

## CHEM 164 Lab

June 2014

**Instructor:** K. Hess    Office 511 Disque hall    krh52@drexel.edu

**Office Hours:** To be announced; also by appointment.

**Place and time:** in Disque Hall 313; Tuesday at 6:00 PM to 8:50

**Prerequisite or co-requisite:** CHEM 162 or equivalent

The **description** of this course is an introduction to some basic principles of chemistry as described below by the title of the experiments.

The **objectives** of this course are: Students are to learn some basic lab skills and some basic principles of chemistry, to verify Boyle's Law and Beer's Law, to learn how to use titration to determine concentration and  $K_a$ , to learn simple chemical analysis, to determine molar mass, to learn about the differences in conductivity between ionic and covalent compounds in water, to observe equilibrium, and to learn about voltaic cells.

**Lab attendance is required. No make up labs** unless there is an exceptional reason such as sickness or some other valid reason. Then you may have to make up missed labs in a later term in which the lab is offered.

**Grades:** You will be able to drop one of your lowest lab grade. Your lab grade will be calculated for the **best** 9 out of 10 lab grades (each week is a lab grade). A missed lab counts as a zero and would be your lowest grade. Therefore missing 2 or more labs will result in a much lower grade (and even failure if your other lab grade were low) because the other zero labs will be averaged into your grade. **Missing more than 3 lab periods, will result in failure of the entire course).**

Your graded will be calculated based upon attendance, performing the experiments, and the completed lab reports. Attendance will be recorded for each lab period.

Tentative grading scheme: A+ = above 97    A = 93 to 97    A- = 90 to 93    B+ = 88 to 90    B = 86 to 88    B- = 84 to 86    C+ = 81 to 84    C = 78 to 81    C- = 74 to 78    D+ = 72 to 74    D = 70 to 72    F = below 70.

Each Lab Period along with its lab report counts as one grade for that week.

**Each student** must turn in their own lab report. All data and calculations must be completed for the lab report. Show your calculations with the "set up" clearly. Show units, using extra paper if needed. Answer all questions on the lab report. Staple all pages together including any needed graphs.

**All lab reports must be given to the instructor the week following the experiment unless directed otherwise** (some lab reports will be turned in at the end of the lab period). **Fifteen points will be deducted from the grade**

of each late lab reports. All reports must be in by the end of the term. Every week the instructor is to sign or initial you data sheets for the data collected that day.

(all above subject to change)

Plagiarism is not allowed. Do not copy. You can be reported to the Office of Student conduct. Reference any source material.

**Required: Safety Glasses, Lab coat and Textbook "Experiments in General Chemistry Laboratory Manual" fourth edition 2005 by S. Solomon and Susan Rutkowsky**

**Required:** You must attend the safety lecture, and read and complete the safety sheet. (your feet must be covered completely, no shorts, no contact lens, no mesh shoes, no open shoes). You must wear your safety glasses and lab coat at all times in the lab.

### CHEM 164

Date	Experiments
June 24	#1 Density, a handout on density and specific heat of a metal Show all calculations and step up. Answer any questions in the lab book.
July 1	#24 Conductance and spectroscopy Fill in all information required and answer questions.
July 8	#6 Beer's Law (2 graph required use a spread sheet or graph paper) Determine the concentration of the unknown and $\epsilon$ . Graphs: <u>wavelength on X-axis and absorbance on Y-axis (no trend line)</u> <b>second graph: Molarity (concentration) on X-axis and absorbance on Y-axis</b> Add the trend line along with the equation for this line. Indicate the slope. Show all calculations and step up. Answer any questions in the lab book.
July 15	#2 Boyle's Law (4 graph required; use a spread sheet or graph paper) For each "run": <u>pressure on X-axis and volume on Y-axis (no trend line)</u> and <b>second graph <u>1/pressure on X-axis and volume on Y-axis with trend line and equation of trend line.</u></b> Show all calculations and step up. Answer any questions in the lab book.
July 22	#10 pH, titration of hydrochloric acid and vinegar (2 graphs required) Determine Molarity of both acids, the % acetic acid in vinegar by mass and $K_a$ of for acetic acid. Graph for each acid: <u>Molarity (concentration) on X-axis and pH on Y-axis for each acid.</u> Show all calculations and step up. Answer any questions in the lab book.
July 29	#19 Analysis of Phosphorous in plant food Show all calculations and step up. Answer any questions in the lab book.

