

DRAFT

Stony Brook University | Department of Biochemistry & Cell Biology BIO 202 Fundamentals of Biology: Molecular and Cellular Biology Summer 2024

**Extended Session 1 ONLINE
Monday, May 20th to Friday, July 12th
DEC: E, SBC: STEM+**

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

Exam 1 - Wednesday, June 5th from 6:30 to 8:00 PM
Exam 2 - Wednesday, June 19th from 6:30 to 8:00 PM
Exam 3 - Wednesday, July 10th from 6:30 to 9:30 PM

NOTE: A computer, webcam, microphone, and reliable high-speed internet are required for this course.

Course Director

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Department of Biochemistry and Cell Biology

Instructional Support:

Learning Assets and Course Administrator

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COURSE DESCRIPTION: A component of the three-semester series on Principles of Biology, BIO202 introduces students to molecular, cellular, and genetic aspects of living systems, with a focus on the relationship between structure and function. These fundamental insights are vital to the understanding of all of biology.

Prerequisite: C or higher in CHE 129 or CHE 131 or Corequisite CHE 152

For Non-Matriculated students contact kristen.slovak@stonybrook.edu for permission for prerequisites.

For Matriculated students contact lynette.giordano@stonybrook.edu for permission

COURSE LEARNING OBJECTIVES: Upon completion of BIO 202 students will be able to:

1. Recognize the structure and explain the function of four major types of biological molecules, polysaccharides, lipids, proteins, and nucleic acids.
2. Compare and contrast the structure of eukaryotic and prokaryotic cells and explain the functions of their individual compartments.
3. Explain concepts and main mechanisms of communication between cells.
4. Explain how all cells produce the energy that they need to function.
5. Explain how plant cells produce chemical compounds from the energy of light (photons).
6. Describe biological activities and regulation of enzymes.
7. Describe how cells store and utilize energy.
8. Explain the function of nucleic acids as carriers of genetic information.
9. Provide a conceptual framework for mechanisms of storage, preservation, and replication of genetic information in cells.
10. Explain the mechanisms of the flow of genetic information from nucleic acids to proteins.
11. Explain mechanisms by which cells divide to produce somatic and germ cells.
12. Describe basic laws of inheritance of genetic traits.
13. Explain modern technologies-based analysis and manipulation of genetic material.
14. Synthesize information from various sources and critically evaluate possible applications of the science.

REQUIRED TEXTBOOK

Campbell BIOLOGY 11th or 12th edition (even older editions are fine). There is a loose-leaf option as well as an eBook available. Any of these formats is acceptable to use it is the Campbell Biology text.

Hardcover: ISBN: 9780134093413
Loose-leaf: ISBN: 9780134154121
eBook ISBN: 9780134446417

COURSE TECHNICAL REQUIREMENTS -An internet connection that can support video is a requirement to take this course

Computer with working webcam and microphone
Stable and Reliable high-speed Internet connection
Access to SBU Brightspace

COURSE ORGANIZATION: This course is organized in thirds with a video-proctored **evening exam** given at the end of each third to assess your mastery of the content presented.

All course content is delivered online through Brightspace. The content of the course is accessible to you via video lectures, lecture PowerPoints for note-taking, and through readings in the 11th Edition of the Campbell Biology textbook.

This is an online course; therefore, online learning assets are a crucial component of learning. well-written and well-researched discussion post per week is required. Discussion posts will include outside research and discussion with colleagues. This portion of your work will also serve as a powerful study aid for mastery of key concepts and performing well on the exams as well as to increase your critical thinking and communication skills. The objective is also to help you learn to synthesize information from various sources and critically evaluate possible applications of the science. Grading for this portion of the course will consist of the assessment of your critical thinking and application skills as guided by the discussion board rubric shown on Brightspace.

Optional content practice quizzes will be available every week. These quizzes are for self-assessment and are NOT graded. You can take each quiz as many times as you like.

