

BIO 2.1 Fundamentals of Biology: Cell and Molecular Biology

Spring 2017 Syllabus, Santa Rosa Junior College
Lecture: MW 12:30-1:50 pm, 1801 Baker Hall
Lab: MW 9:00-12:00 pm, 1885 Baker Hall

Dr. Katy Jamshidi

Office: 1882 Baker Hall

Office Hours: MW 2:00-3:00 pm; TTh 11:00-11:50 am, or by appointment

Phone: 707-521-6987 (but e-mail is a much better way to reach me!)

E-mail: kjamshidi@santarosa.edu

Course Webpage: <https://santarosajc.instructure.com/courses/20369>

Note: approximately halfway through the semester, Dr. Jamshidi will be going on maternity leave. A substitute instructor will teach the course for the rest of the semester.

This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the instructor reserves the right to modify, supplement and make changes as needs arise.

Required Materials:

- **Textbook:** Reece et al. 2010. Campbell Biology 9th edition (ISBN: 9780321558237)
 - A copy is on reserve in library: call number is QH308.2 .C34 2011 PC Metzler
 - You will need to bring your student ID to access reserve materials.
- **Lab Manual:** Santa Rosa Campus, Fall 2016. BIO 2.1 Laboratory Manual (provided)
- i>clicker Student Response System (any model will work)

OR

- Reef Polling by i>clicker (iOS app or use in a browser) on laptop, tablet, smartphone or other mobile device (*see i>clicker information on page 3 of syllabus*)
- Scan-trons for lecture exams

Recommended Materials:

- Alberts et al. 2014. Essential Cell Biology 4th edition (ISBN: 9780815344544)
 - A copy is on reserve in library: call number is QH581.2 .E78 2014
 - You will need to bring your student ID to access reserve materials.
 - *I teach material and use figures / movies from this textbook in quite a few lectures. For your reference, I've included the relevant chapters from this book in italic on the course schedule.*
 - *It's also a great place for curious students to look for more in-depth information about the topics we cover in class!*
 - *If you would like your own copy to read, consider renting it from an online store, or purchasing a less expensive, used copy of an earlier edition such as the 3^d edition.*
- Jan A. Pechenik, 2013. A Short Guide to Writing About Biology 8th edition
 - Earlier edition on reserve in library: call number is QH304 .P43 2004 PC Metzler
 - You will need to bring your student ID to access reserve materials.
 - *This book is great for learning about scientific writing and presentations. See page 3 of syllabus for recommended readings in this book.*

Course Description: This is a rigorous introductory course intended to introduce students majoring in biological sciences to the fundamental concepts in cell and molecular biology, including: cell structure and function, origin, evolution, and diversity of cells, biochemistry, metabolism, molecular genetics, cell regulation, cell differentiation and evolutionary development.

Official Course Outline:

https://portal.santarosa.edu/SRweb/SR_CourseOutlines.aspx?CVID=24016&Semester=20133

Grading:

Lecture Exams	400
Homeworks on Canvas	25
In-Class Clicker Questions	25
Lab Exam, Quizzes & Assignments	215
Lab Write-Ups/Presentations	150
Lab Attendance/Participation	25
<i>Total</i>	<i>840 points</i>

Grade Distribution

90 – 100%	A
80 – 89%	B
70 – 79%	C
60 – 69%	D
<59%	F

Anyone who misses the final exam will receive an "F" in the course regardless of their previous grade (SRJC policy).

Drop Dates:

- Last day to drop and get a refund: 1/29.
- Last day to drop without a "W": 2/5.
- Last day to drop with a "W": 4/23.

Course Policies and Information

Academic Integrity: All written work is to be original; plagiarism of any kind will result in a failing grade on that assignment. Students who plagiarize or cheat may be suspended (for one or two class meetings by the instructor) and referred to the Vice President of Student Services for discipline sanction, in cases of egregious violation. Please read the college policy / procedure on academic integrity at: <http://www.santarosa.edu/polman/3acadpro/3.11P.pdf>

Attendance and Participation: Students are expected to be present, prepared and on time for each class meeting and to participate in discussions and group activities. Please contact me in advance if you cannot attend class due to illness or emergency. Attendance will be monitored in both lab and lecture. Each unexcused lab absence results in a deduction of 3 points from your lab attendance grade; each time you are more than 5-10 minutes late to lab OR leave lab before lab activities are finished, results in a deduction of 1 point. **You may be dropped** if your absences exceed 10% of the total hours of class time (10.5 hours).