August 5 Molar mass, by Freezing Point Depression **handout**

Two graphs: time on X-axis and temperature on Y-axis

Show all calculations and step up. Answer any questions in the lab handout.

Follow write up procedure in the handout.

August 12 #20 or 21 to be determined. Qualitative Analysis of Household Chemical

August 19 #12 Voltaic Cells and #8 Equilibrium

Fill in all information required and answer questions.

August 26 #25 Water of hydration Last lab

Turn in this lab report and all late ones at the end of this lab period.

Show all calculations and step up.

**(subject to change)**

The lab textbook has a section about graphing data.

**Additional Information**

The last day to drop from this course with an advisor's help is **July 7, 2014** before the offices close and if you do not need your advisor's permission by using Drexel One on-line July 7, 2014 before 11:00 PM this term. (see below)

The last day to withdraw from this course with an advisor's help is **August 8, 2014** Friday before the offices closes. (see below)

**Before you drop or withdraw from a course you should check with your Advisors as there may be consequences.** Dropping or withdrawing from a course may affect your academic standing or your financial situation. It may have serious effect on billing at Drexel, financial aid, VA benefits, NCAA athletic eligibility, immigration status for foreign students, and other possible consequences. As a student you are responsible for transactions against your academic record.

**If you register for a course,** the student's responsibility is to complete the course, drop it, or withdraw from the course. If you register for a course and do complete it, drop or withdraw from the course, eventually an NGR grade will turn to a failing grade F.

Different policies apply to dropping a course and withdrawing from a course (Dropping a course result in the course being removed from your transcript. Withdrawing from a course results in a grade of W on your transcript for that course). Student should consult their Advisors (both academic and financial Aid Advisors) and in some cases the instructor before dropping or withdrawing from the course.

**In order to drop or withdraw from a course,** a student must have the "Add/Drop/Withdraw" form signed by the course instructor and the student's Academic Advisor. Dropping or withdrawing from the course may affect your billing and academic record (follow procedures and consults Advisors). Forms are available in many Department offices, in the lobby of Goodwin College and at

<http://www.drexel.edu/drexelcentral/courses/adjustments/course-withdraw/>

[http://www.drexel.edu/provost/policies/course\\_drop.asp](http://www.drexel.edu/provost/policies/course_drop.asp)

**Incomplete grade "I" or No grade reported or No-Credit.** Student must take responsibility to meet the University's policies and deadlines for requesting an incomplete grade and completing a course before the deadline passes. If a student stops attending a course, the student is not automatically removed from the course. The student's responsibility is to complete the course, drop it, or withdraw from the course. If you register for a course and do complete it, drop or withdraw, eventually an **NGR** (no grade reported) grade will

turn to a failing grade **F**. An **Incomplete** grade "I" will turn to an **F** (failure) grade if the student does not complete the course.

**If a student has an Incomplete grade or a No Grade Reported**, the student should see the instructor for the course and the student's Academic Advisor **immediately**,

**If the student's financial obligations to Drexel University are not met**, the student is not entitled to a grade from the University and from the instructor.

**Please read the "Academic Honesty Policy in the student Handbook at <http://www.drexel.edu/studentlife/SLhandbook.htm>.** Students are expected to follow these policies. The handbook also explains policies for dealing with cheating and other forms of academic dishonesty. [http://www.drexel.edu/provost/policies/academic\\_dishonesty.asp](http://www.drexel.edu/provost/policies/academic_dishonesty.asp)  
[http://www.drexel.edu/studentaffairs/community\\_standards/studentHandbook](http://www.drexel.edu/studentaffairs/community_standards/studentHandbook)  
[http://www.drexel.edu/studentaffairs/community\\_standards/studenthandbookgeneral\\_information/code\\_of\\_conduct](http://www.drexel.edu/studentaffairs/community_standards/studenthandbookgeneral_information/code_of_conduct)  
[http://www.drexel.edu/studentaffairs/community\\_standards/studentHandbook](http://www.drexel.edu/studentaffairs/community_standards/studentHandbook)

**For the "Americans with Disabilities Act" Drexel University has the "Office of Disability Services at 3201 Arch Street, Suit 210 and see on line**

<http://www.drexel.edu/oed/disabilityResources/Overview>. This office is to be contacted by the student if special course accommodations, emergency medical information or building evacuations are need. This office will also verify any special needs and give a form to the student to give to the instructor. The student should make the arrangements with this office and inform the instructor within the first two weeks of the term or when a new situation occurs. <http://www.drexel.edu/oed/disabilityResources/students>