

CHM 1030

General Chemistry II Laboratory

Course Webpage - <http://academic.pgcc.edu/~ssinex/chm103.html>

Professor Sinex

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Office Hours: _____

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Required Materials:

- *Further Explorations in the Chemical World: CHM 103 Laboratory Manual, Sinex & Gage, PGCC Press, 2005* (available online at <http://academic.pgcc.edu/psc> and click on resources for students - please note that you cannot print activities in the laboratory - come prepared to class)
- TI-83/TI-84/TI-83 Plus/TI-84 Plus Graphing Calculator (others are usable but instructions are YOUR responsibility)
- Package of graph paper with at least 10 blocks to an inch
- 30 cm ruler and 3-5 different colored pencils

This course introduces you to a number of analytical methods including instrumentation and the computer. Measurement and its error are examined in detail due to the analytical approach taken in the course. Some of the experiments expand topics in CHM 1020, while others build on topics from CHM 1010.

Expected Course Outcomes:

Upon successful completion of this course a student will be able to:

1. use scientific tools for data collection, processing, display, and evaluation, such as the graphing calculator, spreadsheets, and other software;
2. perform, analyze, and report on a variety of laboratory measurements;
3. explain measurement error using a variety of statistical measures;
4. evaluate the accuracy and precision of multiple measurements for an analysis;
5. investigate methods of analysis that are non-visual in detection, such as electrochemical and spectroscopic techniques; interpret data from various analytical techniques, such as potentiometric, photometric, conductometric, and complexometric methods; and,
6. compare and contrast methods of chemical analysis explored in the course.

Completion of ALL laboratory activities is required.

Friday Discussion:

Background material, including use of the graphing calculator and computer for calculations and graphing, and practice problems (handouts) will be covered in the discussion. All of the discussion materials are available as PowerPoint files on the course website. It is highly recommended that you view the PowerPoint slides to review the animations before printing the handouts. It is your

responsibility to get the handouts AFTER lecture. Come to class ready to listen and participate in the discussion of the experiment performed on Monday or Wednesday. This Friday session is a very crucial part of this course and new content and information is provided. You will need to put in time outside of lab and class to work on problem sets, projects, laboratory activities, and studying.

Network of Communication:

You the students need to be able to exchange information and/or results of laboratories, by phone, e-mail, or a meeting place. It is your responsibility to make these arrangements before things are due in class.

Reports will consist of the pages from the manual plus additional computations and graphs.

- Each performance activity is due by one minute (8:59AM) before your lab.
- Submit reports in the box in CH-100 (if you bring them to lab, they are late).
- A penalty of 20% per day will be assessed for late reports.
- Make-up will NOT be possible without early consent of your instructor.

Exams:

Exams cover material given in lectures plus experimental methods and calculations. Exams may include a take-home component that will be provided in the Friday sessions. Old exams are available on the course webpage for practice.

If you are going to miss an exam, you MUST:

1. Have a documented excuse; **AND**
2. Notify your instructor **before** the exam via phone, e-mail, or Federal Express.

I will arrange for earlier than scheduled or slightly later than scheduled **only with notification and a documented excuse**. If the exam is returned to students, you no longer have a make-up option.

Culminating Chemical Analysis Task:

Each student working alone will perform a chemical analysis based on laboratory techniques and procedures acquired during the semester. Measurement error and laboratory safety will also be considered in the task. This is very much like a practical laboratory exam to examine the skills you have obtained and your ability to analyze the data. See the "Expected Course Outcomes" given above. The results will be handed in at the end of the laboratory period. Instructions for this task, including how it is graded, will be provided near the end of the course.

Grading:

3 performance laboratory activities at 50 points each*	150 points
5 mini-lab activities or problem assignments*	50 points
Culminating Chemical Analysis Task*	100 points
2 hour exams at 100 points each	<u>200 points</u>
TOTAL:	500 points

*graded items have points associated with them on the schedule - see last page

Last day to withdraw with a W - 4/17

Cheating and plagiarism will not be tolerated in this class. Maximum penalties will be applied. See Academic Integrity as part of the Student Code of Conduct.

Be considerate to other members of the class and don't be disruptive. Cell phones are NOT to be on or used in the laboratory or Friday discussion. You are responsible for knowing the Code of Conduct in the Student Handbook. See - <http://www.pgcc.edu/students.html>.

Important for Late-arrivers:

Be on time to lab and class! Group activities require group participation by all members. It is unfair to the students who arrive on time, so late-comers to the laboratory will find themselves working all-by-themselves for group activities.

Where to Get Help:

1. See me during office hours, or call for appointment at other times.
2. Visit the Tutoring Center (call for appointments - 301-322-0748) in Bladen Hall room 107 (other student services - call 301-322-0886).
3. Computer lab (CH-309) hours are posted. See other open labs for hours.
4. Many great student support items can be found on the Physical Sciences and Engineering Department webpage - <http://academic.pgcc.edu/psc>

SPRING 2009		CHM 1030 TENTATIVE LABORATORY/DISCUSSION SCHEDULE		SINEX
WEEK	DATES	MONDAY LAB (LD03)	WEDNESDAY LAB (LD01)	FRIDAY DISCUSSION
1	1/23			Introduction
2	1/26, 28, 30	Use of the Analytical Balance	Use of the Analytical Balance	Measurement and Error
3	2/2, 4, 6	Measurement Variation/ Sampling Variation	Measurement Variation	Data Analysis
4	2/9, 11, 13	Accuracy and Precision of Volume Measuring Devices (50 points)	Sampling Variation	Simple Statistics with Problem Set (10 points)
5	2/16, 18, 20	President's Day - no class	Accuracy and Precision of Volume Measuring Devices (50 points)	Volumetric Calculations
6	2/23, 25, 27	More Lights, Color, and Absorption	More Lights, Color, and Absorption	Scatter in Data
7	3/2, 4, 6	An Investigation of Electrochemical Reactions (10 points)	An Investigation of Electrochemical Reactions (10 points)	Spectrophotometry
8	3/9, 11, 13	Conductometric Measurements	Conductometric Measurements	EXAM I
9	3/16, 18, 20	Characterization of a Weak Acid by Potentiometric titration (50 points)	Characterization of a Weak Acid by Potentiometric titration (50 points)	Conductivity Measurements
10	3/23, 25, 27	Kinetics of Crystal Violet Reaction and STELLA model	Kinetics of Crystal Violet Reaction and STELLA model	pH Measurements
11	3/30, 4/1, 3	The Kinetics of Enzyme Reactions - Computer-based lab (50 points)	The Kinetics of Enzyme Reactions - Computer-based lab (50 points)	Spectrophotometry as a Tool for Equilibrium and Kinetics Measurements
	4/6, 8, 10	Spring Break !!!!!		
12	4/13, 15, 17	Equilibrium Constant Determination for $\text{Fe}(\text{SCN})^{2+}$	Equilibrium Constant Determination for $\text{Fe}(\text{SCN})^{2+}$	Problem Solving (10 points) Last day to withdraw with W
13	4/20, 22, 24	Discovering Intramolecular Interactions (10 points)	Discovering Intramolecular Interactions (10 points)	IR Spectroscopy
14	4/27, 29, 5/1	Studying Vibrations in Molecules (10 points)	Studying Vibrations in Molecules (10 points)	EXAM II
15	5/4, 6	Culminating Chemical Analysis Task (100 points)	Culminating Chemical Analysis Task (100 points)	