

Miramar College *Fall 2020*
Biology 210A – Intro. to the Biol. Sciences
(CRN 44324 & 44298)[§]

Professor: Shawn P. Hurley, Ph.D.

Lecture Meets: Monday/Wednesday, 9:35 – 11:00 AM in Zoom*

Laboratory Meets: Mon. or Wed., 11:30 AM – 2:40 PM in Zoom*

Course Website: <http://www.hurleybio210a.com>

E-mail: shurley@sdccd.edu; for inquiries or appointment requests

Remind App: Class name “BIOL 210A”; Class code “@7g2kfd”

“Open Door” Hours (in Zoom*): Mon./Wed., 3 – 4 PM; Fri., 1 – 2 PM

* - Zoom conference room will be accessible by invitation link sent through email

§ - The contents of this syllabus/schedule are subject to change throughout the semester. Students will be notified (if changes are required) during a regularly scheduled meeting period. It will be the student's responsibility to observe these changes once notification has been given.

Course Description:

Introduction to the Biological Sciences I (BIOL 210A) covers topics in biological chemistry, cell structure and function, cellular metabolism, classical and molecular genetics, and evolutionary biology. This is the first semester of a two-semester sequence designed for biological science and pre-professional majors.

Course Aim:

The purpose of this course is to study the chemical and molecular basis for life and the commonalities regarding organization of the molecular systems shared among all organisms on Earth. We will journey from the microscopic to the macroscopic world, moving from an in-depth look at the building blocks of life to their numerous combinations and the processes governing those interactions that have ultimately led to the wondrous array of organismal diversity we see today. The result of your investigations will be a greater understanding and appreciation of the foundations and principles upon which life, as we know it, is centered.

Course Objectives – upon completion of the course, students will be able to:

- explain what properties of water make it crucial to life
- relate classes of biomolecules to the elements of which they are made
- classify biomolecules based on monomeric subunits and linkages connecting them
- compare and contrast prokaryotic & eukaryotic cells as well as plant & animal cells
- compare and contrast acellular parasites/infectious agents (viruses, prions, etc.)
- explain cell theory
- identify the metabolic pathways of cellular respiration and photosynthesis
- explain how genetic information is organized in cells
- compare and contrast mitotic cell division and meiotic cell division
- explain how DNA is replicated at the molecular level
- outline the flow of genetic information in both prokaryotic and eukaryotic cells
- summarize how RNA uses information from DNA to synthesize proteins
- predict a protein sequence using mRNA sequence and the genetic code
- compare and contrast how prokaryotes and eukaryotes regulate gene expression
- compare and contrast the various types of cell communication and pathways involved in signal transduction
- recognize how patterns of heredity can be predicted
- solve complex genetics problems using the rules of probability
- assess whether a population is evolving using the principles of the Hardy-Weinberg equilibrium
- explain how descent with modification by natural selection accounts for both the unity and diversity of life.

Student Learning Outcomes (SLOs)

By the end of this course, students will:

- Apply the scientific method as the means for acquiring knowledge about Biology and will communicate data and findings in appropriate formats in written scientific reports. *These include stating appropriate experimental titles and questions, proposing appropriate hypotheses and predictions, presenting data in tables, figures, and in writing, and stating logical conclusions based on analysis of the presented results.*
- Communicate understanding of the universality of DNA as the genetic material in living cells, and the intra-cellular processes of the flow of genetic information, transcription and translation: their components, steps, and sub-cellular locations.
- Compare and contrast biological entities and living cells (viruses and prions, bacteria, plant and human cells) in terms of: relative size, nature of genetic material, sub-cellular structures, order of appearance on earth, independent reproduction, energy conversion, and response and adaptation to environmental changes.
- Demonstrate knowledge and understanding of common molecular tools and techniques of biotechnology and their scientific basis, *by identifying the specific purpose and/or technology for which common molecular biology reagents are used, and anticipating the profile of DNA fragments generated using a hypothetical digestion of plasmid DNA using restriction enzymes followed by DNA gel electrophoresis, and technical skill in using basic instruments of cell and molecular biology.*
- Retrieve and evaluate information about the cellular and molecular basis of a biotechnology or a contemporary biological topic of personal, public, or ethical relevance, and they will communicate the novel information to classmate orally using information technology media.

Prerequisites:

CHEM 152 & 152L and MATH 096, each with a grade of “C” or better, or equivalent.

