

**CHEM 4303  
Biochemistry  
Spring 2024  
January 16<sup>th</sup>- May 8<sup>th</sup>**

## General Course Information

Information Item	Information
<b>Instructor:</b>	Yingchun Li
<b>Section # and CRN:</b>	P01 24174
<b>Office Location:</b>	New Science Building Room 230M
<b>Office Phone:</b>	936-261-3109
<b>Email Address:</b>	<a href="mailto:ycli@pvamu.edu">ycli@pvamu.edu</a>
<b>Office Hours:</b>	MWF, 11:00 am-1:00 pm
<b>Mode of Instruction:</b>	Face to Face
<b>Course Location:</b>	E.E O'Banion Science Building, Room A104
<b>Class Days &amp; Times:</b>	MWF10:00-10:50 am
<b>Catalog Description:</b>	<b>CHEM 4303 Biochemistry: 3 semester hours</b> A study of the chemistry of biological molecules: proteins, lipids, carbohydrates and nucleic acids. Enzyme catalysis, Bioenergetics, Metabolism of carbohydrates, fats and proteins. Interrelationship of the metabolic pathways.
<b>Prerequisites:</b>	Prerequisites: <a href="#">CHEM 2303</a> and <a href="#">CHEM 2304</a> .
<b>Co-requisites:</b>	None
<b>Required Text(s):</b>	Lehninger Principles of Biochemistry by David L. Nelson & Michael M. Cox 7 <sup>th</sup> or newer edition, older editions are acceptable too.
<b>Recommended Text(s):</b>	

General Course Information Table

## Student Learning Outcomes:

Upon successful completion of this course, students will be able to:  [NOTE: BEGIN each outcome with a VERB]:	Program Learning Outcome Alignment	Core Curriculum Outcome Alignment
1. Know the general 'bio' basis, organism and classifications, basic cell structure components		
2. Know the names, structures and properties of monomeric building blocks and chemical bond linkage between them for biomolecules including proteins, carbohydrate and Nucleic acid		
3. Use hemoglobin, antibody and muscle proteins to illustrate structure, folding and function of proteins		
4. Understand mechanisms and kinetics of enzymes		

5. Know the structures and major functions of carbohydrates		
6. Know the structure and major functions of Nucleic acid and technologies based on it.		
7. Knew the structures, properties and functions of the diverse lipids		
8. Know the biological membranes, structure and transport		
9. Understand biosignaling process		
10.		

**Student Learning Outcomes Table**

## Major Course Requirements

### Method of Determining Final Course Grade

Course Grade Requirement	Value	Total
1. homework	50 x 12	600
2. section exam	(100 online + 100 in person) x 5	1000
3. Final	200 x 1	200
4. pup quiz (required attendance)	5 x 20	100
<b>Total:</b>		<b>1900</b>

Course Grade Requirement Table

### Grading Criteria and Conversion:

A 1710 and above (90% and above)

B 1520-1709 (80-89%)

C 1330-1519 (70-79%)

D 1140-1329 (60-69%)

F below 1039 (below 60%)

### Detailed Description of Major Assignments:

Assignment Title or Grade Requirement	Description
Module 1	Background assessment Online Home 1
Module 2	Online Home 2 EXAM1
Module 3	Online Home 3
Module 4.	Online Home 4 EXAM 2
Module 5.	Online Home 5
Module 6.	Online Home 6 EXAM 3
Module 7.	Online Home 7
Module 8	Online Home 8 EXAM 4
Module 9	Online Home 9
Module 10	Online Home 10 EXAM 5
Module 11	Online Home 11
Module 12	Online Home 12 Final exam

Detailed Description of Major Assignments Table

## Course Procedures or Additional Instructor Policies

### Taskstream

Taskstream is a tool that Prairie View A&M University uses for assessment purposes. One of your assignments may be required to be submitted as an "artifact," an item of coursework that serves as evidence that course objectives are met. If applicable, more information will be provided during the semester by your department, but for general information, you can visit Taskstream via the link in eCourses.

