

Course Syllabus
Windward Community College – Fall 2015

Course Name: Fundamentals of Biochemistry

Course Number: BIOC 141 (CRN 60239; 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: Mondays 7–8 pm online via Chat tool on Laulima course website

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 or higher or instructor's consent.

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

- Daily course website login/activity (videos, tutorials, discussion board, etc.)
- Online homework assignments
- Online quizzes
- Research paper
- Three midterm exams
- Final exam

REQUIRED COURSE MATERIALS

- **Text:** J.G. Smith, *General, Organic, & Biological Chemistry*, 2nd ed., bundled with a Connect Plus Access Code (for online homework and e-text access). Available at WCC and LCC bookstores. **NOTE:** If you want to bypass the printed textbook altogether and just go with the e-text, you can purchase a Connect Plus Access Code directly online. For instructions, follow the links to “Getting Started with Connect” under the Modules section on our Lualima course page
- 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 attendance/activity
 - ii. Quizzes
 - iii. Research Paper
 - 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 attendance/activity:** This will be checked using the Site Stats tool on Lualima. You are *required to log into the site on at least four days out of each week and actively engage with the module resources (videos, tutorials), discussion board, etc.* – you will lose points if you fail to do this.
3. **Homework assignments:** Online homework assignments will be given through our course page on the Connect website (<http://connect.mheducation.com/class/c-guay-fall-2015>). 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 (e.g., the Monday of Labor Day).
4. **Quizzes:** An online quiz will be given once per week. The quizzes will be available through our course site on Lualima. 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 Paper:** You will be asked to write a three-page research paper describing a chemistry concept and its connection to an issue or topic in everyday life. Instructions for writing the research paper are posted in the “Modules” section of our course website on Lualima.
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

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. 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. Work through the **online tutorials** and other supplemental materials that are posted in the "Resources" section for each chapter under the "Modules" on the course website on Lulima.
6. Work on the **homework assignments** on Connect that correspond to the material covered in the textbook readings and videos you watched.
7. Start getting ideas for and working on your **research paper** early. Don't wait until the last minute to get things rolling.
8. 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.
9. Take advantage of my **online office hours** via the Chat tool on our Lulima website. If you are having trouble with any of the topics we are covering, ask me for clarification and additional explanation right away! If you are going to be on the WCC campus and want to meet with me in person, let me know and I can schedule time for you 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**, 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 Lulima***.
6. **Communicating with Instructor:** The best way to reach me is by email and/or using the Chat tool on Lulima during my online 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. 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.

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

BIOC 141 (Guay) Windward Community College
Course Schedule Spring 2015

DATE		TEXT SECTION	TOPIC	OTHER COURSE ASSIGNMENTS
October	17 Sa	5.8	Limiting reactants	
	18 Su	5.9	Oxidation and reduction	
	19 M	5.9	Oxidation and reduction	
	20 Tu	5.10	Pacemakers	
	21 W	6.1	Energy	
	22 Th	6.2	Energy changes in reactions	
	23 F	6.2	Energy changes in reactions	Research paper: Description of intended topic due
	24 Sa	6.3	Energy diagrams	
	25 Su	6.3	Energy diagrams	
	26 M	6.4	Reaction rates	Midterm 2 available at WCC Testing Center
	27 Tu	6.4	Reaction rates	Midterm 2 available at WCC Testing Center
	28 W	6.5	Equilibrium	Midterm 2 available at WCC Testing Center
	29 Th	6.5	Equilibrium	Midterm 2 available at WCC Testing Center
	30 F	6.5	Equilibrium	Midterm 2 available at WCC Testing Center
	31 Sa	6.6	Le Châtelier's Principle	
November	1 Su	6.6	Le Châtelier's Principle	
	2 M	6.7	Body temperature	
	3 Tu	7.1	The three states of matter	
	4 W	7.2	Gases and pressure	
	5 Th	7.3	Gas laws relating pressure, volume and temperature	
	6 F	7.3	Gas laws relating pressure, volume and temperature	Research paper: Peer-reviewed journal article citations due
	7 Sa	7.4	Avogadro's law (volume and moles)	
	8 Su	7.5	Ideal gas law	
	9 M	7.6	Dalton's law and partial pressures	
	10 Tu	7.7	Intermolecular forces	
	11 W	7.8	The liquid state	
	12 Th	7.9	The solid state	
	13 F	7.10	Energy and phase changes	Research paper: Outline due
	14 Sa	7.10	Energy and phase changes	
	15 Su	7.11	Heating and cooling curves	
	16 M	8.1	Introduction to solutions	
	17 Tu	8.2	Solubility — general features	
	18 W	8.3	Solubility — effects of temperature and pressure	
	19 Th	8.3	Solubility — effects of temperature and pressure	
	20 F	8.4	Concentration units	
	21 Sa	8.4	Concentration units	
	22 Su	8.5	Molarity	
	23 M	8.5	Molarity	Midterm 3 available at WCC Testing Center
	24 Tu	8.6	Dilution	Midterm 3 available at WCC Testing Center
	25 W	8.7	Colligative properties	Midterm 3 available at WCC Testing Center
	26 Th	8.7	Colligative properties	Midterm 3 available at WCC Testing Center
	27 F	8.8	Osmosis and dialysis	Midterm 3 available at WCC Testing Center
	28 Sa	9.1	Introduction to acids and bases	
	29 Su	9.2	Reactions of Brønsted-Lowry acids and bases	
	30 M	9.3	Acid and base strength	
December	1 Tu	9.4	Equilibrium and acid dissociation constants	
	2 W	9.5	Dissociation of water	
	3 Th	9.6	The pH scale	
	4 F	9.6	The pH scale	
	5 Sa	9.7	Common acid-base reactions	
	6 Su	9.8	Acidity and basicity of salt solutions	
	7 M	9.9	Titration	
	8 Tu	9.9	Titration	
	9 W	9.10	Buffers	
	10 Th	9.11	Buffers in the blood	

Research paper: Final draft due on Sunday, December 13 (by 11:59 pm) !!!

FINAL EXAM: Available at WCC Testing Center Dec 14-17 (Monday - Thursday)