SYLLABUS 001_ BIOCHEMISTRY II (2026_SPRG_22094_CHEM_4302) **Start Date**: 01/14/2026 **End Date:** 05/05/2026 **Type:** Classroom **Building:** Warnock Science **Room**:00305 **Class hours:** Tuesday/Thursday 02:00PM-03:15PM	SUL ROSS THE FRONTIER UNIVERSITY of Texas **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 II is an upper-division course that builds on the principles of Biochemistry I and focuses on the molecular basis of metabolism and genetic information processing. The course covers major metabolic pathways, their biochemical mechanisms, regulation, and integration in biological systems. Topics include carbohydrate metabolism (glycolysis, gluconeogenesis, the pentose phosphate pathway, and glycogen metabolism), the citric acid cycle, oxidative phosphorylation, fatty acid catabolism, amino acid oxidation and urea production, and lipid biosynthesis. Additional topics include photosynthesis and carbohydrate synthesis in plants, biosynthesis of amino acids, nucleotides, and related molecules, hormonal regulation and integration of mammalian metabolism, and the metabolism of DNA, RNA, and proteins. Emphasis is placed

on understanding how metabolic and genetic processes are coordinated to support cellular and physiological function.

Student Learning Objectives

The objectives of this course are to enable students to:

- Understand the biochemical mechanisms of major metabolic and biosynthetic pathways.
- Explain how metabolic pathways are regulated and integrated at the cellular and organismal levels.
- Examine the molecular basis of energy production and utilization.
- Understand the relationship between metabolism, gene expression, and protein turnover.
- Apply biochemical principles to physiological, biomedical, or experimental contexts.

Student Learning Outcomes

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

- Describe the structure, function, and regulation of major metabolic pathways involved in carbohydrate, lipid, and amino acid metabolism.
- Explain the biochemical basis of oxidative phosphorylation, photosynthesis, and biosynthetic processes.
- Analyze the hormonal regulation and integration of metabolism in mammalian systems.
- Describe the metabolism of DNA, RNA, and proteins and their roles in gene expression.
- Integrate metabolic and molecular biology concepts to interpret biochemical data or physiological case studies.

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	✓ Bioenergetics and Thermodynamics ✓ Common Biochemical Reactions ✓ Biological Oxidation and Reduction Reactions	**Chapter 13:** Introduction to Metabolism
3	January 26-Feb 1	✓ Glycolysis ✓ Gluconeogenesis ✓ The Pentose Phosphate Pathway of Glucose Oxidation	**Chapter 14:** Glycolysis, Gluconeogenesis, and the Pentose Phosphate Pathway
4	February 2-8	✓ The Structure and Function of Glycogen ✓ Breakdown and Synthesis of Glycogen	**Chapter 15:** The Metabolism of Glycogen in Animals
5	February 9-15	✓ Production of Acetyl-CoA ✓ Reactions of the Citric Acid Cycle ✓ The Hub of Intermediary Metabolism ✓ Regulation of the Citric Acid Cycle	**Chapter 16:** The Citric Acid Cycle
6	February 15-22	✓ Digestion, Mobilization, and Transport of Fats ✓ Oxidation of Fatty Acids ✓ Ketone Bodies	**Chapter 17:** Fatty Acid Catabolism
7	February 23- March 1	✓ Metabolic Fates of Amino Groups ✓ Nitrogen Excretion and the Urea Cycle ✓ Pathways of Amino Acid Degradation	**Chapter 18:** Amino Acid Oxidation and the Production of Urea
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	✓ Mitochondrial Respiratory Chain ✓ ATP Synthesis ✓ Regulation of Oxidative Phosphorylation ✓ Mitochondria in Thermogenesis, Steroid Synthesis, and Apoptosis ✓ Mitochondrial Genes	**Chapter 19:** Oxidative Phosphorylation
11	March 23-29	✓ Light Absorption ✓ Photochemical Reaction Centers ✓ Evolution of a Universal Mechanism for ATP Synthesis ✓ Biosynthesis of Starch, Sucrose, and Cellulose	**Chapter 20:** Photosynthesis and Carbohydrate Synthesis in Plants
12	March 30-April 5	✓ Biosynthesis of Fatty Acids and Eicosanoids ✓ Biosynthesis of Triacylglycerols ✓ Biosynthesis of Membrane Phospholipids	**Chapter 21:** Lipid Biosynthesis
13	April 6-12	✓ Nitrogen Metabolism ✓ Biosynthesis of Amino Acids ✓ Molecules Derived from Amino Acids ✓ Biosynthesis and Degradation of Nucleotides	**Chapter 22:** Biosynthesis of Amino Acids, Nucleotides, and Related Molecules
14	April 13-19	✓ Hormone Structure and Action ✓ Tissue-Specific Metabolism ✓ Hormonal Regulation of Fuel Metabolism ✓ Chromosomal Elements ✓ The Structure of Chromosomes ✓ DNA-RNA Metabolism	**Chapter 23:** Hormonal Regulation, and Integration of Mammalian Metabolism **Chapter 24:** Genes and Chromosomes **Chapter 25-26:** DNA and RNA Metabolism
15	April 20-26	✓ The Genetic Code ✓ Protein Synthesis ✓ Protein Targeting and Degradation	**Chapter 27:** Protein Metabolism

	April 29	✓ **Last Class Day before Finals**	
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.