

Essential Cell Biology

PCB 3023 section 5312

3 credits

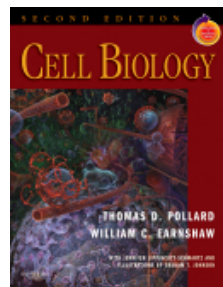
Prerequisites: A grade of "C" or better in Integrated Principles of Biology I and II (BSC 2010, 2010L, 2011, 2011L)

Instructor: David Oppenheimer
Office: 115 Carr Hall
Email: oppenhe@ufl.edu

Class Schedule: Monday, Wednesday, Friday Period 6 (12:50 PM-1:40 PM)

Class Location: Bartram Hall 211

Textbook: *Cell Biology* 2nd Edition
By Thomas D. Pollard, MD,
William C. Earnshaw, PhD, FRSE and
Jennifer Lippincott-Schwartz, PhD
Elsevier (Publisher)



Course website: <https://lss.at.ufl.edu/>

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: Mon. 4:00 PM-5:30 PM, Wednesday 2:00 PM-3:15 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 recognized by my email filters, and thus may not be answered.

Course Objectives This course is an introduction to the basic concepts of molecular cell biology in prokaryotic and eukaryotic systems including experimental strategies and methodology. This course provides a strong foundation for Biology students, and is appropriate for anyone interested in the inner workings of cells. The lecture format will be used for this course, but students will be expected to participate in occasional class discussions. Lecture topics will include cell cycle regulation, the cytoskeleton and cell motility, cellular membrane systems, and the interaction of cells with each other and the environment. Grades will be assigned based on performance on four in-class Exams. Extra credit will be available as in-class quizzes. Exams will emphasize material covered in lecture, but some of the questions will cover material from the assigned reading in the text and supplemental information. Quizzes will cover information presented in the previous lecture, and assigned reading for the current lecture.

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. In class quizzes and problems will be based on the assigned reading.

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 supplemental 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 mostly multiple-choice questions, but may contain several 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.) Filling out the scantron sheet is considered part of the exam; do not expect extra time after the exam period has ended to fill out the scantron.

Quizzes Quizzes will be given during lecture and will be counted as 10% of the course grade. The quizzes will cover the material presented during the previous lecture and the assigned reading for the current lecture. There will be no make-up quizzes.

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). **Make up exams will be given in an essay format.**

Grading Course grades will be determined by the scores of the 4 exams plus the quiz scores as follows: Each exam will be 22.5% of the total course grade (4 exams = 90%). The quiz scores will count as 10% of the course grade, and will be added to the combined test scores (90% exam scores + 10% quiz scores = 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
≥ 90.00	A
≥ 86.66	A-
≥ 83.33	B+
≥ 80.00	B
≥ 76.66	B-
≥ 73.33	C+
≥ 70	C
≥ 66.66	C-
≥ 63.33	D+
≥ 60	D
≥ 56.66	D-
< 56.66	E

Student Response System	We will use the Top Hat Classroom Response System for quiz questions during class. Top Hat allows students to use a cell phone (text messaging), laptop, smartphone Top Hat app, or an iPod touch to participate in class. There will be no make-ups for missed clicker quizzes. If you earn 75% or greater of the total clicker points, you will be given full credit (100%) for the clicker questions. To register, follow the instructions in "Student Quick Start Guide -- University of Florida Edition". This document is posted under "Resources" on the e-Learning website for this course.
Conduct in Class	Please be courteous and do not talk during lecture , as this can be distracting to the professor and the other students. Also, cell phones should be silenced during lecture, except when taking quizzes.
Academic Honesty	<p>All students registered at the University of Florida have agreed to comply with the following statement:</p> <p><i>"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."</i></p> <p>In addition, on all work submitted for credit the following pledge is either required or implied:</p> <p><i>"On my honor I have neither given nor received unauthorized aid in doing this assignment."</i></p> <p>If you witness any instances of academic dishonesty in this class, please notify the instructor, or file an incident report at http://www.dso.ufl.edu/sccr/webforms/incidentreport.php. For additional information on Academic Honesty, please refer to the University of Florida Student Honor Code at http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php.</p>
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 at: http://www.dso.ufl.edu/drc/ .
Counseling Center	Many students experience test anxiety and other stress related problems. "A Self Help Guide for Students" is available through the Counseling Center (301 Peabody Hall, 392-1575) and on the website: http://www.counsel.ufl.edu/
Career Resource Center	Reitz Union, 392-1601, http://www.crc.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
		Introduction to Cell Biology	
Mon 1/6	1	Introduction to course	
Wed 1/8	2	Introduction to Cells	1
		Chemical and Physical Background	
Fri 1/10	3	Proteins	3
Mon 1/13	4	Biophysical Principles	4
Wed 1/15	5	Macromolecular Assembly	5
Fri 1/17	6	Research Strategies	6
Mon 1/20		Holiday (no class)	
		Membrane Structure and Function	
Wed 1/22	7	Membrane structure and dynamics	7
Fri 1/24	8	Membrane pumps/ Membrane carriers	8, 9
Mon 1/27	9	Membrane channels	10
Wed 1/29	10	Cystic Fibrosis Transmembrane Regulator	See course resources
Fri 1/31	11	Membrane physiology	11
Mon 2/3		EXAM 1	
		Cellular Organelles and Membrane Trafficking	
Wed 2/5	12	Post-translational targeting of proteins to organelles	18
Fri 2/7	13	Endoplasmic Reticulum	20
Mon 2/10	14	Secretory Membrane System and Golgi Apparatus	21
Wed 2/12	15	Endocytosis and the Endosomal Membrane System	22
		Signaling Mechanisms	
Fri 2/14	16	Plasma Membrane Receptors	24
Mon 2/17	17	Protein hardware for signaling	25
Wed 2/19	18	Second Messengers	26
Fri 2/21	19	Integration of Signals 1	27
Mon 2/24	20	Integration of Signals 2	27
		Cellular adhesion and the Extracellular Matrix	
Wed 2/26	21	Extracellular Matrix Molecules	29

Fri 2/28		EXAM 2	
Mon 3/3		SPRING BREAK	
Wed 3/5		SPRING BREAK	
Fri 3/7		SPRING BREAK	
Mon 3/10	22	Intercellular Junctions	31
		Cytoskeleton and Cellular Motility	
Wed 3/12	23	Introduction to the cytoskeleton	33
Fri 3/14	24	Actin and Actin-Binding Proteins 1	33
Mon 3/17	25	Actin and Actin-Binding Proteins 2	33
Wed 3/19	26	Microtubules and Centrosomes	34
Fri 3/21	27	Intermediate Filaments	35
Mon 3/24	28	Intracellular Motility	37
Wed 3/26	29	Cellular Motility	38
Fri 3/28	30	Muscles	39
Mon 3/31		EXAM 3	
		Cell Cycle	
Wed 4/2	31	Introduction to the Cell Cycle	40
Fri 4/4	32	Cell cycle and cancer	
Mon 4/7	33	G ₁ Phase and Regulation of Cell Proliferation	41
Wed 4/9	34	S Phase and DNA Replication	42
Fri 4/11	35	G ₂ Phase and Control of Entry into Mitosis	43
Mon 4/14	36	Mitosis and Cytokinesis	44
Wed 4/16	37	Programmed Cell Death	46
Fri 4/18	38	Programmed Cell Death (continued)	46
Mon 4/21	39	Cancer Drug discovery	
Wed 4/23		EXAM 4	