

Chem 162 L General Chemistry Laboratory II

1 credit (CRN 61067)

M 2:00 - 4:45 PM Imiloa 111 & 131

INSTRUCTOR: Leticia Colmenares, Ph.D.
OFFICE: Imiloa 116
E-MAIL: Leticia@hawaii.edu
OFFICE HOURS: MW 10:00-11:00 am (Imiloa 116)
TR 11:30-12:30 pm (Imiloa 116)
TELEPHONE: 236-9120
EFFECTIVE DATE: Fall 2017

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College is committed to excellence in the liberal arts and career development; we support and challenge individuals to develop skills, fulfill their potential, enrich their lives, and become contributing, culturally aware members of our community.

CATALOG DESCRIPTION

Laboratory experiments illustrating fundamental principles of chemistry (2 hrs. 45 min lab.) *Prerequisites:* Credit or registration in Chem 162. *WCC: DY*

STUDENT LEARNING OUTCOMES

1. Develop an appreciation for the methods of scientific inquiry through computer-based laboratory experiments showing real-time data.
2. Apply knowledge to determine molar mass of unknown substance using freezing point data of solution.
3. Calculate chemical reaction rate and constant using graphing analysis.
4. Predict the effects of concentration and temperature changes on equilibrium mixtures using Le Chatelier's principle.
5. Determine whether equilibrium is established and calculate equilibrium concentration constants and cell potentials.
6. Apply and articulate the scientific method by preparing lab reports using the standard scientific format. Express in writing core chemistry principles, results of experiments and do critical thinking by synthesizing conclusions based on observations and data.

LEARNING RESOURCES

Required Textbook: Chemistry 162L Laboratory Manual Fall 2016, edited by Colmenares
Chem 162 Instructor Notes by Colmenares

Course Website: <http://laulima.hawaii.edu> (use UH email account login and password)

Other Requirements: Scientific Calculator, Internet Access, Lab goggles, closed shoes and a lab gown if you wear short pants/skirt/dress or low-waist pants/skirts.

PURPOSE OF THE LABORATORY COURSE

The chemistry laboratory allows the student to understand some of the theories discussed in the lecture more thoroughly. In the laboratory you will be involved with the processes of scientific inquiry used to discover chemical principles. It is the only way for the student to learn the techniques that are so important in research and in most laboratories. The student will discover that doing quality work in the laboratory requires a great deal of patience and care.

GRADING

The final grade will be based on the following scheme:

12 highest (out of 13) Lab Reports*	70% of total
Midterm + Final Exam	15% of total
Final Exam	15 % of total
Total	100%

*The lowest lab report score will be deleted.

Course grades will be assigned as follows:

A-- 90-100%

B-- 80-89%

C-- 70-79%

D-- 60-69%

F-- less than 60%.

For grades I, W, Cr, NC-- See college catalog,

https://windward.hawaii.edu/Catalogs_Schedules/WCC_Catalog_current.pdf

MODE OF INSTRUCTION

The primary mode of instruction is through the use of hands-on laboratory activities. Each hands-on activity will be preceded by a class discussion based on a pre-lab online homework consisting of a reading assignment and completion of pre-lab questions and problems. The homework and pre-lab may consist of videos, websites and computer activities.

Conduct of the Lab:

First 45 min in **Imiloa 111**

Discuss answers to pre-lab assignment problems and questions,
review important principles and safety precautions, demonstrate new
techniques needed or use of new equipment

Remaining time in **Imiloa 131**

Perform hands-on activity, record observation and data, calculate results

10 min Clean-up

Last 30 minutes Answer Post-lab questions

Before leaving the laboratory, you must have your **lab report signed and dated by the**

instructor. The completed lab report is due at the **start of next meeting** (final due date). **Only lab reports that have instructor signature will be accepted.**

COURSE POLICIES AND TIPS TO SUCCEED IN THIS COURSE

1. The **Course Content and Schedule** (activity titles and corresponding dates) is listed on the last page. Changes in the schedule will be announced in class and course website. Use this syllabus as your course guide throughout the semester. You are expected to login to the Laulima course website at least once a week.
2. A lab activity is scheduled for each meeting. You are expected to turn in a lab report for each activity. The maximum points for each activity is **20 points**.
3. **Before class.** Please allot 2-3 hours weekly outside class time to: (1) study the lab manual and videos/resources in Laulima Modules (2) take the pre-lab quiz in Laulima (3) complete your lab report from previous experiment. You are expected to become familiar with the concept, procedure and calculations that will be done in the lab.

