

**Course Syllabus**  
**Windward Community College – Fall 2018**

**Course Name:** Fundamentals of Biochemistry

**Course Number:** BIOC 141 (CRN 64108; 3 credits)

**Class Meeting Days and Times:** Online

**Instructor:** Dr. Christopher Guay

**Email:** cguay@hawaii.edu

**Course website:** <https://laulima.hawaii.edu> (use UH username / password)

**Office Hours:** By email anytime or in person at WCC by appointment

**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**

Biological chemistry focusing on the integration of concepts from general, inorganic, and biochemistry and their application to living systems. Satisfies the one-semester chemistry requirement for pre-nursing and pre-dental hygiene majors. (3 hrs. lecture)

*Prerequisite: A grade of 'C' or better in MATH 25, 26, 28, 29, 75X or higher or consent of instructor.*

*WCC: DP*

**STUDENT LEARNING OUTCOMES**

1. Utilize precise chemical language to effectively communicate biochemical and allied health-related concepts and results.
2. Analyze and apply appropriate procedures for solving biochemical and allied health-related calculations involving solids, liquids, gases, and solutions.
3. Relate the location of an element in the periodic table to its electronic structure and chemical reactivity.
4. Describe ionic and covalent bonding theories and apply them to the construction of proper Lewis structures and prediction of molecular characteristics.
5. Relate biochemical and allied health-related concepts, theories and laws to everyday phenomena.

**COURSE TASKS**

- Online activity and class participation (Discussion Forum on Laulima, etc.)
- Online homework assignments
- Online quizzes
- Research project
- Three midterm exams
- Final exam

## **REQUIRED COURSE MATERIALS**

- **Text:** J.G. Smith, *General, Organic, & Biological Chemistry*, 4th ed., bundled with a Connect Plus Access Code (for online homework and e-text access). For instructions on how to purchase an access code and register, follow the link to “Getting Started with Connect” under the Modules section of our Lualaba course website.
- You will also need a scientific calculator and reliable Internet access.

## **GRADING**

1. Grades will be based on the following categories:

- i. Homework and online activity
- ii. Quizzes
- iii. Research project
- iv. Midterm Exam 1
- v. Midterm Exam 2
- vi. Midterm Exam 3
- vii. Final Exam

Your percentage score in each category will be determined, and an average percentage score for the 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 %

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. **Online activity and class participation:** You will be required to post your thoughts and comments on assigned topics and respond to your classmates' posts on the Discussion Forum on our Lualaba course website. Posting topics and deadlines will be announced throughout the course.
3. **Homework assignments:** Online homework assignments will be given through our course website on the Connect website. Homework assignments will typically be due each Monday and Thursday (the due dates for each assignment will be posted on Connect). Note that assignments are due on or before the specified date even if that date is a holiday.
4. **Quizzes:** An online quiz will be given once per week. The quizzes will be available through our course site on Lualaba. The quizzes will have a time limit (roughly 20 minutes, but may be longer or shorter depending on the material covered on the quiz). You will need to complete each quiz by the specified deadline.
5. **Research Project:** You will be asked to create a power point presentation (~10 slides) summarizing and discussing an article from a scientific journal related to biochemistry. Instructions for preparing the research project will be posted on our course website on Lualaba.
6. **Midterm Exams:** 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. You must take the exams ***in person*** at the WCC Testing Center (located in the library on the WCC campus). **Note:** If you are not able to come to the WCC Testing Center to take the exams, you must notify me during the first week of class so we can make arrangements for you to take the exams in person at a suitable alternative facility.

7. **Final Exam:** The *final exam* will *cover all topics* presented in the course (*i.e.*, the exam is cumulative). You will be given 2 hours to complete the exam. The final exam will be closed book. The final exam must also be taken in person at the WCC Testing Center.

## **HOW TO STUDY FOR THIS COURSE**

Science courses at WCC are very time-intensive, *particularly* during the short summer semester. 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.

- You should plan on spending ***about least one to two hours per day*** watching the lecture videos and ***an additional twelve hours per week (at minimum)*** working on the assigned e-text readings, going through tutorials and other supplemental materials, completing the online homework assignments, etc.

It is your responsibility to allocate the appropriate amount of time needed for study and be realistic about all personal and professional commitments that may cut into your study time.

