearningStudio platform. **ONLY** Pearson LearningStudio based problems are legitimate.

Internet Access

An Internet connection is necessary to participate in discussions and assignments, access readings, transfer course work, and receive feedback from your professor. View the requirements as outlined in Technology Requirements above for more information.

myLeo Support

Your myLeo email address is required to send and receive all student correspondence. Please email helpdesk@tamuc.edu or call us at 903-468-6000 with any questions about setting up your myLeo email account. You may also access information at https://leo.tamuc.edu.

Learner Support

Go to the following link One Stop Shop- created to serve you by attempting to provide as many resources as possible in one location.
Go to the following link Academic Success Center- focused on providing academic resources to help you achieve academic success.

COMMUNICATION AND SUPPORT

The following is the list of communication methods used in this class and their purposes. These include student-instructor, instructor-student and student-student communication.

You will be expected to check your university email account and log onto eCollege at least once every 24 hours Monday-Friday in order to keep abreast of the latest class announcements.

- **Email** will be used by me to communicate to the class as a whole general information about upcoming assignments, due dates, and any changes in the schedule or syllabus that might occur.

  I will also email students individually with occasional feedback from assignments and on the class as a whole.

  Students can use email to ask me any questions about (i) course logistics (upcoming assignments, due dates...) (ii) as any questions about the way their specific assignments were graded and feedback they have been given (iii) constructive feedback to me about how the course is going and any problems/concerns with the course structure (and even things that work particularly well!)

  In emails, please put "PHYS535 Online" in the subject header. I will reply to emails within 24 hours (48 at weekends and holidays)

  I will always send emails to your official University Email address as given through MyLeo. It will be your responsibility to check your university email regularly.

- **Announcements** on LearningStudio (eCollege) will be used to communicate to the class as a whole general information about upcoming assignments, due dates, and any changes in the schedule or syllabus that might occur. New announcements will appear to you the next time you log in to LearningStudio (eCollege).

- **Discussion threads** for each week should be the main way in which you ask and debate the answer to questions you have about the course material itself. Here you can brainstorm problem solving techniques and analyses of reading material. These questions should be continually addressed by your fellow students, and by myself, although in the spirit of discussion concrete answers will only be given after an honest and sustained attempt to figure out the answers

yourselves.

- **Virtual Office** is another place to discuss questions you have about the course individually with me. As well as questions about course logistics, **if anything about the material is unclear to you and preventing you tackling the concepts in the discussion**, this is the place to ask those questions. Any questions that could be answered in the discussion thread, I will only answer here after an honest and sustained discussion on them in the thread. Like emails, I will reply to Virtual Office questions within 24 hours (48 at weekends) unless they are asked during virtual office hours, in which case I'll answer them during those hours.

- **Video Conferencing:** Office hours will be conducted via the video conferencing software **Zoom**. I will send a link just before office hours, which will take you into the meeting room. Webcam and headset recommended. **Online Office Hours** will be held Tuesday/Thursday 6pm-7pm.

- **Student Lounge** is located on the left hand menu under Course Home, and is a place to chat with fellow students about anything you like – as trivial or as deep as you like. This is a place I will NEVER visit, intended for yourselves only.

The following table summarizes where to find the communication tools used in this class:

Communication tool	**Where to find**
Email	Top toolbar or Leomail
Virtual Office	Left menu under "Course Home"
Zoom	Link in email just before office hours
Weekly discussion thread	Left menu under the relevant Week tab.
Student Lounge	Left menu under "Course Home"
Announcements	New announcements appear when you log on to LearningStudio

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures

Academic Honesty

Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including (but not limited to) receiving a failing grade on the assignment, the possibility of failure in the course and dismissal from the University. Since dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. In **ALL** instances, incidents of academic dishonesty will be reported to the Department Head. Please be aware academic dishonesty includes (but is not limited to) cheating, plagiarism, and collusion.

Cheating is defined as:

- Copying another's test of assignment.
- Communication with another during an exam or assignment (i.e. written, oral or otherwise).
- Giving or seeking aid from another when not permitted by the instructor.
- Possessing or using unauthorized materials during the test.
- Buying, using, stealing, transporting, or soliciting a test, draft of a test, or answer key.

