

**Syllabus: Cancer Biology**  
**BIOL 4024W**  
**BIOL 7180G**  
**BIOL 79303 Graduate Center Course number**

**Class Platform:** In-person (Room TBA)  
(**Synchronous Class Sessions** with Asynchronous Activities) (**Day/Time:**  
**TBA**)

**Instructor:** TBA

**Office:** TBA

**E-mail:** TBA

**Subject line:** CancerBio22

**Office hours:** TBA,  
@TBA or @zoom  
Fix an appointment by email.

**Note:** Classes will be in-person. We will follow CDC and CUNY guidelines during the entire coursework. If the situation demands to change the learning modality, then we will accordingly adapt. In-person classroom, during Face2Face office-hours and any in-person discussions, safe distancing and mask are mandatory.

### **Course-outline**

**Rationale:** Cancer is a disease that affects people of all nationalities and age groups. A cancer cell shows uncontrollable growth due to altered genetic and phenotypic characteristics. Understanding the genes or factors controlling the formation and progression of tumor cells has become an ultimate necessity of medical sciences, in order to prevail human health. This is an elective writing-intensive course draws students with specialized interests in learning biology of cancer.

**Bulletin Description:** The course is designed to help understand how the tumor cell is formed and become progressive as well as how inherent tumor-suppressor genes play role/s in killing the cancer cells. The students will get an opportunity to learn molecular mechanisms of a cancer cell and develop an interest in basic or therapeutic cancer research. Writing-intensive course.

### **Course objectives:**

- To acquire basic knowledge about cancer formation, progression and metastasis.
- To gain insights about the mechanisms that surveillance pre-cancer abnormalities and roles of tumor suppressor pathways.
- To gain glimpses of current progress in basic and therapeutic cancer research.
- To develop the skills of library research, scientific writing and presentation.
- To learn scientific material through multiple approaches e.g., “C.R.E.A.T.E.” (Consider, Read, Elucidate hypotheses, Analyze and interpret data, Think of the next Experiment), Bloom’s and Fink’s Taxonomy.

**Course format:** For detailed schedule refer to “**SynchAsynch CancerBio Schedule fall22**”

Live session format: Typically, 9.30-10.25 lecture, 5’ break; 10.30-11.25-continue lesson, 5’ break. Last 45’ there will be in-class activities or discussion or solving problems or group activities. The order may change depending upon the material we learned.

Active classroom discussion will occur on weekly forum, posting Qs about scientific topics and during students' presentations (Week 13-14). Groups will be posted on Bb and Scientific topics for discussions are also assigned and posted on Bb under "Course Documents".

Writing assignments will be posted on Bb under "**Course Documents**"; critical feedbacks will be provided, initially by the instructor and subsequently by student's review process. Students will have an opportunity to revise before final submission for grading.

Quizzes will be on Bb, timed and only one-attempt is possible. Students will be tested for their fundamental knowledge as well as analytical and problem-solving abilities. Questions might include True/False and Justify, match the column, fill in the blanks or define. Data interpretation, write correct sequence, multiple answers, short answers etc. Quizzes can be taken asynchronously.

Exams are taken on a scheduled time and in-person. Exams are modeled from the type of Qs asked in Quizzes. If the instruction modality changes due the pandemic and Exams are taken on blackboard Ultra, then students MUST join also via "zoom" with camera ON.

**Methods of evaluation with {competency measured} and (% of the total grade) in parentheses:**

**Summative assessment:**

- 1) "Writing an abstract" {Integration of material, Comprehension} and "Develop Scientific Project" {Consider, Read, Fundamental Knowledge, analyze and interpret data, think of next experiment/application, metacognitive thinking} (20%)
- 2) "Public Service Announcement" (PSA) as a poster/graphics {self-directed learning, critical thinking} (5%)
- 3) Class group presentation and leading a discussion {team building, becoming civil citizen and learning to appreciate others' point of view} (15%)
- 4) Scheduled three exam scores: Students will be tested for their knowledge and application of the biological concepts learned throughout, but exams will be non-cumulative. {critical thinking, data analyses, fundamental and applied knowledge} (45%) **Formative assessment:**
- 5) Weekly discussion forum and respond to peer's post {self-directed learning, critical thinking, scientific arguments with evidential support} (5%)
- 6) In-class participation: Weekly in-class activities, commenting classmates work & discussions and submitting Qs on Bb for the presenters (Weeks 13-14) (5%)
- 7) Weekly post-class quizzes (5%)

Please refer "**Saxena CBIO 22 Writing Exercises Rubrics**" document for detailed rubrics for all the assignments/activities e.g. "How to write an abstract", "How to write a critical analysis scientific essay", "How to review a scientific write-up" and other tasks such as "Discussion Forum" and posting Qs. Credits will be given when each objective is addressed.

