ME 200 – THERMODYNAMICS I
COURSE POLICY – Spring 2018

7:30 AM in Room 1130 ME, Prof. Naik (naiks@purdue.edu); Division 3
10:30 AM in Room 1130 ME, Prof. Braun (jbraun@purdue.edu); Division 2
12:30 PM in Room 1130 ME, Prof. Buckius (rbuckius@purdue.edu); Division 1
2:30 PM in Room 1130 ME, Prof. Sojka (sojka@purdue.edu); Division 5
4:30 PM in Room 1130 ME, Prof. James (najames@purdue.edu); Division 4

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LEARNING OBJECTIVES:
There are four learning objectives associated with this course:
1. To successfully employ the systematic engineering approach to problem solving
2. To master applying the Law of Mass Conservation when analyzing thermodynamics problems
3. To be proficient in the use of the 1st Law of Thermodynamics so you can perform energy accounting when solving thermodynamics problems
4. To be a competent user of the 2nd Law of Thermodynamics so you can solve thermodynamics problems

TEXTBOOK:
Fundamentals of Engineering Thermodynamics, Moran et al., Wiley for all divisions except division 5 (Sojka @ 2:30 P.M.) and division 1 (Buckius @ 12:30 P.M.). The 8th edition, or previous ones, are acceptable. However, reading assignments will be keyed to the 8th edition. Regardless of the textbook you use, thermodynamic properties must be extracted from the tables provided on your course Blackboard site. A LectureBook will be used for division 5 (Sojka @ 2:30 P.M.) and class notes for division 1 (Buckius @ 12:30 P.M.). They will be provided as a series of pdf files.

PREREQUISITES:
The material in ME 200 requires mastery of: (i) calculus, including ordinary differentiation, integration, and partial differentiation; (ii) physics, including Newton’s laws, concepts of work and energy, simple DC circuits, and gravity; and (iii) chemistry, including concepts of moles, molar mass (molecular weight), and the ideal gas law. Consequently, students must have successfully completed CHEM 115 and PHYS 172, in addition to MA 261 before enrolling in ME 200. If you cannot meet these requirements you should drop this course immediately.

Because a background in physics and chemistry is required, you must be conversant with the CHEM 115 and PHYS 172 material, or review it on your own. Because of this, ME 200 class time and resources are reserved for developing your mastery of thermodynamics as provided by the learning objectives listed above.

THERMO-NUMBER:
Each student will be assigned a four-digit thermo-number before the start of class. The first digit will be the number of your division. You must include this number on all assignments (homework, quizzes, exams, etc.) as it is used for rapidly sorting and alphabetizing the nearly 450 weekly homework assignments, weekly quizzes, hourly examinations, and final exams.

ASSIGNMENTS:
The course syllabus is provided as a separate document. It provides a list of topics to be covered during each class period, the reading to be completed before that class period, as well as the corresponding homework assignments. Duplicates are posted on the ME 200 course website (https://engineering.purdue.edu/ME200/).

CLASS PREPARATION:
As basic preparation for each lecture, you should read the assigned material before coming to class. In-class discussion and examples are designed to help prepare you for homework assignments.
Homework problems are illustrative of those found on quizzes and examinations. However, quiz and exam problems are designed to test your mastery of the four learning objectives so they will not be “just like the homework.”

In addition to the reading and homework assignments, you should review your past class notes on a daily basis. Another suggestion that is known to lead to success is to work additional problems to hone your skills. See the ME 200 course website (https://engineering.purdue.edu/ME200/).

You are responsible for all material listed in the syllabus and discussed in class. Note that even if your instructor does not cover each and every topic on the course syllabus in the order that it is listed, or may not have time in class to cover all the material listed in the syllabus, you are still responsible for all the material that is listed in the syllabus.

