



INTRODUCTION TO CANCER

01:447:245; SPRING SEMESTER 2023

Professor: Dr. Tara Cominski

Office Location: Busch Lab Center, Rm 101

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CLASS MEETS ON WEDNESDAY FROM 12:10-1:30 PM AND FRIDAY FROM 2:00 – 3:20 PM; IN TILLET HALL 232, LIVINGSTON

- Here is a link to the Rutgers map: <https://maps.rutgers.edu/>
- We will meet in-person for class during our designated meeting times as described above. All course materials will be available through CANVAS, you can access our course directly by following the link below and logging in with your Rutgers credentials.
- <https://rutgers.instructure.com/courses/229819>

IN-PERSON OR ZOOM STUDENT SUPPORT HOURS

(BUSCH LAB CENTER RM 101)

Tuesday 1:30 – 4:00 PM

Wednesday 2:00– 3:00 PM

- Please feel free to stop by during the hours listed above to discuss anything related to class, career, life or just to say hi! Still best to send me an email before stopping by!
- **If you would like to meet outside of these times, please email me.

COURSE DESCRIPTION

Prerequisites

General Biology 119:115-116 or 119:101-102

Introduction to Cancer provides an overview of biomedical aspects of malignancy as deviations from the normal biological processes. It builds upon some topics covered in pre-requisite courses, including molecules, cells, tissues, and organisms; and expands upon concepts such as homeostasis and regulation. The course reviews how specific alterations in normal genetic, cellular, and physiological processes are altered in cancer, and how the human systems respond to cancer cells and tumors. The clinical application of these facts and concepts for diagnosis, prognosis, prevention, and personalized therapy are discussed. Some specific cancer types are selected as

examples, such as breast cancer, prostate cancer, colon cancer, melanoma, leukemia, and others. Current unmet medical challenges and possible future solutions are included.

Subjects that will be addressed during the course may include:

- Biology and genetics of cells and organisms
- The nature of cancer
- Cellular and viral oncogenes
- Oncoproteins: receptors, signal transduction, cell cycle control
- Tumor suppressor genes
- Tumor progression and tumor evolution
- Tumor heterogeneity and tumor microenvironment
- Invasion and metastasis
- Cancer Treatment

REQUIRED TEXTS AND COURSE MATERIALS

- **A notebook and pen/pencil to complete in class participation activities!!**
- **The Biology of Cancer (2nd edition)**, Robert Weinberg; ISBN: 978-0-8153-4219-9 (hardcover); paperback and loose-leaf versions are also acceptable.
- A copy of the textbook is also available through university libraries

TECHNICAL / TECHNOLOGY REQUIREMENTS

- **Mobile device or laptop:** Students must have access to their own personal laptop or tablet during class. **Students will regularly use Canvas to complete in-class quizzes or activities.**
- In addition, other types of technology (i.e. *Socratic*) may be used to allow students to actively engage in class and enable the professor to assess student understanding.
- If you do not have the appropriate technology for financial reasons, please email the Dean of Students at deanofstudents@echo.rutgers.edu for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid: <https://financialaid.rutgers.edu/>.
- Please visit the Rutgers Student Tech Guide website for resources: <https://it.rutgers.edu/technology-guide/students/#new-brunswick>

LEARNING GOALS

Course Satisfies Departmental Learning Goals:

- Knowledge specific goals: Know the terms, concepts and theories in genetics.
- Integrate the material from multiple courses and research. That is, to think holistically and to see the whole as well as the parts=

GRADING SCALE

⇒ A = 90 and above

⇒ B+ = 85-89

⇒ B = 80-84

⇒ C+ = 75-79

⇒ C = 70-74

⇒ D = 60-69

⇒ F = 59 or below

⇒ Warning grades will be entered for those students who are exhibiting poor performance or poor attendance.

******Letter grades will be determined based on the course total percentage calculated on Canvas and the scale above; I will not round up!!***

ASSESSMENT / GRADING COMPONENTS

Weighting of Assessments

The final course grade will be determined by the following criteria:

- **65%- Exams** (4 exams total; the 4th exam will be given during the final exam period, will contain some content from earlier in the semester, but will not be entirely cumulative)
- **10% - Participation Assignments/Activities** – there will be an assignment given each class; these assignments can only be completed in class and **cannot be made up**; I will drop the lowest 2 participation assignments (i.e. you can miss 2 classes). If the assignment is complete and submitted on time, i.e., no missing components, you will receive full credit.
- **25%- Quizzes/Assignments** – A graded quiz will be given through Canvas for each lecture (depending on the size of the lecture a quiz may combine two or more lectures); *****most quizzes will be completed in class through Canvas, on the student's personal laptop or tablet.**

** Grades will be calculated using the gradebook in Canvas; this information will be available to students throughout the semester. if you have a question about a grade, please ask ASAP. I do make mistakes!!

**All assignments, quizzes and exams will be delivered and submitted through Canvas. All grades will be posted on Canvas!