Plagiarism is defined as:

- Using someone else's work in your assignment without appropriate acknowledgement.
- Making slight variations in the language and then failing to give credit to the source.

Collusion is defined as:

- Collaborating with another, without authorization, when preparing an assignment.

If you have any questions regarding academic dishonesty, ask. Otherwise, I will assume that you have full knowledge of the academic dishonesty policy and agree to the conditions as set forth in this syllabus.

Attendance Policy

In an online class, attendance means active participation; students are expected to spend at least 2 hours/week on the discussion threads and at least 10 hours/week is required to complete all the assignments, including reading. At least five substantive discussion posts are required by each student each week to gain full points on the discussion part of the grade. If you are unable to log on for an extended period of time (greater than a week) then contact me *in advance* to discuss how to proceed. We recognize that many of you already have a busy work schedule, and that occasionally you might get behind during a week. Spending even 15-30 minutes a day on class material and the discussion threads will help greatly, and if you find yourself struggling at any time, please do not hesitate emailing me; I can be flexible to accommodate your busy schedule.

Assignment policy

All homework assignments will become available with the week's material and will be due 9 days later as outlined in the Course Requirements Section. The due dates for projects will be announced when they are set. Quizzes must be taken between 12 p.m. (noon) Friday when they are made available and the following Wednesday 12 p.m. (noon).

Late work

Late homeworks will be penalized by 10% by each day they are late (i.e. a Homework submitted more than 10 days late gets no credit). Late projects (except the last one, which is due by the last day of classes) will be penalized by 10% by each day they are late. Quizzes and discussion posts will not be accepted past the due date.

Netiquette: Communication Courtesy Code

Students are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. The same rules apply online as they do in person. Be respectful of other students. Foul discourse will not be tolerated. Please take a moment and read the following links concerning "netiquette". http://www.albion.com/netiquette/
http://www2.nau.edu/d-elearn/support/tutorials/discrubrics/netiquette.php

UNIVERSITY SPECIFIC PROCEDURES

Discrimination statement

A&M-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

ADA Statement: Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc.edu

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See *Code of Student Conduct from Student Guide Handbook).*

Harassment Policy

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources here:

University Title IX Contact: Michele Vieira, 903-886-5025, mailto:TitleIX@tamuc.edu

University resource webpages:
http://www.tamuc.edu/facultyStaffServices/humanResources/title-ix/resources.aspx

http://www.tamuc.edu/campuslife/campusServices/universityPoliceDepartment/crimePrevention/sexualAssault.aspx

University Counseling Center: 903-886-5145,
http://www.tamuc.edu/campusLife/campusServices/counselingCenter/default.aspx

Campus police: mailto:upd@tamuc.edu, call 911 in emergency situations

External resources:

Crisis center of NorthEast Texas: http://www.ccnetx.org
Know you IX: http://knowyourix.org
End rape on campus: http://endrapeoncampus.org
Clery Center for Security on Campus: http://clerycenter.org
Not Alone: https://www.notalone.gov

COURSE OUTLINE / CALENDAR

This schedule is tentative.

Week	Topic	Chapter/Sections
1	Basic quantities and concepts – thermal equilibrium, heat, temperature, the ideal gas, the zeroth law of thermodynamics.	1.1-1.2
2	The microphysics of the ideal gas, equipartition, work and internal energy, the first law of thermodynamics	1.3-1.4
3	Thermal and transport properties of matter: heat capacity, conduction, viscosity, diffusion	1.5-1.7
4	Entropy and microphysics I	2.1-2.3
5	Entropy and microphysics II	2.4-2.6
6	Entropy and microphysics III	3
7	MIDTERM	
8	Heat Engines I	4
9	Heat Engines 2	4
10	Chemical Thermodynamics	5
11	Phase transitions	5
12	Boltzmann statistics/The partition function	6
13	Quantum statistics/Ising model	7/8
14	FINAL	

ONLINE DISCUSSION RUBRIC

Each week your discussion posts will be graded using the following rubric. Each week's discussion posts contribute up to 2% to your final grade.

