CHEM 114.1- General Chemistry II Redesigned Laboratory

Laboratory Syllabus

0. General Information
   Lab Hours (12673): Tuesdays 7:30 – 10:20 PM
   Office Hours: Tuesdays 6:35 – 7:25 PM (Remsen 206)
   Laboratory Instructor: Jay Ho
   Email: Jay.Ho@qc.cuny.edu

I. General Laboratory Rules
   1. Always wear safety goggles and contact lenses not allowed.
   2. No short pants, skirts, nor open toe shoes are allowed, and tie back long hair.
   3. NO food, beverages, gum, horseplay, nor stunt experiments allowed.
   4. No computer or cell phone use except as appropriate to laboratory activities.

II. Laboratory Manual: Posted on BlackBoard

III. Laboratory Reports
   1. A report is required for EACH experiment.
   2. Lab reports are always due next lab meeting; late reports will receive a severe reduction in points as determined by your instructor. If you are absent, electronic copies of the lab report are still due.
      a. **Heading:** Always be sure your name, section number, experiment title AND date the experiment was performed is included.
      b. **Abstract:** This is one short paragraph summarizing your entire paper. Do not include any theory in the abstract.
      c. **Introduction/Theory:** Explain concisely the chemistry of the experiment, including any equations and other scientific and mathematical explanations. No fluff, please.
      d. **Procedure:** A concise but complete summary of the steps of the experiment.
      e. **Data:** Include in report your original data; i.e., the “carbon copy” of measurements or observations you directly recorded during the experiment stapled to back of report. However, rewritten data are to be included in the Data section of the report.
      f. **Calculations and Results:** Show all work; but if there is a repetitive calculation, you need only show the equation and its use only once; after that, just list the answer. Include here also any graphs or diagrams that may be required.
      g. **Discussion:** State whether your results were good or bad, and the reasons as to why they were so, or what may have affected your experiment, and any problems with the experiment. Again, be brief and complete. There may be questions you must answer, or blanks in the text of the manual you must fill in for a specific experiment; work them into your discussion.
      h. **Conclusion:** Summarize your final conclusions in your discussion section along with your results and very basically what you did. (The discussion section is where you draw your important conclusions.)
      i. **Works cited/References:** Include for any sources used or cited.
      j. **SWI (Strength, Weakness, Improvement) for the experiment:**
         1. What are the important concepts that became clear after doing this experiment?
         2. (i) Keeping in mind that lab is done by thinking about the experiment and improvising by self, where do you think additional guidance is needed? Also, feel free to express if additional emphasis is needed for any parts of the lab to make learning stronger. (ii) Take a moment to suggest specific recommendations to the lab write-up or experiment corrections.
IV. Grading

A. Late reports are not acceptable, and your instructor will deduct points off the report for each day it is late. This amount will be determined by your instructor. If you are absent for any reason, you are still expected to turn in the lab report by the due date.

B. Lab reports will be graded also for conformance to the above described format; the apportionment of points to be determined by your instructor.

C. Apportionment of course points is also to be determined by your instructor, but there will be points for your performance while in the laboratory. The criteria are as follows:
   1. safety – if you do not work safely, your instructor will deduct points at his/her discretion
   2. independence- your ability to work and think independently, as determined by your instructor
   3. efficiency- your ability to correctly and quickly accomplish the experiment
   4. groupwork – your ability to work with other classmates, work must be evenly distributed
   5. effectiveness- and of course, how well the results turned out

Grade Breakdown (Redesigned Lab)

10% Safety – Any violation of the safety contract rules or failure to follow oral instructions appropriate for the lab as given by the instructor can result in a deduction of points.

20% Quizzes – Prelabs are checked at the beginning of class, these should include the theory/purpose and a short summary of the procedures for the experiment. The prelab is worth 5% of the grade. Post lab quizzes are also given at the beginning of the class, it is given after completion of the experiment and administered in the lab period following the completion of the experiment. This quiz is worth 15% of the grade. The material is based on the pre-lab and previous experiment.

