

**General Chemistry I: Course Syllabus**  
**Windward Community College – Fall 2015**

**Course Number:** CHEM 161 (CRN 60023; 3 credits)

**Class Meeting Days and Times:** MW 10:00 - 11:15 am ('Imiloa 111)

**Instructor:** Dr. Christopher Guay

**Email:** cguay@hawaii.edu

**Course website:** <http://laulima.hawaii.edu> (use UH email account login and password)

**Office Hours:** MW 11:30 am-12:30 pm; TR 1:00-1:55 pm ('Imiloa 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 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 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**

- Daily attendance
- Homework (online and paper-based)
- In-class quizzes
- Three midterm exams
- Final exam (ACS National Standardized Exam for General Chemistry I)

## REQUIRED COURSE MATERIALS

- Printed lecture notes — available at the bookstore.
- Access to Mastering Chemistry for online homework and tutorials (purchase access key online or from WCC Bookstore). Go to [www.masteringchemistry.com](http://www.masteringchemistry.com) and register/login. Join our course using the course ID code **MCGUAY42937**.
- **IMPORTANT!** When you are prompted to select a text for the course, choose “**Tro, Chemistry: A Molecular Approach, 3e**”. You do not need to pay extra to purchase access to this e-text. You just need to select this text so that you will have access to the correct set of homework problems.
- You will also need a scientific calculator and Internet access.

## GRADING

1. Grades will be based on the following categories:

- i. Attendance & Quizzes
- ii. Homework
- iii. Midterm Exam 1
- iv. Midterm Exam 2
- v. Midterm Exam 3
- vi. 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 six 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. **Attendance** will be checked during every class period. You are **required to attend every class** – you will lose points for missing class.
3. **Quizzes:** A short in-class **quiz** (1-3 questions) will be given during every lecture period.
4. **Homework assignments** (online and paper-based) will be due every class period.  
*Online homework:* Online homework assignments will be given through the Mastering Chemistry website. Go to [www.masteringchemistry.com](http://www.masteringchemistry.com) and register/login. Join our course using the course ID code **MCGUAY42937**. Online homework assignments will be due every Monday (even if it's a holiday). Late homework submissions will be penalized 10% per day.  
*Written homework:* Written homework problems will be posted on Lulima. The assignments must be done by hand (*i.e.*, pencil and paper) – be sure to show your work! Written homework assignments are due every Wednesday at the beginning of the class period. **Late homework will not be accepted for written homework assignments.** If you are not coming to class on a day when a written homework assignment is due, you can still scan the assignment and email it to me – but it must be received before the start of the class period to receive credit.
5. There will be **three midterm exams**, each of which will cover approximately one-third of the course. Each exam will last for 75 minutes. All exams will be closed book.

6. 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 2 hours 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 strong study skills. On average, you should spend about **seven hours per week** outside the classroom to study for this course.

1. Prepare for each class by familiarizing yourself with the **lecture slides**, which will be posted beforehand on the course website.
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). Stay engaged and participate in class, ask questions, etc. Bring your **calculator** to class so you can work through sample problems (you will also need it for the in-class quizzes and activities).
3. **Review** your notes soon after class. Come to my office hours regularly. This is a good place to get tips on how to solve your homework and review for quizzes and exams. Also, try to get together with other students in the class to study together.
4. Using your notes, do all of the **homework** assignments.
5. Do additional **practice midterm exams and other review problems** in the lecture notes, modules (Laulima) and Study Area (Mastering Chemistry).
6. Plan on **spending at least 7 hours per week on this course outside of regular class meeting times**. Here is how your time should be allocated during most weeks:
  - 3-4 hours reading lecture notes and going through tutorials, videos, etc., on Laulima
  - 3-4 hours doing homework and practice problems

### **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 are **absent from class**, the quiz you missed will be counted as **zero**. There will be no make-ups for missed quizzes. **Your two lowest quiz scores will be dropped.**
4. **Missed Exams:** If you miss a **midterm exam**, it will count as a **zero**. If a legitimate **emergency** comes up, you must notify me **before the exam** (in person or by email). For a **pre-excused** absence, you may be assigned a score calculated from your other exam scores or allowed to take a make-up exam, provided it is taken before the exams are returned to the other students. It will **not** be possible to make up the **final exam**.
5. **Extra Credit:** You can earn extra credit up to a **maximum of 2% of the total points possible for the course**. Opportunities for earning extra credit points (for example, attending a chemistry forum on campus and submitting a written summary of the topic) will be announced during class.
6. You have access to your scores and grades 24/7 in the **gradebook on Laulima**.
7. **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.

