Chem 162 General Chemistry II

3 credits (CRN 61086 and 61125)

WWW

INSTRUCTOR: Leticia Colmenares, Ph.D.
OFFICE: Imiloa 116
E-MAIL: Leticia@hawaii.edu
OFFICE HOURS: TR 10:00-11:00 am
TELEPHONE: 236-9120
EFFECTIVE DATE: Summer Session II 2014 (6/7-8/14/14)

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

Second course of a two-course sequence designed to meet the one-year General Chemistry requirement for pre-med, science and engineering majors. Topics include thermochemistry, kinetics, acid-base equilibrium, solubility equilibrium and electrochemistry. Emphasis on problem solving.

Prerequisites: A grade of "C" or better in CHEM 161, credit or concurrent registration in MATH 135, or instructor’s consent.
Co-requisite: Concurrent registration in CHEM 162L (override is provided for summer)
WCC: DP

STUDENT LEARNING OUTCOMES

1. Predict properties (boiling point, melting point, osmotic pressure, vapor pressure) of solutions based on concentrations.
2. Determine reaction rate law and calculate rate constants and half-life based on experimental data.
3. Calculate the equilibrium concentration of chemicals in solution involved in precipitation, acid-base and redox reactions.
4. Predict spontaneous reactions based on enthalpy and entropy considerations.
5. Determine the electrochemical potential of redox reactions.

ABOUT this Course

This course starts on July 7 and ends on Aug 14. Students are expected to spend a total of 21 hrs per week: at least 6 hours per week reading the lecture notes, watching narrated PowerPoint videos AND an additional 15 hours per week working on practice problems, Masteringchemistry assignments, taking quizzes and proctored exams.
COURSE TASKS

- Homework (masteringchemistry.com)
- Chapter quizzes
- Four long exams
- Cumulative Final exam

GRADING

1. Grades will be based on the following categories: **homework, quizzes, 4 long exams and a final exam (counted 2 times)**. Your performance (in %) in each category will be determined. The lowest % will be dropped. The average of the remaining seven categories will determine your course grade, as follows:

<table>
<thead>
<tr>
<th>Average</th>
<th>Course Grade</th>
</tr>
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<tbody>
<tr>
<td>100-90 %</td>
<td>A</td>
</tr>
<tr>
<td>89-80 %</td>
<td>B</td>
</tr>
<tr>
<td>79-70 %</td>
<td>C</td>
</tr>
<tr>
<td>69-60 %</td>
<td>D</td>
</tr>
<tr>
<td>below 60%</td>
<td>F</td>
</tr>
</tbody>
</table>

   Curving might be employed if deemed necessary.

   The other grades I, W, Cr, NC to be assigned are described in the current college catalog. The NC grade will be assigned only as part of the Cr/NC option except in very unusual circumstances. Those circumstances must be discussed with the instructor.

2. **Homework**: This will be completed using the online program Masteringchemistry.com. Please register in the course WCC162Summer14 and input the Course ID MCCOLMENARES70055. It is the responsibility of the student to complete and submit the assignments on time. You are **always** allowed to view hints, without penalty. You get bonus points when you don't used hints. You are allowed to rework the problems after due date however, the new score is not saved. Late submission has a small penalty of 10% per day, but the total overall penalty is maxed at 50%. Late homework will be accepted for half-credit until Aug 14, 2014 (end of semester).

3. **Quizzes**. Chapter quizzes will be given in Laulima. These are **timed**. Each quiz **MUST be completed by the time and date set**. Always have a calculator and a periodic chart when taking a quiz. Please turn off your cell-phone when taking a quiz. The reason why the quiz is timed is to prevent cheating.

4. **Proctored long exams**. Each will cover approximately two chapters. Each will last for about 75 min. All of these will be conducted in the Testing Center. This is closed book. You may bring one 3” x 5” notecard with notes on one side. A picture ID and calculator are required.

5. **Final Exam**. The **final exam** will cover all topics (cumulative) 2 hrs. long. This will be administered at the Testing Center on Thursday, Aug 14, 2014. No cheat sheet is allowed. A picture ID and calculator are required.
6. **Extra Credit.** You can earn extra credit up to a **maximum of 20 points = 2% of total grade.** Attendance in the Blackboard Collaborate (online) or face2face supplemental instruction (SI) during the first week of classes will earn 1.0 point. Attendance in 5 SI sessions is required. Extra succeeding sessions will earn 0.5 point each. Others listed in ‘chemistry help’ will earn points as follows: scoring 80% in practice quiz will earn 0.5 point. Each practice worksheet will earn 1.0 point. Feedback on practice worksheets will be provided.

