

**CHEMISTRY 110/SUSTAINABILITY 120:**  
**CHEMISTRY IN A SUSTAINABLE WORLD**

**INSTRUCTOR:** Dr. Kayla Gary

**EMAIL:** kmgary@hawaii.edu

**ASYNCHRONOUS LECTURE INFORMATION:**

Chemistry 110 CRN 76955 & Sustainability 120 CRN 77037

Asynchronous Online Recorded Lectures: Tues & Thurs ~2 Lectures a Week

**\*NOTE: EXAMS WILL BE ON SPECIFIC FRIDAYS  
BETWEEN 6AM – 12 PM HAWAII TIME ON LAULIMA; SEE  
COURSE SCHEDULE BELOW\***

**ONLINE OFFICE HOURS:** Monday & Wednesday 12 - 1 pm using Zoom through STAR Balance (see detailed instructions on Laulima for how to sign-up for office hours)

**COURSE DESCRIPTION**

We are surrounded by chemical structures and chemical reactions, both natural and manmade, and this chemistry is an unavoidable part of life on our planet and in our island environment. Chemistry plays a critical role in our ability to adapt to a changing and ever more crowded world, but chemicals can also cause problems when they are used improperly or in the wrong environment. In this course, we will explore the important roles for natural and man-made chemicals in making our life better in a sustainable and environmentally safe way. We will also explore a few examples where chemicals play a role in damaging our environment, serving as a cautionary note that one needs a clear understanding of how chemicals interact with the environment, whether they will naturally degrade, or how they will be properly contained and disposed of.

**Chemistry Objectives**

The course will cover many fundamental principles of chemistry, including some limited quantitative approaches that will require a working knowledge of algebra and an ability to use a scientific calculator. Some of the chemical concepts include:

- Atoms, chemical bonds, and molecules, and how electrons determine chemical properties.
- Understanding the physical basis for the properties of gases, liquids, and solids.

- Understanding how chemicals contain energy that can be harvested and stored in various ways.
- Developing an appreciation for the fundamental chemicals found in all biological organisms.

### **Sustainability Objectives**

These concepts will be developed by examining a variety of issues that collectively can be considered fundamental modern problems in sustainability and green chemistry. Here we loosely define sustainability as a knowledge-based approach to using chemicals and technology wisely, and in a way that is consistent with protecting human health, the natural environment, and the overall health of our planet. Some examples of modern issues that will be explored include:

- Clean air, air-borne pollution, and the role of ozone in protecting life on our planet.
- Energy from petroleum, biofuels, solar power, and nuclear power; energy storage devices.
- Nutrition, organic foods, and food chemistry of sweeteners and alternative carbohydrates.
- The chemistry of DNA, RNA, and proteins; the scientific background for understanding the GMO debate.

### **GENERAL EDUCATION REQUIREMENTS**

This course serves to fulfill the general education requirements for a physical science course (**DP**). Students who successfully complete this course will understand basic chemical principles and how these principles relate to the world around them. The course must be taken for a letter grade to earn general education credit.

### **STUDENT LEARNING OUTCOMES**

- Students will be introduced to the fundamental principles of chemistry, including atomic structure, chemical bonds, and chemical equations.
- Students will understand the importance of chemistry in many aspects of everyday life and the implications in other fields and sciences, from the arts to environmental science.
- Students will develop an understanding of the complex issues surrounding the interplay of the principles of sustainable living and our desire to use modern technology throughout our everyday life.
- Students will understand how to use a scientific rationale to help develop a critical, educated analysis of major issues in a sustainable society.

## **REQUIRED MATERIALS**

This course will be participating in the bookstore's Interactive Digital Access Program (IDAP) which ensures deeply discounted digital textbook materials. Through this program, you will access your course material digitally through Laulima, and it will be available to you by the first day of class. A charge of \$80.95 for the online homework system and eTextbook will be automatically added to your MyUH account by the first week of school.