Note: One post counts as 100 words or more on topic. Posts with less words or posts not addressing the week's class topic will not be considered for grading. Of course, the discussion should be allowed to flow naturally, and shorter posts will naturally occur, including one word posts of the type "I agree!" and "Yes!" or "No!". This is fine, and indeed necessary – it is just that the grading will be based upon posts of 100 words or more.

A reminder that netiquette should be observed at all times: please make sure you visit and understand the following resources:
http://www.albion.com/netiquette/
http://www2.nau.edu/d-elearn/support/tutorials/discrubrics/netiquette.php

Criteria	**Unacceptable(0)**	**Poor (1)**	**Good (2)**	**Excellent (3)**
Number of posts	No posts during the week.	1-2 posts during the week.	3-4 posts during the week.	5 or more posts during the week.
Spelling and Grammar	Posts are not in complete sentences, or more than half of the sentences have spelling or grammatical errors.	Between a quarter and half of sentences have spelling or grammatical errors.	Less than a quarter of sentences have spelling or grammatical errors.	No spelling or grammatical errors.
Knowledge	Posts demonstrate no evidence of knowledge of the week's reading.	Posts demonstrate evidence of only a cursory reading of the week's material, and little attempt to critically analyze it.	Posts demonstrate reasonable knowledge of the week's reading, and an attempt to critically analyze it.	Posts demonstrate evidence of comprehensive knowledge of the week's reading, and significant attempts to critically analyze it.

Appropriateness and awareness of other student contri-butions	Posts rude/ disrespectful. No attempt to build upon other students' posts or support other people's arguments.	Minimal acknowledge-ment of other students' posts. Little attempt to build upon arguments.	Reasonable attempts to build upon other students' posts and contribute to their arguments.	Excellent awareness os other students' posts and substantial efforts to contribute to their arguments.
References and support	Arguments are unsupported, come across as unsubstantiated opinion.	Minimal support for students' arguments. Student's thinking unclear, hard to discern how student arrived at their conclusions.	Reasonable attempt to justify arguments made, with some references to the week's reading and external sources where appropriate.	Arguments are fully backed up, with clear explanations of how the student arrived at their conclusions, with full references to the week's reading or to external sources where appropriate.

Credit: The following online rubrics have been used to inform the development of the rubric above:
http://www.udel.edu/janet/MARC2006/rubric.html
http://www2.nau.edu/d-elearn/support/tutorials/discrubrics/discrubric.php
https://topr.online.ucf.edu/images/f/f0/IDL6543_Discussion_Rubric.pdf

TUTORIAL HOMEWORK RUBRIC

Each graded item on the tutorial homework is worth 4 points total. The assignment of the 4 points is determined by the following rubric. An item is defined as an individual question/problem, involving a sketch, written explanation, qualitative or quantitative answer.

Points	2	1	0
Quality of written explanation OR sketch	The written explanation shows that the student has put in thought, and the reasoning is logical. OR The sketch shows that the student has put in thought, and the sketch is mostly correct.	The written explanation shows that the student has put in thought, but the reasoning makes little sense. OR The sketch shows that the student has put in thought, but the sketch is mostly incorrect.	Written explanation reflects minimal effort. OR Sketch reflects minimal effort.
Completeness	Response to question is complete. When a written explanation is required, complete sentences are used.	Response to question is incomplete. When a written explanation is required, complete sentences are not used. Much of the writing is unreadable, word choice is inaccurate, and errors severely impede communication.	There is no response.

READING REFLECTION HOMEWORK RUBRIC

Each reading assignment will be accompanied by one or more writing prompts. Students should follow the directions in the prompts. Homework will be graded according to the following rubric. Note that the maximum possible score is 16 points. Scores will be converted to percentages, so that a raw score of 16 is 100%.