**HOMEWORK:**

Homework problems will be available on your division Blackboard site. They are assigned each class. You should attempt to solve them before coming to class. This helps you to formulate questions about the material and concepts to be discussed in teams, as think-pair-share, and in larger groups, plus it also helps you begin to accomplish the learning objectives. When completing all homework problems, you must follow the engineering approach to problem solving outlined below to receive full credit. You must use thermodynamic properties from the tables provided on your course Blackboard site.

All homework solutions must be submitted through GradeScope site. Only pdf files will be accepted. Homework assignments will **always be due at 8:00:00 PM on the dates listed in the syllabus.** If there are extenuating circumstances, the course-wide homework submission deadline may be altered. However, **late homework is never accepted.**

Solutions to assigned problems will be posted on your course Blackboard site. Note that copying homework directly from a friend, or from a file, or a solution manual (or any other resource such as Chegg, Weekly Joys, or any other online resource) is cheating and will be handled in the same manner as cheating on quizzes or exams. See the **ACADEMIC INTEGRITY** section below.

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**Problem Solution Format:**

A. Use 8 1/2 by 11-inch Engineering paper, only one side and only one problem per page. If more than one page is needed for a problem, all pages must be transmitted in order. At the top of the engineering paper there are 5 boxes. Starting from the left:
   
i. Box 1: leave blank
   
   ii. Box 2: put your name (last, first, middle)
   
   iii. Box 3: put the problem number, i.e. HW1, HW17, HW27, …
   
   iv. Box 4: put your thermo number, i.e. XXXX
   
   v. Box 5: put the page number out of the problem/total pages for this problem, i.e. 1/3 or 3/3

B. Underneath the boxes add the information listed below. Also note that **substantial** credit is given for each piece of information in i through v, not just for the final answer.

   **Given:** *Given information serves three purposes. First, it helps you determine which terms in your basic equations you can settle on immediately. Second, it helps you determine how many basic equations you need—the number of basic equations must equal the number of unknowns. Third, it provides guidance for constructing your EFD.*

   **Find:** *List what the problem wants you to find. You use this information to decide on the system you’ll be analyzing, and how you’ll sketch the appropriate energy flow diagram. This information*
Energy Flow Diagram (EFD): Your Energy Flow Diagram (EFD) will identify your system boundary, indicate where energy and mass flow into/out of your system, and which forms these flows take. Your EFD will guide your choice of terms in the basic equations that you keep or reject.

Assumptions: Assumptions are listed to help you eliminate terms in your basic equations. e.g. “Steady state,” “Uniform flow,” “Ideal gas,” etc.

Basic Equations: Your basic equation(s) must be one listed on the ME 200 basic equation sheet. This sheet is posted on the ME 200 course website (https://engineering.purdue.edu/ME200/).

Solution: This includes correct units.

Answer precision: All answers, with the exception of entropy-related quantities, must be reported using three significant figures. Entropy-related quantities should be reported using five significant figures.

EXAMINATIONS:

There are three 90-minute examinations and one two-hour comprehensive final examination. The 90-minute examinations start at 8:00 P.M. and end at 9:30 P.M. Make-up examinations are not given. If you are ill with acceptable medical proof from a physician or nurse practitioner, have an emergency (with proof), or have prior approval from your instructor to miss an examination, your score for the missed examination will be your percentage score from your final exam. In all other cases you will receive a grade of zero for the missed examination. Make-up final examinations are only given in the case of a registered conflict. You must resolve this conflict with your instructor prior to 4:30 P.M. on Friday, April 27 (the last day of the semester). Finally, if you have a letter from the Dean of Students indicating you won’t be taking your exam with the remainder of the students, you must inform your instructor (either in writing or by email) by no later than 4:30 P.M. on Friday, January 12 (the first Friday of the semester).

All examinations, including the final, are closed book and closed notes. A list of basic equations is supplied for exams as a separate document. An identical equation sheet will be provided to you as part of each quiz or examination.

Most importantly, the only calculator allowed during quizzes and exams is one from the TI-30X___ series. There are no exceptions to this rule. You should bring to each examination your TI-30X___ calculator, pencil(s), an eraser, and a straight edge for help when drawing systems, processes, EFDs, and diagrams.