EXAMINATIONS AND GRADES: Grades are a combination of three online, video-proctored exams and weekly discussion board assignments. **All students must participate in the learning asset assignments.**

- Your course grade will be determined as follows:
- 3 midterm exams 90 %
- Learning asset score 10% Final course grades will be assigned on a curve.
- **EXAMS:**
- There will be a total of **3 exams**. Each exam will consist of **40 multiple-choice questions and will last for 90 minutes on the dates/times listed above and on SOLAR**. Each exam covers only one unit of content, and there is **no cumulative final exam**. If you miss an exam and are granted an excused absence, you will be offered a makeup exam. Makeup exams will only be offered on Wednesday, July 12th immediately after exam 3 during the extra time allotted.
- All exams will be taken through **Respondus Lockdown Browser and Monitor**. **To launch Respondus, please log in to Brightspace and click "Launch Respondus" from within Brightspace. That should open the lockdown browser within Brightspace and you will not have to give your login credentials again.**

GRADING POLICY AND GRADE DETERMINATION

All exams are assigned a numerical score. No letter grades are assigned to any individual exams or discussion boards. Only the final grade for the course is assigned a letter grade. After all the numerical scores are available, the final score for the course is calculated based on the weighted percentages shown above. The calculated final scores for the course are then assigned a letter grade, based on a curve that is determined each semester to reflect the average performance of the class. We use the following general guidelines for this curve:

A: top 10% of the class
A-: next 5%
B+: next 5%
B: next 10%
B-: next 5%
C+: next 10%
C: next 25%
D: next 20%
D
F: bottom 10%

Note that these percentage numbers are only approximate and may vary for each class/semester. However, regardless of the exact numerical grade distribution and class performance, “thresholds” for final numerical grades will override the curve. For instance, final numerical grades between 90 and 100 will always be within the A/A- categories and those between 80 and 90 will always be within the B+/B/B- categories. Cut-offs might be lowered, but they will never be raised above the thresholds listed below. In other words, if your numerical course grade is within the threshold, you are guaranteed that grade regardless of the curve.

Thresholds

90% and above = A range (includes A- and A)
80-90 = B range (includes B-, B and B+)
70-80% = C range (includes C and C+, no C-'s are given in this course)
60-70% = D
Below 60% = F

EXAMS:

- Exams may only be taken on the days and times given.
- They will consist of multiple-choice questions presented one at a time with no backtracking. All exams will be video recorded.
- You are responsible for a reliable internet connection, webcam, and microphone for all exams. Devices that utilize mobile operating systems (cell phones, iPads, etc) will not work for exams.
- Students must show their Stony Brook ID or official picture ID, and their surroundings, and make the statement that they have no other electronics in view or in hearing distance before they begin the exam. The exams are closed book. No cell phones or other electronics including watches are permitted.
- Students will be required to download any monitoring software to their computers before the exam.
- Students 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.
 - 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 in the video and if/when asked during the exam.
 - 6) Altering your environment in any way after performing your environment check.
 - 7) Covering, moving, or obstructing your camera at any time during an exam.

Suspicious activity will be turned over to the Academic Judiciary and any plagiarism or other breaches of academic integrity will result in an F for the course.

LEARNING ASSETS:

A. Academic Integrity/Syllabus Quiz (30 points)

One quiz due

B. DISCUSSION BOARD POSTS (DB): (70 points possible)

- Discussion posts are due on Saturday each week.

- **THERE ARE 8 DISCUSSION POSTS DUE** on Brightspace throughout the course. (See the *Assignments* tab on Brightspace each week for details).
- You are required to write **one well-written**, substantial, and researched documented post per week
- **Raw Score Grading is on a categorical scale of 0, 2, 4, 6, 8, and 10.** Each post will be graded according to the rubric provided in the Discussion Board Directions file on Brightspace.
- We drop the lowest scoring post for a total of 7 graded posts (70 points)
- Considering the one dropped post, **NO MAKEUPS OR LATE SUBMISSIONS ARE ACCEPTED.**

Your total and combined learning asset grade (Academic Integrity/Syllabus Quiz + best 7/8 discussion posts) are worth 10% of your final course grade. **Discussion posts are due by Saturday at midnight (end of the day) EDT.**

Learning Objectives of Group Discussion:

1. Sharpen your scientific and intellectual critical thinking skills including learning the skill of attempts at falsification of potential answers/solutions (a key element of scientific inquiry).
2. Achieve complete mastery of fundamental biological concepts as a foundation for mastery of the details of biological systems with minimal memorization and maximal understanding.
3. Learn the hierarchically nested combinatorial nature of all biological systems.
4. Enhance your understanding beyond your current knowledge to improve your exam scores.
5. Practice critical reading skills including relevant detail.
6. Investigate the connections between what you have learned and what you are currently learning.
7. Learn to synthesize information so you can problem solve.
8. Learn to communicate and debate your understanding at a detailed level with your colleagues in a professionally written format including proper internal and external citations.
9. Use an early warning system before exams for crucial study areas for you.