Cell phones: Cell phones are to be turned to silent mode during class. Their inappropriate use (including texting) distracts both you and the instructor. It is, however, acceptable to record lecture audio, use the REEF Polling i>clicker system, and/or view the PowerPoint slides using your cell phones, tablets, or laptops. Cell phones must remain in your bag during exams. Any cell phone use during an exam will be considered cheating.

Classroom Etiquette and Respect: The best way to learn is through active participation; therefore, we respect others when talking by listening actively and by being polite even when we disagree with another's viewpoint. The following behaviors interfere with student learning and are inappropriate during class: arriving late or leaving early, off-topic use of cell phones or other electronic devices, packing up before the end of class, chatting with neighbors, and any offensive or demeaning behavior.

Course Website: The Canvas website is going to be very important for this course. You can find it here: <https://santarosajc.instructure.com/courses/20369>. Materials that you will need to access on the Canvas page include: lecture slides, practice questions, review sheets, homework assignments and due dates, important announcements, supplementary articles to read, helpful links for websites and animations, lab data and information, and your grades. It is important that you put the email address that you check most frequently into your Canvas settings.

Disability-Related Accommodations: If you need disability-related accommodations for this class, such as a note taker, test taking services, special furniture, etc., please provide the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) to the instructor in the first week of class. You may also speak with the instructor privately during office hours about your accommodations. If you have not received authorization from DRD, it is recommended that you contact them directly. Their office is located on the 3rd floor of Bertolini Student Center – (707) 527-4278.

Emergency Evacuation Plan: In case of emergency, dial 527-1000 from a cell phone or 1000 from any campus phone. In the event of an emergency during class that requires evacuation of the building, please leave the class immediately, but calmly. Our class will meet in the parking lot between Baker Hall and Bailey Hall to make sure everyone got out of the building safely and to receive further instructions. If you are a student with a disability who may need assistance in an evacuation, please see me during my office hours as soon as possible so we can discuss an evacuation plan.

Exam Return Policy: It is the policy of the Life Sciences Department to not return exams to students. Once graded, your exams will be filed in my office and available for review during the semester. After each exam is graded **you have one week** to hand in any rebuttals, **in writing**, concerning the grading of that exam. After that week, your grade will remain as given. Once final course grades are posted in the student cubby, students have two months to request an appointment to review any exam from the previous semester and request a re-evaluation of their grade. After that time exams will be shredded.

Homeworks: There are a few homework assignments that you will turn in on Canvas during the semester. The due dates for these assignments are written in the course schedule (attached) but are subject to change (will be on Canvas calendar). These assignments are designed to help you engage with particularly challenging lecture material so that you will be more prepared for exams. Pay attention to the Canvas modules to find these assignments and the instructions to complete them.

Make-up Exams: Lecture exams may be made up only with **prior approval** and at the instructor's discretion. Extenuating circumstances must be supported by official documents (signed doctor's note, etc.). Lecture exams must be made up before the next lecture period. The lab exam requires special setup of the lab room and **cannot** be made up if missed.

Practice Questions: About once a week, a list of practice questions will be posted on Canvas. These questions will be mainly short answer, multiple choice, or true/false (they will be easier than exam questions). These questions are not going to be graded, but they should help you check up on your understanding of the material between exams.

Special Considerations: If you have any special needs or concerns, please be sure to let me know. We will be working in a hands-on environment; therefore challenges may arise that do not generally come up in a lecture classroom.

Suggested readings in Jan A. Pechenik, 2013. A Short Guide to Writing About Biology 8th edition:

These will help you as you research and write your papers for the Sudden Oak Death project. There is an earlier edition of this book on reserve in the library (see 1st page of syllabus for call number). The chapter numbers might be different, but the material is still very useful!

- Reading science: Chapter 3: General Advice on Reading and Note-Taking
- General rules about scientific writing: Chapter 1: Introduction and General Rules
- Writing scientific research reports: Chapter 10: Writing Laboratory and Other Research Reports
- Revising your paper and reviewing others' work: Chapter 6: Revising
- Understanding and writing about statistics: Chapter 4: Reading and Writing about Statistical Analyses
- Preparing talks and poster presentations: Chapter 11: Presenting Research Findings

i>clicker Information

In-class exercises will include i>clicker questions that will help you **think actively** about the material you are learning. This way, you will avoid leaving class not understanding what we talked about that day. i>clickers will also be used to monitor **attendance**: you will get points each day for being in class and participating (answering at least 75% of the clicker questions). Clicker points will be evenly distributed among the lecture periods that use clicker questions. Points will be given for completion, not correctness, as some questions will be speculative or address preconceptions. Clicker points will be divided so that you will be able to **miss up to 3 classes** without losing any points.

