DRAFT
Stony Brook University
Department: Biochemistry & Cell Biology

BIO 361 Biochemistry 1
Summer 1 Extended
May 20nd - July 12th, 2024

This course is an asynchronous online course EXCEPT FOR three synchronous online proctored exams.

NOTE: A computer, with working webcam and microphone, and reliable internet service are required to take this course.

Three synchronous, monitored exam sessions are required in this course:
Exam 1 (Tuesday, June 4th from 6:30-8:30 PM)
Exam 2 (Tuesday, June 25th from 6:30 -8:30 PM)
Exam 3 (Thursday, July 11th from 6:30 - 8:30 PM)

DRAFT Syllabus

Part 1: Course Information

Instructor Information

Online Course Faculty: Dr. Stefan Tafrov, PhD
Office Hours: By Appt. E-mail to schedule: Phone appt. or Zoom virtual office hours through Brightspace
E-mail: Stefan.Tafrov@stonybrook.edu

Online Course Administrator: Kristen Slovak
Office: Life Science Building, Room 372
Office Hours: By Appt. Email to schedule Zoom or phone appt.
Email: Kristen.Slovak@StonyBrook.edu

Course Description
This is the first course of an advanced two-semester study of the major chemical constituents of the cell including carbohydrates, lipids, and proteins. Emphasis is on enzyme structure, enzyme kinetics, reaction mechanisms, and metabolic pathways. This course is especially appropriate for students contemplating entrance exams in medicine, dentistry, and graduate school.

Lecture Content Faculty:
Lectures 01-10: Chi-Kuo Hu, PhD –Biochemistry & Cell Biology
Lectures 11-29: Stefan Tafrov, PhD - Biochemistry & Cell Biology
Lectures 30-34: Chi-Kuo Hu, PhD –Biochemistry & Cell Biology
Lectures 35-39: Martin Kaczocha, PhD- Anesthesiology
Lectures 40-41: Stephan Tafrov, PhD - Biochemistry & Cell Biology

Prerequisite

C or higher in BIO 202 or equivalent; C or higher in CHE 322 or 332
or equivalent or permission of instructor

Required Text

Principles of Biochemistry, Lehninger (8th Ed.) ISBN: 9781319230906 (online or looseleaf versions available)

Course Technical Requirements –

Computer with working webcam and microphone

Stable and Reliable Internet connection

Access to Brightspace

Course Structure
This course content and all learning assets (practice quizzes and discussions) will be delivered entirely online, asynchronously, through the Brightspace course management system. Exams will be SYNCHRONOUSLY administered and monitored through webcams on the dates indicated above, no exceptions. For current Stony Brook University students: You will use your NetID account to log in to the course from the Brightspace login page
https://Brightspace.stonybrook.edu
For visiting students you will receive your NETID account after registering at
http://www.stonybrook.edu/summer-session/visiting-students/ then you will sign onto Brightspace at https://Brightspace.stonybrook.edu

In Brightspace, you will have access to:

- Weekly online assignments, learning objectives, course materials, online practice quizzes, and discussion resources.

- The practice online quizzes and discussion postings are considered learning assets. Quizzes should be taken by yourself to improve your understanding of the course content and topics you may need to review so you perform your best on exams.

- Discussion board assignments involve thinking scientifically to reject incorrect answers on exams. These discussions will be mentored by teaching assistants with the purpose of helping you to solve more difficult, complex questions.

- All discussions will be clarified after they have concluded. Most weeks, there is one due date per week (Saturday) when the assigned learning assets must be submitted. See assignments on Brightspace for all due dates.

  - Discussion assignments are designed to assist you in the higher level critical and scientific thought needed to answer more complex problems utilizing the information you are learning to help you approach such questions utilizing the scientific method of falsification. This approach to problem solving helps to understand course content, improve performance on lecture exams and standardized/prep exams such as the MCAT, DAT, or GRE.

- o Each week, you will access the weekly assignment folder. The lecture videos, textbook readings, lecture PowerPoints, and graded assignment due dates are included in each folder.

- In addition, there are content and administrative question forums. These forums are available for students to ask the faculty and TAs general questions. These forums are NOT graded.

- There are three synchronous proctored exams, each covering approximately one third of the content monitored through the webcam on your computer. Webcams and microphones ARE required to take this course.

- If you need technical assistance at any time during the course or to report a problem with Brightspace you can:

- Visit the Stony Brook University Student Help Desk Page
- Phone: (631) 632-9602
- E-Mail: helpme@stonybrook.edu
- Live Chat: Chat Live with the TLT Student Help Desk!