**Grading: Letter grades will be given A, B, C and F.** Since this is an upper-level course, a D grade is not included.

**Anticipated workflow for the synchronous in-person class sessions (Highly recommended to attend all):**

- Refer to “**SynchAsynch CancerBio Schedule**” for details.
- Refer to **Course Checklist** at the end of the syllabus.
- Check Blackboard (Bb) Announcements for any updates.

| Date  | Week                          | Topic  | Biology of Cancer Textbook |
|---|-------------------------------|--|----------------------------|
|   | <b>Before the first class</b> | <b>Review the Course Syllabus/Navigate Bb Complete Pre-class survey:</b><br>Learning Objectives (LO), Expected Outcomes, How Course Curriculum is Relevant to Students and Community, Evaluation Criteria, Writing Assignments, Discussion Topics, Group Assignment, Course Reading Material, Articles, etc. |                            |
|   | <b>Week 1</b>                 | <b>Biology and Genetics of Cells and Organisms:</b><br><u>LO:</u> Cancer as a ‘chaos’ at chromosomal level and involve malfunctioning genes; Genotype to Phenotype relationship  | Chapter 1                  |
| <b>No Class Scheduled on 9/2/22</b>   |                               |  |                            |
|   | <b>Week 2</b>                 | <b>Nature of Cancer</b><br><u>LO:</u> Classification of types of cancer; Cancer is a disease of malfunctioning cells and tissues   | Chapter 2                  |
|   | <b>Week 3</b>                 | <b>Tumor viruses</b><br><u>LO:</u> Cancer as a disease caused by viruses; Exploitation of Cellular proto-oncogenes by viral genomes; “Transformation” as a cancer phenotype<br><br><b>Guest Lecture: HPV vaccine (tentative)</b>   | Chapter 3                  |
| <b>Draft Abstract/summary of Scientific Project submission to Instructor via Safe Assign, Due TBA</b> |                               |  |                            |

**Written comments will be provided on the draft by TBA**

|  |               |   |           |
|--|---------------|---|-----------|
|  | <b>Week 4</b> | <b>Cellular Oncogenes</b><br><u>LO:</u> Modified cellular genes (at the gene, protein or control level) actually drive cancer | Chapter 4 |
|--|---------------|---|-----------|

| Date | Week          | Topic  | Biology of Cancer Textbook |
|------|---------------|--|----------------------------|
|      | <b>Week 5</b> | <b>Exam 1 (TBA).</b><br>First 30' of the class time and <b>the exam is in-person</b><br><br><b>Open Discussion about the Scientific Project and Poster preparation; Continue lesson plan</b> |                            |
|      | <b>Week 6</b> | <b>Growth factors, receptors and Cancer</b><br><u>LO:</u> Growth factor receptors function as oncoprotein  | Chapter 5                  |
|      | <b>Week 7</b> | <b>Signal transduction and Cancer</b><br><u>LO:</u> Extracellular signal captured at the surface trigger signaling storm in cytoplasm and allow "transformation" phenotype                   | Chapter 6                  |

**First complete draft of "Scientific Project" and Poster submission due on TBA; Reviewers will be assigned by TBA**

|  |                |  |              |
|--|----------------|--|--------------|
|  | <b>Week 8</b>  | <b>Tumor Suppressor Genes</b><br><u>LO:</u> Checkpoints, genes that recognize precancerous 'chaos' to correct; Cancer is a disease due to failure of these surveillance systems!   | Chapter 7    |
|  | <b>Week 9</b>  | <b>pRb and the cell cycle</b><br><u>LO:</u> Control of uncontrolled proliferation <b>p53:</b><br><b>The Master Guardian and Executioner</b><br><u>LO:</u> Recognizing DNA damage and many other stresses and killing cells | Chapter 8, 9 |
|  | <b>Week 10</b> | <b>Exam 2 (TBA).</b><br>First 30' of the class time and <b>the exam is in-person</b>   |              |

