

Chem 151L Elementary Survey of Chemistry Lab

1 credit (CRN 61452)

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

INSTRUCTOR: Dave Reeves
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EFFECTIVE DATE: Fall 2012

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai'i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide O'ahu's Ko'olau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

Experiments introducing laboratory techniques and illustrating chemical principles; supplemented by films, demonstrations, and problem sessions. (3 hrs. lab.)

Prerequisites: Credit or registration in CHEM 151.

WCC: DY

STUDENT LEARNING OUTCOMES

1. Identify/locate laboratory safety equipment and apply laboratory safety procedures.
2. Assemble apparatus to perform common laboratory techniques to verify basic chemistry laws on gases, chemical stoichiometry, preparation of solutions, chemical equilibrium and others.
3. Use molecular models and technology to investigate chemistry concepts.
4. Make and record accurate observations, precise measurements and calculations applying rules on significant figures.
5. Develop hypotheses, use critical thinking to process results and identify sources of error.
6. Apply and articulate the scientific method by preparing a lab report using the standard scientific format.

LEARNING RESOURCES

Required Textbook: Chemistry 151L Laboratory Manual by Colmenares Spring 2011

Course Website: <http://laulima.hawaii.edu> (use UH email account login and password)
 Other Requirements: Scientific Calculator
 Internet Access

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:

13 Lab reports (including 3 Formal)	-----70 % of total
2 Long Tests	-----30 % of total
Total	-----100 %

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

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 homework consisting of a reading assignment and completion of pre-lab questions and problems. During the discussion, videos, websites and computer programs may be utilized.

Conduct of the Lab:

First 30 min	Discuss answers and review <i>Pre-Lab</i> assignment problems and questions, review important principles and <i>safety</i> precautions, demonstrate new <i>techniques</i> needed or use of new equipment (in Imiloa 111)
Remaining time	Perform <i>hands-on</i> activity, record observation and data, calculate results
10 min	Clean-up

The activity report is due at the start of the next meeting.

COURSE POLICIES AND TIPS TO IMPROVE LAB SKILLS

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 in *Assignments* on Laulima at least a week prior to the affected date. You are responsible for obtaining this information whether or not you were present during the announcement.
2. **Before class**. Each hands-on activity is described in detail in the Lab Manual(LM). **Be prepared** for the activity by reading **thoroughly** the background and pre-lab material on Laulima and take the online quiz. Do the **Pre-Lab** homework **before** coming to class. This will allow you to become familiar with the experiment and to better understand the calculations involved. Bring your **Lab Manual** , **scientific calculator** and **lecture textbook** to class at all times.
3. **Pre-lab Period (Imiloa 111)**. You will take your *pre-lab quiz* on Laulima the day before the lab. The Pre-Lab and quiz constitutes **10% of the report grade**. Answers to the Pre-Lab problems and questions will be discussed individually with the instructor at the beginning of the lab period.
4. **Important background information** about the experiment **and safety** will be discussed in the Pre-Lab discussion. If the chemistry concept or theory is entirely new to the class, the instructor will give a short discussion. During the Pre-Lab, you are expected to ask questions regarding the procedure and calculation. However, if you have a lot of questions, get help from your study group, a tutor or from the instructor during office/consultation hours prior to coming to class. If you arrive late, ½ a point will be deducted from your lab score.
5. Some experiments require the use of **laptop computers** from the metal lab cart. This will be wheeled out of the Imiloa AV room before the class and returned there after class.
6. **During lab (Imiloa 131)**. **Wear safety goggles and close-toed shoes at all times**. Sandals or slippers are not allowed. **You will NOT be permitted in the lab** if you are not wearing close-toed shoes. Follow **laboratory rules and procedures** at all times. Treat all chemicals with respect and wipe up any spill, return all reagents to the proper place, replace lids on bottles and report any accident or problem to the instructor. Follow the **directions in the Procedure** precisely. Don't take short cuts nor fake results as these are readily spotted.
7. In the lab, you are to work in pairs. Work cooperatively and maintain a positive attitude. Treat it as an **opportunity to learn** and do **not** simply **rush** through an experiment in order to get out of the laboratory as quickly as possible. **Maintain a positive attitude** and **work cooperatively** with other students and the laboratory instructor. **Be alert** and maintain **presence of mind**.
8. **Inappropriate behavior** such as activated beepers and cell phones, making offensive remarks, prolonged chattering, etc. will not be tolerated. **Do not use cell phones** in the classroom or in the laboratory.
9. When recording a **measurement**, it is expected that the **value** reflect the precision of the instrument used (never round-off) and 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 line thru them. Point deductions will be applied to data with incorrect precision.
10. Do a quick calculation to check if results are reasonable before dismantling the setup. **Repeat the experiment** if you make a mistake. Consult the instructor to **discuss** the probable **causes of error** before doing the repeat.