ALL DISCUSSION POSTS will be monitored by plagiarism check software and all cases of suspected breaches in academic integrity will be turned over to the Academic Judiciary. Breaches include but are not limited to copying another student's post with or without their knowledge, working together and submitting identical work, submitting work previously turned in for another class, plagiarism, improper or no citation, and anything listed on the Academic Integrity website. The penalty is an F in the course! USE YOUR OWN WORDS and REFERENCE ALL SOURCES. ALL Posts are checked with computer software BETWEEN groups and from prior courses as well as the Internet.

BE SURE TO READ THROUGH THE DISCUSSION BOARD RUBRIC AND EXAMPLES OF GRADED DISCUSSION BOARD POSTS BEFORE CRAFTING YOUR POST (Located on Brightspace under Syllabus/Course Information Tab).

RULES OF THE GAME FOR DISCUSSIONS: *Please be aware that the information provided by other students in your group is not necessarily correct. The purpose of discussion groups is to give you the chance to clarify your understanding and sharpen your intellectual skills. Authoritative factual information for EXAM purposes comes from the lecture, the textbook, lecture PowerPoints, and faculty responses to discussions, which will be provided the week after your discussion with your colleagues is over in the discussion clarification document posted on Brightspace. This is important to remember when studying for exams.*

The following behaviors during Group Discussion are unacceptable and will result in your being excluded from the Discussion Group and forfeiting that portion of your grade that week.

- Using abusive, disrespectful, or foul language.
- Using sexually suggestive language (either explicit or implicit) that could be perceived as offensive or harassing.
- Threatening others.
- Insulting others or denigrating the opinions of others. Of course, you may respectfully, even strongly, disagree or challenge the opinions of others, but we attack positions, NEVER individuals in scientific debate.
- If any inappropriate behavior of the sort listed **above** should occur, the offender will be issued one and only one warning. A second offense will be grounds for excluding the offender from the Discussion Group and forfeiting all his/her credit for this course requirement.
- Plagiarism of any sort - either copied work from other sources or other students' posts - will not be tolerated. There is zero tolerance for plagiarism or copying of any sort. Discussion posts should be written in your own words. References and citations must be provided for all sources - **direct quotes are NOT permitted.** See the Academic Honesty statement **Any academic dishonesty will be reported to the Academic Judiciary and can result in an F in the course.**

HOW TO SUCCEED IN BIO 202:

- **WATCH THE ORIENTATION VIDEO:** The orientation video will take you through how the course is managed and set up on Brightspace so you can spend your time learning content during the term.
- **WATCH ALL WEEKLY ASSIGNED ECHO CONTENT LECTURES:** The lectures show you which topics to emphasize, how much detail you need to know, and how the topics fit together. Chapters from the book listed in the Course Schedule will help you to find the relevant material for each lecture. Use the textbook to supplement the material presented in the lectures. **The exams are**

based on the lectures and PowerPoints, which may contain some material that is not found in the textbook; so do not miss any lectures.

- COMPLETE ALL ASSIGNMENTS ON TIME! Weekly assignments with due dates are posted under assignments on the Brightspace site with the assignment at the top being the one due for the week. You may wish to print out lecture PowerPoints given in the assignments before watching lectures for note-taking. Put your best foot forward during the discussion board portion of the course and do not miss any due dates.

BIO 202 ONLINE BRIGHTSPACE SITE: The course is managed completely through the Brightspace site at <https://mycourses.stonybrook.edu/d21/login> All syllabus and grading information is posted along with assignments and lecture videos. Discussion board forums are provided. Pay attention to all announcements and emails.

If you have used Stony Brook's Brightspace system previously, your login information (Username and Password) has not changed. If you have never used Stony Brook's Brightspace system and have not set up your NetID and password go to:

<https://mypasswords.stonybrook.edu/react/>. For help or more information see <https://it.stonybrook.edu/services/tech-stations> or <https://it.stonybrook.edu/services/itsm>. For other problems logging in, go to the helpdesk in the Main Library SINC Site or the Union SINC Site, you can also call 631-632-9602 or email helpme@stonybrook.edu.

