Syllabus **Biology 1 – Cell and Molecular Biology** **Spring 2018**

Lecture/Lab	TTh 3:10-6:10 pm, LS 102 3 hours lecture, 3 hours lab/week	Instructor Email	Patrick Yuh pyuh@gavilan.edu
Course Website	ilearn.gavilan.edu	Office Hours	MW 4-5:30 pm, TTh 2-3 pm, LS 112

Course Description: Cell and Molecular Biology (Bio 1) is an introductory biology course with an emphasis on the structure and function of cells, biological molecules, homeostasis, cell respiration, photosynthesis, cell cycle and its controls, cellular communication, Mendelian and non-Mendelian genetics, evolution, and diversity of life. The philosophy of science and methods of scientific inquiry and experimental design are foundational to this course. The course is required for students majoring in biology and/or its subcategories (e.g. plant or animal sciences).

Prerequisites: Biology 10 or 12 or Environmental Science 1 with a grade of 'C' or better; Chemistry 1A with a grade of 'C' or better; Math 240 with a grade of 'C' or better. **Advisory:** Eligible for English 250 and 260.

Student Learning Outcomes:

1. Identify and describe the structures and interactions between prokaryotic and eukaryotic cells, including metabolism, reproduction, and communication.
2. Describe how organisms use and store energy.
3. Identify and describe the different phases of the cell cycle.
4. Describe how organisms reproduce sexually and asexually.
5. Be able to solve problems in classical genetics and population genetics.
6. Describe the function of genes and how they are expressed.
7. Relate the use of biotechnology to techniques used in the modern laboratory.
8. Describe how the structures of organisms are related to their function, and how those features develop through the process of evolution.

Logistics: Class will begin **promptly** at 3:10 pm. Lab will begin at approximately 4:45 pm and end when students have finished their lab work. YOU ARE EXPECTED TO ATTEND, AND BE ON TIME FOR, ALL CLASS MEETINGS.

Study Time: Keep in mind that this course has lecture and lab components. Plan to spend ***10-15 hours per week*** outside of class to keep up with the material.

Required Materials

1. Reece, et al. *Campbell Biology*, 10th edition. ISBN 9780321775658.
2. Kurushima. *Cell and Molecular Biology Lab Manual*, 2014 edition. Available on iLearn.
3. Binder for Lab Notebook

Other Information

Attendance: Students missing one more class hour than the unit value of the course, without making prior arrangements, may be dropped. You are responsible for ALL material covered in class. Please let me know if you anticipate missing class. **If you wish to drop the class at any point, it is YOUR responsibility to do so.**

ADA Accommodation: Students requiring special services or arrangements because of hearing, visual, or other disability should contact their instructor, counselor, or the Disability Resource Center to make arrangements ASAP.

Occupational/Vocational Students: Limited English language skills will not be a barrier to admittance to participation in Vocational Educational Programs.

Academic Integrity

Students are expected to exercise academic honesty and integrity. Violations such as CHEATING and PLAGIARISM will result in an **AUTOMATIC ZERO** for that assignment or exam, and possibly further disciplinary action which may include recommendation for dismissal.

CHEATING is the use of **ANY** unauthorized source during a quiz or exam, such as the textbook, a cell phone, or another student's answers. PLAGIARISM is the use of material from **ANY** outside source, including your textbook, as your original answer. This occurs most easily on homework assignments. **DO NOT CHEAT OR PLAGIARIZE.**

During all examinations, students will:

1. Turn cell phones OFF or SILENT. **Checking your phone is considered cheating.**
2. Refrain from talking.
3. Put all notes, books, and other materials away from the workspace.
4. Behave in a way that minimizes suspicion of cheating. This includes but is not limited to: keeping your eyes on your own exam; leaving your exam flat on your desk; sitting away from other students.