|  |                        |   |  |
|--|------------------------|---|--|
|  |                        | <b>Guest Lecture: TBA (tentative)</b>   |  |
| <b>Reviews due TBA via SafeAssign</b>  |                        |   |  |
|  | <b>Week 11</b>         | <b>Cell-death pathways (contd.)</b>   |  |
|  | <b>Week 12</b>         | <b>Tumorigenesis, Angiogenesis, Metastasis</b><br><u>LO</u> : Hallmarks of Cancer-revisited   | Each topic<br>Intro from<br>Chapter 10,<br>13 and 14 |
| <b>Thanksgiving Break</b>  |                        |   |  |
| <b>Group Presentations and Discussions: TBA</b>  |                        |   |  |
| <b>Date</b>  | <b>Week</b>            | <b>Topic</b>  | <b>Biology of<br/>Cancer<br/>Textbook</b>            |
| <b>Two Critical Qs</b> should be posted for the presenters on Bb, 1 day before the class meets |                        |   |  |
|  | <b>Weeks<br/>13-14</b> | Editorial, Perspective, News articles, breakthrough cancer discoveries, Peer-reviewed journal articles (posted at Bb, Course Documents) | Students' talks (Groups TBD)                         |
| <b>Final Scientific Project and Poster due TBA, 11.30 pm by via Turnitin Assignment</b>        |                        |   |  |
| <b>Reading Day</b>   |                        |   |  |
|  | <b>Week 15</b>         | <b>Final Exam, TBA (In-person) tentative</b>  | <b>Mostly<br/>Class time</b>                         |

**Scope of the Assignments and Examinations:**

- Check “**SynchAsynch CancerBio Schedule**” for links to the weekly discussion topics
- I suggest that you read the assigned chapter/material before class in order to understand the lecture easily.
- I also recommend completing the post-class quizzes on time.
- **Exams should be taken at a scheduled times and In-person. No makeup exams/Quizzes** will be offered.

In any excruciating conditions, provide validated proofs to be considered.

- **Due to the changing nature of on-going pandemic**, we will abide to the CUNY rules and regulations for the courses. In case the exams need to be on-line, Bb platform will be used. During an on-line exam, you will need to **join Zoom session** with your phone with **video ON** during the entire duration of the exam.
- **All Quizzes/Exams will be timed and scheduled with only one-attempt**. You are not allowed to browse the internet or look through other materials to look for an answer. There might be certain limitations incorporated to minimize academic dishonesty.
- All asynchronous activities need to be completed and submitted on time.

**Late assignments will not be graded and will earn no points.**

- **Extra-Credits:** There will be no extra-credit exams and no projects or other exercises for extra credit. Additional Qs might be included in the scheduled exams as extra credits, if the need arises. There is enough work and ample opportunities for all to accumulate points. It is neither fair nor necessary to impose extra work.

### **Contesting Examination Questions and Scores**

- You will be able to get feedback on your performance throughout the course, either during class instructions and/or individual format. However, the exams will not be freely available to you.
- If you disagree with any questions and/or the answers provided, you may raise a formal objection in accordance with the following rules:
  - Any objections to examination questions and contest of examination scores must be filed within one week after the grades are posted. Late objections will be ignored.
  - All disagreement with examination questions or their answers must be submitted as a written statement.
  - In your statement, explain why you believe that the questions or answers are erroneous, support your objections with documentation or references and propose a resolution. Frivolous objections will be ignored.

### **Textbook:**

1. **Required text: “The Biology of Cancer”, Second edition, Robert A Weinberg, Garland Publishers 2014. (ISBN: 9780815342205).**  
Older edition [ISBN13: 978-0815340782 or ISBN10: 0815340788] can also be used. Students are responsible for making notes about any additional ‘new’ information learned in the class.
2. News Articles, Scientific Perspectives, Editorial Choice, Breakthrough Discoveries as well as Recent and Classical Peer-reviewed articles will be assigned for discussion board, writing exercises and for group presentations. Additional Review articles will be provided for understanding a broader impact on the field and will be covered during lectures with assigned chapters.

### **Authentic Online Resources:**

American Cancer Society  
National Cancer Institute  
Howard Hughes Medical Institute  
HHMI BioInteractive website

<https://www.cancer.org/>  
<https://www.cancer.gov/>  
<https://www.hhmi.org/>  
<https://www.biointeractive.org/>

## Blackboard

The Brooklyn College *Blackboard* system will be used extensively in support of this course. Take full advantage of this resource. Check *Blackboard* frequently for information and be sure that you are able to access the materials posted. Course updates, including announcements, syllabus, lecture slides, as well as other relevant materials, will be available on Bb.

