Stony Brook University

Department: Biochemistry & Cell Biology

BIO 361 Biochemistry 1 (Online)

Summer 1 Extended
May 30th-July 22nd, 2017
This is an asynchronous online course with three live, proctored exams.

BIO 361 in the summer is administered entirely online except for: three required in-person exam sessions consisting of:
Exam 1 (Thursday, June 15th from 6:30 to 8:30 PM)
Exam 2 (Thursday, July 6th from 6:30 to 8:30 PM)
Exam 3 (Thursday, July 20th from 6:30 to 9:30 PM)

Exams are given on West Campus in the Javits Lecture Hall Room 100 OR
Throughout the United States via approved Remote Test Center Sites. Anyone wishing to schedule a remote test center exam should contact Prof. Souza for approval of the site prior to June 3rd.
See http://www.ncta-testing.org/find-a-cctc-participant for potential sites near you.
Fees for remote test centers are the responsibility of the student and are paid to the test center directly

Syllabus

Part 1: Course Information

Instructor Information

Course Instructor/Director: Sanford Simon, PhD
Office: Life Science Building, Room 376
Office Hours: By Appt. E-mail to schedule: Phone appt. or Adobe Connect access through Blackboard or Skype (headsets recommended)
Office Telephone:
E-mail: Sanford.Simon@stonybrook.edu

Online Course Faculty Administrator: Joanne Souza, PhD
Office: Life Science Building, Room 378
Office Hours: By Appt. Email to schedule: Phone appt.
Office Telephone: 631-632-8548
Email: Joanne.Souza@stonybrook.edu

Lecture Content Faculty:
Lectures 1-15: Steven Glynn, PhD –Biochemistry & Cell Biology

Lectures 16-32: Sanford Simon, PhD-Biochemistry & Cell Biology & Pathology-SBU Medicine
Lectures 33-36: Martin Kaczocha, PhD-Stony Brook School of Medicine
Lectures 37-39: Sanford Simon, PhD-Biochemistry & Cell Biology & Pathology-SBU Medicine

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.

Prerequisite

C or higher in BIO 202 or equivalent; C or higher in CHE 322 or 332 or 326 or equivalent or permission of instructor

Textbook & Course Materials

Required Text

- Fundamentals of Biochemistry, Voet (5th Ed.) Loose leaf (ISBN 978-1-118-91843-2) or Hardbound (ISBN 978-1-118-91846-3).
- Available at the University Bookstore at http://www.stonybrook.edu/commcms/fsa/bookstore/students/index.html

Course Technical Requirements

- Internet connection (DSL, LAN, or cable connection desirable)
- Access to Blackboard
    - Browsers by Operating System
        - Windows 8, Windows 10
          Internet Explorer 11
          Firefox 31+
          Chrome 36+
        - Windows 7, Vista
          Internet Explorer 11
          Firefox 31+
          Chrome 36+
        - Mac OS X 10.7, 10.8, 10.9, & 10.10, 10.11, & 10.12
          Safari 6+
          Firefox 31+
          Chrome 36+
- Adobe Acrobat Reader, Quicktime and/or Windows media
- Java: Update to newest version, if prompted

Course Structure

This course, except for three live, proctored exams (see statement on first page of this syllabus) will be delivered entirely online, asynchronously, through the Blackboard course management system. You will use your NetID account to log in to the course from the Blackboard login page (http://blackboard.stonybrook.edu).

- In Blackboard, you will have access to weekly online assignments, learning objectives, course materials, online quizzes, and discussion resources. The required online quizzes and discussion postings are considered learning assets. Quizzes should be taken by yourself to assist your personal learning and raise your personal level of learning. Discussion board submissions consist of strategy and debates between students that are 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. There are TWO due dates per week (Thursday on most weeks, and Sunday) when the assigned learning assets must be submitted. See assignments on blackboard for all due dates.
    - Equizzes are designed to identify and raise your level of learning in each content area. There are different levels of questions within the quizzes as far as complexity designed to help you progress to higher levels of problem solving.
    - 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 and to help you to strategize how to approach such questions.
    - Each week, you will access the lecture folders assigned for the week. Within those folders will be the lecture videos separated into video modules (usually A and B), textbook readings, lecture PowerPoints, and graded assignment due dates.
- Both the quizzes and discussions are designed to help you learn and retain the material in the course and assist you in solving more complex problems such as those on the exams and later standardized preparatory exams (MCAT, DAT, etc) or within advanced biochemistry courses.
- In addition, there will be a general discussion board that is ungraded where students can ask questions of the faculty in any area of the course.