You have the option to opt-out of receiving your course material through IDAP by September 15<sup>th</sup> without penalty. **By opting-out, you will lose access to the course material** and the charge will be refunded on your MyUH account. You may opt-out by visiting your unique Inclusive Access Student Portal, which can be found in your IDAP welcome email (Subject Line: "IMPORTANT: You have enrolled in an IDAP Course"). For more information regarding IDAP, please contact your campus bookstore. **Please note that the online homework and textbook readings are required for this course. If you opt-out of IDAP, you must purchase the digital material separately.**

### **Required Digital Materials:**

- **See "McGraw Online Homework Registration Instructions" on Laulima for detailed instructions on how to access your digital materials.**
  - eTextbook: Chemistry in Context, Applying Chemistry to Society, 9<sup>th</sup> Edition, Fahlman et al. American Chemical Society, McGraw-Hill, 2018.
  - McGraw Hill Connect on-line homework

### **Other Required Materials:**

- Scientific calculator (graphing or non-graphing)

**CHEM 110/SUST 120 TENTATIVE LECTURE SCHEDULE (3 UNIT COURSE)**

<b>Week</b>	<b>Tuesday</b>	<b>Thursday</b>
<b>Week 1</b> Aug 24 <sup>th</sup> – 28 <sup>th</sup>	Introduction to Chemistry 110 Chapter 1: Portable Electronics: The Periodic Table in the Palm of Your Hand	
<b>Week 2</b> Aug 31 <sup>st</sup> – Sept 4 <sup>th</sup>	Chapter 1: Portable Electronics: The Periodic Table in the Palm of Your Hand	Chapter 2: The Air We Breathe
<b>Week 3</b> Sept 7 <sup>th</sup> – 11 <sup>th</sup>	No School Monday Sept 7 <sup>th</sup> : Labor Day	Chapter 2: The Air We Breathe
<b>Week 4</b> Sept 14 <sup>th</sup> – 18 <sup>th</sup>		Chapter 3: Radiation from the Sun
<b>Week 5</b> Sept 21 <sup>st</sup> – 25 <sup>th</sup>		Chapter 3: Radiation from the Sun Chapter 4: Climate Change
<b>Week 6</b> Sept 28 <sup>th</sup> – Oct 2 <sup>nd</sup>		Chapter 4: Climate Change <b>Exam 1 Friday October 2<sup>nd</sup> : Chapters 1-3</b>
<b>Week 7</b> Oct 5 <sup>th</sup> – 9 <sup>th</sup>		Chapter 4: Climate Change Chapter 5: Energy from Combustion
<b>Week 8</b> Oct 12 <sup>th</sup> – 16 <sup>th</sup>		Chapter 5: Energy from Combustion Chapter 6: Energy from Alternative Sources
<b>Week 9</b> Oct 19 <sup>th</sup> – 23 <sup>rd</sup>		Chapter 6: Energy from Alternative Sources
<b>Week 10</b> Oct 26 <sup>th</sup> – 30 <sup>th</sup>	Chapter 8: Water Everywhere: A Most Precious Resource	<b>Exam 2 Friday October 30<sup>th</sup>: Chapters 4-6</b>
<b>Week 11</b> Nov 2 <sup>nd</sup> – 6 <sup>th</sup>	Chapter 9: The World of Polymers and Plastics No School Tuesday Nov 3 <sup>rd</sup> : Election Day	
<b>Week 12</b> Nov 9 <sup>th</sup> – 13 <sup>th</sup>	Chapter 9: The World of Polymers and Plastics Chapter 11: Nutrition No School Wednesday Nov 11 <sup>th</sup> : Veteran's Day	
<b>Week 13</b> Nov 16 <sup>th</sup> – 20 <sup>th</sup>	Chapter 11: Nutrition	<b>Exam 3 Friday November 20<sup>th</sup>: Chapters 8 &amp; 9</b>
<b>Week 14</b> Nov 23 <sup>rd</sup> – 27 <sup>th</sup>	No School Thurs & Fri Nov 26 <sup>th</sup> & 27 <sup>th</sup> : Thanksgiving Holiday	
<b>Week 15</b> Nov 30 <sup>th</sup> – Dec 4 <sup>th</sup>		Chapter 13: Genes & Life
<b>Week 16</b> Dec 7 <sup>th</sup> – 11 <sup>th</sup>	Chapter 13: Genes & Life Last Day of Instruction Thursday Dec 10 <sup>th</sup> <b>Cumulative Final Exam Friday December 11<sup>th</sup></b>	