Advisory:

ENGL 048 & 049 with a grade of “C” or better (or assessment Skill Levels W5/R5).

It is also recommended that one be concurrently enrolled in CHEM 200 & 200L.

Required Texts:

-Campbell Biology (11th edition) – 3 options: 1) Hardcover textbook only (ISBN 9780134093413) *or* 2) bundled loose-leaf text with MasteringBiology (ISBN 9780134454665) *or* 3) bundled eText w/ MasteringBiology (ISBN 9780134446523) – access to MasteringBiology is *highly* recommended, but NOT required.

-Miramar College Biology 210A Laboratory Manual – 2 options: 1) *available for in-person pickup at Mira Mesa Copy Center (address: 9363 Mira Mesa Blvd, Phone: (858) 578-0941) or 2) ordered online (<https://www.miramesacopy.com/miramar/Bio-210A-All-Instructors-p208481150>) for home delivery.* (Cost is approximately \$23 for the manual with \$3 delivery fee for online orders)

Additional Materials:

- Access to a mobile device (smartphone or tablet) and/or laptop/computer with a video camera (for proctoring during assessments) and an ability to download apps (“Remind,” “CamScan,” and “Socrative Student”)
- Handouts for some lecture/lab exercises will be posted on course website for students to print or access digitally in class.

Letter Grade Scale:

Final grades are based on percentages derived from points earned divided by total points possible:

A = 90% and above (394 points or more) B = 80% - 89% (350 to 393.5 points)
C = 70% - 79% (306 to 349.5 points) D = 60% - 69% (262 to 305.5 points)
F = 59% and below (261.5 points or less)

Grading & Point Break-down:

Lecture Exams 1-6 (40 points each; drop lowest score) – 200 points

Lecture Final Exam – 40 points

Lab Quizzes (15, 10 points each; drop lowest score) – 140 points

Lecture Quick Quizzes 1-10 (5 points each; drop lowest score) – 45 points

Virtual Office/“Open Door” Visit (before September 28th) – 5 points

Introduction/Background Assignment – 10 points

Total: 440 points possible *A grade summary can be accessed at any time through teacherease.com – an access code has been/will be sent to your email account in order to check your scores and track your progress*

Assessments (closed book/note unless otherwise specified) * - Illegible written responses will not be given credit; please write clearly. Additionally, electronic submissions of scanned or photographed material to be graded must be of a sufficient resolution quality to allow for legibility upon enlargement/magnification

- Assessments will be administered at the start of lab/lecture – please be punctual; if you arrive late, you will be allowed to take the assessment/quiz without any additional time beyond the specified end time (determined from the time the activity was initiated for the class).
- Lecture exams & quizzes will be administered using the online student response system, Socrative (visit www.socrative.com or download the Socrative Student app), via use of a smartphone, tablet, or laptop/computer interface for multiple choice, fill-in-the-blank, multiple choice, true/false, and/or short answer problems. [Individuals must be logged in to Zoom during the assessment with video camera & microphone engaged for proctoring purposes – if not in attendance, any score recorded **will not** be valid.] A missed assessment will receive a score of “zero.”
- Lab quizzes will be administered using Socrative, as well, with questions derived from the subject material covered in the previous week’s lab. The first eight weeks are dedicated to learning how to write a proper question, hypothesis, prediction, discussion/analysis, conclusion, and how to properly present results/data. The subsequent five weeks will be an exploration of concepts and techniques in the field of biotechnology. [Individuals must be logged in to Zoom during the quiz with video camera & microphone engaged for proctoring purposes – if not in attendance, any score recorded **will not** be valid.] A missed lab quiz/exam will receive a score of “zero.”

Bonus Opportunities:

There will be chances to earn extra points outside of what has been outlined under the “Grading” section above; these *may* include: bonus “pop” quizzes, in-class activities, surveys, and/or bonus problems on exams. These opportunities are not pre-announced, and if not present when administered, the associated points are not attainable/recoverable.