55% In-Class Performance & Lab Reports
Before leaving the laboratory for the day, you must request and obtain the instructor’s signature (or initials) on the experiment’s data page. This must be attached to your submitted lab report. Alternate: In lieu of the instructor’s initials/signature, a data sheet with your observations and experimental data can be submitted the same day as the experiment. Your lab report results and data should match what was submitted in class.

The laboratory report must be typed.
When writing a lab report, use the passive voice, not an active voice.
Incorrect: We wiped off excess water from the sides of the Erlenmeyer flask.
Correct: Excess water was wiped off the sides of the Erlenmeyer flask.

Lab reports should be uploaded to blackboard. Grading and feedback will be done on blackboard. If blackboard is unavailable, an email with the attached lab report and proper subject is an alternate option.

5% SWI Group Evaluation – This applies only to those experiments done as a group. Each individual in a group does their own evaluation. When you evaluate your group, provide insight to the strengths of working together in your group, areas that need improvement and how it will be addressed. Part of the grade also come from visual observation of your group by the instructor and reading your own SWI evaluation of the group. Examples of good comments are, “Our group worked together by dividing the tasks”, “the group digressed from the main idea and therefore we lost a lot of time”, “group members were required to read the lab before coming to class”, etc. Try to be objective in writing SWI because your feedback is very valuable for instructional purposes in addition to showing
us how involved you were with the lab experiment. **SWI group evaluation is completed during lab period (group labs only) and handed over to the instructor.**

**10% Oral Presentation** - Provide a 4-minute oral presentation on a current breakthrough from scientific magazines/journals relevant to chemistry students. This will be graded by students as well as the instructor. A grading rubric will be provided.

By the end of February 2020, students should have their article/topic picked out. Please notify your instructor of your intended topic and get approval.

*Some suggestions:* Look at the science section in New York Times, the science Instagram pages, or science snapchat stories from 2018-2020. When you find an article or topic you wish to speak about, remember to check the original source (usually a credible published article).

*Grading Rubric:* (Subject to change)
- 20% logical organization of the presentation,
- 20% clarity of the presentation,
- 20% conveying the importance of the work and supporting with quality of data
- 20% ability to answer a question asked by a student or instructor.

This adds to 80% of the points and it is given by the instructor for the oral presentation. Students in the lab class grade the talk for the remaining 20 points using the same 4 categories and writing a statement or two to support their grading. Your instructor will explain to you how this works and its benefits.

**V. Laboratory Requirements:**

A. **PRE-LAB:** Write, in your own words, the theory and procedure for the experiment in your notebook before coming to lab. This can be typed as well. This must be done for every experiment.

B. **If you drop the course, you must check-out!** Otherwise, you do so at the normal time on the final check-out day. If you do not check-out, you will be charged a fine by the college.

C. **Eye protection must** be worn at all times in the lab; penalty for failure to do so is a 0 (zero) for the day and/or **dismissal** from lab with no possibility of make-up.

D. You must watch the Department’s ACS lab safety video during the first lab. If for some reason you missed it then, you must immediately arrange with the Chemistry Stockroom to watch it.

E. You **must** have safety goggles, a lab coat, and a combination lock; we will issue these to you.

F. You must have an approved laboratory notebook with carbonless copy pages (for example, ISBN 978-1-930882-74-4; there are other acceptable ones), *and use it;* do not take any notes on scrap paper or other things.

G. You will need a scientific calculator and either a USB flash drive or a SD card.

H. You will read the day’s experiment *before* coming to lab and bring a copy with you.

**VI. Missed Labs/Absences**

A. There is **no** make up for missed labs. However, if you have an extraordinary situation (documentable illness, family emergency, religious observance, etc.), your absence may be excused, and your instructor will provide a chance for you to make up the grade with an exam, quiz, lab work, etc. as appropriate and feasible. No such makeup will be offered for a second absence.

B. If it is a 2-day group lab, you are still expected to gather the results from your classmates and turn in your own individual lab report. Points will be deducted from the In-class performance section, which may result in a 50% loss of the experiment grade.
C. If you miss more than 3 laboratory classes, you will not be able to pass the lab course.