Contact the University Service Desk at (631) 632-9602
Important Note: This syllabus, along with course assignments and due dates, are subject to change. It is the student's responsibility to check Brightspace for corrections or updates to the syllabus. Any changes will be clearly noted in course announcement and/or through Brightspace email.

Part 2: Course Objectives

Biochemistry is the study of the chemical processes in living organisms. Students will learn the molecular basis of many diseases. Biochemical knowledge will guide students in making health decisions in their life and help them in pursuing biomedical related careers. By completing this course, students will:

- Know the structure and function of the basic component molecules in a cell: sugars, polysaccharides, lipids, amino acids, proteins, nucleic acids. Know how these components are polymerized and the functions of these biological polymers.

- Be able to identify the levels of protein structure. Describe the physical and chemical forces that stabilize these structures. Know how the primary sequences of proteins are determined. Know the features of the three-dimensional structures of proteins. Interpret enzyme kinetics data and describe the catalytic mechanisms of representative enzymes. Be familiar with the basic thermodynamics of biochemical reactions and understand the bioenergetics of the multiple enzyme reactions in the cell.

- Know the major pathways in central metabolism. Be able to identify the key regulatory points, the energetics of the reactions and the key chemical transformations involved.

- Gain a deeper appreciation and understanding of how all living organisms are connected by key chemical principles and biological pathways.

- Recognize and understand some of the key functional differences in biochemical

pathways as well as the effects of possible errors/mutations.

- *You will meet the objectives listed above through a combination of the following activities in this course:*

  ➢ Watching assigned lecture module videos

  ➢ Reading assigned chapters in the required textbook

  ➢ Participating in the weekly discussion boards.

  ➢ Completing the three live proctored exams.

Part 3: Grading Policy

Graded Course Activities
Visit the Assignments link in Brightspace for details about each weekly assignment and the due dates.

Percent of Final Grade	Description
25 %	8 extensive & comprehensive discussion board postings + AIQ/Syllabus Quiz
25 %	Exam 1
25 %	Exam 2
25 %	Exam 3
100%	

The AIQ/Syllabus quiz is the only graded quiz. All practice quizzes are optional and not for points.

Discussion grading:
Content Discussion posts are due by 11:59 PM Saturday night.
You will be given a choice of between 6-8 complex questions where you will attempt to falsify potential answer choices and then discuss and debate your logic and knowledge with your colleagues each week.

You are to choose only ONE question per week out of the total questions given. We do not recommend more than 5 students choosing any one question as by the time the last student posts; it will be difficult to earn full credit. If a question has many posters already, we suggest choosing a different question.

Grading is based on the discussion board directions and the grading rubric given.
All grading is categorical in that you can earn 25, 20, 15, 10, 5 or 0 points for your post. See discussion directions and grading rubric for criteria of each category of grading.
Clarifications for all discussion questions will be given after the assignment due date has past so you can use the clarifications for study purposes before exams.

ALL DISCUSSION POSTS will be entered into plagiarism check software and all suspicious posts will be turned over to Academic Judiciary and any plagiarism or breaches of academic integrity may result in an F for the course.

Exams: Exams may only be taken on the days and times given. It is a student's responsibility to clear their calendar for all exam dates and times. Exams will consist of 25 multiple choice questions presented one at a time with no backtracking. All exams will be video recorded. You

must have a reliable internet connection, a webcam and microphone for all exams. Students must show their Stony Brook ID or official picture ID before they begin the exam. The exams are closed book. No cell phones, other electronics including watches are permitted. Students will be required to download any monitoring software to their computer prior to the exam. They will be asked to show their picture ID, to show their surroundings, and to make the statement that they have no other electronics in view or in hearing distance. They should hold their wrists up to show no electronic watches of any kind. They must remain alone for the entire exam.

Violations of academic integrity will include but are not limited to:

1) Covering any portion of your ID or failing to show it clearly in the video

2) Utilizing any electronics other than the computer you are taking the exam on and for the purpose of taking that exam. Utilizing any notes, books, etc. or internet sources. Again, exams are closed book.

3) Leaving the room or the seat and out of camera range at any time during the exam.

4) Having others in the room with you

5) Failure to show your immediate surroundings including your desk during the environment check.

6) Covering, blocking, or tilting your camera at any time during an exam.

All suspicious activity in assignments or exams will be reported to the Academic Judiciary. The recommended penalty is *an F for the course*.