8. **Disruptive behavior** leads to loss of learning time. It is unfair to the other students in class as well as the instructor and it will not be tolerated. Examples include activated cell phones, checking /sending text messages, chattering/whispering during the course of the lecture, making offensive remarks, eating or drinking in the classroom, packing of books or otherwise making noise, leaving class early, sleeping in class, reading other materials not related to the course, etc. If a student engages in disruptive behavior, the instructor reserves the right to ask the student to leave class immediately and the student will be marked absent.
9. If you have any **special learning needs**, including hearing/visual impairment, please inform the instructor as soon as possible
10. **ZERO TOLERANCE for cheating or academic dishonesty**. See the note regarding academic dishonesty on the following page.
11. Any changes to the Course Schedule will be announced in class at least one week prior to the affected date(s). **You are responsible**, however, for knowing about any changes that are made -- whether or not you were in class for the announcement.

### **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 'Akoakoa 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 relatively fast pace, so things will become very 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 lectures, 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 exam) 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.**

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 I see you looking at someone else’s paper during the quizzes and exams, I will assume 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.

WEEK	DATE	TOPICS
1	Aug 24 (Mon)	Unit 1: Measurements: Units, Uncertainty, Significant Figures
	Aug 26 (Wed)	Unit 1: Sig Figs in Calculations; Units; Dimensional Analysis; Density
2	Aug 31 (Mon)	Unit 2: States of Matter; Elements, Compounds and Mixtures; Atoms & Molecules
	Sep 2 (Wed)	Unit 2: Atomic Structure; The Periodic Table; Isotopes; Ions
3	<b>Sep 7 (Mon)</b>	<b>HOLIDAY – LABOR DAY</b>
	Sep 9 (Wed)	Unit 2: Charges of Common Ions; Polyatomic Ions; Ionic and Molecular Compounds; Naming and Formulas of Compounds
4	Sep 14 (Mon)	Unit 3: Mass and Moles; Avogadro's Number; Atomic Mass; Molar Mass
	Sep 16 (Wed)	Unit 3: Percent Composition; Empirical and Molecular Formulas; Balancing Chemical Equations
5	Sep 21 (Mon)	Unit 3: Stoichiometry; Theoretical Yield, Limiting Reactant; Percent Yield
	<b>Sep 23 (Wed)</b>	<b>MIDTERM 1</b>
6	Sep 28 (Mon)	Unit 4: Solutions; Concentration and Molarity; Solubility Rules; Ionic and Precipitation Equations; Electrolytes
	Sep 30 (Wed)	Unit 4: Acids and Bases; Volumetric and Gravimetric Analysis
7	Oct 5 (Mon)	Unit 5: Oxidation-Reduction; Oxidation Number
	Oct 7 (Wed)	Unit 5: Balancing Redox Equations
8	Oct 12 (Mon)	Unit 6: Kinetic-Molecular Theory; Gas State Variables; Relationships Between Gas Pressure, Volume, Temperature and Number of Moles
	Oct 14 (Wed)	Unit 6: Combined Gas Laws; Ideal Gas Law; Gas Density; Gas Stoichiometry
9	Oct 19 (Mon)	Unit 6: Kinetic Molecular Theory Revisited; Diffusion and Effusion; Real (Non-Ideal) Gas Behavior
	Oct 21 (Wed)	Unit 7: Energy, Work; Heat and Temperature; Specific Heat
10	<b>Oct 26 (Mon)</b>	<b>MIDTERM 2</b>
	Oct 28 (Wed)	Unit 7: Thermodynamics and Thermochemistry; System and Surroundings; First Law of Thermodynamics

11	Nov 2 (Mon)	Unit 7: State Functions; Heat, Internal Energy, PV Work; Enthalpy
	Nov 4 (Wed)	Unit 7: Enthalpy of reaction; Enthalpy Diagrams; Hess' Law; Standard Enthalpy Change; Enthalpy of Formation
12	Nov 9 (Mon)	Unit 8: Electromagnetic Radiation; Bohr Model of the Hydrogen Atom; Electron Energy
	<b>Nov 11 (Wed)</b>	<b>HOLIDAY – VETERANS DAY</b>
13	Nov 16 (Mon)	Unit 8: Electronic Structure of the Atom: Quantum mechanics, Orbitals, Quantum Numbers
	Nov 18 (Wed)	Unit 8: Electron Spin; Ground and Excited States; Electron Configurations and Orbital Diagrams
14	Nov 23 (Mon)	Unit 8: Electron Configuration of Ions; Effective Nuclear Charge; Periodic Trends
	Nov 25 (Wed)	Unit 9: Ionic and Covalent Bonds
15	<b>Nov 30 (Mon)</b>	<b>MIDTERM 3</b>
	Dec 2 (Wed)	Unit 9: Polar Covalent Bonds; Electronegativity
16	Dec 7 (Mon)	Unit 9: Lewis Structures; Formal Charges Unit 10: Molecular Geometry and Hybridization
	Dec 9 (Wed)	Unit 10: Molecular Orbital Model

**FINAL EXAM: Monday, December 14  
10:00 am to 12:00 noon**

**REMINDERS: Last day withdraw without a "W" grade: Monday, September 14  
Last day to withdraw with a "W" grade: Friday, October 30**