SOURCES OF HELP:

1. Administrative Questions Forum: There is a forum under your discussion board for all administrative questions - all questions placed here will be answered within 24 hours.
2. TAs: Undergraduate TAs will monitor your discussion boards and assist you in applying critical thinking skills to content.
3. Prof. Citovsky is available for web office hours, for any content-related questions.
4. Kristen Slovak will answer any Brightspace-related and grading concerns regarding the discussion posts.
5. Kristen Slovak is available for additional content assistance via Zoom web meetings. Contact her at Kristen.slovak@stonybrook.edu for an appointment.

UNDERSTAND WHEN YOU MAY DROP THIS COURSE

It is the student's responsibility to understand when they need to consider dropping the 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.

I - Academic Integrity

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/commcms/academic_integrity/index.html

EXAMS: The following are prohibited: Use of books, notes, or other aids during an exam, copying from another student, or letting another student copy from you, failure to provide a thorough environment check, blocking, tilting, or obstructing your camera, the use of any secondary electronic devices (cellular phones, computers, speakers, calculators, tablets, fidgets, and headphones) during an exam, taking an exam for someone else, or permitting someone else to take an exam for you.

DISCUSSION BOARD: The following are prohibited: Posting any work that is not your own, such as work copied from someone else, directly from a reference, including the Internet sources and Artificial Intelligence (AI) programs. All posts must be entirely in your own words and properly referenced. All discussion posts must be your original work written only for this class. You cannot re-use your own work submitted for this or any course taken at any time.

Any suspicious behavior will be reported, with a recommended penalty of an F in the course. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at https://www.stonybrook.edu/commcms/academic_integrity/

II - 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 are confidential. <https://www.stonybrook.edu/commcms/studentaffairs/sasc/facstaff/syllabus.php>

III - Student Support Statements

To access mental health services, call Counseling and Psychological Services at 631-632-6720; Counselors are available to speak with you 24/7.

For updated information on the Academic Success and Tutoring Center please check:
https://www.stonybrook.edu/commcms/academic_success/ for the most up-to-date information.

For IT Support: Students can visit the Keep Learning website at <https://sites.google.com/stonybrook.edu/keeplearning>

For information on the tools, you need for alternative and online learning.
Need help? Report technical issues at <https://it.stonybrook.edu/services/itsm>
or call 631-632-2358.

For information on Library services and resources please visit the *Continuity of Library Operations guide*
<https://guides.library.stonybrook.edu/continuity>

IV - Critical Incident Management:

Stony Brook University expects students to respect other people's rights, privileges, and property. 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. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

COURSE CONTENT: Course material accessed from Brightspace, SB Connect, SB Capture or a Stony Brook Course website is for the exclusive use of students who are currently enrolled in the course. Content from these systems cannot be reused or distributed without the written permission of the instructor and/or the copyright holder. Duplication of materials protected by copyright, without permission of the copyright holder is a violation of the Federal copyright law, as well as a violation of Stony Brook's Academic Integrity and Student Conduct Codes https://www.stonybrook.edu/commcms/academic_integrity/ (you may have to copy and paste the address in a browser).

Honor Code Statement – Closed Book Exams

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. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website
at https://www.stonybrook.edu/commcms/academic_integrity/policies_procedures/index.php

All exams are closed book and will be recorded via Respondus monitoring software. You must download and install the software to take the first quiz. You must take all exams independently with no assistance from any other person, without the aid of any unauthorized materials, and without access to any electronic communication devices or group chats.

I understand that the following materials are permitted for Exams.

- Scratch paper – you must show the front and back of your scratch paper to the camera, at the beginning of the exam. You must show your scratch paper, front and back, again at the end of the exam so we can see what is written on it.
- Picture ID – either your Stonybrook ID or a governmental ID showing your picture and your name. You must show this ID clearly to the camera at the start of the exam.

I understand that the following materials are not permitted as this exam is closed book:

- Phone of any type
- Tablet
- Other electronic equipment including watches.
- Another person
- Other websites including group chats and AI programs.
- Notes, textbook, study material – again, this is a closed book exam, so any materials accessed in any way are not permitted.
- Content questions will not be answered during the exam.

