Chem 162L General Chemistry II Lab
1 credit (CRN 60087)
M 1:00 – 3:45 pm Imiloa 111 & 131

INSTRUCTOR: Dr. Leticia ‘Letty’ Colmenares
OFFICE: Imiloa 116
OFFICE HOURS: MW 11:15am-12 pm, TR 9:45-10:30am; 12:45-1:30pm
or by appointment
TELEPHONE: 236-9120
EMAIL: Leticia@hawaii.edu
EFFECTIVE DATE: Spring Term 2019

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 the Ko‘olau region of O‘ahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

Laboratory experiments illustrating fundamental principles of chemistry (2 hrs. 45 min lab.)

Prerequisites: Credit or registration in Chem 162.

WCC: DY

ACTIVITIES REQUIRED OUTSIDE CLASS TIMES

On average, you should spend about 3-4 hours per week outside the classroom to study for this course.

- 1-2 hours per week to read the lab activity and complete the Pre-Lab assignment.
- 1-2 hours per week completing the report. You are expected to meet the deadline for submission. To reduce the time involved, you should do the calculations and Post-Lab analysis in class immediately after performing the lab while it is fresh in your mind. A formal lab report will take much longer to complete.

STUDENT LEARNING OUTCOMES

As a result of taking this course, students can expect to attain the following 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.

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.

COURSE TASKS AND GRADING

- **Pre-Lab Assignments.** Read through the introduction and experimental procedure, and complete the online Pre-Lab assignment before the start of class. Be sure to submit before deadline, because late submissions are not accepted. Know the objectives and figure out beforehand exactly what you are going to do in the lab.

- **Attendance and hands-on activity.** Attendance in Pre-Lab Discussion (in Imiloa 111) and actual performance of experiment in the laboratory (in Imiloa 131) are required. You will record observation/data, calculate/analyze results and answer post-lab questions in the lab. You must get the professor’s signature after completing the lab.

- **Laboratory reports.** You are expected to turn in an individual report for each lab experiment at the start of the next meeting. The format of each lab is described in the course schedule. Include all data and calculations, and answer ALL questions. Use internet resources and Lecture Notes/textbook to answer post-lab questions.

- **Two (2) exams**, each of which will cover 50% of the course. Each exam will take about 1.5 hours. These are closed notes. A copy of the Periodic Table and physical constants will be provided.

The final grade will be based on the following scheme:

<table>
<thead>
<tr>
<th>Task</th>
<th>Points</th>
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</thead>
<tbody>
<tr>
<td>11 Pre-Lab Assignments, 5 points each</td>
<td>55</td>
</tr>
<tr>
<td>9 Lab Worksheets, 20 points each</td>
<td>180</td>
</tr>
<tr>
<td>3 Formal Lab Reports, 40 points each</td>
<td>120</td>
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<tr>
<td>EXAM 1</td>
<td>80</td>
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<tr>
<td>EXAM 2</td>
<td>80</td>
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<tr>
<td>Total Points</td>
<td>515</td>
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</table>
Course grades will be assigned as follows:
   A-- 90-100% of the cumulative points possible  
   B-- 80-89% of the cumulative points possible  
   C-- 70-79% of the cumulative points possible  
   D-- 60-69% of the cumulative points possible  
   F-- less than 60% of the cumulative points possible  

For grades I, W, Cr, NC-- See college catalog,  
https://windward.hawaii.edu/Catalogs_Schedules/WCC_Catalog_current.pdf  

The deadline to change from A-F to CR/NC/audit option (with Office of Admissions & Records) is on March 25, 2019.  