Take the **online pre-lab quiz** before coming to class. The online quiz is available continuously for one week. It closes 30 minutes before the class starts. Your quiz score constitutes **2 points**.

4. Bring your **Lab Manual, scientific calculator, lecture textbook** and **a stapler** to class at all times.
5. **Safety** is important. Wear closed-toed shoes (preferably sports shoes) to protect from danger of spilling chemicals. Slippers, sandals or similar footwear are not allowed. **You will NOT be permitted in the lab** if you are not wearing close-toed shoes. Short (above the knee) pants/skirt/dress and low-waist pants/skirts are not allowed unless you wear a lab coat over it.
6. **Pre-Lab period (Imiloa 111).** Please come to class on time. Important background information about the experiment and safety will be discussed in the Pre-Lab discussion. During the Pre-Lab, you are expected to ask questions/clarification about the procedure and calculation. If you have a lot of questions, please see the instructor during office hours. Please take notes during the pre-lab session.

Attendance will be checked at the beginning of each Pre-Lab session. If you arrive late, you will be deducted 0.5 points from your lab report score. If you miss the pre-lab session, you will be deducted 1 point from your lab report score.

Extra credit opportunities: WCC Hoolaulea on Oct 7 2017, National Chemistry Week (Kahala Mall) on Oct 28, 2017, attend chemistry forum and submit a 300-word reflection paper (3 points)

7. **During lab (Imiloa 131).** **Wear safety goggles (found in lab cabinet) as soon as you enter the lab.** Follow the **directions in the Procedure** precisely. Gather your materials and supplies from the laboratory cart and from your drawer. Don't take short cuts nor fake results as these are readily spotted. Follow **laboratory rules and procedures** at

all times. Treat all chemicals with respect, replace lids on bottles and report any accident or problem to the instructor. Points will be **deducted** when safety and chemical transfer procedures are not followed.

8. In the lab, you are to work in pairs. You will have a different partner each week. This will be randomly assigned to you. Work cooperatively and maintain a positive attitude. Treat the lab as an **opportunity to learn teamwork**. Do **not** simply **rush** through an experiment in order to get out of the laboratory. **Maintain a positive attitude** and **work cooperatively** with other students and the laboratory instructor. **Be alert** and maintain **presence of mind**.
9. **Inappropriate and disruptive behavior** such as using cell phones, making offensive remarks, prolonged chattering, reading/viewing materials not related to the course, etc. will not be tolerated. Disruptive students will be warned **ONCE**, and if disruptive behavior continues, this will be reported to the Security Office and Student Affairs.
10. When recording **measurements**. The **value must** reflect the precision of the instrument used. **Never round off measurements**. Affix the correct unit. **Record all your data** neatly in ink and with units. Do not erase original data. If you make a mistake just put a strikethrough line. Point deductions will be applied to data with incorrect precision and units.
11. Do your calculations to check if results are reasonable before dismantling the setup. Show your calculation to the instructor. **Repeat the experiment** if there was a mistake. **Discuss** the probable **causes of error with the instructor** before doing the repeat.
12. Use laboratory time efficiently and bear in mind that the experiment **should be done** at least **ten minutes** before the end of class for cleanup activity. When you are finished for the day, clean your glassware, dispose waste in proper containers, cap reagent bottles, and return materials, glassware, Vernier equipment and laptop computer to their proper storage areas. Clean the weighing balance and your bench-top. Points will be **deducted** when clean up and waste disposal techniques and procedures are not followed.

A class monitor team will be assigned to supervise, check and report the cleanup.

