California State University, Sacramento
Department of Biological Sciences

Biology 121: Molecular Cell Biology

Spring 2018, Section 01 (33569)
Lecture: MW 3:00-4:15pm, Academic Resource Center (ARC) 1010
Check out the classroom at: http://csus.edu/irt/learningspaceservices/lecture_capture.html

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Instructor:	Dr. Kelly McDonald
Email:	mcdonald@csus.edu
Faculty Website:	www.csus.edu/faculty/m/mcdonald/
Offices:	Humboldt 211C and Sequoia 339
Instructor Office Hours:	Monday 1:00-2:30pm and Wednesday 10:30-12:00pm (in Squ 339)
PAL Office Hours (at SQU320):	All students welcome. Time TBD (PAL office hours will be posted and announced)
Course Website:	The BIO121 webpage (on Canvas) will be used to distribute course materials, present learning modules, and for all quizzes; please check the page regularly. Please use the discussion board to get assistance and assist others.
Text:	Molecular Biology of The Cell. Alberts et al., 5th *OR* 6th edition (recommended, not required)

Course Description

BIO 121. Molecular Cell Biology (3 units). Cellular and molecular biology of prokaryotic and eukaryotic cells (emphasis will be placed on eukaryotic cells). Topics covered will include membrane structures, transport phenomena, cell to cell communication, gene expression, cytoskeleton and extracellular matrix systems. Lecture, three hours/week.
Prerequisite: BIO 1, BIO 2, and BIO 184. Graded Student.

Student Learning Outcomes

By the end of this course, you will be able to describe the:

- Major cell and tissue types of multicellular organisms
- Molecular basis of cellular specialization
- Mechanisms of cellular communication/signal transduction pathways
- Different types [and molecular mechanisms] of cellular movement
- Regulation of cellular division & death
- Fundamentals of stem cell biology
- Cellular and molecular phenotypes resulting from mutations in specific genes

In addition, you will be able to:

- Communicate your scientific knowledge, both verbally and in written format.
- Articulate the importance of connections between other academic disciplines and the biological sciences and the social relevance of biology.
- Employ the skills needed to be life-long learners in any field of study.
- Identify and apply appropriate information and analyze data in order to solve problems related to molecular and cellular biology and genetics.
- Be able to collaborate with others to solve scientific problems.

Grading The final grade is dependent on three 75-minute exams (80 points each), one ***comprehensive final exam*** (150 points), 10 out of 11 quizzes (5 points each; the lowest score is dropped). Point total: 440

Grading Scale Letter grades are given according to the following scale:

	A = 93 – 100 %	A- = 90 – 92.9 %
B+ = 87 – 89.9	B = 83 – 86.9	B- = 80 – 82.9
C+ = 77 – 79.9	C = 73 – 76.9	C- = 70 – 72.9
D+ = 67 – 69.9	D = 63 – 66.9	D- = 60 – 62.9
F = 0 – 59.9		

Exams The exams are multiple choice & free response. Please bring a scantron form 882-E for exams.

Quizzes Eleven online quizzes will be given. Quizzes will be posted on Wednesdays and due the following Sunday at 11:59pm (the night before class). Quizzes will either be based on online learning modules or on lecture content. Each quiz will consist of five questions worth 1 point each. You will have 10 minutes to complete the quiz and you will get two chances. (The first quiz is an exception: it will be due on a Wednesday.) Quizzes are open note and I encourage you to work in groups. Given the time limit, I ***strongly*** recommend you study in advance. Correct answers will be posted after the submission deadline.

Make-ups Make-up exams are only allowed in the event of health-related or family emergencies (you will be asked to provide proof). They are also permitted if you are an observant member of a religion that has a holiday conflicting with an exam day. You must notify me **in advance** and you may be asked to make arrangements at the testing center (in Lassen Hall).

Testing Center If you need exams to be administered at the testing center, please:

1. Show proof or reason for using the testing center.
2. Fill out the testing center form and turn it in to me at least a day in advance of the exam.

(For the instructor information section, please fill out my name, department, email address, my office phone is 8-5836*, dept office is 8-6535, mailing zip is 6077)*

Disabilities If you have a physical or learning disability and are registered with DSPS, please contact me immediately. Qualified students with physical or documented learning disabilities have the right to free accommodations to ensure equal access to educational opportunities.

Attendance You will not be graded on attendance, but I strongly recommend not missing class. We are in a collaborative learning space, and I like to integrate problem-solving, group work and discussion with lecture. These techniques are proven to aid learning and retention, and they make class more fun! So, you won't want to miss class!

In the Event of a Missed Class I highly encourage you to exchange contact information with classmates in the event that you miss a class. It is your responsibility to get copies of notes and handouts and to be aware of any announcements or changes in assignments.

Add/Drop Policy You cannot add after the end of the second week of classes.
You cannot drop after the sixth week.

Email Disclaimer I try to respond to emails within 24 - 48 hours. The fastest way to get your questions answered is by posting on the online discussions ("Student Questions"), which is monitored by me. The response time is often 0.5 - 6 hours, depending on when you post.

