

PHYSICAL CHEMISTRY I (CHEM 312): THERMODYNAMICS, FALL 2020

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TEXT 1: *Thermodynamics, Statistical Thermodynamics, and Kinetics, 2nd Ed.* by Thomas Engel and Phillip Reed, 2010. Prentice Hall. (ISBN-10: 0-321-61503-4).

TEXT 2: *Absolute Zero and the Conquest of Cold*, by Tom Shachtman, 2000. Mariner Books. (ISBN 0-6180-8239-5) *optional*.

COURSE DESCRIPTION: The topic of *thermodynamics* deals with the description of matter on the macroscopic scale. Thermodynamics does not acknowledge atomic level details, like bond lengths or electron configuration. The description of matter generally falls under one of two categories: 1) behavior of matter, and 2) transformation of matter, generally involving different forms of energy. It is very common in thermodynamics to develop mathematical models using variables that are accessed through experimentation; these models give us predictive powers. This course requires a fair amount of mathematical manipulations, but the student is well assisted by the course textbook. It is my hope that you will find the subject matter interesting and relevant.

CLASS TIMES: MWF 10:00-10:50 am, CSB 378.

LAB TIME: Thus 2-6 pm, CSB 378.

PREREQUISITES: Organic Chemistry II (Chem 230) Calculus I/II (Math 152) and Intro Physics (Phys 132), functioning laptop computer, and a good attitude.

“In-Person” ATTENDANCE: A lecture is a presentation *and* discussion of concepts viewed by the instructor as most important or most difficult and in need of additional explanation. Lecture is a conversation between you and me. If you are not present, I have no choice but to have the conversation in your absence. This, of course, affects our level of communication and ultimately your grade. ***I fully expect that you attend all lectures; if more than 3 unexcused absences I reserve the right to reevaluation of the grading allocations.*** Keep in mind that to make up for missing a 50 minute lecture will take you longer than 50 minutes, therefore missing lecture is a really bad “time management” practice.

“Online” ATTENDANCE: If it becomes necessary for all or some of us to move to online teaching, we will conduct class meetings using the web-based video conferencing software ZOOM. This software requires a functioning internet accessible device; a laptop computer will provide the most satisfying experience. Although a cell phone can be used, the experience is significantly less engaging. ZOOM class meetings will be presented at the regularly scheduled times and will be recorded. Your ability to meet online is dependent on personal circumstances/resources. I believe that online teaching is an acceptable, but lesser alternative to meeting in person. Distractions that exist in non-academic environments can quickly become overwhelming. In case of a shift to online teaching, students are encouraged to maintain an academic focus.

OFFICE HOURS: MWF 11-12 pm in my office (CSB 358). If I am not in my office but my door is open I am in the building..txt me (309-536-2390). Although you may also make an appointment at other times convenient to you and me, I strongly prefer that you find me during business hours (9-5) to seek council.

HOMEWORK: Any discipline requires practice (homework). The depth of understanding will be directly related to your understanding of the assigned homework. Homework will be assigned and evaluated. I encourage you to establish study partnerships. Keep in mind that you will not have your study partner’s help during exams, so make sure that you can independently work problems.

LABORATORY: The lab component to this course that will meet on Thursday from 2-6 pm. Due to COVID distancing restrictions, the lab will meet in CSB 378, with lab activities setup in CSB 378, PChem lab (CSB 373), and the chemistry computer lab (CSB 377). Students will complete activities in some or all locations. The details of the lab will be discussed on the first day of lab (Thurs, Aug 20).

GRADES: Keep in mind that the instructor does not *determine* your grade, but rather *assigns* your grade based on the following: homework (10%), three exams given during lab periods (60%), laboratory (15%) and a remote final exam (15%) provided the week of Nov 30th - Dec 4th; additional information will be provided.

The letter grades will be **assigned** as follows:

| Ave % | Grade | | |
|--------|-------|-------|----|
| 93-100 | A | 77-79 | C+ |
| 90-92 | A- | 73-76 | C |
| 87-89 | B+ | 70-72 | C- |
| 83-86 | B | 60-69 | D |
| 80-82 | B- | < 60 | F |

HOURS PER WEEK WORK EXPECTATION: There is an expectation that you will complete significant work outside of the classroom and laboratory. Understand that the hours listed in the table are weekly averages. Some weeks will demand more than others; for example, in weeks that you have an exam or lab report due. Additionally, some may need more time to master the material than others. Please keep in mind that if during any week you spend “little time” on course material, you are probably falling behind; be proactive.

