**Chem 124L (501)** **Sp 2019**

# General Chemistry II Lab

**Instructor**: Dr. Terry Office A102a tjterry@unm.edu

**Lab:** Tue 10:30-1:15 in Academics 128

**Instructor Tutoring Hours:** Mon 1-3 pm (office)
**Tue 2-4 pm (STEM Center)**
Wed 10:30-12 am (office)
**Thurs 10:30-12 am (STEM Center)**

**Required Supplies:** Lab Coat, Safety Goggles, Lab Notebook, 3-ring binder

**Course Description:** This course is designed to provide practice in laboratory measurements, using laboratory glassware and instrumentation, communicating scientific information, and in performing chemical calculations.

## Course Requirements

- Students are responsible for all assignments regardless of attendance. There are no make-ups for laboratory experiments or exams.
- Lab reports may be turned in during lab or to the Academic Affairs Office on the due date.
- Blackboard Learn and the UNM email systems will be used to distribute class announcements and lab handouts. Make sure your contact information is up to date and check your email often.
- Calculators will be used during many labs and need to have log, anti-log, and exponential functions.
- **LABORATORY SAFETY AND CLEANLINESS WILL BE CLOSELY MONITORED.** *(Safety Rules may be found in the first lab worksheet and are posted on signs in the lab.)* Points will be deducted for safety violations (food in lab, not wearing goggles properly, improper disposal of chemicals, etc.) and for improper treatment of lab equipment or leaving a mess.
- Mandatory laboratory clothing: **GOGGLES**, closed toed flat **shoes** (no high heels, no exposed toes, no exposed heels), and **LAB COATS** are all **REQUIRED FOR MOST LABs**. **Students without proper personal protective equipment will not be allowed in lab.**

**Students without proper PPE, who do not have a written procedure, or who miss the pre-lab lecture may not be allowed to complete the lab.**

## Grading

~330 pts **Experiments and Activities** (~ 30 pts each)

120 pts **Independent Research Project** (~19%)
- 40 pts Proposal: Procedure, Hypothesis, Materials List, Timeline
- 40 pts Experimentation: Lab Notebook
- 40 pts Oral Presentation/Demonstration

100 points **Lab Final** (Solution dilutions and spectroscopic determination of concentration)

**Grades: 98-100% A+, 92-97% A, 90-92% A-; 88-89% B+, 83-87% B, 80-82% B-; 78-79% C+, 73-78% C, 69-72% C-; 60-68%=D; <60%=F**

The total number of points collected for experiments may change if a lab must be cancelled.

## Student Learning Objectives

### By the end of the course, students will be able to…

1. Conduct laboratory experiments safely by wearing appropriate protection, by handling and disposing of chemicals correctly, and by putting away all laboratory equipment and cleaning your lab bench after use.
2. Prepare scientific graphs to demonstrate quantitative relationships between variables.
3. Demonstrate mastery in making chemical measurements.
4. Demonstrate mastery in experimental techniques including: the preparation of solutions using volumetric glassware, conducting isolation methods such as filtration, conducting calorimetric measurements, and conducting spectrophotometric measurements.
5. Write simple hypotheses based on selected chemical principles and/or observations.
6. Design experimental procedures for simple lab questions.
7. Properly use a lab notebook to record experimental data and observations with correct significant figures and units.
8. Make meaningful analyses of experimental data and summarize results in a proper format.
9. Communicate scientific arguments effectively and logically in written and oral forms.

**Demo Project**

- The independent research project for CHEM 124L has three graded components: the proposal, the experimentation, and the oral presentation.
- Each lab group will identify a Learning Objective from General Chemistry I or General Chemistry II and an appropriate classroom demonstration to illustrate that Learning Objective. The Learning Objectives are provided on BBLearn.
- The demo proposal is due by **midnight, March 18$^{th}$, week 10.** Turn in 1 per lab group. Include a Title, the Learning Objective, a brief discussion of how the demo relates to the Learning Objective, a COMPLETE list of materials required, a proposed method, safety concerns, and references.
- Safety:
    - A cover sheet should list any major chemical concerns and disposal of each chemical in bullet point format. In a paragraph form, discuss any safety or clean-up concerns for a classroom demo (carpet, no sinks, no fire extinguisher).
    - Provide a safety data sheet (SDS) for each chemical used.
    - See BBLearn for more information on the cover sheet and how to access SDSs.
- References:
    - You will need to reference a published procedure, even if you make modifications to that original procedure.
    - A list of available sources will be posted in BBLearn.
- Week 12 – use lab time to perform and modify the demonstrations in individual groups.
- Week 14 – use lab time to begin putting together the oral presentations of the demonstration.
- Presentation– (see BBLearn for more info)
    - Introduction (~3-5 min)
    - Demonstration (~3-5 min)
        - Perform demo for the class
    - Discussion (~5 min)
        - classroom demo safety concerns
        - chemistry course concepts at work
        - relationship to the Learning Objective