Standard Practices That Promote Student Success:

- Reading chapter sections/end of chapter summaries and posted anticipatory/concept questions before coming to class
- Attending every lecture and lab in addition to the extra review sessions offered
- Using the course website resources and posted review sheets as a base to refine the focus of review, but not relying on just this base-level of understanding for academic success
- Applying knowledge and checking for understanding by completing textbook section “concept check” questions, textbook end of chapter quizzes/problems, and website-posted practice problems/worksheets and practice quizzes
- Meeting with the professor to address questions/points of confusion on key concepts
- Forming study groups – Reinforcing vocabulary via visual association (diagramming, symbology/iconography), mnemonics, academic talk with others, etc.
- Using study charts (e.g. Quick Study), test-prep guides (e.g. Princeton Review for AP Biology), and/or electronic-based applications media (via tablet, phone or computer)
- Journaling to reflect on which strategies are proving beneficial
- Checking your scores regularly through TeacherEase.com and keeping a running log of your points earned – an access code has been/will be sent to you by email so you can securely/privately view your assessment scores and track your progress.

Absences and Attendance Policy:

- Students may be dropped from the course if they accrue more than 3 absences total from synchronous lecture and lab meetings in Zoom (e.g. 2 lectures and 1 lab, 1 lecture and 2 labs, etc.); additionally, if both lecture and lab are missed in the same day, that is counted as 2 absences (1 lecture and 1 lab). If an individual is not in attendance on the first day of class, the right is reserved to drop that student from the course. *Please stay in regular contact and reach out for guidance if you are having challenges with consistent attendance.*
- Travel arrangements, appointments, etc. should not conflict with due dates/exams/quizzes – students will be expected to fulfill their obligations for the assigned dates. Late work will receive a proportionate point deduction – “late” means not handing in/presenting materials when they have been asked for. Make-up opportunities will be given under legitimate extenuating circumstances only; it is the student’s responsibility to notify the professor regarding such circumstances. Additionally, no early assessments/exams/quizzes will be given.
- Advanced notification of a foreseen/expected absence is an expectation – students need to give notice that they will not be able to attend lecture/lab **at least 24 hours in advance** of the class that will be missed (excluding absences due to extreme emergencies – e.g. car accident, serious illness or injury, etc.; in such cases, students must follow up with notification of the extenuating circumstances and provide proof of such an emergency). If advanced notice is given *and approved*, attendance during an alternate lab section in the same week may be possible. It is still the responsibility of students to request any assignments or pertinent information relevant to the missed lecture/lab prior to the absence and to turn in any assignment(s) before the date due.
- If students know in advance that they will be late to lecture/lab, the professor should be notified beforehand so arrangements can be made to have students seamlessly join class and not be lost/behind. If students habitually arrive to lecture/lab more than 30 minutes tardy (more than once) without proper notification, they may be given an absence for the lecture/lab (as a significant portion of the lesson will have been missed).

Important Dates:

- The last day to receive an add code from a Miramar College instructor and add a class is August 28, 2020.
- The last day to drop a class without receiving a “W” on your record is August 28, 2020.
- The last day to drop a class without receiving a letter grade (and receive a “W” instead) is October 23, 2020.
- Students are responsible for monitoring the dates above and for personally adding or dropping the course by the specified deadline(s).

Accommodation of Disabilities (Administrative Procedure 3105.1):

- Any student with a disability must notify DSPS and the professor within the *first* week of classes and provide necessary documentation (verified by Miramar DSPS) so that their authorized academic needs can be accommodated.

Academic Integrity (Administrative Procedure 3100.3):

- **Plagiarism:** the act of using and passing off the ideas, writings, discoveries, etc. of another as one’s own; also known as copying or taking credit for someone else’s work; this most often occurs when students work together in groups – it is acceptable to gather data, collaborate, and discuss ideas, but your assignments must be written in your own words (i.e. your work must be *your* work). Likewise, allowing someone to knowingly copy your work is not acceptable. This includes copying/allowing copying of someone else’s note sheet/card for use on an exam.
- **Cheating:** the use of unfair or deceitful methods that gives one an advantage over others in the class. Examples include, but are not limited to: sharing or copying answers during a test, informing someone of answers who has not yet taken the test/accepting answers from someone who has already taken the exam, using notes or accessing other information (written or electronic-based) during an exam or quiz that has not been approved by the instructor. This includes use of a note sheet/card that is not submitted for review upon completion of an assessment.

- Plagiarism and/or cheating will NOT be tolerated in ANY form in this class – if you are caught doing so, you will be given an automatic zero for the assignment/exam and your name will be given to the Dean of Student Affairs for administrative counseling.