Work Expectations, continued

| In class | Hours |
|--------------------------------------|-------|
| Lecture | 2.5 |
| In lab | |
| Lab Lecture and Lab | 4 |
| Outside of class/lab | |
| Reading/Homework | 2 |
| Studying for exams/quizzes | 2 |
| Preparation for lab | 0.5 |
| Lab Report Sheets/Lab Report Writing | 2 |
| Total | 13.0 |

STUDENT SUCCESS & ACCESSIBILITY SERVICES:

Student Success & Accessibility Services offers FREE resources to assist Monmouth College students with their academic success. Programs include **Supplemental Instruction**, Drop-In and appointment **tutoring**, and **individual Academic Coaching**. The ACE (Academic and Career Excellence) office, located on the first floor of the Hewes Library, is here to help all students excel academically.

If you have a disability or had academic accommodations in high school or another college, you may be eligible for academic accommodations at Monmouth College under the Americans with Disabilities Act (ADA). Monmouth College is committed to equal educational access. To discuss any of the services offered, please visit the Student Success & Accessibility Services located in the ACE space on the first floor of the Hewes Library, opposite Einstein’s Bros Bagels. They can be reached at 309-457-2257 or via email at: ssas@monmouthcollege.edu

ACADEMIC HONESTY

From the Monmouth College Academic Honesty Policy: **“We view academic dishonesty as a threat to the integrity and intellectual mission of our institution. Any breach of the academic honesty policy – either intentionally or unintentionally - will be taken seriously and may result not only in failure in the course, but in suspension or expulsion from the college. It is each student’s responsibility to read, understand and comply with the general academic honesty policy at Monmouth College, as defined here in the Scots Guide, and to the specific guidelines for each course, as elaborated on the professor’s syllabus.”**

“The following areas are examples of violations of the academic honesty policy:

1. **Cheating (presenting work of others as your own)** on tests, labs, or any assigned work;
2. **Plagiarism**, i.e., using the words, ideas, writing, or work of another without giving appropriate credit;
3. **Improper collaboration** between students, i.e., not doing one’s own work on outside assignments specified as group projects by the instructor;
4. **Submitting work previously submitted** in another course, without previous authorization by the instructor.”

“Please note that this list is not intended to be exhaustive.”

In this course, any violation of the academic honesty policy will have varying consequences depending on the severity of the infraction as judged by the instructor. Minimally, a violation will result in 0 points on the assignment in question. Additionally, the student’s course grade may be lowered by one letter grade. In severe cases, the student will be assigned a course grade of “F” and dismissed from the class. All cases of academic dishonesty will be reported to the Associate Dean who may decide to recommend further action to the Admissions and Academic Status Committee, including suspension or dismissal. It is assumed that students will educate themselves regarding what is considered to be academic dishonesty, so excuses or claims of ignorance will not mitigate the consequences of any violations.

COUNSELING SERVICES: “Monmouth College provides cost-free, professional mental health counseling to support you and to help you manage challenges that may impact your personal and academic success. The Counseling Center is located in the upper level of Poling Hall, offices 204 and 216, and the hours are Monday-Friday, 8:30 am-5:00pm. To request a confidential appointment on-line, use this link <https://titanium.monmouthcollege.edu/> or email counselingcenter@monmouthcollege.edu, Cindy Beadles at cbeadles@monmouthcollege.edu or Tom Caudill at tcaudill@monmouthcollege.edu.”

Instructional Behaviors That Motivate Students

- Hold high but realistic expectations for your students.
- Help students set achievable goals for themselves.
- The instructor needs to be clear in expectations.
- Strengthen students' self-motivation.
- Avoid creating intense competition among students.
- Be enthusiastic about your subject.

Steven Covey’s 7 habits of high effective people.

- Be proactive (as opposed to reactive) – **programmer**
- Begin with the end on mind – **write the program**
- First things first (not second things first) - **execute**
...master the first 3 and your life will change!
- Think win-win!
- Seek 1st to understand, then to be understood
- Synergize
- Sharpen the saw

Also, Knowledge, Skill, Passion; you, I, we (more later)