### COURSE MATERIALS

1. **Required Notes:** Chemistry 162 Lecture Notes (Summer 2014) by Colmenares (sold at WCC Bookstore). Already available in bookshelf, $7.40. Order and check shipping policies at http://www.bookstore.hawaii.edu/wcc
2. **Required. Access Code for homework** (masteringchemistry.com) for online homework (purchase the **access key** online).
3. **Required. Scientific Calculator** (cell-phone based calculator is not allowed)

Course Website: [http://laulima.hawaii.edu](http://laulima.hawaii.edu) (use UH email account login and password). Course content is delivered via lecture videos (mp4).

Optional: Tro, Chemistry A Conceptual Approach, 3rd edition
Any General Chemistry Textbook (available at WCC Library Circulation Call # QD)

### CHEMISTRY HELP

1. Online Supplemental Instruction
2. Instructor Office Hours
3. Online practice chapter quizzes
4. Practice worksheets
5. End-of chapter reviews

### HOW TO STUDY FOR THIS COURSE

**Usually students take online courses with the assumption that it will be easier than face-to-face classes. Unfortunately this is NOT correct. Online courses actually require more discipline and individual effort on the part of the student. The focus is on YOU learning rather than the TEACHER lecturing. However, you have more flexibility, when and where to study.**

1. You are expected to **login the course website** every day. The website is your classroom and not coming to the site is like skipping class. You are expected to spend about **3 hours everyday** for this course. **Please schedule real-time hours** for this course that you will routinely follow in real time, just like your work hours. Your online ‘attendance’ is monitored using **Site Stats.**

2. The course website is organized by **chapter.** It starts with chapter 11 all the way to chapter 19. On the average, each chapter is composed of 3 sections. Each section has a narrated powerPoint of about 20-30 minutes. The powerPoints are found in the Lecture Notes. It is also
downloadable together with the narration. Use the Lecture Notes as your notebook. Take notes on the margins when watching the narrated powerPoint videos, tutorials, and animations.

3. **Learning Checks.** Please do all the learning checks (or React problems) in each chapter as soon as you finish watching the lecture videos.

4. Do the **assignment** on masteringchemistry.com. Most of these are tutorials. You will understand the material better by going through the mastering chemistry problems.

5. **Reinforce** learning. Practice by doing the **worksheets** and all other **end-of-chapter practice problems** found in the Lecture Notes. Then check your answers with the answer key that will be provided. If you have any questions, please feel free to post them in the Chat Room.

6. **Check** your knowledge. You MUST take the **practice test in Tasks, Tests and Surveys at least twice** before the actual quiz. It is important that you feel a certain level of confidence before taking the **actual chapter quiz**.

7. Preparing for **long exams** (proctored). Focus on the **objectives of each chapter**. Re-read the notes and with the objectives in mind.

8. Use online **supplemental instruction (SI)** during the semester. This is the link to online **supplemental instruction** [http://tinyurl.com/WCC-Elluminate-Room-1](http://tinyurl.com/WCC-Elluminate-Room-1). The schedule will be posted later. Students should use this resource from the very beginning of the semester before running into difficulty. Recordings can be retrieved at [https://sas.elluminate.com/drtbl?suid=D.D662527ED7B4B691CD648A88711A1E&sid=vclass](https://sas.elluminate.com/drtbl?suid=D.D662527ED7B4B691CD648A88711A1E&sid=vclass)

9. Have a **study buddy or study group.** Meet frequently to motivate each other.

10. Meet with the instructor during office hours regularly. If you have any problems, please do not hesitate to **email** the instructor.

11. Please pay attention to deadlines. **Use the Course Schedule** (found on the last page) throughout the semester. The topics and test dates are listed there. You are responsible to MEET ALL DEADLINES as listed on the class schedule. **It is very hard to catch up when you fall behind.**

### OTHER POLICIES

1. Software requirements.
   - Laulima and Bb Collaborate (for online SI) are best used in Firefox.
   - Videos are in mp4 format. Can be downloaded and viewed in most video players such as VLC player and Quicktime Player.
   - Powerpoints and Livescribe notes are in PDF format. Best viewed in Adobe Reader or Apple Preview.
   - Make sure Java is up to date. Download available at [https://www.java.com/en/download/](https://www.java.com/en/download/)

2. Technical problems in Laulima. Please make sure that your Internet connection is a **robust** connection when taking online quizzes. Please do NOT take your quiz at the coffee shop or using wireless connection.
In case you encounter a technical problem (e.g., the computer crashes, Laulima is down, etc.), please submit a Request Assistance form (at the bottom of Laulima page) immediately from the computer that the problem occurred. Please indicate the course, which quiz, what kind of computer, which web browser, and what kind of internet connection was used.

Please notify me by email immediately. Upon verification by Laulima staff, your quiz will be reset and you will be allowed a second attempt.

3. Make-up or retaking quizzes will NOT be allowed. Each quiz MUST be completed by the time and date set in the course schedule. If you fail to take a quiz, for whatever reason, your score for that quiz will be zero. Your seven highest chapter quiz scores will be used in calculating your quiz grade.

4. Four long exams and one final exam will be made available at The Testing Center (TTC). If you wish to take these at external testing sites, please arrange with the instructor as soon as possible.