Student Code of Conduct/Behavior & Online Decorum (Board Policy 3100.3.a-s)

- Please join the Zoom classroom using an account name that includes both first and last name that is recognizable for admittance purposes (use of a pseudonym/nickname that has not been given to the instructor in advance will not be acknowledged as valid identification for entry).
- Please silence/mute microphones when entering the Zoom classroom; additionally, when engaging a microphone upon instruction to do so, please ensure background noises are kept to a minimum.
- Please turn on video cameras, when instructed, with an appropriate background/setting (nothing distracting or offensive) and wearing mindful attire.
- Please be respectful and do not talk during lecture and lab while the professor is speaking; additionally, unsolicited side conversations in the chat function of Zoom are disruptive to the learning process – not only are they distracting to the professor and others, they take your focus away from the exchange of information that is occurring – failure to comply (after warning/reminder) will result in dismissal with an absence given for the day and possible loss of points.
- Please be respectful of the learning environment – no put-downs, no interrupting others, no use of profanity, no threats or intimidation, etc. Disrespectful/Defiant behavior (after warning) will result in removal with an absence given for the day and possible loss of points; a referral will also be made to the Dean of Student Affairs.
- Please visit Miramar’s website to learn more about “Online Student Tips for Success” and “Netiquette Guidelines for Online Students” (<https://www.sdmiramar.edu/node/17350>)

* - Recording of lectures (audio or video) is not permitted unless a documented disability requires it as an accommodation

Diversity (Board Policy 3430):

Diversity includes, but is not limited to, ethnicity, language, culture, national origin, class, race, gender, age, sexual identity, religion, disability, marital status and political affiliation. Diversity is acknowledged, respected, and welcomed in the classroom – ALL students are encouraged to be themselves and will be given equal opportunities to learn in an environment where prejudice, intolerance/disrespect, and harassment are prohibited.

Academic Support & Tutoring:

Students in need of additional assistance with studying, preparation and/or conceptual understanding are highly encouraged to seek help from the professor during scheduled office hours (or by scheduling an office hour appointment). Additionally, tutoring services are available through the Academic Success Center (ASC) – students are encouraged to view the ASC’s resources and tutor schedules at <https://www.sdmiramar.edu/campus/asc>.

Problem/Conflict Resolution:

To address any problem/conflict/difficulty concerning this class, first contact the professor as soon as possible to achieve resolution/guidance. If the outcome remains unresolved, you may be advised by the professor to contact the Department Chair. If the matter requires further advisement, you may be referred to the school Dean. Please, do not deviate from this chain of contact.

Words To Remember:

“Science is built of facts the way a house is built of bricks; but an accumulation of facts is no more science than a pile of bricks is a house.” -*Henri Poincaré*

I look forward to an enlightening semester working together and sharing our insights with one another!

