

General Chemistry Lab (1.5 Credits)

CHEM 113-900 Fall Term, 2013

Course Description:

Covers chemical and physical properties and techniques for inorganic, and organic compounds, including sublimation, crystallization, and separation.

Objectives for CHEM 113

- Develop an understanding of the tools and techniques required to measure physical properties such as density, boiling points of both pure organic and inorganic substances and their mixtures.
- Develop an understanding of techniques such as gravimetric analysis, pH measurement, and calorimetry for studying the stoichiometry, extent and heats of chemical reactions.
- Develop an understanding of techniques such as sublimation and crystallization for separating and purifying substances from mixtures.
- Develop a basic understanding of the behavior of gases as a function of pressure, and of solutions as a function of concentration.

Instructor:

Dr. Daniel Kleier: **email:** Daniel.a.kleier@drexel.edu

Course Website:

You will always find here the most current syllabus (supersedes this version), course schedule and announcements about changes in the course, labs and exams at the BBLearn course website. **Check it regularly.** You can get there through DrexelOne ("My Courses") or directly by typing the <https://learn.dcollege.net> into your browser.

1. Required Laboratory Access:

Each weekly laboratory procedure and lab report assignment can be found in the Late Nite Labs Pro™ simulated laboratory located at the LateNiteLabs (LNL) website (<http://latenitelabs.com>). Weekly labs will be opened by 8:00 AM on Tuesday mornings, and the corresponding assignments should be submitted by 11:59 PM Tuesday of the following week.

You may register for "Section 900 S13" by purchasing access directly from the Late Nite Labs website, and then registering for the section code 13693555.

The following steps should be followed in order to register:

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Step 1: Go to the LNL website (<http://latenitelabs.com>).

Step 2: When at the site, click on the Register/Purchase tab at the top of the welcome screen.

Step 3: On the next page select "Student" icon.

Step 4: On the next page enter your email address, and chosen password, then click the "register" button

Step 5: Continue to the next page, and enter your contact information. Enter the section code 13693555 and then select purchase access. Enrollment type will be "credit card purchase".

Step 6: Enter your credit card information, and then click on enroll.

Step 7: Confirm information to complete your registration.

2. Grading policy:

Activity	% Grade	Additional Information
Lab Reports	90	You must score at least 60% in lab to pass the course. You will be able to drop your lowest lab grade. Your lab grade will be calculated on the best 9 grades out of 10. See Section 7 below for more details on lab report grading policy.
Final Exam	10	You must score at least 45% on the final to pass the course.
Total	100	

Students who meet all the requirements will earn letter grades according to the following mapping of numeric grades to letter grades.

97 - 100 → A ⁺	87 - 90 → B ⁺	77 - 80 → C ⁺	67 - 70 → D ⁺
93 - 97 → A	83 - 87 → B	73 - 77 → C	60 - 67 → D
90 - 93 → A ⁻	80 - 83 → B ⁻	70 - 73 → C ⁻	< 60 → F

3. Academic Honesty / Cheating: Students are held to the highest expectations and standards regarding honesty in all aspects of the course, including taking exams and in the preparation of laboratory reports. Cheating, **including misrepresentation of the work of others as your own**, will not be tolerated. **(Understand plagiarism and do not commit it.)** Cases of cheating will be reported to the University and the College of Arts and Sciences. Students caught cheating will receive a failing (F) grade. More information on the "Academic Dishonesty" policy is provided by the provost's office at:

http://www.drexel.edu/provost/policies/academic_dishonesty.asp

4. Final Exam: The final exam will be held during final exam week. The date, and start time will be announced and posted on the course website. **The final exam will cover material from the entire term. You may use your notes for this exam. A student who does not score at least 45% on the final exam will not pass the course, regardless of his/her prior performance in the course.**

5. Pre-lab briefings:

Before entering the laboratory for a weekly unit, be sure to first visit the BBLearn site for the unit, and check for any pre-lab briefings that may be posted there. These briefings may give you a preview of the simulated lab, provide some helpful hints about the procedures, or give some guidance for the calculations.

