

DRAFT

Summer 2 Extended Session 2024

BIO 314.30 Cancer Biology June 17th -August 17th, 2024

This is an 8-week asynchronous online course with 3 synchronous, online proctored exams. A computer*, webcam, microphone, and reliable internet service is required to take this course.

Exam 1 (Monday, July 8th 6:30-8:30 PM)

Exam 2 (Thursday, July 25th 6:30-8:30 PM)

Exam 3 (Thursday, August 15th 6:30-8:30 PM)

***remote proctor application will not work on iPads, tablets or phones**

Course Information:

Instructor Information

Course Instructor: Daniel Moloney, PhD. Research Associate Professor
Program Director, NIH - Bridges to the Baccalaureate "[BioPREP](#)"

Co-Director, [Biotechnology Teaching Laboratory](#)

Office: Life Science Building, Room 092

Office Hours: By appointment, in Zoom

Office Telephone: 631-632-1653

E-mail: Daniel.Moloney@stonybrook.edu

Course Administrator: Kristen Slovak, Instructional Support Technician, Biology Online.

Office: Life Science Building, Room 372

Office Hours: By Appt. Email to schedule: Zoom appt.

Office Telephone: 631-632-1127

Email: Kristen.Slovak@stonybrook.edu

Undergraduate Teaching Assistants:

TBD

Course Description

We will examine the biology of cancer. Emphasis is on molecular and cellular events, such as regulation of gene expression, genome maintenance, cell growth and death, differentiation, cell-cell recognition, signaling, and homeostasis, that are frequently disrupted in cancer. Recent advances in diagnosis and therapy will also be discussed. Prerequisite: C or higher in BIO 202 (Fundamentals of Molecular and Cellular Biology) or equivalent.

Textbook

The textbook is "The Biology of Cancer", R.A. Weinberg, Garland Science (1st edition 2006 or 2007, or 2nd edition 2014). The ISBN Nos. are 978-0-8153-4078-8 or 978-0-8153-4076-1 for 1st edition and 978-0-8153-4220-5 and 978-0-8153-4219-9 for 2nd edition.

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 Structure

This course will be delivered online asynchronously through the Brightspace course management system. In Brightspace, you will have access to lecture Powerpoints, lecture videos, and exam prep resources such as chapter reviews. For current Stony Brook students: You will use your NetID account to log in to the course from the [Brightspace login page](https://mycourses.stonybrook.edu/d2l/login) (<https://mycourses.stonybrook.edu/d2l/login>). 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://mycourses.stonybrook.edu/d2l/login> . 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.

Course Learning Objectives

The course is designed to introduce students with a strong background and interest in biology to the current understanding of the molecular basis of cancer. Emphasis will be placed on the methodologies and approaches of ongoing research efforts, so that students will be more prepared to read research papers published in scientific journals.

The Nature of Cancer: Be able to define cancer and describe the ways in which cancer has been classified by the scientific community. Identify the gradations between normal and cancer cells.

Tumor Viruses: Recognize and be able to describe and discuss the mechanisms of transforming viruses.

Cellular Oncogenes: Explain how cellular oncogenes were identified and indicate how the structural and regulatory alterations of cellular genes can contribute to cancer.

Signal Transduction: Recall the evolution and necessity of cell-cell communication, the mechanisms of G protein and receptor tyrosine kinase signaling. Describe how defects in these proliferative signaling pathways explain the uncontrolled growth seen in cancer cells.

Tumor Suppressor Genes: Define and explain the phenomenon of gene "loss" in cancer, and the mechanism of action of tumor suppressor genes NF-1, APC, and VHL.

Cell growth: Indicate how progression through the proliferative cycle of DNA replication and cell division is regulated in normal cells. Illustrate how the loss of tumor suppressor protein pRb contributes to tumorigenesis.

Cell death: Indicate how the tumor suppressor protein p53 preserves genome integrity by promoting cell cycle arrest, DNA repair, and programmed cell death in cells that have sustained genome damage. Determine the consequences of p53 "loss" in cancer cells.

Cell Immortalization: Distinguish the mechanisms that cause normal cells to eventually stop dividing and examine how cancer cells evade these mechanisms to become "immortal".

Multi-step Tumorigenesis: Define and describe the six hallmarks of cancer cells, the minimal set of genetic modifications that are required to transform normal cells, and the initiator/promoter model of tumorigenesis.

Maintenance of Genomic Integrity: Identify and describe the mechanisms that can introduce mistakes into DNA, the repair pathways that deal with the damage, and the consequences if they are not repaired.