IMPORTANT NOTE:

The use of PDAs, Droids/i-Phones (or other smart phones), cell phones, laptop computers, i-Pads, or any other sources of communication (wireless or otherwise) are strictly prohibited during examinations. Doing so is cheating. See the ACADEMIC INTEGRITY section below below.

If you bring a cell phone/smart phone/smart watch, or other communication device, to an examination it must be turned off prior to the start of the exam, stored out of sight and below your seat, and only used after you leave the examination room for the final time. Otherwise it will be considered a form of cheating and treated as such.

EXAMINATION PREPARATION:

In order to be properly prepared for examinations, you should be: (i) attending and actively participating in your scheduled classes; (ii) reviewing your notes on a regular basis (i.e. every
day); and (iii) completing and studying all the homework assignments. If you neglect any aspect of this trio, you almost certainly guarantee yourself a poor grade. In order to perform well on examinations, you must master the four learning outcomes listed above, as well as having a clear understanding of the basic thermodynamic concepts. This is because the examinations are developed to test your mastery of the four learning outcomes through various types of questions that are not exactly like those you have already seen.

EXAMINATION GRADING:

Points will be deducted if you do not follow the engineering approach to problem solving outlined above and covered in greater detail during class. The problems will be set up so that the Given and Find can be easily identified.

Points will be deducted if you do not construct an appropriate energy flow diagram (EFD), if you do not list your assumptions, or if you do not indicate which basic equation(s) you have used. In addition, you will lose points if you do not provide sufficient detail during your analysis so that the grader can understand what you have done and why you did it, i.e. which terms you dropped from any and all basic equations (as well as your justification for dropping those terms), where the energy interactions are and in which direction energy flows.

Finally, you must carry units through during your analyses, avoid sign errors, and correctly identify the direction of energy flows. Problem solutions that cannot be followed because of illegibility will also lose points.

QUIZZES:

Your instructor may give announced, or unannounced, quizzes during class periods for two reasons. The first is to indicate whether you as an individual have completed the reading prior to class. The second is to determine where you as a class are having difficulties so that the discussion can be tailored to help resolve confusion.

HELP:

There are several sources of help available outside of class. The first is the ME 200 tutorial room (room 2142 in the ME Building Gatewood Wing), the second is instructor office hours, the third is Supplemental Instruction (SI) sessions held four times each week, and the fourth is the Guided Practice Sessions held on the Monday evening prior to each exam. Tutorial room hours are MTWThF as posted on the course website (https://engineering.purdue.edu/ME200/). Instructor office hours will be posted on the ME 200 course website (https://engineering.purdue.edu/ME200/). SI session times and locations will also be posted on the ME 200 course website (https://engineering.purdue.edu/ME200/).

When you bring a question to the tutorial room or instructor’s office, the TA/instructor will ask to see what you have accomplished and where you got stuck. In particular, they will ask you to identify what you are trying to find, to see your EFD, to be told what basic equation(s) you think you should be using, to be informed as to what information you were given (so they can determine if you have an equal number of equations and unknowns), and to be provided with a list of assumptions you have made (to help reduce the number of unknowns to equal the number of equations, and to eliminate terms in the basic equations). If you have not completed these steps you will receive only suggestions as to how you should proceed toward solving the problem. The tutorial room or instructor office hours are not for obtaining easy answers. They exist only to assist you in the process of mastering the learning outcomes.
ME 200 SI takes the form of four 50-minute sessions each week that are outside of your regular class hours. These sessions are hosted by a qualified instructor, who may make a brief presentation on a topic that is causing students some difficulty. The instructor may also work example problems, answer individual student questions, etc. All are welcome to attend. SI hours, locations and instructors will be posted on the ME 200 course website (https://engineering.purdue.edu/ME200/).