Late Work Policy: Be sure to pay close attention to deadlines—there will be no make-up discussions because we drop the lowest scoring post. ==Requests for make-up exams will not be accepted without documentation of serious and compelling issues submitted within ONE WEEK OF THE MISSED EXAM.== You should practice good time management and keep up with the work on a daily basis.

Viewing Grades in Brightspace: Points you receive for graded activities will be posted to the Brightspace Grade Book. Click on the My Grades link on the left navigation to view your points. We will update the online grades each time a grading session has been complete—typically within 5 days following the completion of an activity. You will see an announcement on Brightspace when grades are available.

Letter Grade Assignment

Final letter grades assigned for this course will be based on the percentage of total points earned and may be assigned as follows*:

Letter Grade	Percentage	Performance
A	93-100%	Excellent Work
A-	90-92%	Nearly Excellent Work
B+	87-89%	Very Good Work
B	83-86%	Good Work
B-	80-82%	Mostly Good Work
C+	77-79%	Marginally Good Work

Letter Grade	Percentage	Performance
C	70-76%	Acceptable Work
D	69-60%	Poor Work
F	0-59%	Failing Work
There is no C- grade category		

*NOTE: These letter grades are <u>threshold scores only.</u> Actual final scores needed to earn a certain letter grade may be lowered if warranted based on the difficulty of the exams. In other words, if your final total points in the course equal a 93%, you will not earn less than an A. If your final points equal an 87%, you will not earn less than a B+ but MAY, depending on the difficulty of the exams, earn a higher letter grade.

Part 4: Course Policies

Participation

Students are expected to participate and submit, by the published due dates, <u>all</u> online discussion postings. All discussion post submissions are monitored for plagiarism through Turnitin. <u>All</u> cases of possible plagiarism in your discussions, including cheating on exams, or other violations of academic integrity will be reported to Academic Judiciary and if found guilty, will result in an F in the course. Please be sure all work is in your own words and properly referenced with internal citations and full references.
The discussion board grading rubric with grading criteria is available on Brightspace.

Build Rapport

If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. As you will find, building rapport and effective relationships are key to becoming an effective professional. Make sure that you are proactive in informing your instructor when difficulties arise during the semester so that we can help you find a solution including potentially dropping the course.

Complete Assignments

All assignments for this course will be submitted electronically through Brightspace and dated according to the date/time submitted as shown on Brightspace.
Assignments must be submitted by the given deadline. Extensions will not be given beyond the next assignment except under extreme, documented circumstances.

All requests for regrades, including discussion post grading, must be time stamped through email directly to Kristen Slovak at kristen.slovak@stonybrook.edu within 1 week of when the grade is made available on Brightspace.

Understand When You May Drop This Course
It is the student's responsibility to understand when they need to consider dropping from a course.

Incomplete Policy
Under emergency/special circumstances, students may petition for an incomplete grade. Circumstances must be documented and significant enough to merit an Incomplete. All incomplete course assignments must be completed within the timeframe mandated by the University, usually before the beginning of the following semester. Inform your instructor of any accommodations needed.

Student Accessibility Support Center Statement
If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. https://www.stonybrook.edu/commcms/studentaffairs/sasc/facstaff/syllabus.php

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Student Accessibility Support Center. For procedures and information go to the following website: https://ehs.stonybrook.edu/programs/fire-safety/emergency-evacuation/evacuation-guide-people-physical-disabilities

Academic Integrity/Honesty Statement
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at: http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management Statement
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Email Policies
Email sent via Stony Brook University Gmail is the primary way we will officially communicate with you for this course. It is your responsibility to make sure you read your email in your official University email account. For most students that is Google Apps for Education http://www.stonybrook.edu/mycloud

If you need technical assistance, please contact Client Support at (631) 643-9800 or supportteam@stonybrook.edu

Part 5: Topic Outline/Schedule

Important Note: Refer to the Weekly Assignments on Brightspace for specific lectures and graded assignment due dates for each week. The details of each assignment will be explained within each week's corresponding Lecture folders. If you have any questions as to the administration of the course or grading, please contact Prof. Slovak at Kristen.Slovak@StonyBrook.edu or post your question in the administrative forum on Brightspace for a response within 24 hours. The full course schedule can be found on the following pages.

