Cancer Biology

PCB 3109 3 credits

Prerequisites: A grade of "C" or better in Integrated Principles of Biology I and II (BSC 2010, 2010L, 2011, 2011L)

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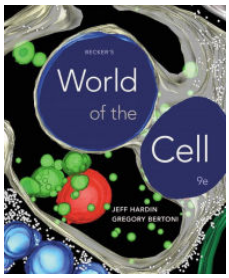
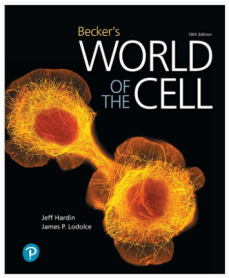
Class Schedule: Monday, Wednesday, Friday, Period 2 (8:30 AM - 9:20 AM)

Class Location: CSE – E222

Textbook: *Becker's World of the Cell* 9th or 10th Edition
By Jeff Hardin et al.
Pearson (Publisher)





Course website: https://elearning.ufl.edu/

(Select Log in to E-Learning) Class material including the syllabus, supplemental readings, and other information related to the course will be posted on the course website on e-Learning.

Office hours: Friday Period 6 (12:50 AM–1:40 PM) or by appointment

Email: All email correspondence must be from your @ufl.edu account, have your full name in the body of the email, and contain the course number in the subject line. Emails not meeting these requirements may not be answered quickly.

Course Objectives: This course is an introduction to the cellular and molecular basis of cancer. The course will take a mechanistic view of the dysregulation of cellular processes that occurs in cancer cells, including the mechanisms of cancer treatments. This course provides a strong foundation for Biology students, pre-med, and pre-health students. This course will include lectures and in-class activities (required readings, presentations and summaries). Topics will include, but are not limited to: dysregulation of the cell cycle, the role of the cytoskeleton and the extracellular matrix in cancer metastasis, oncogenes and cell signaling, tumor suppressors and cell cycle checkpoints, the Warburg effect and cancer cell metabolism, and how our knowledge of these processes is leading to new and effective anti-cancer drugs. Grades will be assigned based on performance on the assessments including in-class activities and in-class exams. Exams will emphasize material covered in lecture, assigned reading in the textbook, and assigned articles.

Class Attendance

Students are expected to attend all classes and are responsible for all material covered during the lecture. Students are required to read the assigned chapters before coming to class to better understand the concepts in the lecture slides.

If you are sick, stay home. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 to be evaluated.

As with any excused absence, you will be given a reasonable amount of time to make up missed work.

Exams

There will be 4 Exams during the semester. Exams are not cumulative. Exams will cover the material presented in lecture as well as any assigned article reading or web-based material. Students will be responsible for assigned reading even if it is not specifically covered during the lecture period. The tests will contain multiple-choice questions, and short written answer questions. No student will be allowed to start an exam after the first student to complete an exam leaves the classroom. All tests and answer sheets will be collected at the end of the exam period. No additional time will be given to complete an exam. (If you begin an exam late, then you will have less time to complete it.) Exams are available for review for only two weeks after the exam. You may not review previous exams, other than Exam 4, after the semester has ended.

Make-up Exams

No make-up exams will be given without prior permission or documentation of illness. In case of illness, a note from your physician is required. A personal matter requires a note from the Dean of Students (http://www.dso.ufl.edu/, 202 Peabody Hall).

In-class group activities

We will separate students into several groups. For the first required reading, all groups present. For the rest of required readings, only one group present the assigned paper and other groups write one-page summaries.

Grading

Course grades will be determined by the scores of the 4 exams plus the quiz scores as follows: Each exam will be 15% of the total course grade (4 exams = 60%). The in-class activities will count for 40% of the course grade. 60% exam scores + 40% activities score = 100% course grade.

A curve for each exam will be calculated as follows: The top three scores on each exam will be averaged, and the difference between that value and the maximum possible value of 100 points will be determined. This curve point value will be added to each exam. At the end of the semester, letter grades will be assigned based upon the percentage of the curved exam grades that you have earned during the semester (plus the quiz scores), using the cut-offs in the adjacent table. These cut-offs may be lowered at the discretion of the instructor, but they will not be increased.

Point Range (%)	Letter Grade
≥ 93.0	A
≥ 90.0	A-
≥ 87.0	B+
≥ 83.0	B
≥ 80.0	B-
≥ 77.0	C+
≥ 73.0	C
≥ 70.0	C-
≥ 67.0	D+
≥ 63.0	D
≥ 60.0	D-
< 60.0	E

Conduct in Class

Please be courteous and **do not talk during lecture** (except during class discussions or activities)**,** as this can be distracting to the professor and the other students. Also, cell phones should be silenced during lecture.

