

Physical Chemistry II Laboratory
Chem 372-500/501
Spring 2008
TR Rybolt

372 Lab COURSE INFORMATION

372-500 Monday 2:00 - 4:50
372-501 Thursday 1:40- 4:30

Attendance

You are expected to attend all sessions of the laboratory. You must make up any missed work. One time will be available at end of the semester for a make-up lab. If you miss lab, discuss with me as soon as possible. If you miss the day that labs are due then the next time I see you, the labs must be ready to hand to me.

Breakage

Most equipment breakage is the result of carelessness. Students who break an item may have their lab grade for that experiment reduced. The damage of a major piece of equipment or an instrument may result in a 0 for that experiment.

Grades

The lab grade comprises 25% of your course grade. Although your laboratory grade will be based on your written lab reports, improper conduct in lab or lack of preparation for lab could affect your grade. At this point in your academic career you should be functioning in a fairly professional and independent manner. You need to keep up during the semester and insure you understand what you are doing. You need to prepare before lab.

Grades are based on 10 points for 6 regular experiments, 30 points for MM modeling project and paper, and 10 points for professional behavior, demeanor, and lab preparation. To be acceptable items turned in for grading must be typed and completed at appropriate level (senior chemistry major quality) without spelling, grammar, and typo errors.

Honesty

One of the distinguishing features of Science as a human endeavor is its emphasis on absolute honesty and truthfulness. You should cultivate this habit in all your undergraduate work. In this lab as in all others whether your data is "good" or "bad" it is real and thus what you have to work with, analyze, and try to understand. You are expected to write your own individual reports. Although you may discuss the experiment with other students and your lab partner, you may not copy, paraphrase, or rewrite portions of another person's report. You are not allowed to permit other persons to use your reports for unethical purposes. Discussions for the purpose of understanding are fine; whereas, copying for the purpose of generating a lab report without understanding is not an acceptable practice and will result in a 0 on the report and possibly an F in the course.

There will be one paper (the MM PAPER) that is a joint report with two co-authors each working equally on the project. Other reports are to be written completely individually.

Notebook

A bound laboratory notebook is required. All recorded information is to be written directly in this notebook in ink. You must use ink. You are not allowed to record information temporarily on scraps of paper or tear pages out of the notebook. You should include enough information so that it is clear what type of data and units are being recorded. You can record sample calculations and any information that will be useful in your data collection and analysis. You should date each data page. Some data is collected directly by computer, but it never hurts to write key numbers in a lab notebook. Sometimes, I'll look at your lab notebooks during lab.

Lab Information

Refer to your lecture textbook for needed background information and read sections that go along with your lab work each week. You should seek to be a person who not only identifies problems, but also finds solutions.

Detailed lab instructions are provided in the website www.utc.edu/Tom-Rybolt under the Chem 372 lab option. This website provides an online version of *Laboratory Manual for Computational and Experimental Physical Chemistry II* written by Kutz and Rybolt. There is no bookstore packet. You are responsible for printing and reading prior to lab the handouts that you will need for each day's work. It is assumed you will use the available time for laboratory work.

Experiments and reports

<u>SYMBOL</u>	<u>EXPERIMENT</u>	<u>(TOPIC)</u>	<u>TURN IN</u>
HC	heat of combustion	(thermochemistry)	report
CS	conductivity of solutions	(ionic chemical equilibrium)	report
IR	infrared spectroscopy of HCl	(spectroscopy)	report
KI	kinetics of acetone iodination	(kinetics)	report
AM	atomic microscopy software	(computational dynamics)	questions/answers
MM	molecular modeling project	(based on selected article)	Complete Paper
NZ	Enzyme Kinetics	(biochemical kinetics)	report

The laboratory experiments and computational chemistry experiments to be conducted during this semester are listed above. The information for each experiment gives some background and theory as well as specialized instructions for your experimental work, data analysis, and lab reports. If corrections or updates are needed during the semester, they will be placed on the bulletin board in

the lab room. **Check this board for any corrections or additions prior to starting your experiment.**

Lab reports are due within the first 5 minutes of the start of lab—either 1:40 to 1:45 or 2:00 to 2:05. Late lab reports will not be accepted unless you miss entire lab.

Save computational work in folder with your name(s) so you can find during semester. Flash drives are useful for transporting work from home to school.

Integration of lecture and lab

In this laboratory course you will have an opportunity to study some of the physical properties of matter that are associated with various chemical substances. The Physical Chemistry Laboratory is designed to demonstrate the application of principles covered in the lecture portion of the course.

You should strive to integrate your knowledge of theory and experiment and understand how these two aspects of Physical Chemistry are interrelated. Each week, you should read the textbook pages that deal with the specific experiment you are doing that week. Lecture can help you understand lab, but lab can also help you understand lecture.

Overview of Lab

In this laboratory course you will have an opportunity to study some of the physical properties of matter that are associated with various chemical substances. The main objective of this lab course is to learn how to gather, organize, analyze, and present data and use this data to obtain chemical or physical properties. The data may be obtained from experiments or from computer calculation/molecular modeling. You will perform experiments designed to enhance your knowledge of quantum theory, spectroscopy, kinetics, and properties of matter. You will continue the development of laboratory skills expected of chemists and other professionals.

The Physical Chemistry Laboratory is designed to demonstrate the application of principles covered in the lecture portion of the course. You should strive to integrate your knowledge of theory and experiment and understand how these two aspects of Physical Chemistry are interrelated.

Lockers

Most experiments have designated locker (drawer or cabinet). Do not remove equipment from other lockers. Leave the equipment and glassware ready for next group as it should have been left for you.

Safety

You must sign a copy of the UTC Chemistry Department safety rules before working in the laboratory and follow the safety rules and the proper disposal of chemical waste. Safety Goggles must be worn while in the laboratory.

Schedule

372 LAB SCHEDULE Spring 2008 372-500 Mo 2:00-4:50 372-501 Th 1:40-4:30

Date/Exp	NZ	AM	HC	MM	IR	MM	KI	MM	CS
Jan 7 10	-----no lab-----								
14 17	Introduction and Preparation for first experiment								
21 24	-----holiday-----								
28 31	1	2	3	4	5	6	7	8	9
Feb 4 7 *	9	1	2	3	4	5	6	7	8
11 14	8	9	1	2	3	4	5	6	7
18 21 *	7	8	9	1	2	3	4	5	6
25 28	6	7	8	9	1	2	3	4	5
Mar 3 6 *	5	6	7	8	9	1	2	3	4
10 13	-----spring break-----								
17 20	4	5	6	7	8	9	1	2	3
24 27 *	3	4	5	6	7	8	9	1	2
31 3	2	3	4	5	6	7	8	9	1
Apr 7 10 *	make- up lab can be done this day								
14 *	all make-up labs (both sections) due this Monday by 5pm								
17	last graded lab reports returned and lab grade given								
21	last graded lab reports returned and lab grade given								

Lab report from previous two weeks **due** these * **days** by 2:05 Monday or 1:45 Tuesday. Late labs not accepted unless you miss entire lab. Have lab ready to hand me the next time you see me after the missed lab. Your **MM project** will be due after third scheduled week of work is completed.

One time only during semester you are allowed to not turn in one report on due date. This will be your **make-up lab**. You can do or redo experiment or calculation during the make-up week at end of semester. On the date the make-up lab would normally be due, give me a piece of paper with the name of the experiment and the words "make-up lab" on the page.

Group	Student Partners
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-