Summer 2014 (Session I)

Course Number: CHEM 161 (CRN 61084; 3 credits)

Class Meeting Days and Times: Online

Instructor:	Dr. Christopher Guay
Email:	cguay@hawaii.edu
Course website:	http://laulima.hawaii.edu (use UH email account login and password)
Office Hours:	TR 9:00-10:00 am; TR 1:00-2:00 pm (ʻImiloa 136)

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

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

CATALOG DESCRIPTION OF THE COURSE

Basic principles of inorganic chemistry with emphasis on problem solving. First course of a two-course sequence designed to meet the one-year General Chemistry requirement for pre-med, science and engineering majors. Topics include chemical calculations, electronic structure, chemical bonding, states of matter and solutions. (3 hrs. lecture)

Prerequisites: A grade of 'C' or better in Math 103, or placement in Math 135 or instructor's consent.

Co-requisite: Concurrent registration in Chem 161L.

Recommended Preparation: Student should have taken high school chemistry, Chem 100 or Chem 151.

WCC: DP

STUDENT LEARNING OUTCOMES

1. Use the mole concept in solving stoichiometry problems involving solids, liquids, gases and solutions.
2. Balance chemical equations, classify reactions, identify and analyze the role of the chemicals involved in chemical reactions.
3. Predict the behavior of gases while undergoing changes in volume, pressure, temperature and quantity.
4. Manipulate thermochemical equations and calculate the amount of energy involved in chemical reactions.
5. Predict physical and chemical properties of elements based on electronic structure and location in the Periodic Table.
6. Predict physical and chemical properties of compounds based on chemical bonding, geometry and intermolecular interactions.

COURSE TASKS

- Lecture videos
- Homework
- Quizzes
- Exams
- Final exam (ACS National Standardized Exam for General Chemistry I)

REQUIRED COURSE MATERIALS

- Access to *Mastering Chemistry* for online homework and tutorials. You will need to purchase an access key online, set up a login account, and join our course on *Mastering Chemistry*. Refer to the handout posted on Laulima for detailed information about how to set up your account on *Mastering Chemistry*.
- A spiral-bound copy of my lecture slides/notes (available at the WCC bookstore)
- You will also need a scientific calculator and Internet access.

OPTIONAL COURSE MATERIALS

- Once you have set up your account on *Mastering Chemistry*, you will have the option of purchasing online access to the e-text used for the course (Tro, *Chemistry: A Molecular Approach,* 3rd ed). Although it is not required for the course, I strongly recommend it. It is good to read the text to reinforce the information present in lecture and it is a good reference to have when you are working on the homework assignments.

GRADING

1. Grades will be based on the following categories:
   i. Homework
   ii. Quizes
   iii. Exam 1
   iv. Exam 2
   v. Exam 3
   vi. Exam 4
   vii. and viii. Final Exam (counts double – *i.e.*, counts as two categories)

   Your percentage score in each category will be determined, and the category with the lowest score will be dropped. An average percentage score for the remaining seven categories will be calculated and 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 %

   Curving might be employed if deemed necessary.

   Grades of I, W, CR, NC are described in the current college catalog. Changing from letter grading (A-F) to CR/NC option must be done by the deadline for the current term – this must be discussed previously with the instructor.

2. **Homework assignments:** Online homework assignments will be submitted through the *Mastering Chemistry* website. When you log into your account and go to our course site, you will be able to view a calendar that lists all of the homework assignments and deadlines. Late homework submissions will be penalized 10% per day.

3. **Quizzes:** An online quiz will be given for each chapter. The quizzes will be available through our course site on Laulima. You will need to complete each quiz by the specified deadline (see course schedule for quiz dates).

4. **Exams:** There will be ***four*** exams, each of which will cover approximately two chapters of material. Each exam will last for 75 minutes. All exams will be closed book. You must take the exams ***in person*** at the WCC Testing Center (located in the library). [Note: If you are not located on Oahu when you are taking this course, you must talk with me beforehand so we can make arrangements for you to take the exams in person at a suitable facility convenient to your location.]

5. **Final Exam:** The *final exam* will be the American Chemical Society's national, standardized exam for First-Term General Chemistry. This exam will consist of 70 multiple-choice questions and ***cover all topics*** presented in the course (*i.e.,* cumulative). You will be given 110 minutes to complete the exam. The final exam will also be closed book.