Grading

Lecture	Homework (4) & Problem Sets (2)	6 x 25 pts	150 pts	15%
	Service Learning Project		50 pts	5%
	Midterms (3)	3 x 100 pts	300 pts	30%
	Final Exam		150 pts	15%
	Lecture points		**650 pts**	**65%**
Lab	Lab Notebook		100 pts	10%
	Pre-Lab Quizzes (11)	10 x 5 pts	50 pts	5%
	Lab Exams (3)	2 x 100 pts	200 pts	20%
	Lab points		**350 pts**	**35%**
			1000 pts	**100%**

Grade	**%**
A	93-100
A-	90-92.9
B+	88-89.9
B	83-87.9
B-	80-82.9
C+	78-79.9
C	70-77.8
D	60-69.9
F	<60

You are guaranteed the grade corresponding to the percentages listed above. At my discretion, I may curve the final grades such that a lower percentage of total points is needed to earn the corresponding grade.

Students can earn up to 50 EXTRA CREDIT points. More details are on iLearn.

Lecture: 65% of final grade (650 points)

HOMEWORK (HW) and PROBLEM SETS (PS) are due in class by 3:10 pm. The content and style of questions will reflect the exams. I will accept **one** late assignment without penalty, to be turned in no later than **72 hours** afterward. Any subsequent late assignments will earn **zero** points.

The SERVICE LEARNING PROJECT involves volunteering at a local nonprofit organization (park, estuary, museum, Gavilan College, etc.). Provide documentation of participation (pictures of you at the event work best!). The volunteer requirement for this course is 3 hours, plus a 1-page reflection. More details are on iLearn.

EXAMS will consist of multiple choice, true/false, fill-in, and free response questions. MIDTERMS will be given during lecture. The FINAL will be 2/3 newer material and 1/3 comprehensive.

Lab: 35% of final grade (350 points) – in order to pass the course you must earn a passing grade for the lab

LAB ATTENDANCE COUNTS! Being late to lab or leaving before finishing ALL assigned lab work will negatively impact your lab grade. Labs CANNOT be made up. Anyone who misses **more than three** labs will fail the course.

Students will keep a LAB NOTEBOOK in which all lab work is written in the format of a lab report. See **Appendix I** of the lab manual for more information. The Lab Notebook will be graded periodically throughout the semester.

Students are expected to prepare for lab by reading the lab manual, writing in their Lab Notebook, and taking the online PRE-LAB QUIZ before lab. Quizzes will open at least one week before a given lab, and close at 3:00 pm the day of lab. Each quiz may be taken twice, with the higher score counted.

LAB EXAMS will be given during lab to test your knowledge and understanding of lab concepts and techniques. They will be similar in format to a lecture exam.

The lowest PRE-LAB QUIZ and LAB EXAM scores will be dropped.

Lecture Schedule

Week	Dates	Lecture Topics	Reading	Due Dates
1	Jan 30, Feb 1	Introduction, Basic Chemistry, Water	Ch. 1, 2, 3	
2	Feb 6, 8	Carbon, Macromolecules	Ch. 4, 5	**2/8: HW1**
3	Feb 13, 15	Cells, Membranes	Ch. 6, 7	
4	**Feb 20**	**Midterm 1: Ch. 1-7**		
	Feb 22	Enzymes & Metabolism	Ch. 8	
5	Feb 27, Mar 1	Cellular Respiration, Photosynthesis	Ch. 9, 10	
6	Mar 6, 8	Mitosis, Meiosis	Ch. 12, 13	**3/8: HW2**
7	Mar 13, 15	Mendelian Genetics, Catch-Up & Review	Ch. 14	
8	**Mar 20**	**Midterm 2: Ch. 8-10, 12-14**		
	Mar 22	Chromosomal Inheritance	Ch. 15	
9	Mar 27, 29	Molecular Inheritance, Genes to Proteins	Ch. 16, 17	**3/27: PS1**
	Apr 2-6	*Spring break!*		
10	Apr 10, 12	Biotechnology, Darwinian Evolution	Ch. 20, 22	**4/12: PS2**
11	Apr 17, 19	Population Evolution, Species Evolution	Ch. 23, 24	**4/17: HW3**
12	**Apr 24**	**Midterm 3: Ch. 15-17, 20, 22-24**		
	Apr 26	Origins of Life	Ch. 25	
13	May 1, 3	Phylogeny, Ecology & Biospheres	Ch. 26, 52	
14	May 8, 10	Population Ecology, Community Ecology	Ch. 53, 54	**5/8: HW4**
15	May 15, 17	Ecosystems, Review	Ch. 55	
	May 22	**Final Exam (1:00-3:00 pm, LS 102)**		

