CHEMISTRY 1892

General Chemistry II Lab
Spring 2018

I. General Information

Instructor: Clarissa Sorensen-Unruh, M.S. Section: 101 (7:30-10:15am T in L 210)
Office Hours+: 11:30am-12:30pm Mondays, 8:30am-9:30am Wednesdays, 12-3pm Thursday
Office Number: Main Campus, JS 312B Phone #: 505-224-4000 (ext. 50078)
Email: csorensen@cnm.edu Website: http://learn.cnm.edu
Twitter Handle: @RissaChem YouTube Channel: https://www.youtube.com/user/csoren1
+**Office hours are subject to change. Other office hours may be scheduled by appointment.**

II. Course Description

Meeting for one three-hour period each week, students perform experiments and complete laboratory reports designed to complement the theory and concepts presented in the Chemistry 1810 lecture. All students must be enrolled in both the Lecture and Laboratory classes. Chem 1892 requires concurrent enrollment in Chem 1810 or previous completion of Chem 1810. **If a student does not meet the prerequisites (or corequisite) for this course, he or she may be dropped from the class at any time during the term.**

III. Texts/Materials

The following are required materials:

- **CNM General Chemistry II Lab Manual** (required and available at CNM Bookstore)
- Students are also required to purchase **splash goggles** from the CNM Bookstore or other local supplier. ("Safety spectacles" are not sufficient protection. If in doubt, ask instructor.)
- **Access to CNM email:** Important class announcements and learning materials will be made to your CNM email and you should check it at least 2-3 times a week.
- **A scientific calculator** is required for this course as well. Inexpensive models may be purchased at stores such as Wal-Mart, K-Mart, Target, OfficeMax, Staples, etc. Two-line displays, such as those found in the series TI 30X II, tend to work best.

IV. Student Learning Outcomes

Students will:

1. develop the "hands-on" skills and techniques to *safely* perform chemical operations and experiments
2. use and understand the capabilities and limitations of selected laboratory instruments
3. collect and process numerical data
4. prepare and analyze graphical plots to draw conclusion from experimental evidence

For a more complete list of student learning outcomes, please see the last two pages of this syllabus.

V. Course Requirements

a) **Attendance is a course requirement.** Missing a lab period will result in a grade of zero for that experiment. You may arrange to make up an experiment in another section during the same week, provided that you obtain permission from both your instructor and the instructor in whose class you will be working. **Your Laboratory Report must be signed and dated by the instructor with whom you made up the experiment, or it will not be accepted. Do not hand in a lab report for which you**

did not perform the experiment. This is considered cheating and will be dealt with according to the CNM Catalog and Student Manual. Students missing more than 15% of the total scheduled course hours may be dropped. Students will ***not*** automatically be dropped for nonattendance. Absences from class do not relieve students from responsibility for missed assignments, material covered in class, or quizzes/exams.

b) You are required to come prepared, having read the experiment before entering the lab. There will be a brief explanation (typically 30 - 45 min) of the experiment, procedures, safety precautions, etc. held in the prelab room before any work is done in the lab. Very important information is discussed in the prelab sessions. You are required to arrive on time. The Pre-Laboratory questions, although not collected, should also be completed. **You will not be allowed to do the experiment without attending the prelab session**.

c) Completed laboratory reports are required at the beginning of the lab period following the completion of an experiment. The report will include sample calculations using your data for instructor review, graphs if appropriate, and completion of any assigned Pre or Post-Laboratory Assignment questions. Late lab reports will be penalized 10% per week for up to two weeks, after which they will not be accepted.

d) Compliance with the Safety Agreement: Students are required to comply with CNM's Safety Policy; this includes wearing safety goggles at all times as directed by your instructor and limiting skin exposure to chemical contact. Children and other visitors are not allowed in the laboratory due to possible hazardous conditions. Failure to comply with the conditions of the safety agreement may result in a grade of zero for the experiment, or the student being dropped from CHEM 1892.

e) *Academic Honesty*: Academic dishonesty will not be tolerated. As a CNM student you agree to adhere to the CNM Dishonesty Policy, please see the following link for details. https://www.cnm.edu/depts/dean-of-students/documents/ACADEMIC_DISHONESTY_POLICY_03-28-08.pdf

VI. Grading*

Quizzes: 30%

Quizzes will be given mostly as take home quizzes. You will be allowed one week to complete the take home quiz. Please bring a scientific calculator to each class. Please be on time for each prelab session. **You will not be allowed to take the quiz after the rest of the class has handed it in.** The lowest quiz score will be dropped.

Lab Reports: **40%**

A lab report is the data collected in lab, the numerical analysis of the data, etc. The lowest lab report grade will be dropped.

Lab Final: 30%

The lab final is a multiple choice written exam covering the main concepts, types of calculations, and procedures in the experiments. There will be a practice final exam with problems similar to those found on the final exam. Practice finals will be provided near the end of the semester, and answer keys will be made available. Along with the practice final exam, the best study aids for the lab final are your graded quizzes and lab reports. It is highly recommended that you save these returned materials. Throughout the term, please be sure you understand what you are doing and why. This insures the best preparation for the final examination.

Course Grade: The course grade will be determined from the following:

Quizzes: 30% **Laboratory reports: 40%** **Final Exam: 30%**

Grades assigned as follows: 90-100%=**A**, 80-89.9%=**B**, 70-79.9%=**C**, 60-69.9%=**D**, below 60%=**F**

*__Note__: In the event CNM closes (due to unforeseeable events) during the lab final exam week, final grades will be calculated based on all the work completed and assessed up to that point in the course.