## **Helpful Tips**

1. Read the sections of the ***text*** that correspond to the topics shown on the *course schedule*.
2. Watch the ***lecture videos*** that are assigned for the topics 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.
3. Take ***notes*** during the lecture videos, 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 sample 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.
4. ***Review*** your notes soon after reading the text and watching the videos.
5. Participate actively and interact with the class on the ***Discussion Forum*** on Lulima.
6. Work through the ***online tutorials*** and other supplemental materials that are posted in the "Additional Resources" section for each chapter on Lulima.
7. Work on the ***homework assignments*** on Connect that correspond to the material covered in the textbook readings and videos you watched.
8. Start getting ideas for and working on your ***research project*** early. Don't wait until the last minute to get things rolling.
9. Study for the ***exams*** using the review guides that will be posted on Lulima. You can also prepare for the exams by doing practice problems similar to those included on the homework assignments, quizzes, and lecture slides.
10. Ask me questions at any time via email. If you are having trouble with any of the topics we are covering, you should seek clarification and additional explanation from me right away! If you are going to be on the WCC campus and want to meet with me in person, let me know and you can stop by during the office hours I hold for my face-to-face courses. Don't wait until you have fallen behind and feel overwhelmed before you seek help.

## **OTHER POLICIES**

1. Reading/lecture topics and exam dates are found in the ***course schedule***.
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.

3. **Missed Quizzes:** If you do not complete any of the online quizzes **by the specified deadline**, you 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 Lulima**.
6. **Communicating with Instructor:** The best way to reach me is by email and/or during my in person office hours. Time spent during office hours will be more efficient if you prepare ahead of time and are ready with specific questions 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 '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 staying focused during the readings and lecture videos, working through additional practice problems on your own, studying with other students, 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 – ask one of the Testing Center staff.
- Keep your eyes on your own paper. If you are observed 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.

Use this schedule as a guide to determine which sections in the text you should be reading (and the corresponding lecture videos, tutorials, etc., that you should be working with) over the course of the semester.

DATE		TEXT SECTION	TOPIC	OTHER COURSE ASSIGNMENTS	
August	20	M	1.1	Introduction	
	21	Tu	1.2, 1.3	States of matter; classification of matter	
	22	W	1.4	Measurements	
	23	Th	1.5	Significant figures	
	24	F	1.6	Scientific notation	
	25	Sa	1.7	Unit conversion; dimensional analysis	
	26	Su	1.8	Clinical conversion factors	
	27	M	1.9	Temperature	Online HW#1 Due
	28	Tu	1.10	Density and specific gravity	
	29	W	2.1	Elements	
	30	Th	2.2	Atomic structure	
	31	F	2.3	Isotopes	Online HW#2 Due
September	1	Sa	2.3	Isotopes	
	2	Su	2.4	The periodic table	
	3	M	2.4	The periodic table	
	4	Tu	2.5	Electronic structure	Online HW#3 Due
	5	W	2.6	Electronic configuration	
	6	Th	2.6	Electronic configuration	
	7	F	2.7	Valence electrons	
	8	Sa	2.7	Valence electrons	
	9	Su	2.8	Periodic trends	Online HW#4 Due
	10	M	2.8	Periodic trends	
	11	Tu	3.1	Introduction to bonding	
	12	W	3.2	Ions	
	13	Th	3.2	Ions	
	14	F	3.3	Ionic compounds	Online HW#5 Due
	15	Sa	3.3	Ionic compounds	
	16	Su	3.4	Naming ionic compounds	
	17	M	3.4	Naming ionic compounds	Midterm 1 available at WCC Testing Center
	18	Tu	3.4	Naming ionic compounds	Midterm 1 available at WCC Testing Center
	19	W	3.5	Physical properties of ionic compounds	Midterm 1 available at WCC Testing Center
	20	Th	3.5	Physical properties of ionic compounds	Online HW#6 Due Midterm 1 available at WCC Testing Center
	21	F	3.6	Polyatomic ions	Midterm 1 available at WCC Testing Center
	22	Sa	3.6	Polyatomic ions	
	23	Su	4.1	Introduction to covalent bonding	
	24	M	4.2	Lewis structures	
	25	Tu	4.3	Exceptions to the octet rule	
	26	W	4.4	Resonance	Online HW#7 Due
	27	Th	4.5	Naming covalent compounds	
	28	F	4.5	Naming covalent compounds	
	29	Sa	4.6	Molecular shape	
	30	Su	4.6	Molecular shape	
October	1	M	4.7	Electronegativity and bond polarity	
	2	Tu	4.7	Electronegativity and bond polarity	
	3	W	4.8	Polarity of molecules	
	4	Th	4.9	Covalent drugs and medicinal products	Online HW#8 Due
	5	F	5.1	Introduction to chemical reactions	
	6	Sa	5.2	Balancing chemical reactions	
	7	Su	5.3	Types of Reactions	
	8	M	5.4	Oxidation and Reduction	
	9	Tu	5.4	Oxidation and Reduction	Online HW#9 Due
	10	W	5.5	The Mole and Avogadro's Number	
	11	Th	5.6	Mass to Mole Conversions	
	12	F	5.7	Mole calculations in chemical equations	