LEARNING RESOURCES  

Required:  Chemistry 162L Laboratory Manual Fall 2018  
Required:  Electronic Lab Notebook https://www.labarchives.com/  
Course Website:  http://laulima.hawaii.edu (use UH email account login and password)  
Required Textbook:  https://openstax.org/details/books/chemistry (free download)  
Other Requirements:  Scientific Calculator, Internet Access, Lab goggles, closed toed shoes and a lab gown if you wear short pants/skirt/dress or low-waist pants/skirts.  
Online Tutoring:  Tutor.com online tutoring open 24/7 https://windward.hawaii.edu/tutor.com/  

ADDITIONAL INFORMATION  

ATTENDANCE and PRE-LAB POLICY. Attendance will be taken at the start of every class meeting. 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 and take notes about the procedure and calculation. If you have a lot of questions, please consult the professor during office hours before the lab.  

LABORATORY CONDUCT. The following guidelines apply.  
   • Bring your copy of the lab procedure/worksheet and scientific calculator to the lab.  
   • Always wear close-toed shoes. You will not be permitted to go in the lab without it.  
   • Short pants/skirt/dress (above the knee) and low-waist pants/skirts are not allowed unless you wear a lab coat over it.  
   • Wear safety goggles (found in lab cabinet) as soon as you enter the lab.  
   • You are to work in pairs. Be alert and work cooperatively with lab partner, classmates and professor.  
   • Maintain a positive attitude and presence of mind. Treat the lab as an opportunity to learn the concepts and scientific process, and to acquire laboratory, teamwork and analytical skills.  
   • Cell phone use is strictly prohibited because it is disruptive of learning. Turn off all cell phones prior to the start of class. Inappropriate and disruptive behavior such as using making offensive remarks, prolonged chattering, reading/viewing materials not related  

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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.

- Obtain your materials and supplies from the laboratory cart and from your drawer.
- 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.
- Follow the directions in the Procedure precisely. Don’t take short cuts nor fake results as these are readily spotted. Consult with the professor if you are not sure what to do.
- When recording measurements, the value must reflect the precision of the instrument used with the correct units. Never round off measurements. For example, a 10-mL graduated cylinder is always read to 2 decimal places (e.g. 8.50 mL) whereas, a 100-mL graduated cylinder is always read to 1 decimal place (e.g. 70.5 mL).
- Record all your data neatly in ink. Do not erase original data. If you make a mistake just put a strikethrough line.
- Do your calculations to check if results are reasonable before dismantling the setup. Repeat the experiment if there was a mistake. Don’t falsify data to get the expected value (see cheating policy).
- Show your data and calculations to your professor and discuss the probable causes of error with the professor before doing the repeat. Don’t dismantle your setup until your worksheet get the official ‘sign-off.’
- 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.

GRADING LAB REPORTS.

- Point deductions will be applied to data with incorrect precision and units, and when safety, chemical transfer, cleanup and disposal procedures are not followed.
- If you were late or missed the Pre-Lab discussion you will incur a one-point deduction.
- Point deductions will be applied to missing data and missing/incorrect/incomplete responses to questions/calculations in the worksheet.
- A grading rubric will be followed when grading formal lab reports. A copy of the grading rubric and a sample formal lab report are available in Laulima.
- Review your graded lab report at the next class meeting. However, you are to return it to the instructor immediately after reviewing it. The instructor will safe 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. (See cheating policy).

LATE POLICY. 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.
MAKE-UP POLICY.

- Chemicals and supplies are available only on the day of the scheduled lab activity. Hence, no make-up lab is allowed. A missed lab will get zero points.

- Only one missed exam (with signed doctor’s note, police report or obituary notice) can be made up, if you notify the instructor in advance or on the day of the exam.

DISABILITIES ACCOMMODATIONS

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 ‘Ākoakoa 213 for more information.

TITLE IX

Title IX prohibits discrimination on the basis of sex in education programs and activities that receive federal financial assistance. Specifically, Title IX prohibits sex discrimination; sexual harassment and gender-based harassment, including harassment based on actual or perceived sex, gender, sexual orientation, gender identity, or gender expression; sexual assault; sexual exploitation; domestic violence; dating violence; and stalking. For more information regarding your rights under Title IX, please visit: https://windward.hawaii.edu/Title_IX/.