- There are three in-person, proctored exams, each covering approximately one third of the content given at approved Test centers including Stony Brook University West Campus or other approved remote testing facilities. See the first page of this syllabus for information as to the exams. Any remote scheduling arrangements should be completed before the end of the first week of the course.

If you need technical assistance at any time during the course or to report a problem with Blackboard 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 Blackboard for corrections or updates to the syllabus. Any changes will be clearly noted in course announcement and/or through Blackboard 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 biomedically 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 deep 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:

- Watch assigned lecture module videos
- Read assigned chapters in the required textbook
- Complete graded learning assets quizzes per module
- Participate in the discussion boards per module
- Complete the three live proctored exams.

Part 3: Grading Policy

Graded Course Activities

Visit the **Assignments** link in Blackboard for details about each weekly assignment and the due dates.

Percent of Final Grade	Description
25 %	Approx. 73 quizzes (386 questions) and 8 extensive & comprehensive discussion board postings. Quiz 0 (exam location quiz=4 bonus quiz points
25 %	Exam 1
25 %	Exam 2
25 %	Exam 3
100%	

Quiz grading:

Following each module, there will be a quiz.

All quizzes should be completed and submitted on blackboard by their due date (usually Thurs. and Sunday of each week except in exam weeks). See the schedule and assignments for further information.

Each question on each quiz is worth 1 point for a total possible of 386 points.

There is also an Equiz 0 regarding syllabus and live exam understanding that is worth 4 points total given during the first week. These four points are bonus points added on top of the 386 points earned for content quizzes.

Discussion grading:

Discussion posts are due by Sunday each week.

You will be given a choice of between 5-6 complex questions **to discuss and debate with your colleagues** each week.

You are to choose only ONE question per week out of the total questions given. We don't recommend more than 5 students choosing any one question as by the time the last student posts; it will be difficult to earn a high grade. 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 30, 25, 15, 5 or 0 points for your post. See discussion directions and 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*.

Late Work Policy

Be sure to pay close attention to deadlines—there will be no make-up quizzes, discussions, or exams accepted without documentation of serious and compelling issues submitted within ONE WEEK OF THE MISSED ASSIGNMENT or EXAM. You should keep up with the work on a daily basis and are expected to have good time management skills. The medical/emergency waiver form is on Blackboard and must be submitted with attachments to the course faculty for potential approval. Examples of acceptable documentation include a physician's note if you are ill, a letter from a clergyman or other person officiating at a funeral, or proof of death of a close family member.

Viewing Grades in Blackboard

Points you receive for graded activities will be posted to the Blackboard 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 Blackboard 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
C	73-76%	Acceptable Work
C-	70-72%	Marginally Acceptable Work
D	69-60%	Poor Work
F	0-59%	Failing Work

*NOTE: These letter grades are threshold scores only. 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, all online activities as listed in the weekly assignments including all quizzes and discussion postings.

All discussion post submissions are monitored for plagiarism through Safe Assign. All cases of possible plagiarism in your discussions, including cheating on exams or quizzes, 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 showing grading criteria is available on Blackboard.

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 quizzes and discussions for this course will be submitted electronically through Blackboard and dated according to the date/time submitted as shown on Blackboard. Assignments must be submitted by the given deadline. Extensions will not be given beyond the next assignment except under extreme, documented circumstances. Any requested extensions must be petitioned for by submitting the makeup request form and proper documentation as shown on the Blackboard site.

All requests for regrades, including discussion post grading, must be time stamped through email directly to Prof. Souza at joanne.souza@stonybrook.edu within 2 weeks of the grade release date on blackboard.

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.

Disability Support Services (DSS) Statement

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services (DSS) at 631-632-6748 or online at http://studentaffairs.stonybrook.edu/dss/. Employees at DSS will determine with you what accommodations are appropriate. All information and documentation is confidential.
Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs 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.

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 are 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/uaa/academicjudiciary/

Email Policies

Email sent via Blackboard is the principle 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 Blackboard for specific lectures and graded assignment due dates for each week. Activity and assignment details will be explained in detail within each week's corresponding Lecture folders. If you have any questions as to the administration of the course or grading, please contact Prof. Souza at joanne.souza@stonybrook.edu or post your question in the administrative forum on Blackboard for a response within 24 hours.