COURSE GRADING:
Your course grade is based on the higher score obtained from the following two algorithms:

- Three 90-minute Examinations: 50% or 30%
- Final Examination: 30% or 50%
- Homework: 5% always
- In class quizzes: 15% always

Your instructor reserves the right to employ the left hand distribution should you miss any of the one-hour examinations; this eliminates the need for any make-up exams. In addition, your lowest quiz score and lowest three homework problem scores will be dropped from consideration. Note that the above grading scheme allows you to still earn a good grade for the course, even if you do poorly on one examination.

Course grading will not be more stringent than a straight-scale (90 ≤ any A; 80 ≤ any B < 90, etc.). Grade break scores may vary from straight-scale, and may be curved, but this cannot be known until after the final exam. Please don’t ask as your instructor is unable to predict this.

Prior to submitting a written request for reconsideration of the grading of homework, quizzes and exams, please review the posted solutions to ensure you understand the correct approach. Regrading requests must be submitted to your instructor within one week of the date the graded document was made available for return. Any regrading requests submitted after this deadline will not be considered. Regrading requests must include a written statement detailing the justification for the regrade. Note that the item to be regraded is regraded from scratch and may result in a score lower than the original score.

CAMPUS EMERGENCY POLICY:
In the event of a campus emergency, the course requirements, deadlines, and grading percentages are subject to changes that may be necessitated by a revised semester calendar. In such an event, your instructor will advise you of the new course policy by email.

CLASSROOM RULES:
Common courtesy while in the classroom is a pre-requisite for learning. The following is the minimum expected of all students in ME 200:

- **Mute all cell phones/smart phones/smart watches etc.** before entering the lecture room. It distracts those sitting near you when your watch, phone, beeper, or pager goes off during lecture. If your watch/phone/PDA/etc. does go off during class, you will be called upon to answer the next question.
- **No head phones on during class.**
- **Do not read the newspaper (or any other non-course material) once lecture has started.** Those behind you cannot see the board/overhead screen through the paper. It is also insulting to your instructor.
- **Remove newspapers, drink cans/bottles, candy/food wrappers, and anything else you bring into the lecture room when you leave.** There are trashcans outside for any refuse, as well as containers for recycling.

- **Class time is not for socializing.** Conversation is welcome as it is an integral part of discussion. However, please restrict your conversations during class to topics related to ME 200. You are welcome to discuss course related topics while lecture is progressing. However, it is distracting and annoying to those sitting near you if you’re talking about non-class issues. Plus, you will invariably miss important information. Finally, it is disrespectful of your instructor.

**ACADEMIC INTEGRITY – IMPORTANT NOTE:**

Any form of academic dishonesty (including cheating) on an examination, quiz, or homework, as defined by Regulations Governing Student Conduct, Disciplinary Proceedings, and Appeals (http://www.purdue.edu/studentregulations/student_conduct/regulations.html) results in a grade of zero for that exam, or a semester long zero for all quizzes, or a semester long zero for all homework, and a letter will be sent to the Dean of Students. After more than one such instance you will receive a failing grade for ME 200 and a letter will be sent to the Dean of Students recommending that you be expelled from Purdue University. Any dishonesty on the final examination will result in a zero on the final examination and the final examination will be given the 50% weighting when calculating the course grade.

**SOME ADVICE:**

It is expected that you will ask questions when you don’t understand, actively participate in class discussions, be prepared to answer when called upon, and generally be alert in class. It is also expected that you will only use your laptops or phones for ME 200-related business while in class.

Reading assignments and reviewing your class notes, and working the homework problems on a daily basis, plus completing additional problems, is the best way to ensure you learn the material, master the learning objectives, and are well prepared for quizzes and examinations. Hard work is required because ME 200 is often the first course engineering students take where their success requires them to adopt the engineering approach to problem solving. Do not procrastinate – once you fall behind in this class it is very hard to catch up. If you continue to have difficulties, consult your instructor. S/he can almost always provide suggestions on how you can study to improve your grade.