6. Laboratory Assignments:

You will have a chemistry lab every week. Your lab report is due on the Tuesday following the week in which the lab is assigned.

For each lab you will enter the lab from the "Dashboard" by clicking on the "Run" button for the lab, follow the procedures as outlined in the electronic procedure manual, record notes in the electronic notebook, and then leave the lab.

The screenshot shows the Late Nite Labs dashboard for CHEM 113 F12 / Section 900 F12 / Dan Kleier. A table lists lab titles with corresponding 'Run' and 'Go' buttons. Red arrows point to the 'Go' buttons for 'Decomposition of Malachite' and 'Boyles Law'. A green arrow points to the 'View' button for 'Sample Lab'.

Lab Title	Run Lab	Assignments	Due Date	Grade
Boyles Law	Run	submitted	---	View
Decomposition of Malachite	Run	Go	---	View
Density - A Characteristic Property	Run	Go	---	View
Identifying Unknown Substances From Characteristic Properties	Run	Go	---	View
Molecular Weight by Freezing Point Depression (Custom)	Run	Go	---	View
Sample Lab	Run	graded	---	View
Separating a Mixture of Compounds	Run	submitted	---	View
Standardization of an NaOH Solution (Custom)	Run	Go	---	View

After leaving the lab, you can return to the dashboard to prepare your written assignment. From the dashboard, just click on the "go" button corresponding to your lab to open the assignment form. A partially completed sample assignment form for the "Decomposition of Malachite" lab is shown below.

The screenshot shows the 'Decomposition of Malachite' assignment form. It includes a table with experimental data and a 'Submit Assignment' button at the bottom, which is highlighted by a red arrow.

a	Mass of an empty crucible (g) 15.5
b	Mass of the crucible with malachite(g) 25.9
c	Subtract (a) from (b) to obtain the mass of malachite (g) 10.4
d	Divide (c) by the molecular weight of malachite (MW = 221.1)

The lab assignments will include calculations based on data collected in the simulated lab, responses to questions on theory and concepts, and occasionally graphs prepared using the LNL graphing tool. Upon completing the written assignment, it can be submitted, by clicking on the "submit assignment" button at the bottom of a screen (see red arrow in figure above).

The instructor will grade your reports, post feedback at the LNL site, and record your numeric grade at the BBLearn site for the course. **To get a passing grade for CHEM 113-900, you must obtain a cumulative lab grade of 60% or higher.**

6. Communications

E-mail and web-based communication

Feedback for each individual lab report can be found by returning to the LNL website a few days after submission of your report. If the status of the assignment on the LNL dashboard is "graded", you can click on the "view" button (see green arrow in figure displaying the Dashboard) to view your grade and feedback.

E-mail communications from the instructor will be sent to the student's official Drexel University e-mail address. The instructor will usually communicate to the students via the "Announcements" section of BBLearn. Students should routinely check their Drexel email and BBLearn for the latest class announcements.

If you are having trouble with your e-mail account, go to <http://accounts.drexel.edu>. For help with your BBLearn account, contact Drexel eLearning technical support using the form found at <http://www.drexel.com/help>. Please limit your e-mail to the instructor to personal questions. All other questions should be posted on the course discussion board.

Discussion Board:

The discussion board should be used for any problems, questions or requests related to lab procedures or reports.

7. Lab Report Grading Policy: Your lab report is due by 11:59 PM on Tuesday of the week following the week in which the lab is assigned. Five points will be deducted for each day (not including weekends or holidays) that the report is late. Any report submitted more than two weeks late is worth zero (0) points. A laboratory for a given experiment will generally be closed two weeks after the report is due. Any lab report that is a direct copy of another submitted report will receive zero (0) points.

Roughly 50% of the grade will be based on following correct procedures, and reporting reasonable data from the laboratory. Remember that physical quantities typically include a number as well as a unit. A number such as 9.21 is not an acceptable value for the mass of an object. You must include the units (e.g., g or kg) to be meaningful. The other 50% of your grade will be based upon your calculations, answers to questions and graphs.