HOW TO STUDY FOR THIS COURSE

Nothing is more important to your academic success than developing strong study skills. And since this is an online course, you will need to be *especially* self-disciplined and efficient when it comes to managing your time and making sure you do all of the work required for the course. On average, you should plan on spending about one to ***two hours per day*** watching the lecture videos and an additional ***twelve hours per week*** devoted to reading, working through tutorials and other supplemental materials, working on homework assignments, etc.

1. Watch the ***lecture videos*** that are assigned for the dates shown on the *course schedule*. It is a good idea to watch each video all the way through once, then go back and re-watch portions that you did not completely understand the first time through.
2. Take ***notes*** during the lecture, but don't focus too much energy on trying to write down every single thing (remember, you can download and print out the lecture slides). Have your ***calculator*** handy so you can work through samples problems that are worked out during the lecture videos. Don't hesitate to pause the video if you need time to work through the problem before continuing..
3. ***Review*** your notes soon after watching the videos. If you purchased access to the e-text, ***read*** the sections that are relevant to the videos you just watched.
4. Watch the ***supplemental videos*** and work through the ***online tutorials*** for each chapter that are posted under the "Modules" section of the course site on Laulima.
5. Work on the ***homework assignments*** on Mastering Chemistry that correspond to the material covered in the videos you watched.
6. Do additional ***practice/review problems*** posted in the Study Area on the *Mastering Chemistry* site.
7. Come talk to me during my ***office hours*** and/or ask me ***questions*** via email. If you are having trouble with any of the topics we are covering, ask me for clarification and additional explanation right away! Don't wait until you have fallen way behind and feel overwhelmed before you seek help.

OTHER POLICIES

1. Lecture topics and exam dates are found in the ***course schedule*** at the end of this syllabus.
2. You are expected to have the required ***mathematics skills*** for the course. You should be familiar with setting up and solving algebraic equations, exponents, logarithms, scientific (engineering) notation, significant figures, proportionality, and percentages. See the math review modules on the course website to review this material. Another place to review is the Study Area on the Mastering Chemistry site. Please let me know immediately if you have any problems with any of these.
3. **Missed Quizzes:** If you do not complete any of the online quizzes ***by the specified deadline***, your will receive a score of ***zero*** for the quiz. There will be no make-ups for missed quizzes.
4. **Missed Exams:** If you do not take an exam by the ***specified deadline***, you will receive a score of ***zero***. If a legitimate ***emergency*** comes up, you must notify me ***before the exam deadline*** (in person or by email) and try to arrange an alternate date for you to take the exam.
5. You have access anytime to your scores for quizzes, exams and homework assignments in the ***gradebook on Laulima*** and the ***gradebook on Mastering Chemistry.***
6. **Communicating with Instructor:** The best way to reach me is by email and/or by coming to see me during my office hours. Time spent during office hours will be more efficient if you prepare ahead of time and come with specific questions ready to ask.

7. If you have any ***special learning needs***, including hearing/visual impairment, please inform the instructor as soon as possible
8. **ZERO TOLERANCE for cheating or academic dishonesty.** See the note regarding academic dishonesty on the following page.

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 drop by her office in ʻAkoakoa 213.

SOME FINAL WORDS OF ADVICE…

BE SURE TO KEEP UP WITH THE WORK IN THIS CLASS! We will be covering a lot of material at a very fast pace during the compressed summer session, so things will become extremely difficult if you fall behind. Gaining an understanding of basic chemistry concepts and an ability to solve chemistry problems requires practice, and you need to be actively involved in the learning process. This means being focused during the lecture videos, working through additional practice problems on your own, asking for help when you need it, etc. If you are having trouble keeping up with the class material and wait until the last minute (*i.e.*, right before the exams) before trying to cram everything in, it will be too late.

VERY IMPORTANT NOTE REGARDING ACADEMIC HONESTY

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 – in fact, I strongly encourage you to study with your classmates outside of class time. But it is also important that you learn how to solve problems on your own, and **you must submit your own work for online homework assignments and quizzes.**

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 if you 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 you are caught looking at someone else's paper during the exams, it will be assumed that you are cheating.
- You are not allowed 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 allowed to use standard scientific calculators – no cell phones, PDA's (iPhones, Blackberrys, 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.

