SYLLABUS VMC_ BIOCHEMISTRY I (2026_SPRG_22093_CHEM_4301) **Start Date**: 01/14/2026 **End Date:** 05/05/2026 **Type:** Classroom **Building:** Warnock Science **Room**:00305 **Class hours:** Tuesday/Thursday 11:00AM-12:15PM	**Instructor:** Esra BALCIOGLU **E-mail:** esra.balcioglu@sulross.edu **Office hours:** Wednesday Afternoon, appointment by Blackboard Message **Office Phone:** 432 8378614 **Campus Office:** MAB 112/A

Contacting Me: The best way to reach me is via Blackboard Message. I will respond to Blackboard message inquiries as soon as possible.

COURSE MATERIALS

The following course materials are required

1. David L. Nelson; Michael M. Cox. Eighth Edition, 2021. Lehninger Principles of Biochemistry. Macmillan Learning. [VitalSource Bookshelf version] ISBN: 9781319350147
2. Recommended-American Psychological Association (October 2019). Publication Manual of the American Psychological Association, Seventh Edition, https://apastyle.apa.org/products/publication-manual-7th-edition-spiral

Additional resources, including supplementary readings, videos, and other materials, will be made available on Blackboard throughout the semester.

SRSU Library Services and Support

The Bryan Wildenthal Memorial Library at Sul Ross State University is your go-to hub for academic resources, offering a wealth of materials and services to the entire SRSU community at no cost. You'll find a vast collection of books, articles, and online databases readily accessible at www.library.sulross.edu. If you're accessing resources off campus, simply use your Lobo ID and password to log in. For checking out physical materials, remember to bring a photo ID.
Need assistance? Our librarians are here to help! You can reach them via email at srsulibrary@sulross.edu, by phone at 432-837-8123, or by visiting them in person.

Course Description

Biochemistry I is an upper-level undergraduate course that introduces the chemical principles underlying biological molecules and processes. The course covers the structure, properties, and functions of the major classes of biomolecules, including amino acids, proteins, carbohydrates, nucleotides, nucleic acids, and lipids. Topics also include the role of water in biological systems, protein structure and function, enzyme kinetics and mechanisms, glycobiology, membrane structure and transport, and the principles of bioenergetics.

Emphasis is placed on developing critical thinking and problem-solving skills by applying chemical concepts to biological systems. This course provides the foundation for advanced studies in metabolism, molecular biology, biotechnology, and related disciplines

Student Learning Objectives

Upon successful completion of this course, students will be able to:

- **Foundations of Biochemistry**: Explain the scope of biochemistry, cellular organization, and the chemical basis of life.
- **Water & Noncovalent Interactions**: Describe the properties of water, pH, buffering systems, and the role of weak interactions in biomolecular stability.
- **Amino Acids & Proteins**: Identify amino acid structures and properties; explain peptide bond formation, protein purification, and characterization techniques.
- **Protein Function**: Analyze the relationship between protein structure and function, including ligand binding, enzyme activity, and oxygen transport.
- **Enzymes**: Apply principles of enzyme kinetics, inhibition, and catalytic mechanisms.
- **Carbohydrates**: Classify carbohydrates and glycoconjugates and explain their structural and biological roles.
- **Nucleotides & Nucleic Acids**: Describe the structure, chemical properties, and biological functions of nucleotides, DNA, and RNA.
- **Lipids & Membranes**: Explain lipid structure, function, and classification; evaluate the organization and properties of biological membranes.
- **Membrane Transport**: Differentiate between passive and active transport and analyze the role of membrane proteins and ion channels.

Student Learning Outcomes (SLO)

A student graduating with a chemistry major is expected to demonstrate that (s)he is able to do the following:

- Explain the chemical basis of biological systems, including cellular organization and biomolecular interactions.
- Describe the role of water, pH, buffering systems, and noncovalent interactions in biomolecular structure and function.
- Identify the structures, properties, and functions of major classes of biomolecules, including proteins, carbohydrates, nucleotides, and lipids.
- Explain the relationship between protein structure and function, including ligand binding and enzyme activity.
- Apply principles of enzyme kinetics and catalytic mechanisms to biochemical problems.
- Analyze the structure and function of biological membranes and distinguish between passive and active transport mechanisms.