Heterotypic Interactions: Describe and examine the interactions between cancer cells and normal cells that enable angiogenesis, invasion and metastasis, and the suppression of the anti-tumor immune response.

The Rational Treatment of Cancer, special topics in cancer research: Be able to define and describe the conventional therapies: surgery, radiation, and the classes of chemotherapy, and the mechanisms that result in resistance. Evaluate the dietary and lifestyle choices that are believed to promote cancer, and those that are believed to prevent cancer. Describe and be able to discuss the process of drug discovery and evaluate and appraise some of the promising novel targeted therapies including immunotherapy.

You will meet the objectives and learning outcomes listed above through a combination of the following required course activities provided in the weekly assignment folders on Brightspace:

- Watch assigned lecture module videos with associated Powerpoints
- Review the comparable content in the textbook.
- Complete the chapter quizzes. These quizzes are open book/notes. They are not timed or proctored. See course schedule for quiz assignments and due dates.
- Complete the three synchronous, video-proctored exams. See course schedule for exam dates.

Exams:

Exams 1,2 and 3 are unit exams; there is no cumulative final in this course. All exams are mixed question types including multiple choice, true/false, fill in the blank, and short answer. All exams, and the syllabus/academic integrity quiz, will be taken through **Respondus Lockdown Browser / Respondus Monitor. See detailed instructions for use and download at the end of this document.**

Grading Policy

Course Numerical Grades are determined as follows:

Percent of Final Grade	Description
15%	Top 10 content quizzes + Top 6 Discussion Assignments and syllabus/academic integrity quiz
85%	average of exams 1, 2 and 3
100%	

Conversion of course numerical grades is determined as follows*:

Letter Grade	Course numerical grade
A Range (A- thru A)	88% and up
B Range (B-, B, B+)	75 - 87.9%
C Range (C and C+)	58 - 74.9%
D	50 - 57.9%
F	Below 50%

*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 overall student performance. In other words, if your course numerical grade is 58%, you are guaranteed a C.

Course Policies

Course Withdrawal and Incomplete

It is the student's responsibility to understand when they need to consider dropping the course. Consult the Academic Calendar for the official Add/Drop deadline. Incompletes are granted only under significant and documented emergencies. Contact Professor Erster to discuss the situation and options.

STATEMENTS:

STUDENT ACCESSIBILITY SUPPORT CENTER STATEMENT:

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact the 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.

ACADEMIC INTEGRITY 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.

No course materials, exams and exam answers should be uploaded to any internet resources or shared with others in any way, even after completion of the course.

We take seriously our responsibility to give students an accurate and fair evaluation of their performance in the course. We therefore have a “zero tolerance” policy towards cheating in any form for all exams and assignments. Anyone caught cheating will be reported to the Academic Judiciary Committee. Our recommended penalty for students found guilty of academic dishonesty is an F for the course.

Examples of academic dishonesty include but are not limited to:

- During exams, the use of cell phones, smart watches, headphones or any other digital devices aside from the computer you are using to take the exam. University policy regards receiving a cell phone call during an exam, even if it is unrelated, as cheating.
- Use of books, notes, or other aids during an exam, copying from another student, or letting another student copy from you during an exam or quiz, taking an exam or quiz for someone else, or permitting someone else to take an exam or quiz for you.

Collaborating with others in any way during exams.

- Failing to provide a thorough environment check or turning off or obstructing your camera in any way during exams.
- Misrepresenting your work or the work of others in any way.
- Sharing your NetID and/or password with anyone else.
- 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/>

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 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 MATERIALS AND COPYRIGHT STATEMENT:

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 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.

HONOR CODE STATEMENT - CLOSED BOOK EXAMS

All exams are CLOSED BOOK and will be recorded via Respondus monitoring software. You will have to download and install this software to use for the Academic Integrity quiz which is due the first week of classes. You must take the quiz and the exams independently with no assistance from any other person, without the aid of any unauthorized materials, and without access to any digital devices aside from the computer you are using to take the quiz or exam. You will be expected to show your picture ID clearly, to perform a thorough environment check when prompted moving your camera to show your environment, and to stay clearly in the frame of your camera at all times. No other person should be in the room or communicating with you at any point.

The following materials **are** permitted for Exams.

Scrap paper – you must show the scrap paper to be utilized to the camera, front and back at the beginning of the exam. You must show the paper again at the end of the exam front and back so we can see what is written on it.

Picture ID - either your Stony Brook ID or any government-issued photo ID. You must show this ID clearly with your picture and name visible to the camera at the start of the exam.