CHEM 161 — Guay (61084) **COURSE SCHEDULE** **Summer 2014 (Session I)**

Month	Date	Unit	Topics	Reading (Tro)
May	26	1	Measurements: Units, Uncertainty, Significant Figures	Appendix 1; 1.7
	27	1	Sig Figs in Calculations; Units; Dimensional Analysis; Density	1.6; 1.8
	28	1	States of Matter; Elements, Compounds and Mixtures; Atoms & Molecules	1.3; 1.4
	29	2	Atomic Structure; The Periodic Table; Isotopes; Ions	2.3; 2.4; 2.5; 2.6; 2.7
	30	2	Charges of Common Ions; Polyatomic Ions; Ionic and Molecular Compounds	2.7; 3.4
	31	2	Naming and Formulas of Compounds	3.3; 3.5; 3.6; 3.7
June	1	3	Mass and Moles; Avogadro's Number; Atomic Mass; Molar Mass	2.8; 2.9; 3.8
	2	3	Percent Composition; Empirical and Molecular Formulas; Balancing Chemical Equations	3.9; 3.10; 3.11
	3	3	Stoichiometry: Theoretical Yield and Percent Yield	4.2; 4.3
	4	3	Stoichiometry: Limiting Reactant	4.3
	5	4	Solutions: Concentration and Molarity	4.4
	6	4	Solutions: Solubility Rules; Ionic and Precipitation Equations; Electrolytes	4.5; 4.6; 4.7
	7	4	Acids and Bases; Volumetric and Gravimetric Analysis	4.6; 4.8
	8	5	Oxidation and Reduction	4.9
	9	5	Oxidation Number (Oxidation State)	4.9
	10	5	Balancing Redox Equations	18.2
	11	6	Kinetic-Molecular Theory; Gas State Variables	5.2; 5.8
	12	6	Relationships Between Gas Pressure, Volume, Temperature and Number of Moles	5.3
	13	6	Combined Gas Laws; Ideal Gas Law	5.3; 5.4
	14	6	Gas Density; Gas Stoichiometry	5.5; 5.6; 5.7
	15	6	Kinetic Molecular Theory Revisited; Diffusion and Effusion; Real (Non-Ideal) Gas Behavior	5.8; 5.9; 5.10
	16	7	Energy, Work; Heat and Temperature; Specific Heat	6.2; 6.4
	17	7	Thermodynamics and Thermochemistry; System and Surroundings; First Law of Thermodynamics	6.3
	18	7	State Functions; Heat, Internal Energy, PV Work	6.3; 6.4
	19	7	Enthalpy; Enthalpy of Reaction; Enthalpy Diagrams	6.6
	20	7	Hess' Law; Standard Enthalpy Change; Enthalpy of Formation	6.8; 6.9
	21	8	Electromagnetic Radiation; Bohr Model of the Hydrogen Atom; Electron Energy	7.2; 7.3; 7.4; 7.5
	22	8	Electronic Structure of the Atom: Quantum mechanics, Orbitals	7.5; 7.6
	23	8	Quantum Numbers; Electron Spin	7.6; 8.3
	24	8	Ground and Excited States; Electron Configurations and Orbital Diagrams; Electron Configuration of Ions	8.3; 8.4; 8.5
	25	8	Effective Nuclear Charge; Periodic Trends	8.6; 8.7; 8.8; 8.9
	26	9	Ionic and Covalent Bonds	9.2; 9.3; 9.4; 9.5
	27	9	Polar Covalent Bonds; Electronegativity	9.5; 9.6
	28	9	Lewis Structures; Resonance; Formal Charges	9.7; 9.8; 9.9; 9.10
	29	10	Molecular Geometry	10.2; 10.3; 10.4; 10.5
	30	10	Valence Bond Theory; Hybridization of Atomic Orbitals	10.6; 10.7
July	1	10	Molecular Orbital Model	10.8
	2		Review	
	3		FINAL EXAM	

EXAM SCHEDULE

	Start Date	End Date
Exam 1	June 5	June 6
Exam 2	June 12	June 13
Exam 3	June 19	June 20
Exam 4	June 25	June 26
Final Exam	July 2	July 3