CHEM 443 Physical Chemistry Lab

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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 (2nd 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 and equipment used in the experiments and are encouraged to ask questions if you are unsure about procedures. Safety goggles are required at all times in the lab.

3) Grades:

The final grades will be calculated on a normal grade scale (93%=A, 90%=A-, 87%=B+, 83%=B, 80%=B-, 77%=C+, 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. Note that the TA assignments are nominal, and there will be team teaching for some labs.

<table>
<thead>
<tr>
<th>SET 1</th>
<th>2/9</th>
<th>2/16</th>
<th>2/23</th>
<th>3/2</th>
<th>TA</th>
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<tbody>
<tr>
<td>iodine clock</td>
<td>1</td>
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<td>2</td>
<td>4</td>
<td>JO</td>
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<tr>
<td>dye-bleach kinetics</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>JO</td>
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<tr>
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<td>3</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>SC</td>
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<tr>
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<td>2</td>
<td>3</td>
<td>1</td>
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<td>SET 2</td>
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<td>3/23</td>
<td>3/30</td>
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<tr>
<td>FTIR spectra of HCl</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>SC</td>
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<tr>
<td>Charge B transfer spectroscopy</td>
<td>2</td>
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<td>1</td>
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<tr>
<td>Powder X-ray spectroscopy</td>
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<td>2</td>
<td>JO</td>
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<tr>
<td>Quantum chemistry with Spartan</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>JO</td>
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**Prelab Preparation**
You should be familiar with the theory behind an experiment before you attempt the experiment. In many cases, there is a lab handout you should have read and understood. In addition, the class will meet on February 2 for lab check-in and a lecture on the upcoming experiments. This should take two hours or less. Following are recommended section of the 441 text for some of the labs:

- **Aggregation number of SDS** Atkins section 17C2a on micelles
- **FTIR spectra of HCl** Atkins 12D
- **Charge Transfer Spectroscopy** Atkins 13A2a
- **Powder X-ray Spectroscopy** Atkins 18A1,2,3
- **Spartan** If you have not done the lab involving Spartan from CHEM 442, see me to get prepared

**Academic Integrity:**
Good academic work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced is regarded by the faculty and administration as a serious offense. Students are considered to have cheated if they copy the work of another during an examination or turn in a paper or an assignment written, in whole or in part, by someone else. Students are responsible for plagiarism, intentional or not, if they copy material from books, magazines, or other sources without identifying and acknowledging those sources or if they paraphrase ideas from such sources without acknowledging them. Students responsible for, or assisting others in, either cheating or plagiarism on an assignment, quiz, or examination may receive a grade of F for the course involved and may be suspended or dismissed from the university. (Note that *working together* on a lab is not considered plagiarism in this class; *copying* another’s lab is.)

**Accommodations for Students with Disabilities:**
NIU abides by Section 504 of the Rehabilitation Act of 1973 which mandates reasonable accommodations be provided for qualified students with disabilities. The NIU Center for Access-Ability Resources (CAAR), located on the 4th floor of the University Health Service (815.753.1303) is the designated office on campus to provide services and accommodations to students with diagnosed disabilities. You need to provide documentation of your disability to CAAR if you seek accommodations in this course. If you have a disability or any other special circumstance that may have some impact on your work in this class, and for which you may require special accommodations, please contact me early in the semester so that accommodations can be made in a timely manner.