Hours of operation may vary from campus to campus. At the WCC Testing Center, the hours are found in this link: http://windward.hawaii.edu/Testing_Center/index.php

After taking the exam, you must not tell anybody what is in the test, as this would fall under the guidelines of academic integrity. Any evidence of cheating will result in a score of zero for all parties involved, and this will be reported to the Vice Chancellor for disciplinary action.

5. Communicating with instructor. Please email the instructor using the Mailtool in Laulima. Please check your Hawaii.edu account for instructor response to your email. Please ALLOW 24 HOURS for responses to emails or messages. In emergencies, please call 236-9120.

6. You have access to your scores and grades 24/7 in Laulima gradebook.

7. If you drop out from the course without any notice you will get a ‘F’ grade. To avoid this, please withdraw officially (through MyUH) by 07/29/14

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. Also, inform your instructor ASAP.

COURSE CONTENT AND TENTATIVE SCHEDULE

Important Dates: 07/08/14 Last day to receive 100% tuition refund
07/14/14 Last day to receive 50% tuition refund
07/14/14 Last day to drop (No ‘W’ on transcript)
07/29/14 Last day to withdraw from class (’W’ on transcript)
<table>
<thead>
<tr>
<th>Date*</th>
<th>Chapter</th>
<th>Topics</th>
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<tbody>
<tr>
<td>7/7</td>
<td>Introduction</td>
<td>Review</td>
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<tr>
<td>7/8</td>
<td>11- Liquids, Solids and Intermolecular Forces</td>
<td>Dispersion, Dipole-dipole forces, Hydrogen bonding, heating curve, phase diagrams, properties of liquids. Unit cell, types of solids, types of solids, semiconductors</td>
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<td>7/10</td>
<td>12-Solution Properties</td>
<td>Predict properties (boiling point, melting point, osmotic pressure, vapor pressure) of solutions based on concentrations. Solvation, factors affecting solubility, enthalpy and entropy of solution, Henry's law</td>
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<tr>
<td>7/15 Tuesday</td>
<td>Long Exam #1</td>
<td>Available for 2 days.</td>
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<tr>
<td>7/16</td>
<td>13- Chemical Kinetics</td>
<td>Determine reaction rate law and calculate rate constants and half-life based on experimental data. Reaction mechanism, activation energy, catalyst, intermediate, Arrhenius equation, collision theory</td>
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<tr>
<td>7/21</td>
<td>14- Chemical Equilibrium</td>
<td>Characteristics of equilibrium, Equilibrium constant, K, Le Chatelier's principle, equilibrium calculations, reaction quotient, Q.</td>
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<td>7/23 Wednesday</td>
<td>Long Exam #2</td>
<td>Available for 2 days.</td>
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<td>7/22</td>
<td>15- Acids &amp; Bases</td>
<td>Strong and weak acids and bases, conjugate acid/base, pH, salts and oxides, convert Convert between: [H₃O⁺], pH, [OH⁻] and pOH. Calculate Ka (or Kb), % ionization, pH, or [H⁺] for a weak acid or weak base solution, Predict whether a salt solution will be acidic, basic or neutral.</td>
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<td>7/29</td>
<td>16- Aqueous Equilibria</td>
<td>Calculate the equilibrium concentration of chemicals in solution involved acid-base reactions. Common-ion effect, Titrations, Buffers, pH curves, indicators. Calculate the equilibrium concentration of chemicals in solution involved in precipitation reactions. Calculate solubility, Ksp, predict whether precipitation occur.</td>
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<tr>
<td>7/31 Thursday</td>
<td>Long Exam #3</td>
<td>Available for 2 days.</td>
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<td>8/4</td>
<td>17- Spontaneity &amp; Chemical Change</td>
<td>Predict spontaneous reactions based on enthalpy and entropy considerations. Second Law of Thermodynamics, Free energy, Third Law of Thermodynamics. Calculate $\Delta G^\circ$ from K and perform</td>
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This syllabus is subject to change. Please bring any error to the attention of the instructor.

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/6</td>
<td>18- Electrochemistry</td>
<td>Determine the electrochemical potential of redox reactions. Electrochemical cells, electrolysis, anode/cathode, cell potentials, volts, coulombs. Interconvert $E^\circ$, $\Delta G^\circ$ and $K$ for redox reactions, Use the Nernst Equation.</td>
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<tr>
<td>8/11</td>
<td>Long Exam #4</td>
<td>Available for 2 days.</td>
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<tr>
<td>Monday</td>
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<tr>
<td>8/12</td>
<td>20- Nuclear Chemistry</td>
<td>Balancing nuclear equations, types of radiation, review first order reaction, half life, radiocarbon dating</td>
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<tr>
<td>8/14</td>
<td>FINAL EXAM</td>
<td>Available for 2 days. Closes at 4 pm on Friday.</td>
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<tr>
<td>Thursday</td>
<td></td>
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