SCHEDULE OF TOPICS

***This will be updated regularly on our course canvas site; please check the Canvas site for updates, including exams dates; do not use the syllabus for this information

***All lectures and related material will be available on Canvas; All exam questions will come from the lectures and supplementary material covered in class

Week 1 (1/18-1/20)

Course Introduction

Chapter 1: The Biology and Genetics of Cells and Organisms

Magic Bullets Video

Week 2 (1/25-1/27)

Chapter 2: The Nature of Cancer

The Blind Men and the Elephant Video

Week 3 (2/1-2/3)

Chapter 3: Tumor Viruses

Week 4 (2/8-2/10)

Chapter 3 Part 2/Review for Exam 1

EXAM 1 – FRIDAY 2/10

Week 5 (2/15-2/17)

Chapter 4: Cellular Oncogenes

Finding an Achilles Heel Video

Week 6 (2/22-2/24)

Chapter 5: Growth Factors, Receptors, and Cancer

Week 7 (3/1- 3/3)

Chapter 6: Cytoplasmic Signaling Circuitry Programs Many of the Traits of Cancer

EXAM 2 – FRIDAY 3/3

Week 8 (3/8-3/10)

Chapter 7: Tumor Suppressor Genes

SPRING BREAK – 3/13- 3/17

Week 9 (3/22-3/24)

Chapter 8: pRb and Control of the Cell Cycle Clock

Week 10 (3/29-3/31)

Chapter 9: p53 and Apoptosis

Chapter 10: Cell Immortalization (If time permits)

Week 11 (4/5-4/7)

Chapter 10/Exam 3 Review

EXAM 3 FRIDAY 4/7

Week 12 (4/12-4/14)

Chapter 11: Multi-Step Tumorigenesis

Week 13 (4/19 – 4/21)

Chapter 12 (If time permits): Maintenance of Genomic Integrity and the Development of Cancer

Chapter 14: Invasion and Metastasis

Week 14 (4/26-4/28)

Chapter 15: Tumor Immunology and Immunotherapy

Chapter 16: The Rational Treatment of Cancer

REGULAR CLASSES END MONDAY MAY 1ST

Reading Days May 2nd and May 3rd – Final Exam Review Session

FINAL EXAM (EXAM 4) – Given during Final Exam Week 5/4-5/10 – Day and Time TBD

POLICIES

ATTENDANCE, PARTICIPATION AND MISSED ASSIGNMENTS

- Students are expected to attend class regularly; quizzes, review questions and other activities to support the lectures will take place during each class and will count toward the final grade. In addition, these exercises serve to enhance student learning and are necessary to succeed in this course. **10% of the grade comes from participation activities; these are completion grades and are always due by the end of class that day; makeups will not be given for these assignments!!**
- If you need to miss class or need extra time to complete an assignment, please email me ahead of time and we will work together to construct a plan to make-up

the missed work. If you do not communicate with me about a missed quiz, exam, or assignment and contact me well after the due date, **a make-up will not be possible. Make-ups for Quizzes and Exams are at the discretion of the professor and may not be granted!**

- Students with prolonged health and/or financial issues impacting their academics and well-being over an extended period should contact the Dean of Students at deanofstudents@echo.rutgers.edu.
- [Link to Rutgers Policy on Attendance and Cancellation of Classes](#)

CLASSROOM NORMS

It is important that you come to class ready to learn. The following requirements are designed to increase everyone's classroom engagement.

- Be fully present even with technology
 - Do not use computers or other electronic devices during class unless you are using them to take notes or participate in a classroom activity.
 - If an urgent call needs to be answered, please leave the room to do so.
- Speak your truth
- Be respectful – one voice, but it is okay to disagree!
- Ask questions
- Share your experiences and expertise
- Be comfortable!
- Continued disruption during class by texting, talking, or otherwise inappropriate behavior (i.e. sleeping) will result in ejection from the classroom and a referral to the Dean.

DISABILITY ACCOMMODATIONS

- To receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation.
- Please review the policies and procedures of the Office of Disability Services website: <https://ods.rutgers.edu> for additional information

ACADEMIC INTEGRITY

- Please familiarize yourself with the University website on Academic Integrity: [Academic Integrity Policy Link](#)
- Rutgers University takes academic dishonesty very seriously. By enrolling in this course, you assume responsibility for familiarizing yourself with the Academic Integrity Policy and the possible penalties (including suspension and expulsion) for violating the policy. As per the policy, all suspected violations will be reported

to the Office of Student Conduct. Academic dishonesty includes (but is not limited to):

- Cheating
- Plagiarism
- Aiding others in committing a violation or allowing others to use your work
- Failure to cite sources correctly
- Fabrication
- Using another person's ideas or words without attribution, including re-using a previous assignment
- Unauthorized collaboration
- Sabotaging another student's work

If you are ever in doubt, consult your instructor.

STUDENT SUPPORT AND MENTAL WELLNESS

⇒ **Here is a list of Rutgers resources to support students in their academic success and mental wellness.**

- Student Success Essentials: <https://success.rutgers.edu>
- Student Support Services: <https://www.rutgers.edu/academics/student-support>
- The Learning Centers: <https://rlc.rutgers.edu/>
- The Writing Centers (including Tutoring and Writing Coaching): <https://writingctr.rutgers.edu>
- Rutgers Libraries: <https://www.libraries.rutgers.edu/>
- Office of Veteran and Military Programs and Services: <https://veterans.rutgers.edu>
- Student Health Services: <http://health.rutgers.edu/>
- Counseling, Alcohol and Other Drug Assistance Program & Psychiatric Services (CAPS): <http://health.rutgers.edu/medical-counseling-services/counseling/>
- Office for Violence Prevention and Victim Assistance: www.vpva.rutgers.edu/