11. 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. Leave your laboratory station in good order when you are finished for the day. Points will be **deducted** when safety precautions, chemical transfer, clean-up and waste disposal techniques and procedures are not followed.

12. **After the lab. Complete your calculations as soon as possible** after the laboratory. Do not procrastinate and wait until the night before the next laboratory to write your report. Remember you will need to prepare for the new one as well.

13. **Laboratory reports.** You are expected to turn in an **individual** report at the beginning of next class. Lab reports **will not** be accepted via email. 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**. Copying someone else's work or answers is cheating. Students involved in **cheating** will be assigned a grade of "F" and will be reported to the Dean . Hence, the student should not allow anybody to copy one's work.

14. **Formal Laboratory Reports.** A **formal** laboratory report is required for Experiments on *Determining Chemical Formula* and *Boyle's Law* while an **informal** lab report is required for all the other experiments. **Formal reports** should follow the standard format (see sample formal report in Laulima course website). The **rubric for grading** the formal lab reports and tips on **how to write a formal report** are found in your Lab Manual.

15. **Late Reports.** 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**. The grade assigned will be **zero** if submitted much later.

16. The **graded lab report** will be returned to you in the following lab session and you are to return them to the instructor immediately after reviewing them. Graded labs will be returned to you to study a week before each exam. **Monitor your class performance by keeping a record of your scores.**

17. **Make-up.** No make-up is allowed and the student gets "zero" for the missed lab activity.

18. **Attendance** will be checked at the beginning of each Pre-Lab session. If you are absent, you will not get a grade for the experiment done on that date.

19. If you have any **special learning needs**, including hearing/visual impairment, please inform the instructor 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

Holidays: Sep 3 (M), Nov 12 (M), Nov 22 (R), Nov 23 (F)

Important Dates: **Last day for withdrawal**, Oct 29 (M)

Last day of instruction, Dec 6 (R)

<i>Date*</i>	<i>Activity Title</i>
Aug 20	1- Laboratory Safety, Equipment & Procedures
Aug 27	2- Measurements: Length, Mass, Volume, & Density
Sept 3	Labor Day Holiday
Sep 10	3- Endothermic and Exothermic Reactions (Computer-based Lab)
Sep 17	4- Periodic Trends
Sep 24	5- Chemical Bonds, Models & Shapes
Oct 1	6- Types of Chemical Reactions
Oct 8	7- <i>Determining the Chemical Formula of Magnesium Oxide**</i>
Oct 15	Midterm Exam (Activities 1-6)
Oct 22	8- Chemical Stoichiometry
Oct 29	9- <i>Boyle's Law** (Computer-based Lab)</i>
Nov 5	10- Solutions: Preparation and Properties
Nov 12	Veterans Day Holiday
Nov 19	11- Acids, Bases, pH Indicators and Buffers
Nov 26	12- Forensic Detective Activity
Dec 3	Final Long Exam (Activities 7-12) & Check-out

***Subject to change**

**** Require formal lab report**