

**CHEM 443 Physical Chemistry Lab**  
Spring 2009

**Instructor:** Dr. Lee Sunderlin  
**Office:** Faraday West 327  
**Office hours:** MWF 10-11  
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**Lab TAs:** Brendan Dutmer (FW 310) and Chetan Suryawanshi (FW 315).

**Text:** There is no textbook for this course, although you should have a copy of the CHEM 441 textbook available. A lab notebook is required. An optional book, Applied Mathematics for Physical Chemistry (2<sup>nd</sup> edition, J.R. Barrante), is also available in the bookstore.

### **General Information**

The experiments in CHEM 443 draw on the same body of knowledge covered in the CHEM 441 lecture, although the experiments are not precisely synchronized with the lecture course. It cannot be stressed enough that you **MUST** carefully study the theory and experimental procedures before carrying out the experiment in the lab. Some of the experiments are not experiments in the strict sense of the word but are tutorial guides in areas that are important to a physical chemist. It is sincerely hoped that the course will be both educational and fun.

1) The aims of this course are:

- To equip you with practical skills used in experimental physical chemistry
- To develop your scientific judgment and your ability to innovate and think critically
- To encourage you to assess methods and procedures in a constructive and critical manner
- To improve your skills of research and communication by teaching you how to fully document a scientific experiment and to present the information in a competent and professional laboratory report

2) A word about safety:

You have a legal obligation to work safely in the laboratory, to insure that you do not expose yourself or your co-workers to hazard. You will be instructed as to the safe handling of all chemicals used in the experiments and are encouraged to ask questions if you are unsure about procedures. One of the labs involves the use of a Class IIIB laser; you will be given special safety instructions as to the use of the instrument at the time of the experiment. Safety goggles are required at all times in the lab.

3) Grades:

The final grades will be calculated on a normal grade scale (90%=A, 80%=B, 70%=C, 60%=D). There are a total of eight lab reports due that are worth 100 points each. All lab reports will be due two weeks after the day of the experiment. The dates are given below with the schedule. All labs must also be turned in by the Friday before finals week to receive any credit. (There will be no final in the class.) There will be a penalty of 5 points per day (weekends and holidays do not count) for reports turned in after the due date. Copies of lab notebook pages for each lab should be turned in with each lab.

#### 4) Schedule:

The course consists of eight experiments, divided into two sets. Each section will be divided into four groups (1-4 in table). The rotation for carrying out the experiments for each group is as follows:

<b>SET 1</b>	2/2,2/4	2/9,2/11	2/16,2/18	2/23,2/25	TA
iodine clock	1	2	3	4	BD
Powder X-ray spectroscopy	4	1	2	3	CS
Quantum chemistry with Spartan	3	4	1	2	BD
CO <sub>2</sub> solubility	2	3	4	1	CS
<b>SET 2</b>	3/2,3/4	3/16,3/18	3/30,4/1	4/6,4/8	
FTIR spectra of HCl	1	2	3	4	CS
Charge – transfer spectroscopy	4	1	2	3	BD
Aggregation number of SDS	3	4	1	2	CS
Raman spectroscopy	2	3	4	1	BD

In addition, the class will meet on January 26-28 for lab checkin and a lecture on the upcoming experiments. The lecture should take about two hours.

If you have specific physical, psychiatric or learning disabilities and require accommodations, please let me know early in the semester so that your learning needs may be appropriately met. I will be happy to discuss any disability-related need during my office hours or after class. All such information will remain confidential. You may need to provide documentation of your disability to the Center for Access-Ability Resources (CAAR), located on the 4<sup>th</sup> floor of the University Health Service, 753-1303.