Master Course Syllabus

For additional course information, including prerequisites, corequisites, and course fees, please refer to the Catalog: https://catalog.uvu.edu/

Semester: Spring
Year: 2025
Course Prefix: CHEM
Course and Section #: 3600-001
Course Title: Biological Chemistry
Credits: 3

Course Description

I Introduces principles of the chemical processes that define living organisms. Covers structure and function of proteins, carbohydrates, lipids and nucleic acids. Explores metabolic pathways, biosynthesis, enzymatics, thermodynamics, membrane dynamics and related processes within a living cell. Emphasizes molecular mechanisms of reactions and their outcome.

Course Attributes

This course has the following attributes:

☐ General Education Requirements
☐ Global/Intercultural Graduation Requirements
☐ Writing Enriched Graduation Requirements
☒ Discipline Core Requirements in Program
☒ Elective Core Requirements in Program
☐ Open Elective

Other: *Click here to enter text.*

Instructor Information

Instructor Name: Professor Nathan E. Goldfarb, B.S., M.S., Ph.D.

Student Learning Outcomes

1. **Appreciate the relationship of Biochemistry to both Biology and Chemistry, bringing these two branches of science together in a meaningful way.**
2. **Grasp the centrality of proteins as mediators of biochemical function, including protein structure/function relationships and the concept of molecular recognition.**
3. **Conceptually apply the basic methods used to study proteins and other biomolecules.**
4. **Apprehend the central role of enzymes in enabling biochemical pathways and systems, and analyze the properties and basic mechanisms of enzymes as catalysts.**
5. **Identify the major means of enzyme regulation and how that enables dynamic biological response.**
6. **Enumerate the structures and roles of carbohydrates in biology.**
7. **Categorize lipids, including those involved in membranes, and appreciate the roles of proteins in membranes as well.**
8. **Synthesize a coherent view of the basic metabolic concepts, including both catabolism and anabolism.**

9. **Be intimately familiar with the fundamental energy metabolism pathways (glycolysis, citric acid cycle, electron transport chain and oxidative phosphorylation)**
10. **Assimilate the concepts of photosynthetic fixation of carbon and the fixation of nitrogen, as well as the subsequent biosynthetic pathways that create biomolecules.**
11. **Overview the integration of metabolic pathways at the level of the organism as well as the level of the cell.**
12. **See the relevance to human health of biochemical pathways including those of metabolism.**

Course Materials and Texts

Biochemistry, Berg, Tymoczko & Stryer, 9th ***or*** 10th ed.

Course Requirements

Course Assignments, Assessments, and Grading Policy
TOTAL 100%

Exam 1:	**20%**
Exam 2:	**20%**
Exam 3:	**20%**
Exam 4:	**20%**
Final Exam:	**20%**
Extra Credit:	**up to 2%**
	102%

Required or Recommended Reading Assignments

Biochemistry, Berg, Tymoczko & Stryer, 9th ***or*** 10th ed.

General Description of the Subject Matter of Each Lecture or Discussion

- Chapter 1 and 2: Introduction to the class/ Molecular Interactions and Proteins I
- Chapter 3: Proteins II
- Chapter 7: Globins
- Chapter 8: Enzymes
- Chapter 9: Mechanisms
- Chapter 10: Regulation
- Chapter 11: Carbohydrates
- Chapter 12: Lipids
- Chapter 15: Metabolism Overview
- Chapter 16: Glycolysis and Gluconeogenesis
- Chapter 17: Krebs Cycle
- Chapter 18: Oxidative Phosphorylation
- Chapter 19: Photosynthesis
- Chapter 20: Calvin Cycle

• Chapter 21: Glycogen Metabolism
• Chapter 22: Fatty Acid Metabolism
• Chapter 22: Amino Acid Catabolism
• Chapter 22: Amino Acid Anabolism

Required Course Syllabus Statements

Generative AI
This course requires you to complete assignments that assess your understanding, application, and problem-solving ability applied to chemistry. You are expected to do your own work. Problem solving and scientific thinking are tools that are necessary for students to learn in this course. The use of artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, is strictly prohibited for any part of your assignments. Using these tools will be considered academic dishonesty and will be handled according to the university's academic honesty policy. If you have questions about acceptable use of AI tools, please consult the instructor before submitting your work.