Refer to Bb resource for students [Bb Student guide](#)

## E-mail

Concerning items of a more personal nature, such as grades, I will communicate with you through individual e-mail. Check your e-mail address listed on *Blackboard* to ensure that it is correct. If your e-mail address is not listed at all, rectify the situation immediately. For security and privacy reasons, **I will use your CUNY issued e-mail address (or the one used in your Bb profile) only**. This will ensure that the communication is coming from and going to you personally. If you want to change the email address where you like to receive all the emails and notifications, YOU NEED TO MAKE THAT CHANGE (refer to Bb help if you do not know how to).

## Microsoft Office 365 for Students

Download the office 365 as you will need Word for writing assignments, PowerPoint for group presentation etc.

<http://www.brooklyn.cuny.edu/web/academics/technology/MsOffice365students.php>

**Explore the online resources and information available to students:** [Returning Safely Together](#)

**Academic Integrity Policy:** The faculty and administration of Brooklyn College support an environment free from cheating and plagiarism. Each student is responsible for being aware of what constitutes cheating and plagiarism and for avoiding both. The complete text of the CUNY Academic Integrity Policy and the Brooklyn College procedure for policy implementation can be found at [www.brooklyn.cuny.edu/bc/policies](http://www.brooklyn.cuny.edu/bc/policies). If a faculty member suspects a violation of academic integrity and, upon investigation, confirms that violation, or if the student admits the violation, the faculty member **MUST** report the violation. *Students should be aware that faculty may use plagiarism detection software*. Plagiarism and cheating are serious academic infractions. Brooklyn College has a standing **zero-tolerance** policy on such behavior. **Any form of plagiarism or cheating will result in a failing course grade (F). There will be no exception.**

**The Center for Student Disability Services (CSDS)** will be working remotely for the fall semester. In order to receive disability-related academic accommodations students must first be registered with CSDS. Students who have a documented disability or suspect they may have a disability are invited to schedule an interview by calling (718) 951-5538 or emailing [testingcsds@brooklyn.cuny.edu](mailto:testingcsds@brooklyn.cuny.edu). If you have already registered with CSDS, email [Josephine.Patterson@brooklyn.cuny.edu](mailto:Josephine.Patterson@brooklyn.cuny.edu) or [testingcsds@brooklyn.cuny.edu](mailto:testingcsds@brooklyn.cuny.edu) to ensure the accommodation email is sent to your professor.

Please check the [Student Bereavement Policy](#).

**Consideration of Religious Observance:** The course synchronous activities are scheduled in such a way to avoid any conflicts with religious holidays and related religious observances. Course asynchronous activities are given ample time to complete due to any such conflicts. Even so, if you recognize any such conflict/s, must report to the professor by Sept. 11, 2020. With guidance from Anthony Brown, Chief Diversity Officer, such permission will be granted case by case. Students may also be directed to Ronald Jackson, Vice President for Student Affairs, if they have questions about accommodations for religious observance.

**Sexual and Gender-based Harassment, Discrimination, and Title IX**

Brooklyn College is committed to fostering a safe, equitable and productive learning environment. Students experiencing any form of prohibited discrimination or harassment on or off campus can find information about the reporting process, their rights, specific details about confidentiality of information, and reporting obligations of Brooklyn College employees on the [Office of Diversity and Equity Programs](#) website. Reports of sexual misconduct or discrimination can be made to Public Safety (719.951.5511), the New York City Police Department (911 or a local NYPD precinct), Ivana Bologna, Title IX Coordinator (718.951.5000, ext. 3689), or Michelle Vargas, Assistant Director of Judicial Affairs, Division of Student Affairs (718.951.5352).

The full academic calendar, including many other important dates, is available on the [Office of the Registrar's](#) website.

**Cancer Biology Course Checklist:** Class meets on scheduled DATES TBA

- ◆ Weekly Discussion topics: Ideally complete before the class meets; Due every Tuesday following the class,
- ◆ Weekly post-class Quizzes will be available @ TBA, every week when class meets: Due every Tuesday following the Friday class
- \*\*\*\*\*
- ◆ Draft Abstract/Scientific Project summary plan submission to Instructor via Safe Assign, Due TBA,
  - Written comments will be provided on the draft by TBA



- ◆ First complete draft Scientific Project due on TBA
- ◆ Draft poster/graphic due on TBA
- Reviewers will be assigned by TBA
- ◆ Reviews due TBA via SafeAssign
- ◆ Group Presentations and Discussions: TBA
- ◆ Two Critical Qs should be posted for the presenters on Bb, one day before the class meets (weeks 12-13)
- ◆ Final Scientific Project and Poster due TBA by via Turnitin Assignment

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- ◆ Exam 1: TBA
- ◆ Exam 2: TBA
- ◆ Final Exam: TBA