Syllabus for Chem 222 – Spring 2005
Introduction to Analytical Chemistry

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Instructor: **Prof. Yoshitaka Ishii**, office: **5414 SES**

Office Hours: Mondays 1:30 – 2:30 PM and Fridays 1:30 – 2:30 PM
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Course Information on the Internet:
For the syllabus, laboratory syllabus, tentative list of homework problems, report cover sheets, links to experiments and link to the textbook: www.chem.uic.edu/chem222/

LECTURE: 12:30-1:20, Tuesday and Thursday Lecture Center D4

LABOTATORIES	**TA**	**E-mail**	**Phone**
8:00-10:50 MW	Yangsoo Choi	ychoi13@uic.edu	6-8649
8:00-10:50 TR	Manshui Zhou	mzhou4@uic.edu	6-8649
2:00-4:50 MW	Sujeewu Piyankuauge	spiyan2@uic.edu	6-9704
2:00-4:50 TR	Panchatapa Jash	pjash2@uic.edu	6-5424
11:00-1:50 MW	Miao-Jen Lu	mlu6@uic.edu	

COURSE MATERIALS

Textbook: Harris, "Quantitative Chemical Analysis", 6th Ed. Freeman, 2003.

Laboratory: You are also required to purchase a BOUND laboratory notebook and splash goggles. The experiments are found at http://www.whfreeman.com/qca.

ABOUT THE COURSE: GOALS, COMPONENTS & GRADING
Goals. Chemistry 222 is an introduction to the principles and practices of analytical chemistry. Analytical chemistry is often called by the more descriptive name "quantitative analysis." The focus of this course is the analysis and separation of chemical substances, which form basis of other research areas, in particular, biochemistry and modern biology. Analysis means both identifying chemical substances and determining their amounts. The laboratory portion of the course is balanced by an in-depth review of general chemistry principles (equilibrium and stoichiometry), as applied to the problem of quantifying and separating substances from mixtures and compounds. You are graded on the accuracy of your laboratory results. Many of the experimental methods used are very accurate: you will receive a good lab grade if you are able to achieve this accuracy in your results: you won't get a good lab grade if your answers are not accurate.

Homework and Group Problems in Lecture. Homework will be regularly assigned in class, but will not be graded or collected. The exams will cover material from the lecture, homework, and laboratory work. Some questions related to home work may be given in the lecture. Questions related to home work are asked in the lectures. Group problems will occasionally be given in lecture to allow you to practice problem solving.

Grading Policy. Your final grade in this class is a simple average using the following weights:

500 points laboratory	All laboratory reports are weighted equally.
500 points quizzes and exams	Several (10-15 min) quizzes will be given in lecture (total 100 points). Quizzes will be announced at least 1 lecture in advance. There is one mid-term exam (150 points) and a final hour exam (250 points). Only pencils, pens, and calculators are allowed. All exams are closed book. I reserve the right to reject the use of any hand-held computers, cell phones, and any other electronic devices during exams: see me if you have questions about your own device. As extra points, class participation (answering questions in classes) will be added up to 20 points.

The following considerations are used in determining your grade:

1) Your final letter grade is determined directly from your total score for the semester. This grading standard may be relaxed a little, but I will not make it more difficult than cited below. A linear curve may be applied in order to give A to ~ 15 % of students.

> 90 % →A > 80 % →B > 65 % →C > 50 %→D < 50 % →E

2) Furthermore, **to pass this course**

- **You must get an average of at least 50% on the exams and quizzes.**
- **You may not miss more than two labs or classes (in total).**
- **You must hand in all lab reports for experiments complete**d, even if you could not analyze your data.
- **Missed quizzes, exams, and labs will be given zeros unless I excuse you personally. There are no makeup quizzes or exams.**

3) Please don't miss any classes or labs. Please do not be late. There is some penalty.

- **In case you have to miss any lab, you need to inform me and your Lab Teaching Assistant (TA) at least one day (24 hours) in advance and obtain permission from me.** Otherwise, missed labs will count as zeros.
- **If you are late for more than 10 minutes, we will subtract 5 % (up to 30 mins), 20 % (up to 1 hour), or 50 % (more than an hour) of your Lab grade for the corresponding report. The penalty can be accumulated if you are late more than twice for the same report.**
- **In case you have to miss any lecture, you need to inform me at least one day in advance and obtain permission. Otherwise, a missed lecture will lead to 5 point reduction (5%) in your final grade.**
- **If you are late for more than 5 or 10 minutes for a lecture, I reserve a right to subtract 0.5 % or 2 % in your final grade, respectively.**
- **All the above penalties accumulate.** For example, if you miss one lecture and you are 30 minutes late in one lecture, your penalty is 5% + 2% = 7 %.
- If you have a valid & verifiable excuse (ex. medical emergency or death of your direct family member) to miss the midterm exam, your final exam grade will be used to calculate your midterm grade.
- **Academic dishonesty will not be tolerated. Grade E will be given for the overall course grade if you are involved in academic dishonesty.**
- **If we find that you are disturbing the class (lab or lecture) or performing dangerous practice in lab, your Lab TA or I will request you to leave the class. In this case, you are considered to be absent without notice. Namely, no points will be given for the lab or 5 % reduction will be incurred for the lecture.**