Technology Requirements

This course requires frequent use of **Blackboard**. Students must check it regularly for announcements, assignments, grades, and course materials. Key Blackboard tools include email, course documents, discussion boards, grade center, SafeAssign, and external links.

Basic Computer Skills Needed:

- Sending/receiving email with attachments
- Browsing the internet and downloading files
- Using word processing software (e.g., MS Word) **Required Technology:**
- A reliable computer with stable internet access
- A current web browser capable of streaming content and downloading materials
- Access to Blackboard using your **Lobo ID and password**
- For assistance, tutorials are available on the Blackboard support page.

Participation Policy

This is a fully online course with no class meetings scheduled. However, active participation is expected. To start, please complete the non-graded **"Introduction" post** to introduce yourself to your classmates and your professor.

Students are expected to:

- **Log into Blackboard regularly** to check announcements, assignments, and deadlines
- **Complete all assignments and exams online** by their posted due dates
- **Contact the instructor via email** with any questions about course materials, assignments, or exams.
- Consistent engagement is key to success in this course.

Attendance Policy

Although this is a fully online course, student engagement and participation are still mandatory. The University's attendance policy applies to all distance learning courses. A student may be dropped with an **"F" grade** for excessive non-participation—defined as **more than 3 weeks of inactivity** in a long semester, **1 week in a summer session**, or **3 days in a midwinter session**.

Inactivity includes:

- Not logging into Blackboard
- Not submitting assignments
- Not participating in required activities
- Not communicating with the instructor
- Not following the participation guidelines in the syllabus

Students must respect academic integrity and copyright laws. All submitted work must be their own unless group work is specifically assigned. Additionally, students accessing the course from a remote site are expected to treat the host campus, its facilities, and staff with professionalism and care.

Students are required to check their **SRSU email accounts regularly**, as all official communications—including those sent via Blackboard—will be directed there.

Late Assignment Submission Policy

All coursework and assignments must be submitted **by the stated deadlines**. Late work is generally **not accepted**, as students are informed of all due dates at the beginning of the term and are expected to plan accordingly.

Exceptions will only be made in cases of **documented and university-recognized excuses**. If a student misses an assignment or exam, they must promptly provide a valid explanation and supporting documentation.

Students are strongly encouraged to review the syllabus regularly and stay informed of all deadlines throughout the semester.

Academic Integrity
Students are expected to uphold the highest standards of academic honesty as outlined in the **Sul Ross Student Code of Conduct**. Any form of academic dishonesty—including **cheating, plagiarism, collusion, fabrication, or falsification of records**—will not be tolerated and will be addressed in accordance with university policies.

Definitions:
- **Cheating:** Using unauthorized materials or assistance during exams, altering academic records, or obtaining answers through dishonest means.
- **Plagiarism:** Submitting another's work, ideas, or words as your own without proper citation.
- **Collusion:** Assisting or being complicit in another student's academic dishonesty.

Using tools like **ChatGPT or other AI generators** is prohibited unless explicitly permitted for a specific assignment. Violations may result in penalties ranging from a failing grade on an assignment to failure of the course and may lead to further disciplinary action.
Maintaining academic integrity protects both the value of your education and the credibility of the university.

Student Support Services
Sul Ross State University offers various programs to help students succeed, including advising, counseling, mentoring, tutoring, supplemental instruction, and writing assistance. For a complete list of services, visit Student Support Services **at** https://www.sulross.edu/section/311/student-support-services. For more information, contact SSS at (432) 837-9118 or visit Ferguson Hall, Room 105.

Counseling Services: Sul Ross students have access to nine free counseling sessions through TimelyCare. For 24/7 support, visit TimelyCare/SRSU. In-person counseling is also available in Ferguson Hall, Room 112 (Alpine campus), and via telehealth for remote and RGC students.

Students with Special Needs - Americans with Disabilities Act as Amended (ADAAA)
Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Alpine students seeking accessibility/accommodations services must contact Mary Schwartze Grisham, M.Ed., LPC, SRSU's Accessibility Services Coordinator at
432-837-8203, or email mschwartze@sulross.edu The office is located on the first floor of Ferguson Hall # 112, and the mailing address is P.O. Box C-122, SRSU, Alpine. Texas, 79832.

