CHM 1030
General Chemistry II Laboratory

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

Professor Sinex

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Office Hours: ________________
Phone: 301-341-3023

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

1. Analyze data with scientific tool such as calculators and spreadsheet programs.
   (Display data in meaningful ways such as graphs, process and evaluate data)
2. Perform laboratory measurements with appropriate precision and accuracy.
   (Report measurement results in proper scientific format)
3. Quantify measurement error with statistical measures.
4. Evaluate the accuracy and precision of multiple measurements for an analysis.
5. Analyze data from techniques including potentiometric, photometric, conductometric and complexometric methods and electrochemical and spectroscopic techniques.
   (Investigate methods of analysis that are non-visual in detection)
6. Compare methods of chemical analysis explored in the course.
Completion of ALL laboratory activities is required.
Come to lab prepared by reading the activity before class!!!

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 or 12:59PM) before your lab.
- Submit reports in the box in CH-100 (if you bring them to lab, they are late).
- Make deadlines as 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 Student Learning 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*  
4 mini-lab activities or problem assignments*  
Culminating Chemical Analysis Task*  
2 hour exams at 100 points each  
TOTAL: 500 points

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

Last day to withdraw with a W - 4/10

Cheating and plagiarism (such as copying laboratory data) 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/email for an 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
5. Use the vast number of resources available of the course website- http://academic.pgcc.edu/~ssinex/chm103.html

Two important helpful tips that can make a very big impact on your success:
1. Read materials carefully and follow instructions.
2. Be on time with all materials that are due for grading.

#Monday Lab - You will need to complete "Use of the Analytical Balance" by coming in on Wednesday's during weeks 1 - 3 or make arrangements with your instructor.
<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATES</th>
<th>MONDAY LAB (LD03) - Revised</th>
<th>WEDNESDAY LAB (LD01/02)</th>
<th>FRIDAY DISCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/19, 21, 23</td>
<td>MLK Holiday - No class (Use of the Analytical Balance)#</td>
<td>Use of the Analytical Balance</td>
<td>Introduction</td>
</tr>
<tr>
<td>2</td>
<td>1/26, 28, 30</td>
<td>Measurement Variation/ Sampling Variation (can do balance activity)</td>
<td>Measurement Variation</td>
<td>Measurement and Error</td>
</tr>
<tr>
<td>3</td>
<td>2/2, 4, 6</td>
<td>Accuracy and Precision of Volume Measuring Devices (50 points)*</td>
<td>Sampling Variation</td>
<td>Data Analysis</td>
</tr>
<tr>
<td>4</td>
<td>2/9, 11, 13</td>
<td>Nuts and Bolts of Let's Make an Error (20 points)</td>
<td>Accuracy and Precision of Volume Measuring Devices (50 points)*</td>
<td>Simple Statistics with Problem Set (10 points)</td>
</tr>
<tr>
<td>5</td>
<td>2/16, 18, 20</td>
<td>President's Day - no class</td>
<td>Nuts and Bolts of Let's Make an Error (20 points)</td>
<td>Volumetric Calculations</td>
</tr>
<tr>
<td>6</td>
<td>2/23, 25, 27</td>
<td>More Lights, Color, and Absorption (10 points)</td>
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<td>Spectrophotometry</td>
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<tr>
<td>7</td>
<td>3/2, 4, 6</td>
<td>An Investigation of Electrochemical Reactions</td>
<td>An Investigation of Electrochemical Reactions</td>
<td>EXAM I</td>
</tr>
<tr>
<td>8</td>
<td>3/9, 11, 13</td>
<td>Conductometric Measurements</td>
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<td>Conductivity Measurements</td>
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<td>9</td>
<td>3/16, 18, 20</td>
<td>Characterization of a Weak Acid by Potentiometric titration (50 points)*</td>
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<td>pH Measurements</td>
</tr>
<tr>
<td>10</td>
<td>3/23, 25, 27</td>
<td>Kinetics of Crystal Violet Reaction</td>
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<td>Spectrophotometry as a Tool for Kinetics and Equilibrium</td>
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<td>3/30, 4/1, 3</td>
<td>Spring Break - No classes!!!!</td>
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<td>11</td>
<td>4/6, 8, 10</td>
<td>Modeling the Crystal Violet Reaction (10 points)*</td>
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<td>More Spectrophotometry Last day to withdraw with W</td>
</tr>
<tr>
<td>13</td>
<td>4/20, 22, 24</td>
<td>Equilibrium Constant Determination for Fe(SCN)²⁻</td>
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<td>Problem Solving</td>
</tr>
<tr>
<td>14</td>
<td>4/27, 29, 5/1</td>
<td>Culminating Chemical Analysis Task (100 points)*</td>
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<td>EXAM II</td>
</tr>
<tr>
<td>15</td>
<td>5/4</td>
<td>No lab/pick-up exams all sections!</td>
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*Come to Wednesday class to do or make arrangements with instructor  
*DUE at end of the laboratory period