Week #	Lect. No.	Lect. Initial	Lecture Name	Text Reading	Lecture Video Modules	Quiz & Discussion	Due Date
1 5/29	0	JS	Introduction and Orientation	Syllabus & Course Information	Orientation Video Academic Integrity Video	**Quiz 0 Disc post 1 Introduct.**	**Thursday June 1st 11:59 PM**
	1	SG	Overview & Intro. to Thermodyna.	Chapter 1, Section 3	Module 1A Module 1B	**Quiz 1: 1A Quiz 2: 1B**	**Thursday June 1st 11:59 PM**
	2	SG	Water & Buffers	Chapter 2, Sects. 1, 2	Module 2A Module 2B	**Quiz 3: 2A Quiz 4: 2B**	**Thursday June 1st by 11:59 PM**
	3	SG	Amino Acids	Chapter 4, Sects. 1-3	Module 3A Module 3B	**Quiz 3A Quiz 3B**	**Sunday June 4th 11:59PM**
	4	SG	Protein Purification, Techniques, Evolution	Chapter 5, Sects. 1, 2, 4	Module 4A Module 4B	**Quiz 4A Quiz 4B**	**Sunday June 4th 11:59PM**
	5	SG	Protein Primary Structure, Sequencing	Chapter 5, Section 3	Module 5A Module 5B	**Quiz 5A Quiz 5B Dis. Post 2 Lect. 1-5**	**Sunday June 4th 11:59PM**
2 6/5	6	SG	Protein Secondary Structure	Chapter 6, Section 1	Module 6A Module 6B	**Quiz 6A Quiz 6B**	**Thursday June 8th 11:59 PM**
	7	SG	Protein Tertiary & Quaternary Structure	Chapter 6, Sects. 2, 3	Module 7A Module 7B/C	**Quiz 7A Quiz 7B/C**	**Thursday June 8th 11:59 PM**
	8	SG	Protein Folding & Misfolding	Chapter 6 Sects.4, 5	Module 8A Module 8B/C	**Quiz 8A Quiz 8B/C**	**Thursday June 8th 11:59 PM**
	9	SG	Enzymes as Catalyst	Chapter 11 Sects. 1-3	Module 9A Module 9B/C	**Quiz 9A Quiz 9B/C**	**Sunday June 11th 11:59PM**
	10	SG	Enzyme Mechanisms-Lysozyme	Chapter 11 Section 4	Module 10	**Quiz 10**	**Sunday June 11th 11:59PM**
	11	SG	Enzyme Mechanisms-Serine Proteases	Chapter 11 Section 5	Module 11A Module 11B	**Quiz 11A Quiz 11B Disc Post3 6-11**	**Sunday June 11th 11:59PM**
3 6/12	**EXAM 1**		**Lectures 1-11 Evening Exam**	**Day: 6/15**	**Place: West Campus-Javits 100 or remote**	**Time: 6:30 – 8:30 PM**	
	12	SG	Enzyme Kinetics	Chapter 12 Section 1-3	Module 12A Module 12B/C	**Quiz 12A Quiz 12B/C**	**Friday June 16th 11:59 PM**
	13	SG	Enzyme Inhibition	Chapter 12 Section 2	Module 13	**Quiz 13**	**Friday June 16th 11:59 PM**
	14	SG	Muscle and Structural Proteins	Chapter 7 Section 2	Module 14A Module 14B	**Quiz 14A Quiz 14B**	**Sunday June 18th 11:59PM**
	15	SG	Immunoglobulins	Chapter 7 Section 3	Module 15A Module 15B	**Quiz 15A/B**	**Sunday June 18th 11:59PM**
	16	SS	Myoglobin & Hemoglobin I	Chapter 7 Section 1	Module 16A Module 16B	**Quiz 16A Quiz 16B Disc post 4**	**Sunday June 18th 11:59PM**