When reporting calculated results, you should include at least one example calculation of each type. Thus, if you are asked to calculate the density of several objects, select one and show in detail how its density was calculated. For example, if the selected object has a measured mass of 9.21 g, and volume of 5.32 mL, show the calculation:

$$\text{Density} = \text{mass of object} / \text{volume of object} = 10.21 \text{ g} / 5.32 \text{ mL} = 1.73 \text{ g/mL}.$$

Percentage grades for the reports will be transcribed to the BBLearn grade center, but feedback can only be viewed at by returning to the LNL site.

A model report for the titration tutorial, which is performed during the first week of the quarter, is shown below:

Titration Tutorial

Experiment 1

1. For your most exact titration, record the following:

a	Volume of NaOH solution in the burette at the start (mL):	50mL
b	Volume of NaOH solution in the burette at the end (mL):	38.77mL
c	Volume of NaOH solution delivered to the flask (mL):	11.23mL
d	Volume of HCl solution in the flask (mL)	10mL

2. Calculate the molarity of the HCl concentration from the equation (C stands for concentration and V stands for volume):

$$C(\text{acid}) = C(\text{base}) * V(\text{base}) / V(\text{acid})$$

$$C(\text{acid}) = (0.100 \text{ M}) * (11.23 \text{ mL}) / (10 \text{ mL}) = .1123\text{M}$$

8. Disability Services: Students with disabilities who wish to request accommodations and services at Drexel University need to present a current accommodation verification letter ("AVL") to the instructor before accommodations can be made. AVL's are issued by the Office of Disability Resources ("ODR"); <http://www.drexel.edu/oed/disabilityResources/students/>

9. Course drops or withdrawals

For the latest course drop and withdrawal policy check the following documents:

http://www.drexel.edu/provost/policies/course_drop.asp and

http://www.drexel.edu/provost/policies/pdf/course_withdrawal.pdf

Course Drop Policy:

Courses may only be dropped during the "drop period" lasting from the beginning of the enrollment period through the end of the second week of the quarter. Dropping a course results in the course being removed from the student's academic record

without a "W" appearing on the transcript—specifically, neither the course nor the grade of "W" appears on the student's transcript. Freshmen and new first-term transfer students must meet with their academic advisors to drop courses during the first quarter. Undergraduate upper-class and graduate students may use BannerWeb to drop courses; no approvals are required for upper-class and graduate students.

Course Withdrawal Policy:

For students on the quarter system, the withdrawal period lasts from the beginning of the third week through the end of the seventh week of the term.

Specifically, withdrawal from a course taken on the quarter system must be executed by close of the business day on the Friday of the seventh week of the term.

Before withdrawing from a course, students should consult with the instructor. All students must obtain their advisor's written authorization before withdrawing from courses. Written authorization is obtained once the instructor has signed the "ENROLL/WITHDRAW" form.

8. Laboratory Schedule

Week	Category	Lab Title(s)	Date Lab Report Due
1	INTRODUCTION TO LABORATORY	Sample Lab <u>and</u> Titration Tutorial	10/1/13 Two Reports
2	MEASUREMENT OF CHARACTERISTIC PROPERTIES OF MATTER	Identifying Unknown Substances from Characteristic Properties	10/8/13
3	MEASUREMENT OF CHARACTERISTIC PROPERTIES OF MATTER	Density Determination	10/15/13
4	CLASSIFICATION OF MATTER	Separation of a Mixture of Compounds	10/22/13
5	THERMOCHEMISTRY	The Enthalpy Change of a Chemical Reaction	10/29/13
6	CHEMICAL REACTIONS AND STOICHIOMETRY	Decomposition of Malachite	11/5/13
7	GAS LAWS	Boyle's Law	11/12/13
8	SOLUTION CHEMISTRY	Molecular Weight by Freezing Point Depression	11/19/13
9	QUANTITIES OF REACTANTS AND PRODUCTS	Aspirin Synthesis and Analysis	12/3/13
10	ACIDS AND BASES	Standardization of a NaOH Solution	12/10/13