\*Times listed are based on the HAWAII TIME ZONE\*

\*Changes may be made at any time at the discretion of the instructor\*

**GRADING & EVALUATION SYSTEM FOR CHEM 110/SUST 120:**

**HOMEWORK (15%):** Homework will be assigned on McGraw Hill Connect, our textbook's online homework system. **Homework is due on various days and times; you are responsible for submitting your homework on time. No late homework will be accepted.**

**GROUP FORUMS & DISCUSSIONS ON LAULIMA (20%):** Weekly discussions will be posted on Laulima. Your participation, creativity, use of knowledge from lecture, and information found online in the discussions will be worth 20% of your final grade. See instructions on Laulima for Group Discussion guidelines.

**EXAMS (45%):** Three free response/multiple choice exams will be given throughout the term on Laulima to determine students' level of mastery of the material and will cover approximately 3 chapters each. Each exam will count for 15% of your total grade. Make-up exams will not be given and will be given only on the assigned day and time. **You will have 75 minutes to complete exams on Fridays between the times of 6am – 12pm Hawaii Time on Laulima. If the listed exams do not work for your schedule, you MUST let me know by the end of Week 1.** Make-up exams are always at the discretion of the professor, regardless of the excuse.

**CUMULATIVE FINAL EXAM (20%):** There will be a free response/multiple choice cumulative final exam given at the end of the course and will count for 20% of your total lecture grade. **The final exam will be given on Friday December 11<sup>th</sup> between 6am -12pm on Laulima that will last 75 minutes.** Make-up exams will not be given and will be given only on the assigned day and time.

**GRADING:** The grading scale for lecture is below. \*Scores *may* be curved at the end of the semester, and is up to the discretion of the professor.

<b>Overall %</b>	<b>Grade Earned</b>
98% or Above	A+
93-97%	A
90-92%	A-
88-89%	B+
83-87%	B
80-82%	B-
78-79%	C+
73-77%	C
70-72%	C-
68-69%	D+
63-60%	D
59% or Below	F

## **INSTRUCTOR METHODS & COURSE POLICIES**

Students should read the textbook for the upcoming lecture material prior to watching the lecture. **The textbook is a very good read!** During reading and during lecture, students should take notes in lecture to enhance learning. You are encouraged to go to the office hours of the professor or any of the other free online UH Manoa tutoring resources for help working through problems. A list of free tutoring resources is posted on Laulima.

**Students are responsible for keeping track of their own points along with the instructor.** It is essential that students retain all returned assignments and course information. Late work will not be accepted; students must turn in assignments at assigned dates and times only. Every student is accountable for all work missed. Instructors are under no obligation to make special arrangements for students who are absent.

Students **MUST** have daily internet access and check their UH email and Laulima for updates and announcements regarding the course.

## **STUDENTS WITH DISABILITIES**

Students with conditions that may require classroom or test accommodations are encouraged to contact me privately and contact the KOKUA Program (the Office for Students with Disabilities). KOKUA can be reached at (808) 956-7511 or (808) 956-7612 (voice/text) in Room 013 of the Queen Lili'uokalani Center for Student Services.

## **ACADEMIC DISHONESTY & CONDUCT**

Any act of plagiarism, or any other attempt to defraud the academic process will meet with reprimand and possible dismissal from the course without credit. Cheating in any form on an assignment will, at a minimum, result in a zero grade on that assignment and the filing of an Academic Dishonesty Report Form describing the incident with the Vice President of Student Affairs. Prior or future cheating incidents anywhere in the university could result in expulsion. Cheating includes: the copying or exchanging of information during exams or quizzes, using banned materials, information, or devices during exams/quizzes, and plagiarism. Exact reproduction of written materials from other students on any lab report will result in all parties receiving a zero. An on-line version of the Academic Honesty Policy for the university can be found at:

[http://www.studentaffairs.manoa.hawaii.edu/policies/conduct\\_code/](http://www.studentaffairs.manoa.hawaii.edu/policies/conduct_code/)