<b>Semester Calendar</b>	
<b>Week</b>	<b>Description</b>
<b>Week 1</b>	Introduction and foundation of chemistry
Chapter 1 topic	M cellular foundation W chemical and biological foundation F genetic and evolutionary foundation
Assignment	Homework 1
<b>week 2:</b>	Chemistry of water, acids, bases, salts and buffers
Chapter:2 Topic	M weak interactions in aqueous solution W Ionization water, acid and base (weak and strong) F buffer
Assignment	Homework 2
<b>Week 3:</b>	Amino acids, peptides and proteins
Chapter 3 topic	M <b>EXAM1(chapter 1 and 2)</b> W amino acids, peptides and proteins F isolation and primary structure of proteins
<b>Assignment</b>	Homework 3
<b>Week 4</b>	<b>3-D structure of Proteins</b>
Chapter (s) 4 Topics	M overview and peptide bond W secondary, tertiary and quaternary F denaturation, folding and misfolding
Assignment (s):	Homework 4
<b>Week 5</b>	Protein functions
Chapter (s):5 topic	M <b>Exam 2</b> W reversible binding and hemoglobin F complementary binding and Immunoglobulins
Assignment	Homework 5
<b>Week 6</b>	Enzyme (I)
Chapter (s):6 topics	M introduction to enzyme W How enzyme work F enzyme kinetics
Assignment (s):	Homework 6
<b>Week 7</b>	<b>Enzyme (II)</b>
Chapter 6 topc	M enzymatic mechanism W examples of enzymatic reactions F regulatory enzymes
Assignment (s):	Homework 6
<b>Week 8</b>	Carbohydrate and Glycobiology
Chapter (s):7	M <b>EXAM 3</b> W monosaccharide and polysaccharide F glycoconjugates and the sugar code
Assignment (s):	Homework 7
<b>Week 9</b>	Nucleic acids
Chapter (s):8 topic	M some basics W Nucleic acid structure F Nucleic acid chemistry
Assignment (s):	Homework 8
<b>Week 10</b>	DNA-Based information technology
Chapter (s):9 topic	M <b>Exam 4</b> W genes and functions F DNA based method to understand protein functions
Assignment (s):	Homework 9
<b>Week 11</b>	Lipids

Chapter (s):10	M storage lipids and membrane lipids W lipid signals, cofactor, and pigments F working with lipids
Assignment (s):	Homework 10
<b>Week 12</b>	Biological membrane and transport
Chapter (s):12	M <b>Exam 5</b> W composition, architecture and dynamics of mebrane F solute transport across membrane
Assignment (s):	Homework 11
<b>Week 13:</b>	Biosignaling
<b>Chapter 13</b>	M general feature of signal transduction W G protein-coupled receptor and second messenger F gated ion channels
Assignment (s)	Homework 12
<b>week 14</b>	Review and Thanksgiving Break
<b>Week 15</b>	<b>Review and Final exam (Dec. 3)</b>
<b>Holyday</b>	<b>Holyday</b>

## **Student Support and Success**

### **John B. Coleman Library**

The John B. Coleman Library's mission is to enhance the scholarly pursuit of knowledge, to foster intellectual curiosity, and to promote life-long learning and research through our innovative services, resources, and cultural programs, which support the Prairie View A&M University's global mission of teaching, service, and research. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty. Website: <https://www.pvamu.edu/library/>; Phone: 936-261-1500

### **Academic Advising Services**

Academic Advising Services offers students a variety of services that contributes to student success and leads towards graduation. We assist students with understanding university policies and procedures that affect academic progress. We support the early alert program to help students get connected to success early in the semester. We help refer students to the appropriate academic support services when they are unsure of the best resource for their needs. Faculty advisors support some students in their respective colleges. Your faculty advisor can be identified in PantherTracks. Advisors with Academic Advising Services are available to all students. We are located across campus. Find your advisor's location by academic major at [www.pvamu.edu/advising](http://www.pvamu.edu/advising). Phone: 936-261-5911