Windward Community College is committed to the pursuit of equal education. If you or someone you know has experienced sex discrimination or gender-based violence, WCC has resources to support you. To speak with someone confidentially, contact the Mental Health & Wellness Office at 808-235-7393 or Kaahu Alo, Designated Confidential Advocate for Students, at 808-235-7354 or kaahualo@hawaii.edu. To make a formal report, contact the Title IX Coordinator, Karla K. Silva-Park, at 808-235-7468 or karlas@hawaii.edu.

ACADEMIC INTEGRITY

You are allowed 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 data or answers is cheating. Copying someone else’s work from the internet, book, or publication without giving reference to the original author is plagiarism. Submitting falsified data in a subsequent lab report for a lab that you missed is dishonest. If you wish to help your classmates, you explain the topic to them but do not give your report to be copied. If your sentence/s are the same word for word with another student’s, then both/all students will be assigned a grade of “F” for the activity. All cheating incidents will be reported to the Vice Chancellor for Student Affairs. To avoid copying answers from old labs, you are required to turn in all your lab reports to the professor at the end of the semester.
### ALTERNATE CONTACT INFORMATION

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

Location: Alakai 121  
Phone: 808-235-7422  
Email: wccaa@hawaii.edu

### COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Date*</th>
<th>Experiment Title</th>
<th>Report</th>
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<tbody>
<tr>
<td>1/7/19</td>
<td>1- Laboratory Safety and Procedures</td>
<td>Worksheet due before 1/14/19 class</td>
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<tr>
<td>1/14/19</td>
<td>2- Intermolecular Forces, Evap &amp; Surface Tension</td>
<td>Worksheet due before 1/28/19 class</td>
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<tr>
<td>1/21/19 (H)</td>
<td>Dr. Martin Luther King Jr. Day</td>
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<tr>
<td>1/28/19</td>
<td>3- Phase Changes of Water and Carbon Dioxide</td>
<td>Worksheet due before 2/4/19 class</td>
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<tr>
<td>2/4/19</td>
<td>5- Freezing Point Depression</td>
<td>Worksheet due before 2/11/19 class</td>
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<td>2/11/19</td>
<td><strong>6- Reaction Kinetics</strong></td>
<td>Formal Lab Report due before 2/25/19 class</td>
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<tr>
<td>2/18/19 (H)</td>
<td>Presidents’ Day</td>
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<tr>
<td>2/25/19</td>
<td>7- Rate Order Graphing Analysis</td>
<td>Worksheet due before 3/4/19 class</td>
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<tr>
<td>3/4/19</td>
<td><strong>Exam 1 (coverage: all previous experiments)</strong></td>
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<tr>
<td>3/11/19</td>
<td>8- The Determination of Equilibrium Constant</td>
<td>Worksheet due before 3/25/19 class</td>
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<tr>
<td>3/18/19</td>
<td>Spring Break</td>
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<tr>
<td>3/25/19</td>
<td>9- Le Chatelier’s Principle  <em>(Last day to withdraw)</em></td>
<td>Formal Lab Report due before 4/1/19 class</td>
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<tr>
<td>4/1/19</td>
<td>10- pH of Salts and Buffers</td>
<td>Worksheet due before 4/8/19 class</td>
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<tr>
<td>4/8/19</td>
<td><strong>11- Titration Curves of Strong/Weak Acids/Bases</strong></td>
<td>Formal Lab Report due before 4/15/19 class</td>
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<tr>
<td>4/15/19</td>
<td>12- Solubility and Thermodynamics</td>
<td>Worksheet due before 4/22/19 class</td>
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<td>4/22/19</td>
<td>13- Electrochemical Cells</td>
<td>Worksheet due before 4/29/19 class</td>
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<tr>
<td>4/29/19</td>
<td><strong>Exam 2 (coverage: last 6 experiments)</strong></td>
<td>Return all Lab Reports</td>
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