Chem 162L General Chemistry II Lab
1 credit CRN 64337
T 2:00pm – 2:30pm Imiloa 111
2:30pm – 4:45pm Imiloa 131

INSTRUCTOR: Jeffrey A. Tibbitt, Ph.D.
OFFICE: Imiloa 136
E-MAIL: jtibbitt@hawaii.edu
OFFICE HOURS: TR 12:50pm – 1:50pm
TELEPHONE: 236-9125
EFFECTIVE DATE: Spring 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
Laboratory experiments illustrating fundamental principles of chemistry. (3 hrs. lab)

Prerequisite: Credit or registration in CHEM 162

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 depression 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 concentrations / 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 2008, edited by L. Colmenares
Course Website: [http://laulima.hawaii.edu](http://laulima.hawaii.edu) (use UH email login/password)
Other Requirements: Scientific Calculator
Lab Requirements: Lab goggles
(lab coat is required if you wear shorts or low-waist pants/skirt or dress)

PURPOSE OF THE LABORATORY

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:

- Lab reports: Formal and Informal (Prelab Included) 80 % of total
- Exams: Midterm and Final (10% each) 20 % of total
- Total 100 %

Course grades are assigned as follows:

- A 90 – 100 %
- B 80 – 89 %
- C 70 – 79 %
- D 60 – 69 %
- F below 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 activities in the chemistry laboratory (Imiloa 131). Each hands-on activity is preceded by a class discussion (Imiloa 111) that is based on a pre-lab homework consisting of a reading assignment and completion of pre-lab questions and problems. The class discussion is also for reviewing important principles and safety precautions and demonstrating new techniques needed or the use of new equipment. The time it takes to do this varies each week. Once in the lab, students will perform hands-on activity, record observation and data, calculate results and clean up. The lab 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 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. Be prepared for the activity by reading thoroughly the scheduled activity and 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, lecture textbook and a stapler to class at all times.

3. Pre-lab Period (Imiloa 111). Answers to the Pre-Lab problems and questions will be tackled first thing in class. You will review your pre-lab quiz. The Pre-Lab and quiz constitutes 10% of the report grade. If you arrive late, the Pre-Lab section will count as ‘zero’.

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 prior to grading the Pre-Lab homework. 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.

5. Some experiments require the use of laptop computers in the metal cart in the AV room. This will be wheeled out of the Imiloa AV room before the class and returned there after class. Be prepared to act as computer monitor on a rotating basis.

6. During lab (Imiloa 131). Wear safety goggles and close-toed shoes at all times. Sandals or slippers are not allowed. 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.
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. 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. Identical answers, word for word, and identical calculations will get automatic deductions. Hence, the student should not allow anybody to copy one’s work.

14. Formal Laboratory Reports. A formal laboratory report is required for Experiments Boyle’s Law, Conductivity and Evaporation 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 and 65% if less than 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 put these in a folder. The folder stays in the lab until prior to the 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.
COURSE SCHEDULE

Important Dates:
- Jan 16: Dr. Martin Luther King, Jr. Day – no classes
- Jan 30: Last day to withdraw without a ‘W’ grade.
- Feb 20: Presidents’ Day – no classes
- Mar 2: Excellence in Education – no classes
- Mar 26-30: Spring Recess – no classes
- Apr 2: Last day to withdraw with a ‘W’ grade
- May 2: Last day of instruction

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<th>Week</th>
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<th>Material</th>
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<td>1</td>
<td>Jan 10</td>
<td>1- Laboratory Safety, Equipment &amp; Procedures</td>
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<td>2</td>
<td>Jan 17</td>
<td>2- Intermolecular Forces</td>
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<td>3</td>
<td>Jan 24</td>
<td>3- Dry Ice and Phase Diagrams</td>
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<td>Jan 31</td>
<td>4- Separating Mixtures Using Chromatography</td>
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<td>5</td>
<td>Feb 7</td>
<td>5- Using Freezing-Point Depression to Find Molecular Weight</td>
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<td>6</td>
<td>Feb 14</td>
<td>Make Your Own Demo --Extra Credit--</td>
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<td>7</td>
<td>Feb 21</td>
<td>6- Rate Order Graphing Analysis</td>
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<td>8</td>
<td>Feb 28</td>
<td>Midterm Exam (Labs 1-6)</td>
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<td>9</td>
<td>Mar 6</td>
<td>8- Rate Law Determination of the Crystal Violet Reaction**</td>
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<td>10</td>
<td>Mar 13</td>
<td>9- The Determination of an Equilibrium Constant</td>
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<td>11</td>
<td>Mar 20</td>
<td>10- Chemical Equilibrium and Le Chatelier’s Principle**</td>
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<td>12</td>
<td>Mar 27</td>
<td>Spring Recess – no classes</td>
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<td>13</td>
<td>Apr 3</td>
<td>11- Acid Dissociation Constant, Ka</td>
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<td>14</td>
<td>Apr 10</td>
<td>12- Buffers</td>
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<td>15</td>
<td>Apr 17</td>
<td>13- Titration Curves of Strong and Weak Acids and Bases**</td>
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<td>16</td>
<td>Apr 24</td>
<td>14- Establishing a Table of Reduction Potentials</td>
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<td>17</td>
<td>May 1</td>
<td>Final Exam (Labs 7-14)</td>
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* Course schedule subject to change
** Formal Lab Report Required

ACCOMODATION FOR STUDENTS WITH DISABILITIES

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.
TWO-WAY COMMUNICATION DEVICES:
These devices are not allowed in the classroom. Please see to it that these devices are turned off while in class.

UH POLICY ON EMAIL COMMUNICATION:

The electronic communications policy adopted in December 2005 establishes the University of Hawai‘i Internet service as an official medium for communication among students, faculty, and staff. Every member of the system has a hawaii.edu address, and the associated username and password provide access to essential Web announcements and email. You are hereby informed of the need to regularly log in to UH email and Web services for announcements and personal mail. Failing to do so will mean missing critical information from academic and program advisors, instructors, registration and business office staff, classmates, student organizations, and others.