Biology 210A Schedule* (Dr. Hurley) – Fall 2020 CRN 44324 & 44298

Class Week	Date/Day	Lecture Topics (Mon/Wed)	Campbell (11 th edition)	Lab Topic: Mon Lab (CRN 44324)/Wed Lab (CRN 44298)
1	Aug 17 M	Intro to Biological Themes/Chem. of Life/	Ch. 1, 2	Scientific Method
1	Aug 19 W	Water/Carbon Chemistry	Ch. 3, 4	Scientific Method
2	Aug 24 M	Quick Quiz 1 Biomolecular Structure & Function	Ch. 5	Biomolecules ◇Lab Quiz 1
2	Aug 26 W	Biomol Structure & Function (Cont)	Ch. 5	Biomolecules ◇Lab Quiz 1
3	Aug 31 M	→ Exam #1 (Ch. 1-5) Intro to the Cell: A Microcosm	Ch. 6	Microscopy ◇Lab Quiz 2
3	Sep 2 W	Quick Quiz 2 Organelle Function & Overview of Viruses (Characteristics & Types)	Ch. 6, 19 (sections 19.1 & 19.2)	Microscopy ◇Lab Quiz 2
4	Sep 7 M	Holiday: Labor Day – No Class Read Chapter 8	Ch. 8	Holiday – Complete Virtual Lab
4	Sep 9 W	Quick Quiz 3 Fundamentals of Metabolism	Ch. 8	Enzymes ◇Lab Quiz 3
5	Sep 14 M	→ Exam #2 (Ch. 6, 8, 19) Membrane Structure & Function	Ch. 7	Osmosis/ Osmolarity ◇Lab Quiz 3 & 4
5	Sep 16 W	Membrane Structure & Function	Ch. 7	Osmosis/ Osmolarity ◇Lab Quiz 4
6	Sep 21 M	Quick Quiz 4 Cellular Respiration & Fermentation	Ch. 9	Fermentation ◇Lab Quiz 5
6	Sep 23 W	Cellular Respiration & Fermentation	Ch. 9	Fermentation ◇Lab Quiz 5
7	Sep 28 M	→ Exam #3 (Ch. 7 & 9) Photosynthesis: Light Reactions	Ch. 10	Photosynthesis ◇Lab Quiz 6
7	Sep 30 W	Photosynthesis: Calvin Cycle & Combatting Photorespiration	Ch. 10	Photosynthesis ◇Lab Quiz 6
8	Oct 5 M	Quick Quiz 5 The Cell Cycle and Mitosis	Ch. 12	Cell Cycle & Microvolumetrics ◇Lab Quiz 7
8	Oct 7 W	Sexual Reproduction: Meiosis	Ch. 13	Cell Cycle & Microvolumetrics ◇Lab Quiz 7
9	Oct 12 M	→ Exam #4 (Ch. 10, 12, 13) Molecular Basis of Inheritance	Ch. 16	Biotech. - Plasmids & Restriction Enzymes (Ch. 20) ◇Lab Quiz 8
9	Oct 14 W	DNA Replication	Ch. 16	Biotech. - Plasmids & Restriction Enzymes (Ch. 20) ◇Lab Quiz 8
10	Oct 19 M	Quick Quiz 6 Gene Expression: Transcription & RNA Processing	Ch. 17	DNA Gel Electrophoresis (Ch. 20) ◇Lab Quiz 9
10	Oct 21 W	Gene Expression: Translation	Ch. 17	DNA Gel Electrophoresis (Ch. 20) ◇Lab Quiz 9
11	Oct 26 M	Quick Quiz 7 Gene Expression: Mutation	Ch. 17	Transformation (Ch. 20) ◇Lab Quiz 10
11	Oct 28 W	→ Exam #5 (Ch. 16 & 17) Prokaryotic Gene Regulation	Ch. 18 (section 18.1)	Transformation (Ch. 20) ◇Lab Quiz 10
12	Nov 2 M	Prok. Gene Regulation (Cont) Eukaryotic Gene Regulation	Ch. 18 (sections 18.2 & 18.3)	PCR (Ch. 20) ◇Lab Quiz 11
12	Nov 4 W	Quick Quiz 8 Cell Communication	Ch. 11	PCR (Ch. 20) ◇Lab Quiz 11
13	Nov 9 M	Cell Communication	Ch. 11	Molecular Genetics ◇Lab Quiz 12
13	Nov 11 W	Holiday: Veteran's Day – No Class Review Ch. 11 & 18	Ch. 11 & 18	Holiday – Complete Virtual Lab
14	Nov 16 M	→ Exam #6 (Ch. 11 & 18) Genetics: Mendel's Model	Ch. 14	Human Heredity/Bioinformatics ◇Lab Quiz 13
14	Nov 18 W	Complex Genetics: Beyond Mendel	Ch. 14	Human Heredity/Bioinformatics ◇Lab Quiz 12 & 13
**	Nov 30 M	Quick Quiz 9 Complex Genetics: Beyond Mendel	Ch. 14	Hardy Weinberg Lab & Genetics Practice Problems ◇Lab Quiz 14
15	Dec 2 W	Population Genetics	Ch. 23 (sections 23.1-23.2)	Hardy Weinberg Lab & Genetics Practice Problems ◇Lab Quiz 14
16	Dec 7 M	Quick Quiz 10 Mechanisms of Microevolution	Ch. 23 (sections 23.3-23.4)	Exit Survey & Review ◇Lab Quiz 15
16	Dec 9 W	Mechanisms of Microevolution (Cont)		Exit Survey & Review ◇Lab Quiz 15
17	Dec 14 M	→ Final Exam (Ch. 14 & 23)		TBA
**=Nov 23	Nov 25	Thanksgiving Break (No Class)		Thanksgiving Break (No Lab)

* - Schedule is subject to change

◇ = All lab quizzes will pertain to material presented in the prior week's lab