Policy on Dishonesty Cheating earns an automatic "F" for the exam and will be reported to the department chair.

CHEATING includes but is not limited to:

1. Communication between students during an exam
2. Looking at another student's work
3. Having written materials out during the exam
4. Providing answers to another student during exams
5. Changing answers after the exam is handed back & asking for a re-grade

Classroom Conduct

1. Please be courteous to everyone in your class; being disrespectful will result in your being removed from the class.
2. No disruptive behaviors during lecture (such as talking at inappropriate time and noise level, watching youtube on your laptop, using phone, etc)
3. Please do not engage in any non-class related activities on your laptop or phone during class: **no snapchat, no shopping, no texting, etc**; otherwise, you may be asked to leave the classroom.

Extra Credit Opportunity I will award you 3 points of extra credit if you complete two appointments with Commit to Study (http://www.csus.edu/nsm/c2s/) **by March 9th.** There will be other opportunities to earn EC throughout the semester, and you may earn a maximum of 10 points total.

Several points related to my philosophy of teaching, based on research about learning:

1. The one working the hardest is learning the most! You must work your brain (just like a muscle) if you want it to grow. This explains why I try to limit lecture and instead facilitate learning through proven "active learning" methods: group work, peer discussion, reflective (metacognitive) activities, problem-solving for practice, etc. Practice is essential for learning!
2. Desirable difficulty: this is the sweet spot for learning. If the material is too easy, it is boring; if it is too hard, it is discouraging. We all need to struggle with material just a bit in order to really learn, retain and evolve as scientists.
3. Frequent feedback is critical. You need feedback from me and I need feedback from you. I will survey you to find out how you are adjusting to my methods and with which concepts you are struggling. I will provide one-on-one feedback as best I can and will routinely provide feedback to the whole class.
4. You learn best when you are building on your own ideas and existing knowledge. I will use "formative assessment" strategies to gauge your existing knowledge, and you can try making connections and drawing relationships, rather than memorizing.

My most important role is to help motivate and support you!

Tips for Bio121 Success from Drs. Mulligan and McDonald

1. **Review the lectures & try to do the review questions BEFORE coming to class**
   You will have access to lecture slides and review questions on the course website at least 48 hours prior to lecture. Try to do the review questions before even coming to lecture. Studies show we learn most effectively when we try to figure things out on our own prior to instruction. At minimum, take 15-20 minutes to preview the slides and questions before coming to class. (Many test questions will draw from the topics covered on the review questions, which come from the lecture slides.)

2. **Review PowerPoint slides and lecture notes using some deep learning techniques**
   As soon as you can after class (within 24 hr if possible), go through the PowerPoint slides and notes you took in lecture. Below are some effective ways to review class materials so that you develop a deeper understanding and better retention:
   a) Attempt to draw images/figures/models of the information on slides with a lot of text. So, transform the text on your slides to pictures that represent your understanding of the material.

b) Attempt to write out your understanding of slides that have mostly images/figures (like you are writing a figure legend in a text book).
c) If you like to re-write your notes/slides, don't just copy them – paraphrase them (write them in your own words) and summarize key information from the slides in bullet points.
d) Flag/mark material or information that you don't understand. Look up the concepts/words in your book or online or ask a classmate or me! You can use the discussion board for this as well.
e) Write sample test questions related to the information on the slides or in your notes. If you study with friends, you can quiz each other.
f) Write down questions that occur to you because you are interested in the answer (even if you don't think it will be on the test)!
g) Try to relate the material you are learning to real life situations that interest you.

3. **How to use the review questions**
After you have reviewed the slides and class notes (using tips from #2), try to do the review questions WITHOUT looking at your notes. Mark the questions that you need your notes for (you will probably need to review these again).

4. **ASK QUESTIONS!!! USE THE DISCUSSION BOARDS!!!**
If you're having a problem understanding something, ask me! I'm here to help you understand the material. Asking questions aids in everyone's learning experience because it leads to concepts being explained in more detail and in different ways. If you don't want to ask questions in class, come see me or a PAL during office hours or post questions on the online discussion boards.

5. **Form study groups or join PALs**
Find another student or students and form study groups to help prepare for exams or, if time permits, have weekly or bi-monthly review sessions to discuss the material. If you can join a PALs session (1 unit credit, attendance is mandatory), do so! ***The average grade increase of PALs participants is 15%!!!!!!***

6. **Practice Tests**
Do practice tests without looking at the answers. Then use the answers to correct your exam. Do not memorize answers. ***Make sure you understand the concepts***. (Think about *why* each answer is right or wrong.)

7. **Consult the textbook**
Lectures will follow subject matter covered in your text. If you're confused about a topic covered in lecture, chances are your book will help clarify things for you. And if you are looking for more detail, your textbook will be your best friend. Don't have a book? You can borrow mine during office hours to make copies.

8. **Think critically!**
Keep me on my toes by challenging me. Challenge the text. Challenge each other. Be sure to take time to reflect…each lecture will add a piece to the larger puzzle of cell biology. Put the puzzle pieces together in your head as the class proceeds. Concept mapping is a great tool for synthesizing details and identifying relationships between terms/concepts to really help you understand the big picture!