Academic Honesty

All students registered at the University of Florida have agreed to comply with the following statement:

"I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

In addition, on all work submitted for credit the following pledge is either required or implied:

"On my honor I have neither given nor received unauthorized aid in doing this assignment."

If you witness any instances of academic dishonesty in this class, please notify the instructor, or file an incident report at: Link to incident report forms

For additional information on Academic Honesty, please refer to the University of Florida Student Honor Code at: Link to Student Honor Code

Accommodations for Students with Disabilities

Students with disabilities who require accommodations should first seek assistance at the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352-392-1261). The Dean of Students Office of Disability Resources will work with the instructor to accommodate the student. Please see the University of Florida Disability Resources website for more information.

Personal Wellness

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Many students experience test anxiety and other stress related problems. "A Self Help Guide for Students" is available through the Counseling and Wellness Center (3190 Radio Road, 352-392-1575). Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Career Connections Center

Reitz Union, 352-392-1601, https://career.ufl.edu/

Lecture Schedule Lecture topics for this course are listed below. This is a flexible, tentative schedule; the dates and amount of coverage of specific topics may vary somewhat from the list below.

Date		Topic	Chapter, Presentation
		Course Introduction	
Wed 8/24	1	Introduction to the course	
Fri 8/26	2	Introduction to Cancer 1	26
Mon 8/29	3	Proteins structure and function	3.1
		Background: Macromolecules	
Wed 8/31	4	Introduction to Cancer 2	Presentation
Fri 9/2	5	Lipids and cancer	3.4
Mon 9/5		Holiday — no classes	
Wed 9/7	6	Membrane components 1	7.1, 7.3-7.4, Presentation
		Macromolecules in cancer	
Fri 9/9	7	Membrane components 2	7.1, 7.3-7.4
Mon 9/12	8	Membrane trafficking 1	12.1-12.7, Presentation
Wed 9/14	9	Membrane trafficking 2	12.1-12.7
Fri 9/16	10	Proteasome and cancer	20.4, Presentation
Mon 9/19		**EXAM 1**	
		Cell Signaling	
Wed 9/21	11	G-protein coupled receptors	23.1, 23.2, 26
Fri 9/23	12	Hedgehog signaling	23.4, 26
Mon 9/26	13	Receptor tyrosine kinases	23.3, Presentation
Wed 9/28		School closed	
Fri 9/30		School closed	
Mon 10/3	14	Oncogenes	26.4
Wed 10/5	15	Tumor suppressors	26.4
Fri 10/7		Holiday — no classes	
		Cell Cycle	
Mon 10/10	16	Overview of the Cell Cycle	24, Presentation
Wed 10/12	17	Cell cycle regulation	24, 26

Fri 10/14	18	Rb and synthetic lethality	24, 26, Presentation
Mon 10/17	19	G2 phase checkpoint	24, 26
Wed 10/19		**EXAM 2**	
		Metastasis and the Cytoskeleton	
Fri 10/21	20	Overview of the cytoskeleton	13
Mon 10/24	21	Cytoskeletal regulatory proteins 1	13, 14
Wed 10/26	22	Cytoskeletal regulatory proteins 2	13, 14, Presentation
Fri 10/28	23	Cell motility and metastasis	14
		Extracellular Matrix and the Tumor Microenvironment	
Mon 10/31	24	Extracellular matrix 1	15, Presentation
Wed 11/2	25	Extracellular matrix 2	15, Presentation
		Cellular Metabolism and the Warburg effect	
Fri 11/4	26	ECM and cancer	5, 9, 10
Mon 11/7	27	The Warburg effect 1	9, 10, Presentation
Wed 11/9	28	The Warburg effect 2	9, 10
Fri 11/11		Holiday — no classes	
Mon 11/14		**EXAM 3**	
		Apoptosis, Disease and Drug discovery	
Wed 11/16	29	Apoptosis and synthetic lethality 1	24.5, Presentation
Fri 11/18	30	Apoptosis and synthetic lethality 2	24.5
Mon 11/21	31	Cancer Stem Cells 1	Presentation
Wed 11/23		Holiday — no classes	
Fri 11/25		Holiday — no classes	
Mon 11/28	32	Cancer Stem Cells 2	Presentation
Wed 11/30	33	Epigenetic processes	26
Fri 12/2	34	Epigenetic mechanisms and cancer	26, Presentation
Mon 12/5	35	Drug discovery	26
Wed 12/7		**EXAM 4**	