### **The University Tutoring Center**

The University Tutoring Center (UTC) offers free tutoring and academic support to all registered PVAMU students. The mission of the UTC is to help provide a solid academic foundation that enables students to become confident, capable, independent learners. Competent and caring staff and peer tutors guide students in identifying, acquiring, and enhancing the knowledge, skills, and attitudes needed to reach their desired goals. Tutoring and academic support are offered face-to-face in the UTC, in virtual face-to-face sessions (<https://www.pvamu.edu/student-success/sass/university-tutoring-center/>), and through online sessions (<https://www.pvamu.edu/pvplace/>). Other support services available for students include Supplemental Instruction, Study Break, Academic Success Workshops, and Algebra Study Jam. Location: J. B. Coleman Library, Rm. 307; Phone: 936-261-1561; Email: [pvtutoring@pvamu.edu](mailto:pvtutoring@pvamu.edu); Website: <https://www.pvamu.edu/student-success/sass/university-tutoring-center/>

### **Writing Center**

The Writing Center provides well-trained peer tutors to assist students with writing assignments at any stage of the writing process. Tutors help students with various writing tasks from understanding assignments, brainstorming, drafting, revising, editing, researching, and integrating sources. Students have free access to Grammarly online writing assistance. Grammarly is an automated proofreading and plagiarism detection tool. Students must register for Grammarly by using their student email address. In addition, students have access to face-to-face and virtual tutoring services either asynchronously via email or synchronously via Zoom. Location: J. B. Coleman Library, Rm. 209; Phone: 936-261-3724; Website: <https://www.pvamu.edu/student-success/writing-center/>; Grammarly Registration: <https://www.grammarly.com/enterprise/signup>

### **Academic Early Alert**

Academic Early Alert is a proactive system of communication and collaboration between faculty, academic advisors, and PVAMU students that is designed to support student success by promptly identifying issues and allowing for intervention. Academic Early Alerts help students by providing a central location to schedule advising appointments, view advisor contact information, and request assistance. Students who recognize that they have a problem that is negatively affecting their academic performance or ability to continue school may self-refer an Academic Early Alert. To do so, students will log in to PV Place and click on Academic Early Alert on the left sidebar. Phone: 936-261-5902; Website: <https://www.pvamu.edu/student-success/early-alert/>

### **Student Counseling Services**

The Student Counseling Services unit offers a range of services and programs to assist students in maximizing their potential for success: short-term individual, couples, and group counseling, as well as crisis intervention, outreach, consultation, and referral services. The staff is licensed by the State of Texas and assists students who are dealing with academic skills concerns, situational crises, adjustment problems, and emotional difficulties. Information shared with the staff is treated confidentially and in accordance with Texas State Law. Location: Hobart Taylor, 2<sup>nd</sup> floor; Phone: 936-261-3564; Website: <https://www.pvamu.edu/healthservices/student-counseling-services/>

### **Office of Testing Services**

Testing Services serves to create opportunities by offering a suite of exams that aid in the students' academic and professional success. Currently, we administer entrance (HESI A2), college readiness (TSI assessment), Prior Learning (CLEP, DSST), and proctored exams. Location: Wilhelmina Delco, 3<sup>rd</sup> Floor, Rm. 305; Phone: 936-261-3627; Email: [aetesting@pvamu.edu](mailto:aetesting@pvamu.edu); Website: [www.pvamu.edu/testing](http://www.pvamu.edu/testing)

### **Office of Diagnostic Testing and Disability Services**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, contact the Office of Disability Services. As a federally-mandated educational support unit, the Office of Disability Services serves as the repository for confidential disability files for faculty, staff, and students. For persons with a disability, the Office develops individualized ADA letters of request for accommodations. Other services include learning style inventories, awareness workshops, accessibility pathways, webinars, computer laboratory with adapted hard and software, adapted furniture, proctoring non-standardized test administrations, ASL interpreters, ALDs, digital recorders, Livescribe, and a comprehensive referral network across campus and the broader community. Location: Hobart Taylor, Rm. 1D128; Phone: 936-261-3583; Website: <https://www.pvamu.edu/disabilityservices/>

### **Center for Instructional Innovation and Technology Services (CIITS)**

Distance Learning, also referred to as Distance Education, is the employment of alternative instructional delivery methods to extend programs and services to persons unable to attend college in the traditional manner. The Center for Instructional Innovation and Technology Services (CIITS) supports student learning through online, hybrid, web-assist, and 2-way video course delivery. For more details and contact information, visit: <https://www.pvamu.edu/dlearning/distance-learning-2-2/students-2/>; Phone: 936-261-3283

