CHEM 162L: GENERAL CHEMISTRY II LAB
1 Credits (CRN 61363)
M 1:00 – 3:45 pm (Zoom and/or ‘Imiloa 131)

INSTRUCTOR: Marc Bresler
OFFICE HOURS: Mon/Thur 9:00 am – 10:00 pm Tue/Wed 1:00-2:00
EMAIL: mbresler@hawaii.edu
EFFECTIVE DATE: Spring 2022

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
Laboratory experiments illustrating fundamental principles of chemistry. (3 hrs. lab)
Prerequisite: 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 Châtelier’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

- Account registered on www.labflow.com. For each experiment that we will perform, this online platform will contain background information, a pre-lab assignment, online data entry, and post-lab assignments.
- Text:  [https://openstax.org/details/books/chemistry](https://openstax.org/details/books/chemistry) (free download)
- Course website: [http://laulima.hawaii.edu](http://laulima.hawaii.edu) (use UH email account login and password).
- You will need to have a standard scientific calculator, safety goggles, and Internet access.

CLASS FORMAT

Each class will be split into two sessions:

**Pre-lab Session (“Imiloa 131) :** This will be a classroom discussion of the experiment that will be performed that day. We will go over the background material and experimental procedure described in the online lab notebook, and any special safety precautions. If necessary, the use of specific equipment or laboratory techniques required for the experiment will be demonstrated. This will be the time for you to ask questions and make sure that you understand what you will be doing when you conduct the experiment – in terms of being able to carry out the correct procedural steps as well as understanding the overall purpose of the experiment and related chemical concepts.

**IMPORTANT:** You will need to have completed the online pre-lab assignment in your Lab Archives online notebook before coming to the pre-lab session – I will be checking your work at the beginning of class. I will also be taking attendance at the beginning of the pre-lab session, so you need to be there for the entire session (you can not skip the pre-lab session and just come to the laboratory session to perform the experiment).

**Laboratory Session (“Imiloa 131) :** Following the pre-lab session, we will move from the classroom to the laboratory to perform the experiment for the day. The primary mode of instruction in this course is through hands-on laboratory activities, so the laboratory session is the most crucial aspect of this course. You will set up the equipment for the experiment, carry out the steps in the experimental procedure, record your observations and data, and perform calculations to obtain your results. The last 10 minutes of the class will be devoted to cleaning up your workspace and equipment and putting everything away. The experiment assignments in your online notebook for the experiment (and the formal lab reports for the three experiments that will require them) will be due at the beginning of the following week’s pre-lab session.

ASSESSMENT TASKS AND GRADING

1. Grades will be based on the following categories:
   - 11 Pre-lab Assignments (10 pts each)
   - 11 Experiment Assignments (25 pts)
   - 2 Formal Lab Reports (50 pts each)
   - 2 Exams (75 pts each)

   **Total points possible for course:** 635 pts
The number of points you earn for the course will be calculated as a percentage of the total points possible for the course. This percentage score will be used to assign your grade for the course as follows:

A: 100 - 90.0 %
B: 89.9 - 80.0 %
C: 79.9 – 70.0 %
D: 69.0 – 60.0 %
F: below 60 %

Grades of I, W, CR, NC are described in the current college catalog – this must be discussed previously with the instructor.

2. **Pre-lab Assignment (labarchives.com online notebook):** Every experiment in the online laboratory notebook on labarchives.com includes a Pre-Lab Assignment. The Pre-Lab Assignment must be completed before you can begin an experiment (if you haven’t completed the Pre-Lab Assignment, you will not be allowed to perform the experiment during the lab session). You must complete the pre-lab assignment for the corresponding experiment before coming to the pre-lab session that day (i.e., do not try to work on the pre-lab assignment while you are sitting in the classroom during the lecture session).

3. **Experiment Assignments (labarchives.com online notebook):** Every experiment in the online laboratory notebook on labarchives.com includes a Data and Analysis section, and Post-Lab Questions. As you are conducting the experiment, record your data and observations in the Data and Analysis section. After you finish the experiment, answer all of the Post-Lab Questions (be sure to show your work and calculations). The Data and Analysis and the Post-Lab Questions must be submitted prior to the beginning of the following week’s pre-lab session.

4. **Formal Lab Reports:** A formal laboratory report is required for two of the experiments: 
   Formal reports should follow the standard format for laboratory reports – we will discuss this in class. A sample of a formal lab report can be downloaded from the course website on Laulima.

