

Biology 313: Cancer Biology Syllabus

Course Overview:

Lecture Info: Room = CBB 269 Weekdays = TR Times = 12:30pm – 1:45pm

Important Dates:

Exams (all in CBB 269):
#1 = 10/11 in class ; #2 = 11/27 in class ; #3 (final) = 12/19 @ 10:15am
Final Project:
Topic Selection 10/16 ; Peer Review 11/20-27 ; Brochure Due 12/13 ; Report Due 12/19 @ Midnight

Instructor:

Lindsay R. Dresang, Ph.D.
Office hours: CBB 313, T/R @ 11:00am (or by appointment)
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Course Description: (Prereq. = BIOL 210 and CHEM 220 or 221 or 326) An introduction to cancer biology, from microscopic to macroscopic processes. Topics include the initiation, promotion, and progression of cancer.

Course Objectives: Cancer is not just one disease; there are nearly as many different cancers as there are types of differentiated cells. How a cell (or cells) diverts toward this disease is also quite variable. Studying cancer from the molecular and cellular point of view, there are about ten or so major programs which are commonly altered. Studying cancer from its evolution within the host, we recognize that subsets of these programs are typically disrupted in a highly specific pattern—initiation, promotion, and progression. Studying cancer from a medical point of view, how cancer interacts with the host and how it might wreak havoc on normal organ and organ system functions depends upon its assessed stage, giving rise to differential prognoses. In this course you will:

- 1) Recognize the stages of initiation, promotion, and progression in terms of carcinogenesis
- 2) Compare and contrast normal and pathogenic processes (from microscopic to macroscopic states) leading toward cancer
- 3) Appreciate the diversity of cancer by reviewing select individual cancers and recalling their causes and symptoms
- 4) Distinguish between different types of carcinogens and chemotherapeutics by their structure, function, and source
- 5) Understand how cancer is diagnosed, treated, followed, and finally recognize when and why treatment options vary

Required Materials @ Text Rental:

DeVita VT Jr, Lawrence TS, Rosenberg SA. 2015. Cancer: Principles & Practice of Oncology: Primer of the Molecular Biology of Cancer. Ed. 2, Wolters Kluwer Health and Lippincott Williams & Wilkins.

“Required” Materials @ D2L: You will not need to print these textbooks, but they will be used in this course. I will use figures and facts from these sources in addition to the book at text rental. Where I can, I will indicate sources and page ranges in course notes. These texts are also here for you to use as potential resources for your final project.

Pitot HC. 2002. Fundamentals of Oncology, Ed. 4, Marcel Dekker, Inc., New York.

International Agency for Research on Cancer. 2014. World Cancer Report 2014. (BW Stewart & CP Wild) World Health Organization Press, Lyon, France.

Course Requirements and Grading:

Letter Grades (rounded at the hundredths):

A = 100-96%	A- = 95.9-92%	B+ = 91.9-88%	B = 87.9-84%	B- = 83.9-80%	C+ = 79.9-76%
C = 75.9-72%	C- = 71.9-68%	D+ = 67.9-64%	D = 63.9-60%	F ≤ 59.9%	

Point Distribution:

Graded Item	Points
Attendance (see below)	5
Exam 1	32
2	32
3	16
Final Project	15
Total	100 pts

Exams: Exams will test your ability to recall specific facts, vocabulary terms, evaluate the importance/severity of different factors within a list, propose appropriate experiments to further evaluate a set of observations, reconstruct normal vs. pathological pathways, discuss the etiology of specific cancers discussed, etceteras. There will be a range of question types and difficulty per question for each exam. Since the topics covered over the semester are not equally dense, their point values are adjusted accordingly. Exam 3, the final, will NOT be cumulative.