### **Veteran Affairs**

Veterans Services works with student veterans, current military and military dependents to support their transition to the college environment and continued persistence to graduation. The Office coordinates and certifies benefits for both the G.I. Bill and the Texas Hazlewood Act. Location: Evans Hall, Rm. 102; Phone: 936-261-3563; Website: <https://www.pvamu.edu/sa/departments/veteranaffairs/>

### **Office for Student Engagement**

The Office for Student Engagement delivers comprehensive programs and services designed to meet the co-curricular needs of students. The Office implements inclusive and accessible programs and services that enhance student development through exposure to and participation in diverse and relevant social, cultural, intellectual, recreational, community service, leadership development, and campus governance. Location: Memorial Student Center, Rm. 221; Phone: 936-261-1340; Website: <https://www.pvamu.edu/studentengagement/>

### **Career Services**

Career Services supports students through professional development, career readiness, and placement and employment assistance. The Office provides one-on-one career coaching, interview preparation, resume and letter writing, and career exploration workshops and seminars. Services are provided for students at the Northwest Houston Center and College of Nursing in the Medical Center twice a month or on a requested basis. Distance Learning students are encouraged to visit the Career Services website for information regarding services provided. Location: Anderson Hall, 2<sup>nd</sup> floor; Phone: 936-261-3570; Website: <https://www.pvamu.edu/careerservices/>

## **University Rules and Procedures**

### **Academic Misconduct**

Academic dishonesty is defined as any form of cheating or dishonesty that has the effect or intent of interfering with any academic exercise or fair evaluation of a student's performance. The college faculty can provide additional information, particularly related to a specific course, laboratory, or assignment.

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with the *University Administrative Guidelines on Academic Integrity*, which can be found on the [Academic Integrity webpage](#). Students who engage in academic misconduct are subject to university disciplinary procedures. As listed in the *University Administrative Guidelines on Academic Integrity*, the University Online Catalog, and the

Student Code of Conduct, the following are examples of prohibited conduct. This list is not designed to be all-inclusive or exhaustive. In addition to academic sanctions, any student found to have committed academic misconduct that is also a violation of criminal law may also be subject to disciplinary review and action by the Office of Student Conduct (as outlined in the Student Code of Conduct).

### **Forms of Academic Dishonesty:**

1. Cheating: Deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not learned, giving or receiving aid unauthorized by the instructor on assignments or examinations. Examples: unauthorized use of notes for a test; using a "cheat sheet" on a quiz or exam; any alteration made on a graded test or exam which is then resubmitted to the teacher;
2. Plagiarism: Careless or deliberate use of the work or the ideas of another; representation of another's work, words, ideas, or data as your own without permission or appropriate acknowledgment. Examples: copying another's paper or answers, failure to identify information or essays from the internet and submitting or representing it as your own; submitting an assignment which has been partially or wholly done by another and claiming it as yours; not properly acknowledging a source which has been summarized or paraphrased in your work; failure to acknowledge the use of another's words with quotation marks;
3. Collusion: When more than one student or person contributes to a piece of work that is submitted as the work of an individual;
4. Conspiracy: Agreeing with one or more persons to commit an act of academic/scholastic dishonesty; and
5. Multiple Submission: Submission of work from one course to satisfy a requirement in another course without explicit permission. Example: using a paper prepared and graded for credit in one course to fulfill a requirement and receive credit in a different course.

### **Nonacademic Misconduct**

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. The Office of Student Conduct will adjudicate such incidents under nonacademic procedures.

### **Sexual Misconduct**

Sexual harassment of students and employees at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating the university's sexual harassment policy will be subject to disciplinary action. In accordance with the Texas A&M University System guidelines, your instructor is obligated to report to the Office of Title IX Compliance ([titleixteam@pvamu.edu](mailto:titleixteam@pvamu.edu)) any instance of sexual misconduct involving a student, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which the instructor becomes aware during this course through writing, discussion, or personal disclosure. The faculty and staff of PVAMU actively strive to provide a learning, working, and living environment that promotes respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like assistance or have questions, they may contact the Title IX Coordinator at 936-261-2144 or [titleixteam@pvamu.edu](mailto:titleixteam@pvamu.edu). More information can be found at [www.pvamu.edu/titleix](http://www.pvamu.edu/titleix), including confidential resources available on campus.

