

Bio 411 Cell Biology Lecture Syllabus, Fall 2009
MWF 1:00-1:50 pm

Course instructor: Dr. David Keller
dmkeller@csuchico.edu
Office: Holt 318 Phone: 898-5040

Objectives: This course is designed to give you an overview of cell biology. Cell biology is a constantly evolving and complex field, and gaining a mastery of all the sub-disciplines takes many years and is, perhaps, not achievable in any one lifetime. However, you will be introduced to the foundations of cell biology, from which you can pursue additional study or research, if you choose. It is also critically important for professionals in the health sciences, as many diseases are understood and can be treated at the cellular level. Indeed, cell biology is the foundation upon which all modern therapies are based.

Textbook: For Lecture: Molecular Biology of the Cell, 5th edition. Bruce Alberts *et al.*
For Lab: Bio 411 Lab Manual, available from Omicron.

Additional readings: Primary research from cell biology journals. These will be assigned throughout the course.

Journal Clubs: In groups of four, students will present a journal article to the class at scheduled times during the semester. The purpose of the journal club is several-fold: 1) To introduce you to primary and current research in the area of cell biology. 2) To train you how to read scientific papers, as the format and style of writing is quite different from standard writing. 3) To train you how to communicate the findings of the article with your peers. 4) To learn how researchers approach scientific questions.

Paper: Choose a cell biology topic of interest to you, and select 4 journal articles of primary literature that you think best illustrate the development of that topic. Each article should be a significant advance in the understanding of that field. In your paper, you should explain why each article represents a significant advancement and how each successive article builds upon the advances of the previous article. You should write approximately two pages (double-spaced, 12-point Times-Roman font, 1 in. margins) about each article.

Exams: There will be three exams of equal point values given approximately every 5 weeks. They will cover only the material since the previous exam; there will not be a comprehensive final exam. The exams will include material from class lectures and from the assigned readings.

Attendance: Attendance will be taken each day. You are allowed two absences without penalty, after that, 5 points will be deducted from your final course grade for each additional absence. Absences will be excused only with instructor permission *prior* to the absence.

Grading: The course grade will be a combination of lecture and lab grades. The lecture component will consist of ~2/3 of the grade (200 pts) and the lab will consist of ~1/3 (120 pts).

Exams:	40 pts x 3 (120 pts total)	288-320 pts	(90-100%)	A
Paper:	40 pts	256-287 pts	(80-89%)	B
Journal Club:	40 pts	224-255 pts	(70-79%)	C
Absences:	2 free then 5 pts off each additional absence	192-223 pts	(60-69%)	D
	200 pts	191 pts and below		Fail
Lab:	120 pts			
	320 pts total			

Disclaimer: The instructor reserves the right to make changes to the syllabus throughout the semester. If changes are made, every attempt will be made to make the changes clear to all students. Further instructions about the exams, paper, and journal club will be given in class.

Bio 411 Cell Biology Lecture Schedule.

Week	Dates	Section	Lecture topic	Reading Assignment (Alberts et al)
1	Aug 24 Aug 26 Aug 28	Plasma membrane	Introduction Lipid bilayer Ion channel and pumps	p.617-624; 629-635; 642-648 p.651-666
2	Aug 31 Sep 2 Sep 4		Selectivity and blood-brain barrier Electrically-excitable membranes Action potential	p.671-675; <i>Gouaux and MacKinnon</i> p.667-671 p.675-682
3	Sep 7 Sep 9 Sep 11	Cytoskeleton, Part 1	Labor Day—No class Heart and skeletal muscle Journal club #1	p.973-983; 1010-17; 1025-28 <i>Journal Club paper</i>
4	Sep 14 Sep 16 Sep 18		Excitation-contraction coupling-1 Excitation-contraction coupling-2 Cell-cell contacts-desmosomes	p.1028-1031; 682-688 p.983-88; 1131-39; 1143-44;
5	Sep 21 Sep 23 Sep 25		Cell-cell contacts-gap junctions Extracellular matrix Journal club #2	p.1158-1163 p.1164-69; 1178-91 <i>Journal Club paper</i>
6	Sep 28 Sep 30 Oct 2		Cell-matrix attachments Exam #1 Neutrophil rolling and migration	p.1169-72 p.1145-47; 1445-46 (CD)
7	Oct 5 Oct 7 Oct 9		Actin cytoskeleton Chemotaxis and actin dynamics Chemotaxis and cell signaling	p.965-983 (focus on actin); p.994-1010 p.1036-46 p.175-81; 904-5; 931-33
8	Oct 12 Oct 14 Oct 16		Rho and Rac signaling Journal club #3 Cancer biology	p.1172-77 <i>Journal Club paper</i> p.1205-23; 1230-36
9	Oct 19 Oct 21 Oct 23	Regulation of cell growth and death	Oncogenes Tyrosine kinase signaling Cell cycle	p.177-78; 935-37; 1175-77 p.921-931 p.1053-66
10	Oct 26 Oct 28 Oct 30		Tumor suppressors Journal club #4 Apoptosis and necrosis	p.1101-12; 1241-49 <i>Journal Club paper</i> p.1115-18
11	Nov 2 Nov 4 Nov 6		Intrinsic and extrinsic pathways Exam #2 Apoptosis—Bcl2 family members	p.1118-21 p.1121-28
12	Nov 9 Nov 11 Nov 13		Organelle structure and function Veteran's Day—No class Vesicle budding and fusion-1	p.695-701; 721; 723-726; 771-773; 779-781; 813-18 p.749-760; 789-90
13	Nov 16 Nov 18 Nov 20	Intracellular trafficking	Vesicle budding and fusion-2 Journal club #5 Microtubules and motor proteins	p.760-765 <i>Journal Club paper</i> p.965-83 (focus on MTs); 992-1001; 1014-22
14	Nov 23		Thanksgiving—No class	
15	Nov 30 Dec 2 Dec 4		Endoplasmic reticulum ER to Golgi transport Cargo receptors	p.701-03; 723-736 p.736-40; 766-77 p.782-95
16	Dec 7 Dec 9 Dec 11		Exocytosis Regulated secretion TBA	p.799-809 Paper due in class
17	Dec 16		Exam #3, 2 pm	