DATE		TEXT SECTION	TOPIC	OTHER COURSE ASSIGNMENTS
October	13	Sa	5.8	Mass calculations in chemical equations
	14	Su	5.8	Mass calculations in chemical equations
	15	M	5.9	Percent Yield Online HW#10 Due
	16	Tu	5.10	Pacemakers Research project: Description of intended journal article due
	17	W	6.1	Energy
	18	Th	6.2	Energy changes in reactions
	19	F	6.2	Energy changes in reactions
	20	Sa	6.3	Energy diagrams
	21	Su	6.3	Energy diagrams Online HW#11 Due
	22	M	6.4	Reaction rates Midterm 2 available at WCC Testing Center
	23	Tu	6.4	Reaction rates Midterm 2 available at WCC Testing Center
	24	W	6.5	Equilibrium Midterm 2 available at WCC Testing Center
	25	Th	6.5	Equilibrium Midterm 2 available at WCC Testing Center
	26	F	6.5	Equilibrium Midterm 2 available at WCC Testing Center
	27	Sa	6.6	Le Châtelier's Principle
	28	Su	6.6	Le Châtelier's Principle
	29	M	6.7	Body temperature Online HW#12 Due
	30	Tu	7.1	The three states of matter Research project: Outline due
	31	W	7.2	Gases and pressure
November	1	Th	7.3	Gas laws relating pressure, volume and temperature
	2	F	7.3	Gas laws relating pressure, volume and temperature
	3	Sa	7.4	Avogadro's law (volume and moles)
	4	Su	7.5	Ideal gas law Online HW#13 Due
	5	M	7.6	Dalton's law and partial pressures
	6	Tu	7.7	Intermolecular forces
	7	W	7.8	The liquid state
	8	Th	7.9	The solid state
	9	F	7.10	Specific Heat
	10	Sa	7.11	Energy and phase changes
	11	Su	7.12	Heating and cooling curves Online HW#14 Due
	12	M	8.1	Introduction to solutions
	13	Tu	8.2	Electrolytes and non-electrolytes Research project: Rough draft due
	14	W	8.3	Solubility – general features
	15	Th	8.4	Solubility – effects of temperature and pressure
	16	F	8.5	Concentration units Online HW#15 Due
	17	Sa	8.5	Concentration units
	18	Su	8.6	Molarity Comments on research project drafts due
	19	M	8.6	Molarity
	20	Tu	8.7	Dilution Online HW#16 Due Midterm 3 available at WCC Testing Center
	21	W	8.8	Colligative properties Midterm 3 available at WCC Testing Center
Nov 22-23 (Th-F)		<b>THANKSGIVING!!</b> <b>Relax, study, catch up, work on your research project</b>		
	24	Sa	8.9	Osmosis and dialysis
	25	Su	9.1	Introduction to acids and bases
	26	M	9.2	Reactions of Bronsted-Lowry acids and bases Online HW#17 Due Midterm 3 available at WCC Testing Center
	27	Tu	9.3	Acid and base strength Midterm 3 available at WCC Testing Center
	28	W	9.4	Equilibrium and acid dissociation constants Online HW#18 Due Midterm 3 available at WCC Testing Center
	29	Th	9.5	Dissociation of water
	30	F	9.6	The pH scale
December	1	Sa	9.6	The pH scale Online HW#19 Due
	2	Su	9.7	Common acid-base reactions
	3	M	9.8	Acidity and basicity of salt solutions
	4	Tu	9.9	Titration Online HW#20 Due
	5	W	9.9	Titration
	6	Th	9.10, 9.11	Buffers Online HW#21 Due

**Research project Final draft due on Sunday, Dec 9 (by 11:59 pm) !!!**

**FINAL EXAM: Available at WCC Testing Center Dec 10-14 (Monday - Friday)**

**TITLE IX** Title IX prohibits discrimination on the basis of sex in education programs and activities that receive federal financial assistance. Specifically, Title IX prohibits sex discrimination; sexual harassment and gender-based harassment, including harassment based on actual or perceived sex, gender, sexual orientation, gender identity, or gender expression; sexual assault; sexual exploitation; domestic violence; dating violence; and stalking. For more information regarding your rights under Title IX, please visit: [https://windward.hawaii.edu/Title\\_IX/](https://windward.hawaii.edu/Title_IX/). Windward Community College is committed to the pursuit of equal education. If you or someone you know has experienced sex discrimination or gender-based violence, Windward CC has resources to support you. To speak with someone confidentially, contact Karla Silva-Park, Mental Health Counselor, at 808-235- 7468 or [karlas@hawaii.edu](mailto:karlas@hawaii.edu) or Kaahu Alo, Designated Confidential Advocate for Students, at 808-235- 7354 or [kaahualo@hawaii.edu](mailto:kaahualo@hawaii.edu). To make a formal report, contact the Title IX Coordinator at 808-235-7393 or [wcctix@hawaii.edu](mailto:wcctix@hawaii.edu).