Using Remote Testing Software
☒ This course does not use remote testing software.

☐ This course uses remote testing software. Remote test-takers may choose their remote testing locations. Please note, however, that the testing software used for this may conduct a brief scan of remote test-takers' immediate surroundings, may require use of a webcam while taking an exam, may require the microphone be on while taking an exam, or may require other practices to confirm academic honesty. Test-takers therefore shall have no expectation of privacy in their test-taking location during, or immediately preceding, remote testing. If a student strongly objects to using test-taking software, the student should contact the instructor at the beginning of the semester to determine whether alternative testing arrangements are feasible. Alternatives are not guaranteed.

Required University Syllabus Statements

Accommodations/Students with Disabilities
Students needing accommodations due to a permanent or temporary disability, pregnancy or pregnancy-related conditions may contact UVU Accessibility Services at accessibilityservices@uvu.edu or 801-863-8747.

Accessibility Services is located on the Orem Campus in BA 110.

Deaf/Hard of Hearing students requesting ASL interpreters or transcribers can contact Accessibility Services to set up accommodations. Deaf/Hard of Hearing services can be contacted at DHHservices@uvu.edu

DHH is located on the Orem Campus in BA 112.

Academic Integrity
At Utah Valley University, faculty and students operate in an atmosphere of mutual trust. Maintaining an atmosphere of academic integrity allows for free exchange of ideas and enables all members of the community to achieve their highest potential. Our goal is to foster an intellectual atmosphere that

produces scholars of integrity and imaginative thought. In all academic work, the ideas and contributions of others must be appropriately acknowledged and UVU students are expected to produce their own original academic work.

Faculty and students share the responsibility of ensuring the honesty and fairness of the intellectual environment at UVU. Students have a responsibility to promote academic integrity at the university by not participating in or facilitating others' participation in any act of academic dishonesty. As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, assessments, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Likewise, instructors are responsible to clearly state expectations and model best practices.

Further information on what constitutes academic dishonesty is detailed in UVU Policy 541: *Student Code of Conduct*.

Equity and Title IX

Utah Valley University does not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, gender expression, age (40 and over), disability, veteran status, pregnancy, childbirth, or pregnancy-related conditions, citizenship, genetic information, or other basis protected by applicable law, including Title IX and 34 C.F.R. Part 106, in employment, treatment, admission, access to educational programs and activities, or other University benefits or services. Inquiries about nondiscrimination at UVU may be directed to the U.S. Department of Education's Office for Civil Rights or UVU's Title IX Coordinator at 801-863-7999 – TitleIX@uvu.edu – 800 W University Pkwy, Orem, 84058, Suite BA 203.

Religious Accommodation

UVU values and acknowledges the array of worldviews, faiths, and religions represented in our student body, and as such provides supportive accommodations for students. Religious belief or conscience broadly includes religious, non-religious, theistic, or non-theistic moral or ethical beliefs as well as participation in religious holidays, observances, or activities. Accommodations may include scheduling or due-date modifications or make-up assignments for missed class work.
To seek a religious accommodation, a student must provide written notice to the instructor and the Director of Accessibility Services at accessibilityservices@uvu.edu. If the accommodation relates to a scheduling conflict, the notice should include the date, time, and brief description of the difficulty posed by the conflict. Such requests should be made as soon as the student is aware of the prospective scheduling conflict.

While religious expression is welcome throughout campus, UVU also has a specially dedicated space for meditation, prayer, reflection, or other forms of religious expression.