Course Evaluation
- **Attendance Requirement**: Students who are absent for more than **nine (9) lectures** will automatically fail the course.
- **Classroom Policy**: Cell phones must be turned off during class and are strictly prohibited during examinations.
- **Homework (30%)**: Homework will be assigned throughout the semester and will account for **30% of the final grade**. All assignments must be completed in **pen** and submitted by the specified due date.
- **Examinations**: The course includes one midterm examination and a comprehensive final examination. **No make-up exams** will be offered. The final exam is **mandatory**.
- **Important Dates**: Students are responsible for consulting the course calendar and the university's academic calendar on Blackboard for all due dates and deadlines.

Grading

Grading Components

Assessment	%
Homework	30
Midterm Exam	30
Final Exam	40
Total Possible Points	100

Course Grade Scale

Letter Grade	Points Range
A	100 –90
B	89 – 80
C	79 – 60
D	59 –50
F	49 & below

Course Schedule

This course schedule is subject to change as needed to meet the needs of the course. Students will be notified of adjustments when they are made. Also, any additional reading materials, resources and other information will be posted on Blackboard.
Students will be notified of how to access this information by the instructor. ***All times are in central time***

Week	Dates	Topics	Assignments
1	January 14-18th 15th 1st Day of class	✓ **Course Introduction & Requirements**	Syllabus & Semester Project Guidelines
2	January 19-25	✓ Cellular Foundations ✓ Chemical Foundations ✓ Physical Foundations ✓ Genetic Foundations ✓ Evolutionary Foundations	**Chapter 1:** Foundations of Biochemistry
3	January 26-Feb 1	✓ Weak Interactions in Aqueous System ✓ Ionization of Water, Weak Acids and Bases ✓ Buffering against pH Changes in Biological System	**Chapter 2:** Water, The Solvent of Life
4	February 2-8	✓ Amino acids	**Chapter 3:**

		✓ Peptides and Proteins ✓ Working with Proteins ✓ The Structure of Proteins: Primary Structure	Amino acids, Peptides, and Proteins
5	February 9-15	✓ Overview of Protein Structure ✓ Protein Secondary Structure ✓ Protein Tertiary and Quaternary Structures ✓ Protein Denaturation and Folding ✓ Determination of protein and Biomolecular Structures	**Chapter 4:** The Three-Dimensional Structure of Proteins
6	February 15-22	✓ Reversible Binding of a Protein to a Ligand: Oxygen-Binding Proteins ✓ Complementary Interactions between Proteins and Ligands: The Immune System and Immunoglobulins ✓ Protein Interactions Modulated by Chemical Energy	**Chapter 5:** Protein Function
7	February 23- March 1	✓ An Introduction to Enzymes ✓ How Enzymes Work ✓ Enzyme Kinetics are Approach to Understanding Mechanism	**Chapter 6:** Enzymes
8	March 2-8 March 6, Final Day for Midterm Exam	✓ **Midterm Exam**	
9	March 9-15	✓ March 9-13 Spring Break No Classes	
10	March 16-22	✓ Examples of Enzymatic Reactions ✓ Regulatory Enzymes	**Chapter 6:** Enzymes
11	March 23-29	✓ Monosaccharides and Disaccharides ✓ Polysaccharides ✓ Glycoconjugates: Proteoglycans, Glycoproteins, and Glycolipids ✓ Carbohydrates as Informational Molecules: The Sugar Code ✓ Working with Carbohydrates	**Chapter 7:** Carbohydrates and Glycobiology
12	March 30-April 5	✓ Some Basic Definitions and Conventions	

		✓ Nucleic Acid Structure ✓ Nucleic Acid Chemistry ✓ Other Functions of Nucleotides	**Chapter 8:** Nucleotides and Nucleic Acids
13	April 6-12	✓ Storage Lipids ✓ Structural Lipids in Membranes ✓ Lipids as Signals, Cofactors, and Pigments ✓ Working with Lipids	**Chapter 10:** Lipids
14	April 13-19	✓ The Composition and Architecture of Membranes ✓ Membrane Dynamics ✓ Solute Transport Across Membranes	**Chapter 11:** Biological Membranes and Transport
15	April 20-26 April 29	✓ Biochemical Signaling ✓ **Last Class Day before Finals**	**Chapter 12:** Biochemical Signaling
16	May 1-3	✓ Final Exams	

END OF COURSE EVALUATIONS: Student evaluations of faculty are administered online at the end of each term/session for all courses with five or more students. Students will receive an email containing a link to a survey for each course in which they are enrolled. All responses are anonymous.