### **Pregnancy, Pregnancy-related, and Parenting Accommodations**

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related conditions, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Disability Services or the Dean of Students' Office for additional information and to request accommodations.

### **Non-Discrimination Statement**

Prairie View A&M University does not discriminate on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, or gender identity in its programs and activities. The



University is committed to supporting students and complying with The Texas A&M University System non-discrimination policy. It seeks to establish an environment that is free of bias, discrimination, and harassment. If you experience an incident of discrimination or harassment, we encourage you to report it. If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are individuals who can meet with you. The Director of Equal Opportunity & Diversity has been designated to handle inquiries regarding the non-discrimination policies and can be reached at Harrington Science Building, Suite 109 or by phone at 936-261-1744 or 1792.

### **Class Attendance Policy (See the University Online Catalog for Full Attendance Policy)**

Prairie View A&M University requires regular class attendance. Attending all classes supports the full academic development of each learner, whether classes are taught with the instructor physically present or via distance learning technologies such as interactive video and/or the internet. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in the assignment of a grade of "F." Absences are accumulated beginning with the first day of class during regular semesters and summer terms. Each faculty member will include the University's attendance policy in each course syllabus.

### **Student Academic Appeals Process**

Authority and responsibility for assigning grades to students rest with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the University Online Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

### **Technical Considerations**

#### **Minimum Recommended Hardware and Software:**

- Intel PC or Laptop with Windows 10 or later version; Mac with OS High Sierra\*
- Smartphone or iPad/Tablet with Wi-Fi\*
- High-speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, or Firefox

**Note:** Be sure to enable Java & pop-ups in the Web browser preferences

\* Smartphones, Google Chrome books, and Android tablets may not be supported. iPads are the only tablets supported.

#### **Participants should have a basic proficiency of the following computer skills:**

- Sending and receiving email
- A working knowledge of the Internet
- Microsoft Word (or a program convertible to Word)
- Acrobat PDF Reader
- Windows or Mac OS
- Video conferencing software

#### **Netiquette (online etiquette)**

Students are expected to participate in all discussions and virtual classroom chats as directed. Students are to be respectful and courteous to others on discussion boards. Foul or abusive language will not be tolerated. Do not use ALL CAPS for communicating to others AS IT CAN BE INTERPRETED AS YELLING. Avoid slang terms such as "wassup?" and texting abbreviations such as "u" instead of "you." Limit and possibly avoid the use of emoticons. Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post, and the message might be taken seriously or sound offensive.

### **Video Conferencing Etiquette**

When using Zoom, WebEx, or other video conferencing tools, confirm the visible area is tidy, clear of background clutter, inappropriate or offensive posters, and other distractions. Ensure you dress appropriately and avoid using high traffic or noisy areas. Stay muted when you are not speaking and avoid eating/drinking during the session. Before the class session begins, test audio, video, and lighting to alleviate technology issues.

### **Technical Support**

Students should go to <https://mypassword.pvamu.edu/> if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Center for Instructional Innovation and Technology Services at 936-261-3283 or email [ciits@pvamu.edu](mailto:ciits@pvamu.edu).

### **Communication Expectations and Standards**

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

### **Discussion Requirement**

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can occur in a seminar fashion. The use of the discussion board will accomplish this. The instructor will determine the exact use of discussion boards.

**It is strongly suggested** that students type their discussion postings in a word processing application such as Word and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, copy and paste to the discussion board.

### **Possible Change of This Syllabus:**

The instructor will follow this syllabus most of the time but held the right of change in case of necessary.

### **Rules for Attendance, Homework, Exam and Quiz:**

1. Attendance, Homework, Exam and Quiz can be excused with a verifiable, acceptable note.
2. Exam makeup must be done in 5 days after the exam if the make-up is granted.
3. Pup-quiz will be given at any time and in any format in the lecture. No makeup allowed.
4. Homework can be extended, but 10 points will be deducted each day after the due date until 0 reached.