VII. Safety:
Goggles, long pants or skirts, closed toe shoes, and long hair tied back are required. Eating, drinking, gum chewing, horseplay, stunt experiments, and contact lenses are not allowed; wear glasses to lab if needed. Safety shower, eyewash, and fire extinguisher locations must be noted. Chemical waste handling protocols must be observed; if in doubt ask! **Points will be deducted for unsafe practices or violations of waste protocols, and you may be ejected from lab and receive a zero (0) for that experiment.** You must also watch the safety video before any work starts this semester, regardless of whether you have seen it before. If you happen to miss it, tell your instructor to arrange a session for you as soon as possible.

VIII. Code of Conduct
A. Plagiarism—Plagiarism or any other form of cheating is not tolerated and will be severely punished by point and other penalties and/or referral to the Chairman and the Dean; any assignment involved will receive a grade of zero (0). Failure to properly cite a source may be considered plagiarism.

B. Inappropriate behavior, e.g., horseplay or off-color language, will not be tolerated and may lead to expulsion from class and a zero if during an examination or assignment. Cell phone, tablet and computer usage is not permitted during class time except as permitted; you must have a calculator for class and examinations or quizzes. Please bring a USB thumb drive to save necessary data.

IX. Schedule of Experiments:

<table>
<thead>
<tr>
<th>Lab Date</th>
<th>Laboratory Experiment</th>
<th>Due Date</th>
<th>Type of Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 28</td>
<td>Check In; Safety Review; Exploring Boiling Points</td>
<td>Feb 11</td>
<td>Solo</td>
</tr>
<tr>
<td>Feb 04</td>
<td>Beer’s Law</td>
<td>Feb 11</td>
<td>Group (3)*</td>
</tr>
<tr>
<td>Feb 11</td>
<td>Analyzing a Complex Mixture with Paper Chromatography and Visible Light Spectroscopy</td>
<td>Feb 18</td>
<td>Solo</td>
</tr>
<tr>
<td>Feb 18</td>
<td>Kinetics Part I – Chickpeas Experiment</td>
<td>Mar 03</td>
<td>Group (3)</td>
</tr>
<tr>
<td>Feb 25</td>
<td>Kinetics Part II – Chickpeas Experiment Continued</td>
<td>Mar 03</td>
<td>Group (3)*</td>
</tr>
<tr>
<td>Mar 03</td>
<td>Equilibrium – Part I: Le Chatelier’s Principle</td>
<td>Mar 17</td>
<td>Group (3)</td>
</tr>
<tr>
<td>Mar 10**</td>
<td>Equilibrium – Part II: Measuring an Equilibrium Constant Prep &amp; Analysis of a Complex Ion Compound (Part 1)</td>
<td>Mar 17</td>
<td>Group (3)*</td>
</tr>
<tr>
<td>Mar 17</td>
<td>Prep &amp; Analysis of a Complex Ion Compound (Finish)</td>
<td>Mar 24</td>
<td>Group (3)*</td>
</tr>
<tr>
<td>Mar 24</td>
<td>ORAL PRESENTATION DAY</td>
<td>Mar 24</td>
<td>Group (3)</td>
</tr>
<tr>
<td>Mar 31</td>
<td>Acids, Bases, Buffers, &amp; Salts</td>
<td>Apr 21</td>
<td>Solo</td>
</tr>
<tr>
<td>Apr 21</td>
<td>Identifying an Acidic Salt by Titration</td>
<td>Apr 28</td>
<td>Solo</td>
</tr>
<tr>
<td>Apr 28</td>
<td>Qualitative Analysis of Cations: Do It Yourself</td>
<td>May 05</td>
<td>Group (3)*</td>
</tr>
</tbody>
</table>
### May 05
May 05 | Electrochemistry

### May 12
May 12 | Check Out – Lab Final

**N/A** | Solo

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_X. Questions about Chemistry 114:
I am always available to answer any questions regarding chemistry 114. My intention is for you to pass this course with a strong foundation in chemistry, if you ever need extra study material or additional review for the lecture, recitation or lab, do not hesitate to email me._