Week #	Lect. No.	Lect. Initial	Lecture Name	Text Reading	Lecture Video Modules	Quiz & Discussion	Due Date
						12-16	
4 6/19	17	SS	Myoglobin & Hemoglobin II	Chapter 7 Section 1	Module 17A Module 17B	**Quiz 17A Quiz 17B**	**Thursday June 22nd 11:59 PM**
	18	SS	Myoglobin, Hemoglobin III, and Allostery	Chapter 7 Section 1 Chapter 12 Section 3	Module 18A Module 18B	**Quiz 18A Quiz 18B**	**Thursday June 22nd 11:59 PM**
	19	SS	Carbohydrates	Chapter 8 Sect. 1-3	Module 19A Module 19B	**Quiz 19A Quiz 19B**	**Sunday June 25th 11:59PM**
	20	SS	Intro to Metabolism	Chapter 14 Sects. 1-3	Module 20A Module 20B	**Quiz 20A Quiz 20B**	**Sunday June 25th 11:59PM**
	21	SS	Glycolysis I	Chapter 15 Sects. 1,2	Module 21A Module 21B	**Quiz 21A Quiz 21B Disc 5 17-21**	**Sunday June 25th 11:59PM**
5 6/26	22	SS	Glycolysis II	Chapter 15 Sects. 1,2	Module 22A Module 22B	**Quiz 22A Quiz 22B**	**Thursday June 29th 11:59 PM**
	23	SS	Pentose Phosphate pathway	Chapter 15 Sects. 3,6	Module 23A Module 23B	**Quiz 23A Quiz 23B**	**Thursday June 29th 11:59 PM**
	24	SS	Gluconeogenesis	Chapter 16 Sect. 4	Module 24A Module 24B	**Quiz 24A Quiz 24B**	**Sunday July 2nd 11:59PM**
	25	SS	Glycogenesis & Glycogenolysis	Chapter 16 Sects. 1-3	Module 25A Module 25B/C	**Quiz 25A Quiz 25B/C**	**Sunday July 2nd 11:59PM**
	26	SS	Pyruvate DH	Chapter 17 Sect. 1,2 Chapter 14, Sects. 2D, 3A	Module 26A Module 26B	**Quiz 26A Quiz 26B Disc 6: 22-26**	**Sunday July 2nd 11:59PM**
6 7/3	**EXAM 2**		**Lectures 12-26 Evening Exam**	**Day: 7/6**	**Place: West Campus- Javits 100 or remote**	**Time: 6:30 -8:30 PM**	
	27	SS	Krebs Cycle I	Chapter 17 Sect. 3	Module 27	**Quiz 27**	**Friday July 7th 11:59 PM**
	28	SS	Krebs Cycle II	Chapter 17 Sects. 4, 5	Module 28A/B Module 28C/D	**Quiz 28A/B Quiz 28C/D**	**Friday July 7th 11:59 PM**
	29	SS	Electron Transport I	Chapter 18 Sects. 1, 2	Module 29A Module 29B	**Quiz 29A Quiz 29B**	**Sunday July 9th 11:59PM**
	30	SS	Electron Transport II	Chapter 18 Sects. 1, 2	Module 30A Module 30B	**Quiz 30A Quiz 30B**	**Sunday July 9th 11:59PM**
	31	SS	ATP Synthase	Chapter 18 Section 3	Module 31A Module 31B	**Quiz 31A Quiz 31B Disc 7 27-31**	**Sunday July 9th 11:59PM**
7 7/10	32	SS	Regulation of ATP Synthesis- Inhibitors & Uncouplers	Chapter 18 Sects 3, 4	Module 32	**Quiz 32**	**Thursday July 13th 11:59 PM**

Week #	Lect. No.	Lect. Initial	Lecture Name	Text Reading	Lecture Video Modules	Quiz & Discussion	Due Date
	33	MK	Fatty Acid Degradation I	Chapter 20 Section 1 Chapter 22 Section 2	Module 33A Module 33B	**Quiz 33A Quiz 33B**	**Thursday July 13th 11:59 PM**
	34	MK	Fatty Acid Degradation II	Chapter 20 Sects 2,3	Module 34A Module 34B	**Quiz 34A Quiz 34B**	**Sunday July 16th 11:59PM**
	35	MK	Fatty Acid Biosynthesis	Chapter 20 Sects. 4, 5	Module 35A Module 35B	**Quiz 35A Quiz 35B**	**Sunday July 16th 11:59PM**
	36	MK	Cholesterol Biosynthesis	Chapter 20 Section 7	Module 36A Module 36B	**Quiz 36A Quiz 36B Disc Post 8: 32-26**	**Sunday July 16th 11:59PM**
8 7/17	37	SS	Metabolic Regulation I	Chapter 17 Section 4	Module 37A Module 37B	**Quiz 37A Quiz 37B**	**Wed. July 19th 11:59 PM**
	38	SS	Metabolic Regulation II	Chapter 22 Section 3 Chapter 13 Sects.2,3	Module 38A Module 38B	**Quiz 38A Quiz 38B**	**Wed. July 19th 11:59 PM**
	39	SS	Metabolic Regulation III	Chapter 13 Sects. 2,3	Module 39A Module 39B	**Quiz 39A Quiz 39B**	**Wed. July 19th 11:59 PM**
	Exam 3		**Lectures 27-39**	**Day: 7/20**	**Place: West Campus- Javits 100 or remote**	**Time: 6:30 – 9:30 PM**	

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