5. **Exams:** There will be two midterm exams, each of which will cover approximately one half of the course. Each exam will last for 75 minutes. The exams will be closed book.

**OTHER COURSE POLICIES**

1. The course schedule (experiment titles and corresponding dates) is included at the end of this syllabus. Any changes in the schedule will be announced in class (or on the course website) at least a week prior to the affected date. You are responsible for obtaining this information, whether or not you were present when the announcement was made during class.

2. **You must be prepared for each class!** This means that you need to do the following before coming to the pre-lab session each week:
   - thoroughly read the introduction and procedure for the experiment in the online lab notebook on labarchives.com
   - complete the online pre-lab assignment on labarchives.com. *You will need to have this completed in order to enter the lab to perform the experiment for that day!*
3. **Come to class on time!** Attendance will be checked at the start of the pre-lab session. Important background information and safety precautions for the experiment will be discussed during the pre-lab session, and you are expected to ask questions and take notes. The instructor may disallow the student from the lab session or deduct 10% from the grade for the experiment if the student is absent from the pre-lab session.

4. Bring your **scientific calculator** to every class.

5. **Safety** is of the utmost importance. There are many potential dangers in any laboratory, and you can minimize the risk of harm to yourself and/or others by strictly observing all laboratory safety rules, policies, and procedures. Some of the most important of these include:

   • **Wear your safety glasses/goggles at all times** when you are in the laboratory (‘Imiloa 131) — whether or not you are actively performing any experimental procedures. Do not slide your glasses up onto your forehead or take your glasses off when you think no one is looking and attempt to put them back on quickly when the instructor walks by. I am a real stickler about this! I don’t want anyone going blind as a result of an accident in one of my labs (stop for a moment and think about what it would be like to go through the rest of your life without your eyesight). If I see you without your glasses on at any time in the lab, I will warn you once to put them back on and leave them on. If it happens again, I will ask you to leave the laboratory for the rest of the lab session.

   • **Wear closed-toed shoes** (preferably sports shoes) to protect yourself from the 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.

   • To protect yourself from chemical spills, it is best to wear long pants or a long skirt and a long-sleeved shirt/top when you are working in the lab. Wear clothes made of cotton or wool -- avoid synthetic fabrics, as these can be extremely flammable and constitute an extreme fire hazard. If you are wearing shorts, a short skirt, tank tops, etc., you will need to wear a lab coat or lab apron over your clothes.

   • **No eating or drinking at any time during the lab.** This includes coffee, water bottles, etc. There are many dangerous chemicals present in the laboratory and it is very easy for food or drink to be contaminated with substances that can be highly harmful to you if ingested — even in trace amounts. If you need a snack or a drink of water, go outside the lab and wash your hands thoroughly with soap or water before eating or drinking.

   • Of course, there is no smoking in the laboratory at any time.

   • **Do not use cell phones in the laboratory.** If you really need to make a call or send/read a text message, step outside of the laboratory to do it.

6. Treat all chemicals with respect. Wipe up any spills, return all reagents to the proper place, replace lids on bottles, and report any accidents or problems to the instructor. Precisely follow the directions in the experimental procedure for use and disposal of chemicals.

7. During the lab sessions, you will work in pairs to perform the experiments. Maintain a positive attitude and work cooperatively with other students and the laboratory instructor. Be alert and maintain presence of mind. Treat the lab sessions as opportunities to learn and do not simply rush through an experiment in order to get out of the laboratory as quickly as possible. Do not take short cuts!
8. When recording a measurement, your must write down a value that reflects the precision of the instrument used (never round-off arbitrarily!) and affix the correct unit. Record all your data arefully, with units included.

- Points will be deducted for data with incorrect precision or missing/incorrect units.

9. Before dismantling your experimental setup, do a quick calculation to check whether your results are reasonable. Repeat the experiment if you have made a mistake. Consult the instructor to discuss the probable causes of error before doing the repeat. If your results are not what you expected, do not try to make up data to get your results to turn out how you want them to – this is unethical and scientifically/academically dishonest, and it is painfully obvious when students attempt to do this.

10. Use laboratory time efficiently and bear in mind that the experiment should be completed at least ten minutes before the end of class to allow for cleanup.

11. When you have finished your work, wash and put away all of your lab glassware and equipment in the proper storage areas – otherwise, points will be deducted. Points will also be deducted if safety precautions, chemical transfer, clean-up, and waste disposal techniques and procedures are not followed.