Points	4	3	2	1
Clarity of main points	Main points are clear and easy to comprehend.	The main points are mostly clear, but slightly difficult to comprehend.	Main points are difficult to identify, or writing is difficult to comprehend.	Writing is incomprehensible.
Detail	Writing includes many specific details that are related to the main points.	Writing includes some specific details that are related to main points.	Writing includes very few specific details, or there are many details that are unrelated to the main points.	Writing includes no specific details.
Argument	The writer connects their main points with the details they have provided and makes a coherent argument.	The writer connects some of their main points to details provided, but the argument is may not be logically clear.	The writer's arguments or justifications are difficult to follow.	The writer includes no arguments or justifications.
Relevancy	Writing is completely related to the prompt.	Writing is mostly related to the prompt but is occasionally off topic.	Writing is occasionally related to the prompt but is mostly off topic.	Writing is completely unrelated to the prompt.

COURSE DUE DATES: DISCUSSION POSTS

Each week, you must post at least **one** post in each of **three different** discussion threads, giving your initial thoughts on the subject of the thread or any conceptual or mathematical difficulties you are having with the thread subject. You must also post at least **two** follow up posts in your choice of the **previous week's** threads, responding to another person's comments, or one of my comments. That makes a total of **five** posts per week that will be graded, except for the first week.

Discussion threads for a particular week open at **12.01 a.m.** each **Friday** with the rest of the week's material. To receive credit for your posts, they must be made within the time-frame outlined below. The threads remain open until the end of the semester.

WEEK	DISCUSSION THREADS OPEN	3 POSTS IN 3 DIFFERENT THREADS DUE	2 FOLLOW-UP POSTS DUE
1	Aug 28	Sept 10	Sept 17
2	Sept 8	Sept 17	Sept 24
3	Sept 15	Sept 24	Oct 1
4	Sept 22	Oct 1	Oct 8
5	Sept 29	Oct 8	Oct 15
6	Oct 6	Oct 15	Oct 22
7 (MIDTERM)	Oct 13	Not graded	Not graded
8	Oct 20	Oct 29	Nov 5
9	Oct 27	Nov 5	Nov 12
10	Nov 3	Nov 12	Nov 19
11	Nov 10	Nov 19	Dec 3
12	Nov 17	Dec 3	Dec 10
13	Dec 1	Dec 10	Dec 17
14 (FINAL)	Dec 10	Not graded	Not graded

COURSE DUE DATES: QUIZZES

The introductory week's **pre-course assessment** and **syllabus quiz** becomes available on **Monday Aug 28th** at **12.01 a.m.** *For the syllabus quiz only, you may take the quiz as many times as you like. You will only gain access to the rest of the course once you have made 100% on the syllabus quiz and have completed the pre-course assessment.*

Quizzes on each week's reading material become available at **12.01 a.m.** each **Friday**, with the rest of the week's material, and close at **11.59 p.m. (midnight)** the following **Sunday, 9 days later**.

NOTE: *Apart from the introductory quiz, quizzes can only be attempted once. Once you begin taking the quiz, you will have a time limit of one hour to complete it. Once completed, you cannot return to it and revise your answers.*

WEEK	QUIZ AVAILABLE	QUIZ DUE
1	Aug 28	Sept 10
2	Sept 8	Sept 17
3	Sept 15	Sept 24
4	Sept 22	Oct 1
5	Sept 29	Oct 8
6	Oct 6	Oct 15
7 (MIDTERM)	-	-
8	Oct 20	Oct 29
9	Oct 27	Nov 5
10	Nov 3	Nov 12
11	Nov 10	Nov 19
12	Nov 17	Dec 3
13	Dec 1	Dec 10
14 (FINAL)	-	-

COURSE DUE DATES: HOMEWORKS

Homework for a given week becomes available with each week, on **Friday** at **12.01 a.m.** They are due at **11:59pm** on the due dates shown in the calendar below.

WEEK	HW AVAILABLE	HW DUE
1	Aug 28	Sept 24
2	Sept 8	
3	Sept 15	
4	Sept 22	Oct 15
5	Sept 29	
6	Oct 6	
7 (MIDTERM)	-	
8	Oct 20	Nov 12
9	Oct 27	
10	Nov 3	
11	Nov 10	Dec 10
12	Nov 17	
13	Dec 1	
14 (FINAL)	-	