VII. Other Course Information

- Any student who has trouble with basic needs (including, but not limited to, food, housing, clothing, supplies) and believes this may affect their grade in the course is urged to contact CNM Connect Services (https://www.cnm.edu/student-resources/connect-services/about-us) ASAP. Also, please notify the professor if you are comfortable in doing so because this will enable her to access any alternative resources she knows of.
- PaperCut is an element of the sustainability effort at CNM. Its purpose is to reduce paper usage. Each student has an online account with an allotment of 150 free printer pages per term. If this allotment runs out, the student may purchase additional pages. For more information, go to the PaperCut website: http://cnm.edu/papercut.
- Students with disabilities, including dual enrollment and high school age students, are encouraged to contact the Disability Resource Center to arrange for academic adjustments, including aids, i.e., auxiliary accommodations.
  Main Campus and Westside Campus 224-3259, e-mail: disability_resource_center@cnm.edu;
  Montoya Campus 224-5946, e-mail: disability_resource_center_jmmc@cnm.edu;
  Website: http://www.cnm.edu/depts/disability-resource-center
- **Commit to graduate**! **Graduating with an associate's degree or certificate will make you more employable and will increase your earning potential for a lifetime.** Getting your degree or certificate is your reward for the hard work and dedication you put into your studies at CNM. Set your graduation date today! Learn more at http://cnm.edu/graduation**.**
- **Smoke-free campus:**
  In an effort to respect all students, CNM has created smoke-free zones as well as designated smoking areas at all CNM locations. The use of tobacco products, including the use of chewing tobacco and e-cigarettes is limited to the designated smoking areas and banned from all other areas. View CNM's policy on smoking at http://www.cnm.edu/about/smoke-free-campus. View a map of the designated smoking areas at http://www.cnm.edu/about/smoke-free-campus/designated-smoking-areas.
- **Faculty Feedback:** The Faculty feedback system allows your instructor to securely provide feedback on your performance in this course. If your instructor uses it, you may be contacted by a CNM Academic/Achievement Coach to follow up on the feedback. You can read more about the system here:
  http://www.cnm.edu/depts/academicaffairs/documents/FacultyFeedbackStudentInformation.docx

CHEMISTRY 1892 LABORATORY SCHEDULE
Spring 2018

Note that the sequence of experiments listed here does not match the sequence in your laboratory manual. Please follow the sequence shown below and always come to lab having read the appropriate experiment for that day.

WEEK	LABORATORIES
1	Laboratory Safety, Check-In, Gen Chem I Review
2	Oxidation-Reduction Titration of Vitamin C
3	Determination of Molar Mass by Freezing Point Depression
4	Building Organic Molecules
5	Introduction to Equilibrium
6	Spectrophotometric Determination of an Equilibrium Constant
7	Determination of a Weak Acid's Ionization Constant by Titrimetry
8	pH and Buffers
9	Determination of Copper Ion by Ion Exchange
10	Estimating Entropy for the Dissolution of a Salt Complete calculations from pH and Buffers
11	Electrochemical Cells (hand out review for final)
12	Synthesis of Tetraamminecopper (II) Sulfate/Basic Infrared Spectroscopy
13	Kinetics: Determination of a Rate Law and Measurement of an Activation Energy
14	***Final Exam***
15	Kinetics: Determination of a Rate Law and Measurement of an Activation Energy

1st Note: The last day to drop without a grade of F or to change your grading option (letter grade, CR/NC, Audit) is **March 30th.** If you drop the CHEM 1810 lecture, you will be dropped from the CHEM 1892 Lab. If you have any questions, please discuss them with lab instructor and/or your advisor. **2nd Note:** Any student changing from audit status to either traditional or C/NC status is still required to have completed all graded assignments on time throughout the year. **Some changes may occur in the schedule as we proceed through the course. Changes will be announced in class and/or through CNM email.**

CHEM 1892 Student Learning Outcomes

Upon completion of CHEM 1892 students will be able to:

1. Demonstrate proficiency in the handling (measurement and transfer) of pure chemicals and chemical solutions.
2. Demonstrate proficiency in stoichiometric calculations and in conversions between common units (grams, mols, molarity, molality, coulombs, amps etc...).
3. Use standard titrimetric procedures to quantitatively determine the concentration of a variety of compounds in solution.
4. Use spectrophotometric methods to monitor solute concentrations in a reaction mixture.
5. Qualitatively relate how changes in concentration, temperature, and the effect of a coupled reaction, alter the position of equilibrium in a reaction mixture.
6. Quantitatively correlate equilibrium constants and initial conditions with equilibrium concentrations in a reaction mixture.
7. Prepare linear and non linear graphs based on data they collect and interpret the graphs to determine physically meaningful information and chemical constants.
8. Measure pH of aqueous solutions.
9. Calculate the expected pH of various solutions, including buffer solutions, and calculate the expected change in the pH of these solutions upon the addition of strong acids or basses.
10. Use chromatographic methods (GC and TLC) to separate and identify the components of a mixture.
11. Recognize isomeric relationships between organic compounds.
12. Classify organic compounds based on functional groups.
13. Write chemical reactions for acid base processes/ precipitation reactions/ and complex ion formation reactions.
14. Use ion exchange resins to convert a simple ionic compound into an acid or a base which can then be easily analyzed via titration.
15. Determine the rate law and activation energy for a reaction by measuring the rate of the reaction under various starting conditions.
16. Make measurements of voltage and amperage.
17. Prepare tables of standard reduction potentials.
18. Use tables of standard reduction potentials to calculate predicted voltages for electrochemical reactions.
19. Perform calculations relating time, amperage, and amount (mols and grams) of a chemical produced/consumed in an electrolytic cell.