13. **After completing the lab**. Show your data and responses to your instructor and request for her signature.
14. **Laboratory reports**. You are expected to turn in an **individual** report for each lab experiment at the start of the next meeting. Please include all data and calculations, and answer ALL questions. Use **internet resources** and **Lecture Notes/textbook** to answer post-lab questions. Points will be deducted for omissions or incorrect answers.

You are expected to discuss results, calculations and interpretations with your laboratory partner and classmates, but calculations and answers in the report should be completely **your own work**.

Cheating policy. Copying someone else's data or answers is cheating. If your sentence/s are the same word for word with another student's, then both students will be assigned a grade of "F" for the activity and will be reported to the Vice Chancellor of Student Affairs. If you copy someone else's work from the internet/book/publication without giving reference to the original author, this is plagiarism and an act of dishonesty. Also, you should NOT turn in a lab report for the activity you were absent.

15. A **formal** laboratory report is required for Experiments on *Rate Law Determination*, *Chemical Equilibrium* and *Titration Curves* while an **informal** lab report is required for all the other experiments. **Formal reports** should be typewritten and follow the standard format. The **rubric for grading** the formal lab reports and tips on **how to write a formal report** are found in your Lab Manual. A sample formal lab report is accessible at Laulima course website.
16. **Late Reports and Penalties.** If submitted one week after the due date, the lab report (only for labs the student was present) will be given a **grade of 70% if complete** and 65% if less than complete. The grade assigned will be **zero** if submitted much later.
17. Each **lab report** is worth 18-20 points. You will get your **graded lab report** at the following lab session. However, you are to return it to the instructor immediately after reviewing it. The instructor will keep the graded lab reports but you will be allowed to take them home the week before the exam. You are to return these to the instructor on the day of the exam.

Monitor your class performance by keeping a record of your scores on the table of contents page of the Lab Manual. Check your grades in Laulima Gradebook.
18. **Make-up.** Chemicals and supplies are available only on the day of the lab activity. Hence, no make-up is allowed and the student gets "zero" for the missed lab activity. You cannot turn in a lab report for a missed activity.
19. If you have any **special learning needs**, including hearing/visual impairment, please inform the instructor as soon as possible.
20. Please communicate with the instructor if you can't attend class as soon as possible.

DISABILITIES ACCOMMODATION

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Disability Specialist Counselor to discuss reasonable accommodations that will help you succeed in this class. Ann Lemke can be reached at 235-7448, lemke@hawaii.edu, or you may stop by Hale 'Akoakoa 213 for more information.

COURSE CONTENT AND SCHEDULE

Important Dates: No classes on Sep 4 (M), Nov 10 (F), Nov 23-24 (RF)

Last day for withdrawal and change grade option, Oct 30 (M)

Last day of instruction, Dec 7 (R)

Date*	Experiment Title	Notes
Aug 21	1-Laboratory Safety, Equipment & Procedures	
Aug 28	2- Intermolecular Forces	
Sep 4	Holiday	
Sep 11	3- Dry Ice and Phase Diagrams	
Sep 18	4- Separating Mixtures Using Chromatography	
Sep 25	5-Using Freezing Point Depression to Find Molecular Weight	
Oct 2	6- Rate Order Graphing Lab	
Oct 9	8- <i>Rate Law Determination of the Crystal Violet Reaction**</i>	Formal Lab Report
Oct 16	Midterm Exam (Experiment 1-6)	How to Write a Formal Lab Report
Oct 23	9- The Determination of an Equilibrium Constant	
Oct 30	10- <i>Chemical Equilibrium and Le Chatelier's Principle**</i>	Formal Lab Report
Nov 6	Field Trip or 11 – Acid Dissociation Constant	
Nov 13	12- Buffers	
Nov 20	13- <i>Titration Curves of Strong and Weak Acids and Bases**</i>	Formal Lab Report
Nov 27	14- Electrochemistry	
Dec 4	Final Long Exam (Experiment 7-13) & Check-out	

***Subject to change**

**** Require formal lab reports-see sample in Laulima**