You may purchase an **i>clicker** (any version will work) at the SRJC bookstore (\$30-\$45) or online (there are various websites that sell used i>clickers at lower prices than the bookstore). I also have four clickers to loan out to students for free, so send me an email if you would like to be considered for one of these.

Alternatively, you may use the **REEF Polling** system by i>clicker. (<https://app.reef-education.com/#/login/>) It is economical (\$10 for a 6-month subscription) and may be convenient for those of you who have mobile access to the Internet during class time. It may be used in any browser (laptop, tablet, smartphone) and there are mobile apps for Android and Apple devices. However, the wireless internet service in the lecture hall is not always good, so you may have to communicate with me on days when you notice that your answers are not going through.

To **register your i>clicker**, go to <https://www1.iclicker.com/register-clicker/> and fill out the form. In the Student ID field, please enter the **last 4 digits** of your student ID. If you can't find your i>clicker's **remote ID**, check the diagrams on the website or come see me. If you have trouble with registration or if it asks you for money to register your clicker, come see me because I have a way to do it for free. Clicker points will begin on the date shown on the course schedule, so be sure to have your clicker set up and registered to your name by then.

Bio 2.1 Fundamentals of Biology: Cell and Molecular Biology Spring 2017 Tentative Class and Exam Schedule

*Note: Readings marked in italic are from Alberts Essential Cell Biology textbook (see **recommended materials** on first page of syllabus)*

Week	Date	Lecture topic	Lecture reading	Lab topic	Lab reading
1	1/18	What is Science?	Review Chapter 1	Introduction Characteristics of Life	pp. i.1 – 1.9
2	1/23	Cell theory & Cell diversity	Sections 26.6, 27.1, Mazzarello (1999)	Microscope I: Use and Care Microscope II: Introduction to Cells Quiz: Safety & Sanitation (10 pts)	pp. 2.1 – 2.8
	1/25	History of Life Canvas homework due: Phylogenetic trees (5 pts)	Sections 6.2-6.3, 6.5	Microscope III: Eukaryotic Diversity Microscopy IV: Bacteria Quiz: Microscope Use & Care (10 pts)	pp. 3.1 – 3.11 Answer as many lab manual questions as possible <u>before lab!</u>
3	1/30	Membrane structure	Sections 5.3, 7.1-7.5 (Ch. 12 ECB)	Chemistry Review	pp. 4.1 – 4.11
	2/1	Membrane transport	Sections 5.3, 7.1-7.5 (Ch. 12 ECB)	Macromolecules I, II, III: Functional Groups, Carbohydrates, Proteins	pp. 5.1 – 5.11 Answer as many lab manual questions as possible <u>before lab!</u>
4	2/6	Protein structure and function *Clicker points begin*	Section 5.4 (Ch. 4 ECB)	Macromolecules IV, V: Lipids, Nucleotides & DNA Quiz: Chemistry (25 pts)	pp. 5.12 – 5.20 Answer as many lab manual questions as possible <u>before lab!</u>
	2/8	Protein structure and function		Enzymes I	pp. 6.1 – 6.6
5	2/13	Enzymes and inhibitors	Sections 8.1-8.2, 8.4-8.5 (Ch. 3, 4 ECB)	Enzymes II *Enzymes graphs due (5 pts + 2EC); Enzymes lab manual questions due (5 pts)*	pp. 6.6 – 6.8 Answer as many lab manual questions as possible <u>before lab!</u>
	2/15	Signal transduction	Sections 11.1-11.3 (Ch. 16 ECB)	Lab Exam (100 pts) (through Macromolecules)	
6	2/20	No class, no lab			
	2/22	Signal transduction	Section 11.4	PV92 – DNA Extraction & PCR; Library resources introduction	pp. 7.1 – 7.8

