

INSTRUCTIONAL SYLLABUS

TITLE: Introduction to Biochemistry

COURSE NUMBER: CH 228H

SECTION: All

INSTRUCTOR: Physical Science Faculty

DEPT/DIV: Physical Sciences/Natural Sciences, Mathematics and Technology

DELIVERY METHOD: Online

DATE: March 2020

OVERVIEW:

The principle goal of this course is a working understanding of human metabolism from the standpoint of the chemical reactions involved. You will investigate the chemistry of life using three major frameworks: structure/function, energetics, and dynamic equilibrium. You will develop and apply these frameworks to the analysis of the chemistry of organic and biological molecules (including carbohydrates, lipids, and proteins) and metabolic reactions and processes (including enzyme-catalyzed reactions and metabolic pathways related to energy production, utilization, and regulation). At the same time, you will articulate your understanding in writing, demonstrating correct and precise use of biochemical terminology and appropriate chemical rationale.

TEXTS AND MATERIALS:

CH 228H Text: Students are required to have access to a scientific calculator and a one-semester textbook covering General, Organic and Biochemistry. One suggestion would be:

General, Organic and Biological Chemistry
Laura Frost and Todd Deal (Pearson), 4th Edition, 2020

Current edition is the 4th. Any edition is acceptable.

COURSE OUTCOMES:

The principle goal of this course is a working understanding of intermediary metabolism, which is a summation of the chemical reactions in humans. This can be broken down to several components. Upon successful completion of this course, you should be able to:

1. Identify (by name, formula or function) compounds representative of the functional

groups and types characteristic of the various biomolecules.

2. Demonstrate relationships between structure and physical properties, between structure and chemical reactivity for these compounds.
3. Analyze the structure and function of biomolecules, particularly carbohydrates, lipids, proteins, and enzymes, using structure-property and energetic frameworks.
4. Draw relationships among the types of reactions, catalytic agents, and control systems in cells, especially with regard to energy production, utilization, and regulation. This phase also requires knowledge of the means by which cells solve problems involving energy transfers.
5. Articulate, in writing, scientific principles (including proper use of terminology and vocabulary) and thought processes for arriving at problem answers.

ASSIGNMENTS/ASSESSMENTS:

Assessments of the development of your critical thinking and analytical skills, including your mastery of course content, will take place at the end of each course module in this online course. Quizzes and assignments incorporated into each module will help prepare you for these assessments. All quizzes for each module must be completed to unlock the assessment for that module.

Course outcomes are demonstrated through development of answers that meet assessment criteria. All criteria must be satisfactory to demonstrate the course outcomes.

COURSE MODULES:

Module 1: Atomic Structure and Chemical Bonding

Module 2: Functional Groups and Organic Reactions

Module 3: Physical Properties and Noncovalent Interactions

Module 4: Thermodynamic Principles

Module 5: Acid/Base Chemistry

Module 6: Biomolecules

Module 7: Glucose Metabolism

EXPECTATIONS:

The recommendation is for all students to complete one module per week leaving time to the end for a final assessment project.

Email

You are expected to check your Alverno e-mail regularly. Alverno email is the College's official way of communicating. If your instructor needs to communicate with you outside the scheduled lab and class times, you will receive an email to your Alverno address. Instructors can also be contacted through their Alverno email accounts, which will be provided at the start of the course. You can access student email through [Outlook Web App \(OWA\) at https://student.alverno.edu/](https://student.alverno.edu/).

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From the Alverno Student Handbook

Be Ethical

Accurately identify yourself and your affiliations; use the Alverno College name only for official school business; use Alverno College technologies for lawful purposes only.

Be Respectful

Do not share confidential information; do not send offensive communications or materials; do not send chain letters, spam, or unsolicited advertisements.

Be Secure

Do not share your password; change your password when prompted; if you are using a personal computer, it must have an anti-virus software.

Accessibility

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Academic Honesty

Throughout your studies at Alverno College, you will be exposed to a variety of learning styles and experiences. In some classes faculty require students to complete assignments in groups while others may require students to complete work on an independent basis. Both experiences can be stimulating and rewarding. Each academic experience at Alverno requires that you take responsibility for your own work in accordance with the instructions of your professor and with sound academic principles. Each student is expected to conduct her work in ways that are academically honest.

Academic honesty is a basic requirement of the Alverno programs. Failure to comply with procedures that are academically honest is grounds for failing a class, being dismissed from a particular program or being dismissed from the college.

Professional Behavior

Appropriate professional behavior is expected of all students. Your professionalism in this course must be of the highest standards. Included within the realm of professionalism is your ability to interact appropriately with other students and the professor through all modes of communication and interaction. Unprofessional behaviors will be addressed by the instructor and may result in an unsatisfactory progress code.