4) Incomplete grades are only given if you have a valid and verifiable medical excuse to miss the final exam. If you have a <50% average for the quizzes and mid-term exam, you will not be eligible for an incomplete grade under any circumstances.

5) **If you presently know that you cannot make the midterm or final exam due to prior commitments, you should drop the course now!** If you do not drop the course, I will assume that you are available on these dates to take these exams.

TEACHING ASSISTANT RESPONSIBILITIES

1. Your TA will briefly describe the experimental and analysis details at the beginning of every lab period during which a new lab is begun. **Each student must still read the manual and understand the experiment before coming to lab.**
2. Each TA will set up one office hour per week, at a time that a majority of students in that section are free.
3. Your TA is available during their office hour or by appointment to help you with both lab reports and homework.

LABORATORY NOTES

The Lab Notebook. Scientists keep careful records of their experiments, including observations, data, and comments on what worked and what didn't work. For this course, you must purchase and use a bound laboratory notebook (i.e., a composition book) and organize it in such a way that anyone could easily follow your progress through the assigned experiments. Your lab notebook must be recorded in blue or black ink and should contain:

1. A Table of Contents.
2. Numbered pages.
3. No torn out pages. Instead, neatly cross out any unwanted pages.
4. Corrections to items in your notebook must be made by drawing a single horizontal line through the items to be corrected.
5. Write on and number only the right facing page, keeping the back facing page blank for scratch work.
6. Use correct English grammar and spelling throughout.
7. Final analysis of your data and your final results, clearly written in blue or black ink.
8. You must prepare your lab notebook before you start each experiment as follows:

a. Describe the experiment to be performed. You can write this description in your own words and/or use a photocopy of the description of the experiment. In addition, a flow chart for the experiment is required.

b. Outline the calculations you will use to convert the experimental data to the answers required on the lab cover sheet (see www.chem.uic/chem222). Preparing tables for all the data you expect to collect that day in the lab is the best practice.

c. Your notebook will be checked by your TA before you start your experiment. *If your notebook is not properly prepared, you may not start your experimen*t.

9. All plots, computer-generated material and Photocopies should be neatly glued, taped, or stapled into the notebook. All fitting of data to straight lines must be done by linear least squares analysis. Numerical values for the slope and intercept must be given and errors in the slope and intercept as well as the correlation coefficient must be included.
10. Your final lab grade will include a grade for your lab notebook as well as for lab etiquette. Etiquette includes arriving on time for the lab session, proper use of the balance as well as other lab equipment, the development of good lab techniques, and finally leaving the lab space clean and ordered.

Your TA must sign your data pages on the day the data is recorded.

Lab Report Procedure. Do not hand in your lab notebook to the TA until the end of the term. Lab reports will have the following information in them:

1. Cover sheet with the final results and a statement of what you measured (i.e., Nicotine in unknown tobacco sample #_____) unknown number, average value of your determinations, and both absolute and relative standard deviations. YOU NEED TO PRINT OUT A COVER SHEET TO RECORD YOUR LAB RESULTS at the web site (www.chem.uic.edu/chem222).
2. Analysis section (2-4 pages in double space). Summarize your analysis for the lab. Clearly explain how you calculated the results you filled in the cover sheet. Show at least example calculations. Also, show graphs etc if they are required for analysis. Type this section for clarity.
3. Photocopy of the experiment description you placed in your notebook before the start of the experiment.
4. Photocopy (or carbon) copies of the signed data pages you recorded in lab. Do not recopy these for neatness.

Lab Report Due Dates. See the "Lab Schedule and Lab Due Dates" sheet or the Internet for actual due dates. Revisions to the schedule will only be posted on the Internet. **Hand in reports to your own TA during the lab session.** If you cannot complete a lab, but have collected some data on it, then your TA should make a note to this effect on your lab report and you will receive some credit for your effort (~30%). Please note that your lab notebook must contain data for all assigned experiments.