CHEMISTRY 3510 - Physical Chemistry

Dr. Paul Marshall
Fall 2012

Text:

- Physical Chemistry by Peter Atkins and Julio de Paula, 9th Edition. Chapter Outline and Homework available online at http://www.chem.unt.edu/~marshall/c3510cha.htm.
- Student's Solutions Manual to accompany Physical Chemistry, 9th Edition (optional - I have placed a copy in the ISB Library Reserves)

Lectures:

Mondays, Wednesdays and Fridays at 10:00 am - 10:50 am, in room 352 of the Chemistry Building.

My Office Hours:

Mondays 1 - 3 pm and Thursdays 2-3 pm, at Room 274 in the Chemistry Building. You may drop by at any time; you might want to check ahead that I will be in or make an appointment.

My e-mail is marshall@unt.edu and phone is (940) 565-2294.

The Teaching Assistant is Ms. Kate Kerr who can be reached at katekerr@gmail.com. Her office hours are the hour after class in Room 223.

Additional Information:

The information on this page is also available online at http://www.chem.unt.edu/~marshall/c3510.htm.

This department believes in reasonably accommodating individuals with disabilities and complies with the university policy established under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (1990) to provide for equal access and opportunity. Please communicate with your professor as to your specific needs so appropriate arrangements can be made through the department and/or the Office of Disability Accommodation (Room 318A, University Union, (940) 565-4323).

Legal Notice:

My lectures are protected by state common law and federal copyright law. They are my own original expression. Whereas you are authorized to take notes in class thereby creating a derivative work from my lecture, the authorization extends only to making one set of notes for your own personal use and no other use. You are not authorized to record my lectures, to provide
your notes to anyone else or to make any commercial use of them without express prior permission from me in writing.

**Pre-requisites**

CHEM 1420, CHEM 1422 or CHEM 1423; MATH 1720; PHYS 1420 or PHYS 2220. **This means two semesters of calculus.**

**Exams:**

Electronic calculators are allowed in exams but tablet or laptop computers, cell phones, head phones and earbuds are forbidden. Wide-brimmed hats may not be worn.

There will be four 50-minute semester exams plus a 2-hour comprehensive final exam which will count as two semester exams.

<table>
<thead>
<tr>
<th>Date</th>
<th>Max. Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, September 28</td>
<td>100</td>
</tr>
<tr>
<td>Friday, October 12</td>
<td>100</td>
</tr>
<tr>
<td>Wednesday, October 31</td>
<td>100</td>
</tr>
<tr>
<td>Wednesday, November 28</td>
<td>100</td>
</tr>
<tr>
<td>Wednesday, December 12 (8 am) (Final Exam)</td>
<td>200</td>
</tr>
</tbody>
</table>

**Attendance and Grading Policy:**

Class attendance is not formally required but **highly recommended** - if you miss classes you may not do well in the exams. If you miss an exam you score zero for that exam.

Your grade will be based strictly on your examination performance. **There will be no make-up exams.** I will however drop your lowest 100 points (i.e. I drop the lowest exam if it is before May or grade the final out of 100 if the final is the lowest score) when I calculate your semester average, based on your best 500 points.

If your semester average is at least 90% your final grade will be A.
If your semester average is 80-89% your final grade will be B.
If your semester average is 70-79% your final grade will be C.
If your semester average is 60-69% your final grade will be D.
If your semester average is below 60% your final grade will be F.

I reserve the right to give a higher grade than allowed by the above scheme.

Homework problems will not be collected nor graded. However, **working the problems is strongly encouraged.** This is how you will gain skill at quantitative problems. It is important that
you keep up with the homework. Leaving it until the day or two before an exam is not a strategy for success. Expect to spend at least several hours on homework each week.

There are optional recitations scheduled for Wednesdays at 1:00-1:50 pm in room 352 where we will discuss examples from the homework and elsewhere, and any problems you raise over the class material, homework problems and so on.

Some comments:

You can learn a little more about me and my research at my website www.chem.unt.edu/~marshall, and we can arrange lab tours as well.

There are many equations in this course, but the emphasis is strongly NOT on memorizing a bunch of formulae. I hope students will grasp the scientific principles which, together with a few key equations, will let you solve all kinds of problems. In particular, new problems which you haven't seen before, just like in real life. If you can do this, you truly understand the material, and that is my goal for everyone.

A second goal is for you to see how the general principles we develop help us to understand all kinds of phenomena, some well outside chemistry.

Working the homework is really crucial. It is how you put into practice the principles from the classes, plus it is training for the exams. You can check yourself, or perhaps solve a difficulty, by referring to the Solutions Manual. If there is anything that doesn't make sense after that, please raise it at recitation or office hours with me or the TA.

The classes more or less track along with the arrangement in the textbook. However, please note that in some chapters I have reordered the material into what I think is a clearer way, and often I have skipped some of the less critical discussion. The syllabus is different from previous years so don't worry if what you are learning now doesn't match with the old exams I put on the web. I promise I will not test over anything you do not see in the course; anything you do see I consider to be fair game!

Dates:

Wednesday, November 7, 2012 is the last day to drop this course.

University Policies:

ACADEMIC DISHONESTY Students caught cheating or plagiarizing will receive a "0" for that particular assignment or exam. Additionally, the incident will be reported to the Dean of Students, who may impose further penalty. According to the UNT catalog, the term "cheating" includes, but is not limited to: a. use of any unauthorized assistance in taking quizzes, tests, or examinations; b. dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; c. the acquisition, without permission, of tests or other academic material belonging to a faculty or staff
member of the university; d. dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s); or e. any other act designed to give a student an unfair advantage. The term "plagiarism" includes, but is not limited to: a. the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and b. the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

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 www.dos.unt.edu/conduct.

Listed below are the chapter outlines and homework assignments for this course. Some past exams are available online.

**Chapter 1 - The Properties of Gases**

Sections 1-4

**Homework Assignments**

Exercises 1-16, 18-22 (do part "a" of each assigned exercise in every chapter)
Problems 27

**Chapter 2 - The First Law**

Sections 1-12

**Homework Assignments**

Exercises 1-16, 18-20, 22-27, 30-33
Problems 1, 5, 7

**Chapter 3 - The Second Law**

Sections 1-9
Homework Assignments

Exercises 1-19
Problems 1, 5, 9, 25

Chapter 4 - Physical Transformations of Pure Substances

Sections 4

Homework Assignments

Exercises 9-11
Problems 3

Chapter 5 - Simple Mixtures

Sections 1-3

Homework Assignments

Exercises 1-1, 2 8-10
Problems -

Chapter 6 - Chemical Equilibrium

Sections 1-4

Homework Assignments

Exercises 1-6, 8(a,c,d), 9, 10, 15-17
Problems -

Chapter 20 - Molecules in Motion

Sections 1-3

Homework Assignments

Exercises 1, 2, 5-13
Problems -

Chapter 21 - The Rates of Chemical Reactions
Sections 1-8, 10

**Homework Assignments**

Exercises 1-5, 8-12, 14, 15, 21-23

Problems -

**Chapter 22 -Reaction Dynamics**

Sections 1-7

**Homework Assignments**

Exercises 1-4

Problems -

**Past Exams and Solutions from CHEM 3510**


**Past Exams and Solutions from CHEM 5200**