9. **Tutoring**
If you are doing all that you can and still find yourself struggling, PARC (located in Lassen Hall) offers free one-on-one tutoring sessions. You can make appointments in person at the PARC office or online: http://www.csus.edu/parc/

10. **Do not let this class (or any class…or any person) break you**
Anxiety and stress is real, and can be heartbreakingly damaging. *Every single one of us needs help sometime.* The counseling center offers free, confidential counseling: https://shcssacstate.org/

Course Schedule

Week	Date	Lecture Topic	Online Quiz Schedule
1	Monday, Jan 22	1. Introduction to Molecular Cell Biology	No Quiz
	Wednesday, Jan 24	2. Introduction/Review of Genetic Variability & Protein Expression (Part I)	
2	Monday, Jan 29	3. Introduction/Review of Genetic Variability & Protein Expression (Part II)	Quiz 1 on Learning Module 1 Due Wed (Jan 31) by 11:59pm
	Wednesday, Jan 31	"Meet The Professor"/Advising Lecture	
3	Monday, Feb 5	4. Introduction to Multicellularity	Quiz 2 on Lect 2-3 Due by Sun (2/4) at 11:59pm
	Wednesday, Feb 7	5. Tissue Structure and Function	
4	Monday, Feb 12	6. Cell Specialization: Regulation of Transcription (Part 1)	Quiz 3 on Learning Module 2 Due by Sun (2/11) at 11:59pm
	Wednesday, Feb 14	7. Cell Specialization: Regulation of Transcription (Part 2) *& HW Due*	
5	**Monday, Feb 19**	**EXAM 1**	No Quiz
	Wednesday, Feb 21	8. Cell Specialization: RNA and Protein Processing (Part 1)	
6	Monday, Feb 26	9. Cell Specialization: RNA and Protein Processing (Part 2)	Quiz 4 on Learning Module 3 Due by Sun (2/25) at 11:59pm
	Wednesday, Feb 28	10. Protein Structure and Function	
7	Monday, Mar 5	11. Biological Membranes	Quiz 5 on Lect 10 Due by Sun (3/4) at 11:59pm
	Wednesday, Mar 7	12. Endomembrane System and Intracellular Trafficking (Part 1)	
8	Monday, Mar 12	13. Endomembrane System and Intracellular Trafficking (Part 2) & HW Due	Quiz 6 on Learning Module 4 Due by Sun (3/11) at 11:59pm
	Wednesday, Mar 14	**EXAM 2**	
9	Monday, Mar 19	**Spring Break!**	
	Wednesday, Mar 21		
10	Monday, Mar 26	14.The Cytoskeletal System (Part 1)	Quiz 7 on Learning Module 5 Due by Sun (3/25) at 11:59pm
	Wednesday, Mar 28	15.The Cytoskeletal System (Part 2)	
11	Monday, Apr 2	16. Cellular Adhesion	Quiz 8 on Lect 14/15 Due by Sun (4/1) at 11:59pm
	Wednesday, Apr 4	17. Mechanisms of Cell Communication - Signal Transduction (Part 1)	
12	Monday, Apr 9	18. Mechanisms of Cell Communication - Signal Transduction (Part 2)	Quiz 9 on Learning Module 6 Due by Sun (4/8) at 11:59pm
	Wednesday, Apr 11	19. Consensus Signal Pathways and Molecules & HW Due	
13	**Monday, Apr 16**	**EXAM 3**	No Quiz
	Wednesday, Apr 18	20. Integration, Hierarchy, and Regulation by Multiple Required Signals	
14	Monday, Apr 23	21. Cellular Movements	Quiz 10 on Learning Module 7 Due by Sun (4/22) at 11:59pm
	Wednesday, Apr 25	22. Mitotic Cell Cycle and Cell Death (Part 1)	
15	Monday, April 30	23. Mitotic Cell Cycle and Cell Death (Part 2)	Quiz 11 on Learning Module 8 Due by Sun (4/29) at 11:59pm
	Wednesday, May 2	24. Stem Cells & Tissue Renewal	
16	Monday, May 7	25. Wound Healing	No Quiz
	Wednesday, May 9	26. Final Review, HW Due & Practice Quiz Competition	
Finals Week	**Monday, May 14**	**COMPREHENSIVE FINAL EXAM (3:00pm-5:00pm)** The exam will be ~50% Lect 1-19 and Learning Modules 1-6 & ~50% on Lect 20-25 and Learning Modules 7-8	

PAL Sections (Spring 2018)

PAL sections are a separate 1 unit course (**NSM12H**). These courses are led by facilitators who are former BIO121 students. Students who participate in PALs achieve, on average, 5-15% higher grades. I strongly recommend enrolling in a PAL section.

Code	Room	Section	Day/Time
34211	RVR 2010	Section 1	TR 12-12:50
34213	MND 1024	Section 3	MW 10-10:50
34214	ALP 205	Section 4	MW 2-2:50