## General Campus Policies

### Academic Honesty

*Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, including dismissal, against any student who is found responsible for academic dishonesty. Any student who has been judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.*

*Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; and misrepresenting academic or professional qualifications within or outside the University.*

### Equal Access

If you have a documented disability, please make sure Equal Access Services has contacted me as soon as possible to ensure that your accommodations are provided in a timely manner.

### Title IX

In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees" by the Department of Education (see pg 15 - http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: https://policy.unm.edu/university-policies/2000/2740.html

### Equal Opportunity

Harassment is a form of discrimination. When University faculty, administrators, and supervisors witness or receive a written or oral report or complaint of discrimination or harassment, they are required to engage in appropriate measures to prevent violations of this policy and promptly notify OEO, including notification of any actions taken to achieve informal resolution of the complaint. The University relies on its employees to notify the University's OEO office of all disclosures of discrimination and harassment as defined in this policy. https://policy.unm.edu/university-policies/2000/2720.html

| Date | Spring 2018 Chem 124 Lab Schedule | |
|---|---|---|
| | **Lab** | **Notes** |
| 1<br>Jan 15 | • Safety, Lab Notebook, Measurements Review WS<br>• Independent Project Description<br>• Chem121 Review Games | Games, Online Quizzes |
| 2<br>Jan 22 | **Jet Fuel for Thought Activity (30 pts)**<br>*Due before lab: Online Quizzes (30 pts)* | **Online quizzes due before lab:**<br>Safety, Equipment, Fuel Pre-lab |
| 3<br>Jan 29 | **Colligative Properties of Candles** | Completed lab notebook and PPE* |
| 4<br>Feb 05 | **Solution Spectroscopy**<br>*Due: Candle Report (30 pts)* | Completed lab notebook and PPE* |
| 5<br>Feb 12 | **Kinetics of Bleaching Food Color**<br>*Due: Solution Report (30 pts)* | Completed lab notebook and PPE*<br>*Don't wear nice clothes*. |
| 6<br>Feb 19 | **Ca Titration of Water Samples**<br>*Due: Kinetics Report (30 pts)* | Completed lab notebook and PPE* |
| 7<br>Feb 26 | **Le Chatelier's Principle**<br>*Due: Ca Report (30 pts)* | Completed lab notebook and PPE* |
| 8<br>Mar 05 | **pH Indicator**<br>**Discussion of Demo Project Part 1: Proposal**<br>*Due: Le Chat. Report (30 pts)* | Bring lab notebook |
| 9 | **Spring Break** | ***Independent Project Proposal due Monday, Mar 18th (40 pt)*** |
| 10<br>Mar 19 | **Determine $K_a$ of Weak Acid** | Completed lab notebook and PPE* |
| 11<br>Mar 26 | **Ocean Acidification** | Completed lab notebook and PPE* |
| 12<br>Apr 02 | **Demo Project Part 2 – Experimentation**<br>*Conduct experiments, make modifications.* | Bring lab notebook and PPE* |
| 13<br>Apr 09 | **Thermodynamics of Malic Acid Dissolution** | Bring lab notebook and PPE* |
| 14<br>Apr 16 | **Independent Project Part 3 – Analysis**<br>*Analyze results, Organize presentation and Report.*<br>*Due: Malic Acid Report (30 pts)* | Bring lab notebook and PPE* |
| 15<br>Apr 23 | **Demo Project: Oral Presentation (40 pts)** | Bring lab notebook and PPE* |
| 16<br>Apr 30 | **Lab Final** –<br>Dilutions and Spectroscopic Determination of Concentration | Bring lab notebook and PPE* |
| Finals Week – no lab | | |