Week #	Lec #	Lect. Initial	Lecture Name	Text Reading Chapter/Sections	Assignment Due
Week 1 5/20	0	KS	*Introduction and Orientation*	Syllabus & Course Information	
	1	CKH	*Thermodynamics*	Ch1, Sect 2-3	
	2	CKH	*Water & Buffers*	Ch 2 ,Sect 1-4	
	3	CKH	*Amino Acids*	Ch 3, Sec 1-2	
	4	CKH	*Protein Purification, Techniques*	Ch 3, Sect 3	
	5	CKH	*Protein Primary Structure, Sequencing*	Ch 3, Sect 4	**Post 1 Intro and Post 2 Lect. 1-5 & Quiz Due 5/25**
Week 2 5/27	6	CKH	*Protein Secondary Structure*	Ch 4, Sect 1-2	
	7	CKH	*Protein Tertiary & Quaternary Structure*	Ch 4, Sect 3	
	8	CKH	*Protein Folding & Misfolding*	Ch 4, Sect 4	
	9	CKH	*Immunoglobulins*	Ch 5, Sect 2	
	10	CKH	*Muscle and Structural Proteins*	Ch 5, Sect 3	
	11	ST	*Myoglobin and Hemoglobin*	Ch 5, Sect1	**Post 3 Lect. 6-11 Due 6/1**

Week 3 6/3	12	ST	*Allosteric Models*	Ch 5, Sect 1	
Exam 1 Lectures 1-11 from 6:30 – 8:30 PM Tuesday June 6th					
	13	ST	*Enzymes as Catalysts*	Ch 6, Sect 1-2	
	14	ST	*Enzyme Mechanisms – Serine Proteases*	Ch 6, Sect 4	
	15	ST	*Enzyme Kinetics*	Ch 6, Sect 3	
	16	ST	*Enzyme Inhibition*	Ch 6, Sect 3 & 5	**Post 4 Lect. 12-16 Due 6/8**
Week 4 6/10	17	ST	*Principles of Metabolism*	Ch 13, Sect 1-4	
	18	ST	*Carbohydrates*	Ch 7, Sect 1-4	
	19	ST	*Glycolysis I*	Ch 14, Sect 1	
	20	ST	*Glycolysis II*	Ch14, Sect 1-3	
	21	ST	*Gluconeogenesis*	Ch14, Sect 4	**Post 5 Lect. 17-21 Due 6/15**
Week 5 6/17	22	ST	*Pentose Phosphate pathway*	Ch14, Sect 5	
	23	ST	*Glycogen Synthesis and Breakdown*	Ch 15, Sect 4-5	
	24	ST	*Pyruvate Dehydrogenase*	Ch 16, Sect 1	
	25	ST	*Krebs Cycle I*	Ch16, Sect 2	
	26	ST	*Krebs Cycle II*	Ch16, Sect 2-3	**Post 6 Lect. 22-26 Due 6/22**
Week of 6/24	27	ST	*Electron Transport I*	Ch 9, Sect 1	
Exam 2 Lectures 12-26 Tuesday June 27th from 6:30 – 8:30 PM EDT					
	28	ST	*Electron Transport II*	Ch 19, Sect 1	
	29	ST	*ATP Synthase*	Ch 19, Sect 2	
	30	CKH	*Protein Degradation and Nitrogen Flow*	Ch 18, Sect 1-2	
	31	CKH	*Amino Acid Degradation*	Ch 18, Sect 3	**Post 7 Lect. 27-31 Due 6/29**

Week 7 7/1	32	CKH	*Amino Acid Biosynthesis*	Ch 22, Sect 1-2	
	33	CKH	*Purine Metabolism*	Ch 8 Sect 1 & Ch 22 Sect 4	
	34	CKH	*Pyrimidine Metabolism*	Ch 22, Sect 4	
	35	MK	*Fatty Acid Metabolism I*	Ch 17, Sect 1	
	36	MK	*Fatty Acid Metabolism II*	Ch 17, Sect 2-3	**Post 8 Lect. 32-36 Due 7/6**
Week 8 7/8	37	MK	*Fatty Acid Metabolism III*	Ch 20, Sect 2-3	
	38	MK	*Cholesterol Metabolism*	Ch 21, Sect 4	
	39	MK	*Signaling Lipids*	Ch 23, Sect 1-2	
	40	ST	*Metabolic Regulation*	Ch 23, Sect 2	
	41	ST	*Hormones and Signal Transduction*	Ch12 Sect 1-4 & Sect 7-8	
Exam 3 Lectures 27-41 from 6:30 – 8:30 PM **Thursday, July 13th**					

Course policies are subject to change. It is the student's responsibility to check Brightspace for corrections or updates to the syllabus. Any changes will be posted in Brightspace.