Final Project: You will be assigned a set of questions to tackle as an overall project pertaining to either a particular type of cancer, treatment, carcinogen, or other pre-approved topic. Over the course of the semester you will look up references to address these questions and upload your final report to upload onto D2L by midnight the same day as the final / exam 3. You will also be disseminating this information into a brochure. The purpose of the brochure is for you to communicate to a broad audience what you have judged to be the most interesting and important facts amassed on this topic. You need not include answers to all of the questions within the brochure, but it should be informative and creative. You will need to complete peer evaluations on these brochures and reports partway into the semester to verify that adequate progress is being made. It will also serve as an opportunity to gain new ideas from your peers and learn about valuable resources others may have found which can be shared. Further details on this project, including the break-up of points throughout the semester, will be available at a later date.

Course Outline:

What is Cancer Biology? *Research Point-of-View*

- What is Cancer?
a short overview

What Goes Wrong? *Normal vs. Pathological*

- How Does Cancer Develop?
stages of carcinogenesis and the cancer wheel
- Growth Pathways:
hitting the accelerator
- Checkpoints, Checkpoints, Checkpoints!
cutting the brake lines
- Growing Pains:
overcoming constrictions imposed by excessive growth
- Running From the Law!
escaping immune surveillance

Exam #1

Project Topic Selections

What Tips the Scales? *Etiology*

- Assessing Risks:
how to identify what causes cancer
- Common Carcinogens:
from subatomic particles to organic compounds
- Environmental Contributions:
work, diet, lifestyle, and location
- Parasites and Viruses:
the unintended carcinogens
- What's in the Genes?
the genetics of the cancer wheel...and more viruses!

Project Peer Reviews (*pre-arranged before fall break*)

Exam #2

What is Oncology? *Medical Point-of-View*

- How do we Detect Cancer?
from imaging to screening
- How do we Treat Cancer?
non-specific, targeted, and/or combination therapies
- Regression, Remission, and Recurrence:
hoping for the best, preparing for the worst

Brochures Due: last day of regular class,

Exam #3: at final (non-cumulative),

Reports Due: midnight day of final

Absence Policy:

The resources for this course are quite scattered. Certain components of this course are best characterized in texts long since out of print, while other components are so frequently updated that even new textbooks are out-of-date. Therefore, most of what you learn in this class will be disseminated in lecture, not in reading assignments. This lack of a singular resource for common referral really does mean that **YOU MUST COME TO CLASS!!!**

Attendance will be taken each class and account for 5% of your overall grade. Only **two** absences due to undocumented illnesses or other circumstances will be permitted *before* I start deducting points. Each subsequent absence will result in a **0.5 point** loss. An absence due to a documented illness, injury, other (in other words, those with a doctor's note, sports conflict form, etc.) *may* be excused. Absences occurring over scheduled exams or other due dates require my approval to reschedule.

Just showing up to class does **NOT** guarantee you attendance points. If I find you repeatedly falling asleep or spending class looking at your cell phone, I will count your attendance as an "in-person-absence" and adjust your points accordingly. So, 1 day sleeping in class, 1 day on your cell phone, 1 day you forget about class, and 1 day out with a cold means that you will be out 1 point.

Accommodations:

In compliance with the Americans with Disabilities Act (ADA), I will make every effort to honor requests for reasonable accommodations made by individuals with disabilities. If you have a disability and require accommodations, please register with the Disability and Assistive Technology Center (6th floor of Albertson Hall) and *let me know as soon as possible*. Requests for accommodations, including university-sanctioned extra-curricular event conflicts, can be responded to most effectively if I receive the requests early. Examples of accommodations include extended exam durations, scheduling an alternate test site with proctor for quieter test-taking, use of ear plugs, etceteras. Such requests are confidential. More information about the ADA at UWSP can be found under this subsection of the human resources webpage at <https://www.uwsp.edu/hr/Pages/Affirmative%20Action/ADA.aspx>.

UWSP Community Bill of Rights and Responsibilities:

UWSP values a safe, honest, respectful, and inviting learning environment. A set of expectations for students and instructors, known as Student Rights and Responsibilities, is intended to help establish a positive living and learning environment. For more information go to the webpage for the Dean of Students, which outlines expectations for a respectful learning environment, as well as the an overview on school policies regarding academic misconduct. The minimum penalty for violating this policy is a recorded zero for the assignment in question. The Dean of Students webpage is found at: <https://www.uwsp.edu/dos/Pages/default.aspx>.