The following materials **are not** permitted as all exams are closed book:

Phone of any type

Tablet or iPad

Other digital devices, including but not limited to smart watches, calculators, headphones, earbuds, or air pods.

Another person

Other websites or apps, 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 exams.

Violations will result in exam disqualification and/or a report to the Academic Judiciary. If found responsible by Academic Judiciary, the recommended penalty is an F for the course.

ONLINE COMMUNICATION GUIDELINES AND LEARNING RESOURCES STATEMENT:

The classroom is a professional environment where academic debate and learning take place. You are expected to respect the opinions, ideas, and beliefs of other students. Offensive language or rudeness will not be tolerated. We reserve the right to remove any comments or questions posted on the course forums that display inappropriate language or content.

If you post questions to the content or administrative question forums, try to include specific details such as question, slide, and page numbers.

Please read the questions posted by your classmates to see if your question has already been answered. If you think you know the answer to a classmate's content question, feel free to post it with references.

Email Policies

Email sent via Brightspace 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 (<https://www.stonybrook.edu/mycloud>)

If you need technical assistance, please contact Client Support at (631) 632-9800 or supportteam@stonybrook.edu

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.

Course Schedule

Important Note: Refer to the Weekly Assignments on Brightspace 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 folders. If you have any questions as to the administration of the course, please contact Kristen Slovak at kristen.slovak@stonybrook.edu or post your question in the administrative forum on Brightspace.

SUMMER 2024 BIO 314 CANCER BIOLOGY COURSE SCHEDULE						
Week #	Lec	Lecture Name	Reading	Lecture Videos	Assignment	Due Date
Week 1 Tues 6/17	0	Orientation, Academic Integrity, Exam Location	Syllabus & Course Info	Orientation & Academic Integrity Videos	AIQ/Syllabus Quiz & Intro	11:59 PM Sun 6/23
	1	The Nature of Cancer	Ch 2	Ch 2 A & B		
	2	Tumor Viruses	Ch 3	Ch 3 A & B	Ch 2 & 3 Quiz DB 2	11:59 PM Sun 6/23
Week 2 6/24	3	Cellular Oncogenes	Ch 4	Ch 4 Parts A & B	Ch 4 Quiz	11:59 PM Wed 6/26
	4	Growth Factors & Their Receptors	Ch 5	Ch 5 Parts A - C	Ch 5 Quiz	11:59 PM Sun 6/30
Week 3 7/1	5	Cytoplasmic Signaling	Ch 6	Ch 6 Parts A - C	Ch 6 Quiz DB 3	11:59 PM Sun 7/7
Exam 1 Monday, July 8th 6:30 – 8:30 PM covers Chapters 2-5						
Week 4 7/8	6	Tumor Suppressor Genes	Ch 7	Ch 7 Parts A - C	Ch 7 Quiz	11:59 PM Wed 7/10
	7	pRb & Control of the Cell Cycle	Ch 8	Chr 8 Parts A - C	Ch 8 Quiz DB 4	11:59 PM Sun 7/14

Week 5 7/15	8	p53 & Control of Apoptosis	Ch 9	Ch 9 Parts A - C	Ch 9 Quiz	11:59 PM Wed 7/17
	9	Telomeres & Cell Immortalization	Ch 10	Ch 10 Parts A - C	Ch 10 Quiz DB 5	11:59 PM Sun 7/21
Week 6 7/22	10	Tumor Progression1	Ch 11	Ch 11 Parts A & B		
	11	Tumor Progression2	Ch 11	Ch 11 Parts C & D		
Exam 2 Thursday July 25th 6:30 – 8:30 PM covers Chapters 6-10						
Week 7 7/29	12	Genome Integrity 1	Ch 12	Ch 12 Part A	Ch 11 Quiz	11:59 PM Wed 7/31
	13	Genomic Integrity 2	Ch 12	Ch 12 Part B & C	Ch 12 Quiz DB 6	11:59 PM Sun 8/4
	14	Angiogenesis, Invasion & Metastasis	Ch 13 & 14	Ch 13 & Ch14		
Week 8 8/5	15	Rational Treatment of Cancer 1	Ch 16	Ch 16 Parts A & B	Ch 13 & 14 Quiz	11:59 PM Wed 8/7
	16	Rational Treatment of Cancer 2	Ch 16	Ch 16 Part C		
	17	Rational Treatment of Cancer 3	Ch 16	Ch 16 Part D	Ch 16 Quiz DB 7	11:59 PM Sun 8/11
Exam 3 Thursday Aug. 15th 6:30-8:30 PM covers Chapters 11-16						