Week	Date	Lecture topic	Lecture reading	Lab topic	Lab reading
7	2/27	Introduction to SOD project	DiLeo et al. 2009	Lecture Exam 1 (100 pts) (through Signal transduction; includes Enzymes lab material as well)	
	3/1	DNA / chromosome structure	Sections 5.5, 16.1, 16.3, O'Connor (2008) (Ch. 5 ECB)	Pepperwood Preserve Field Trip	
8	3/6	DNA replication Canvas homework due: DNA replication (5 pts)	Section 16.2 (Ch. 6 ECB)	SOD Leaf Inoculation	
	3/8	Molecular genetics: Central dogma and transcription	Sections 17.1-17.2 (Ch. 7 ECB)	PV92 – Gel Electrophoresis; Discuss scientific paper format: intro *Paper format assignment due (10 pts)*	pp. 7.8 – 7.15 Ch. 1 and Ch. 10 of Pechenik book
9	3/13	Molecular genetics: RNA processing, translation	Sections 17.3-17.4	SOD Leaf Analysis; Discuss scientific paper format: methods Quiz: Micropipettor Use (10 pts)	Ch. 10 of Pechenik book
	3/15	Molecular genetics: mutations, DNA damage and repair	Sections 17.5, 16.2	GFP – Plasmid Miniprep; Discuss SOD results; Discuss scientific paper format: results	pp. 7.16 – 7.21 Ch. 10 of Pechenik book
Spring Break!					
10	3/27	Intracellular transport	Section 6.4, Canvas materials (Ch. 15 ECB)	Drosophila I: Introduction; Discuss scientific paper format: discussion	pp. 8.1 – 8.8 Ch. 10 of Pechenik book
	3/29	Intracellular transport / Cytoskeleton	Section 6.6 (Ch. 17 ECB)	Drosophila II – Parental Crosses Basic Genetics Take-home Quiz due (10 pts) *Bring SOD drafts: peer feedback*	pp. 8.9 – 8.11
11	4/3	Cytoskeleton	Section 50.5	GFP – Gel Electrophoresis & PCR; GFP project overview (part 1) *SOD First Draft due 9 pm on turnitin.com (10 pts)*	pp. 7.22 – 7.25
	4/5	ATP and Redox	Section 8.3, 9.1 (Ch. 3 ECB)	GFP – PCR clean & Gel & Restriction Digest, Drosophila III – Clearing the parental generation	pp. 7.26 – 7.29
12	4/10	No lecture (exam day)		Lecture Exam 2 (100 pts) (through Cytoskeleton, includes lab topics of PCR & gel electrophoresis)	
	4/12	Cellular respiration Canvas homework due: Redox and Energy (5 pts)	Sections 9.2-9.3 (also see movies on Canvas) (Ch. 13 ECB)	Drosophila IV – F ₁ count & cross Drosophila V – Chromatography I	pp. 8.12 – 8.14 pp. 8.15 – 8.17

Week	Date	Lecture topic	Lecture reading	Lab topic	Lab reading
13	4/17	Cellular respiration	Sections 9.4-9.6 (Ch. 13, 14 ECB)	GFP – Ligase & Transformation I; GFP project overview (part 2)	pp. 7.30 – 7.32
	4/19	Cellular respiration	Sections 9.4-9.6	GFP – Transformation II Drosophila VI – VII – Chromatography II	pp. 7.33 – 7.35 pp. 8.17 – 8.24
14	4/24	Photosynthesis	Sections 10.1-10.3 (Ch. 14 ECB)	GFP – Plasmid Miniprep & Restriction Digest Group SOD – Design GFP Project Quiz (10 pts)	
	4/26	Gene regulation Canvas homework due: Citric Acid Cycle vs. Calvin Cycle (5 pts)	Sections 18.1-18.2 (Ch. 8 ECB)	Drosophila VIII – F ₂ count GFP – Gel Electrophoresis Group SOD: lists due for Peggy/Beth *SOD Final Draft Due on turnitin.com Sunday, April 30 @ 9 pm (90 pts)*	pp. 8.25 – 8.27 pp. 7.21 – 7.22
15	5/1	Gene regulation	Sections 18.2-18.3	Pepperwood Preserve Field Trip	
	5/3	Development, Cell determination and differentiation Canvas homework due: lac & trp operons (5 pts)	Sections 47.1-47.2, 18.4 (Ch. 20 ECB)	Group SOD – Leaf Inoculation	
16	5/8	Cell determination and differentiation, Stem cells	Section 20.3 (Ch. 20 ECB)	Drosophila problem set due (20 pts) Drosophila IX – Statistics	pp. 8.28 – 8.33
	5/10	Cell cycle – regulation	Sections 12.2-12.3 (Ch. 18 ECB)	Group SOD – Leaf Analysis	
17	5/15	Cell cycle – cancer	Section 18.5, Chow (2010), Vogelstein (2010) (Ch. 20 ECB)	Group SOD – Presentation Prep	
	5/17	Catch up / Bioethics Discussion	Materials on Canvas	Group SOD – Presentation (25 pts) *Group poster PDF due on Canvas Sunday 5/21 at 9 pm (25 pts)*	
Finals Week	5/24 8:00- 12:45	Combined: Lecture Exam 3 (100 pts) (includes GFP project and Drosophila project from lab) & Cumulative Final Exam (100 pts)			