12. After finishing the experiment, perform your calculations as soon as possible (be sure to round off your answers to the correct number of significant figures). Do not procrastinate and wait until the night before the next class to complete the assignment or write your formal lab report. Remember you will also need to prepare for the upcoming experiment, so budget your time wisely.

14. You are expected to discuss results, calculations and interpretations with your laboratory partner and classmates, but calculations and answers in your experiment assignments and lab reports should be completely your own work. Copying someone else’s work or answers is considered cheating. The will be ZERO TOLERANCE for cheating or academic dishonesty. If you are caught cheating, you will receive an “F” grade for the assignment and be reported to the Department Head and the Dean’s Office.

15. There are no make-ups if you miss a lab session. If you did not perform an experiment, you will receive a score of zero for that experiment. You cannot turn in worksheets or lab reports using someone else’s data.

16. Late Work. You can submit experiment assignments and lab reports up to one week after the due date, but you will be penalized 30%. You will not receive credit for any work that is turned in more than one week late.

**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 (Ann Lemke) to discuss reasonable accommodations that will help you succeed in this class. She can be reached at 235-7448 or lemke@hawaii.edu. You can also stop by her office in Hale ‘Ākoakoa 213 for more information.
ACADEMIC INTEGRITY (VERY IMPORTANT!!)

Make sure that you are familiar with the sections related to “Academic Dishonesty” in the College’s policies governing student conduct (available on the WCC website). The fundamental principle governing academic integrity and academic dishonesty is that each student is responsible for presenting his/her own work at all times.

It is fine to discuss homework assignments with other students and help each other out – I strongly encourage you to study with your classmates outside of class. But it is also important that you learn how to solve problems on your own, and you must submit your own work.

Of course it is **not OK** to collaborate on exams. The following rules will be enforced during exam periods:

- Absolutely no talking once the exam begins. If you have a question or need something during an exam, do not ask your neighbor. Raise your hand and I’ll come help you.
- Keep your eyes on your own paper. If I see you looking at someone else’s paper during the quizzes and exams, I will assume you are cheating.
- You are not to bring in any notes or other outside materials to the exams. I will give you copies of the periodic table and other information -- formulas, constant values, etc. (during the lectures, I will tell you which things you need to memorize and which things will be provided for the exams).
- You can (and should) bring a calculator for the exams. But you will only be to use standard scientific calculators – no cell phones, PDA’s (iPhones, Androids, etc.), mini-computers, or any device that can connect to the internet, communicate with other devices, or has data storage capacity.
- No listening to any audio devices (iPods, etc.) during exams.

If you are observed cheating on any of the class assignments (homework, quizzes or exams), your will receive an F for the assignment and I will refer the matter to the Department Head and the Office of the Dean. Cheating is unfair to everyone involved: the teacher, the cheater, and especially the honest students in the class. I adhere to a zero-tolerance policy regarding cheating and academic dishonesty, so consider this your first and only warning – there will be no "second chances" in this area.

**Trust me – you do NOT want to test me on this!!!** I have come down hard on students in my classes for cheating before and will not hesitate to do so if necessary in the future.
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<th>DATE</th>
<th>EXPERIMENT NUMBER AND TITLE</th>
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<tr>
<td>1</td>
<td>Jan 10 (Mon)</td>
<td>Intro Part 1 and 2 Laboratory Safety and Procedures</td>
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<td>2</td>
<td>Jan 17 (Mon)</td>
<td><strong>HOLIDAY – DR. MARTIN LUTHER KING JR. DAY</strong></td>
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<td>3</td>
<td>Jan 24 (Mon)</td>
<td>1. Intermolecular Attractions via Viscosity</td>
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<td>Jan 31 (Mon)</td>
<td>2. Melting Points of Compounds and Mixtures</td>
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<td>Feb 7 (Mon)</td>
<td>3. Molar Mass of Solute Using Freezing Point Depression</td>
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<td>Feb 14 (Mon)</td>
<td>4. Kinetics of an Iodine Clock Reaction (microscale)</td>
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<td><strong>HOLIDAY – PRESIDENTS DAY</strong></td>
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<td>8</td>
<td>Feb 28 (Mon)</td>
<td>5. Determination of an Equilibrium Constant</td>
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<td>6. Le Châtelier's Principle (Formal Lab Report)</td>
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<td>9. <strong>Determination of Solubility Product Constant (Formal Lab Report)</strong></td>
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<td>10. Entropy of Borax Dissolution</td>
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**REMINDERS:**
- Last day to withdraw without a "W" grade: February 02
- Last day to withdraw with a “W” grade: March 28