REMINDER: Homework and Problem Sets are due by the beginning of class on the dates indicated. One late assignment (up to 72 hours late) will be accepted without penalty. Subsequent late work will earn zero points.

MAKE-UP EXAM POLICY: Make-up exams will be given ONLY IF

1. You have a previous commitment that cannot be rescheduled AND notify me at least ONE WEEK in advance, OR
2. You provide documentation of severe illness that prevented you from taking an exam on the scheduled date AND notify me WITHIN 24 HOURS of the missed exam

Lab Schedule

Week	Date	Lab Activities	Other
1	Jan 30	Lab 1: Scientific Process/Method	
	Feb 1	Lab 2: Introduction to the Microscope (Ex. A, B, C)	
2	Feb 6	Lab 2: Introduction to the Microscope (Ex. D, E)	
	Feb 8	Lab 3: Measuring Techniques (dry) (Ex. A, B)	
3	Feb 13	Lab 3: Measuring Techniques (wet) (Ex. C, D)	
	Feb 15	Lab 4: Using the Spectrophotometer	
4	Feb 20	Lab 5: Enzymes (Ex. A, B)	**Notebook: Labs 1-3**
	Feb 22	Lab 5: Enzymes (Ex. C, D)	
5	Feb 27	Lab 6: Cellular Respiration & Fermentation	
	Mar 1	Lab 7: Photosynthesis (Ex. A, B)	
6	Mar 6	Lab 7: Photosynthesis (Ex. C)	**Lab Exam 1 (Labs 1-5)**
	Mar 8	Lab 8: Mitosis	
7	Mar 13	Lab 9: Meiosis	
	Mar 15	Lab 10: *Drosophila* Genetics (set up P cross)	
8	Mar 20	Lab 11: Bacterial Cell Cultures (Ex. A, B)	**Notebook: Labs 4-9**
	Mar 22	Lab 11: Bacterial Cell Cultures (Ex. C, D)	
9	Mar 27	Lab 11: Bacterial Cell Cultures (Ex. E)	
	Mar 29	Lab 10: *Drosophila* Genetics (F1 generation)	
	Apr 2-6	*Spring break!*	
10	Apr 10	Lab 10: *Drosophila* Genetics (if needed)	**Lab Exam 2 (Labs 6-11)**
	Apr 12	Lab 10: *Drosophila* Genetics (F2 gen., χ^2 analysis, test cross)	
11	Apr 17	Lab 12: Hardy-Weinberg Equilibrium; Practice loading gels	
	Apr 19	Lab 13: Genetic Basis of Evolution	
12	Apr 24	Lab 10: *Drosophila* Genetics (score test cross progeny)	**Notebook: Labs 10-12**
	Apr 26	Lab 14: Diversity of the Three Domains of Life	
13	May 1	Lab 15: Fungi and Early Plantae	
	May 3	Lab 16: Tracheophytes	
14	May 8	Lab 17: Ecology of Gavilan (wear walking shoes)	
	May 10	Review	**Notebook: Labs 13-16**
15	May 15	*No new lab activities*	**Lab Exam 3 (Labs 12-16)**
	May 17	*No lab!*	

REMINDERS: Most labs have online Pre-Lab Quizzes that will be open for one week until 3 pm the day of lab. Do not miss more than three labs! Over 3 missed labs = fail.

IMPORTANT DATES

Feb 9	Last day to add semester courses
Feb 11	Last day to drop semester courses with a refund; NRS deadline
Apr 27	Withdraw deadline