Suspected violations will result in a report to Academic Judiciary and a course grade of F will be recommended for those found responsible.

You will be expected to show your picture ID clearly, perform the environment check when prompted to move your camera to show your environment, and always stay clearly in the frame of your camera. No other person should be in the room or be communicating with you at any point.

This honor code applies to all exams for your online course.

COURSE SCHEDULE

Weekly Assignments referred to below are located on Brightspace in the weekly assignment folders.

Week #	Lecture	Faculty	Lecture Name	Assigned Reading	Assignment Due
Week 1: 5/20	0	KS	Orientation and Academic Integrity	Syllabus, Honor Code, Directions	
	1	VC	Atoms and Molecules in Biology	Chapter 2	
	2	VC	Chemical Bonds, Functional Groups	Chapters 3-4	
	3	VC	Acids, Bases, pH, Buffers. Macromolecules 1: Lipids and Carbs	Chapter 5	
	4	VC	Macromolecules 2: Nucleic Acids	Chapter 5	
	5	VC	Macromolecules 3: Proteins	Chapter 5	
	6	VC	Protein structure, enzymes, & catalysis	Chapters 5,8	AIQ & Posts 1 & 2 Due 5/25
Week 2: 5/27	7	VC	Enzymes & Regulation of Enzymes	Chapter 8	
	8	VC	Energy in Biology, ATP	Chapter 8	
	9	VC	Cell structure, organelles 1	Chapter 6	
	10	VC	Organelles 2	Chapter 6	
	11	VC	Cytoskeleton 1	Chapter 6	
	12	VC	Cytoskeleton 2, Intercellular connections	Chapter 6	
	13	VC	Membrane structure	Chapters 6 -7	Post 3 Due 6/1
Week 3: 6/3	14	VC	Osmosis, transport across membranes	Chapter 7	
Exam 1 Lectures 1 - 14. Wednesday June 5th from 6:30 - 8:00 PM EDT					
	15	VC	Cell communication and signaling 1	Chapter 11	
	16	VC	Cell communication and signaling 2	Chapter 11	
	17	VC	Cell communication and signaling 3	Chapter 11	
	18	VC	Cellular respiration: glycolysis	Chapter 9	
	19	VC	Krebs cycle, fermentation, control of respiration	Chapter 9	Post 4 Due 6/8
Week 4: 6/10	20	VC	Photosynthesis 1	Chapter 10	
	21	VC	Photosynthesis 2	Chapter 10	
	22	DB	Chromosomes and cell division. Mitosis	Chapter 12	
	23	DB	Cell cycle, intro to cancer	Chapter 12	
	24	DB	Meiosis	Chapter 13	
	25	DB	Mendel and the gene idea	Chapter 14	
	26	DB	Mendelian patterns in human inheritance	Chapter 14	
	27	DB	Chromosomal basis of inheritance	Chapter 15	Post 5 Due 6/15
Week 5: 6/17	28	DB	Genetic variation: exceptions to Mendel's law	Chapter 15	
Exam 2 Lectures 13 - 28. Wednesday June 19th from 6:30 - 8:00PM EDT					
	29	DB	DNA the genetic material	Chapter 16	
	30	DB	DNA Replication	Chapter 16	
	31	DB	Transcription and RNA processing	Chapter 17	Post 6 Due 6/22
Week 6: 6/24	32	DB	Translation	Chapter 17	
	33	DB	Mutations, Bacterial Genetics	Chapt. 17-18	
	34	DB	Regulation of eukaryotic gene expression	Chapter 18	
	35	DB	Intro to protein structure	Chapter 18	
	36	DB	Eukaryotic genomes	Chapter 21	Post 7 Due 6/29
Week 7: 7/1	37	DB	Bacteria and Viruses	Chapter 19	
	38	DB	Biotechnology 1	Chapter 20	
	39	DB	Biotechnology 2	Chapter 20	
	40	DB	Fertilization & Early Development	Chapt. 21,47	
	41	DB	Mechanisms of Development 1	Chapt. 18, 47	Post 8 Due 7/6
Week 8: 7/8	42	DB	Mechanisms of Development 2	Chapt. 20, 47	
Exam 3 Lectures 29 - 42. Wednesday July 10th 6:30 - 9:30 PM EDT					

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.