

Basic Course Information

Semester:	Fall 2023	Instructor Name:	Dr. Daniel Gilison
Course Title & #:	General Biology: Molecules, Cells, and Genetics – BIOL 180	Email:	daniel.gilison@imperial.edu
CRN #:	10530	Webpage (optional):	http://www.imperial.edu/students/canvas
Classroom:	2726 (lec), 2711 (lab)	Office #:	2770
Class Dates:	8/14 – 12/9	Office Hours:	M 2:30-3 PM (2770) T 12-1 PM (2711) W 10:30-11 AM (2770) R 9-11 AM (Zoom)
Class Days:	MTW	Office Phone #:	(760) 355-5759
Class Times:	1-2:25 PM (lec) 1-4:10 PM (lab)	Emergency Contact:	(760) 355-5759 or daniel.gilison@imperial.edu
Units:	4	Class Format:	Face to face

Course Description

This is one of two entry-level courses designed for life science majors, health care, and science educators intending to transfer to four-year institutions. However, the course is open to all students. This course will introduce students to molecules of cells, cell structures and functions, cell division, cellular respiration, photosynthesis, molecular biology, and genetics. (CSU, UC)

Course Prerequisite(s) and/or Corequisite(s)

Successful completion of Intermediate Algebra or appropriate placement as defined by AB705.

Student Learning Outcomes

Upon course completion, the successful student will have acquired new skills, knowledge, and or attitudes as demonstrated by being able to: demonstrate the ability to think like a scientist by coming up with a valid experimental design. (ILO2)

Course Objectives

Upon satisfactory completion of the course, students will be able to:

1. Understand the basic concepts of biology and explain and use the scientific method.
2. Describe the structure of atoms, and understand why chemical bonds form.
3. Explain the important properties of water molecules and carbon atoms for life.
4. Describe the different macromolecules in living organisms, and give examples of each type.
5. Understand the functions of cell organelles.
6. Explain the functions of the cell membrane.
7. Describe metabolism, and understand how enzymes assist in chemical reactions.
8. Explain the processes of cellular respiration and photosynthesis.
9. Understand the processes of cell communication.
10. Describe the processes of mitosis and meiosis, and how they are regulated.
11. Explain Mendelian inheritance, give examples of inheritance patterns, and work problems dealing with basic Mendelian genetics.
12. Describe chromosome structure and function, including DNA replication and repair, and give examples of genetic diseases at the chromosomal level.
13. Understand the processes of transcription and translation, and how DNA mutations cause changes in protein sequences.
14. Discuss modern DNA technologies, and their importance in life.

Textbooks & Other Resources or Links

- Reece, J.B., Urry, L.A., Cain, M.L., Wasserman, S.A., Minorsky, P.V., Jackson, R.B. (2016). *Campbell Biology, Custom Edition* (12th/e). San Francisco Pearson/Benjamin Cummings. ISBN 9780135188743
 - **CLASS WILL BE USING A CUSTOM EDITION OF THE ABOVE TEXTBOOK**
- Morgan, Judith G., and Carter, M. Eloise Brown (2017). *Investigating Biology Lab Manual* (9th/e). San Francisco Pearson/Benjamin Cummings. ISBN 9780134473468
 - **CLASS WILL BE USING A CUSTOM EDITION OF THE ABOVE LAB MANUAL**
- BioRad Lab Manual
- Online textbook: <https://console.pearson.com/enrollment/5ikxhx>

Course Requirements and Instructional Methods

1. There will be **4 exams**, worth **100 points** each (**400 points** total). Exams will consist of 50 multiple choices dealing with lecture material. Figures from the lectures and textbook will appear on the exams. Scantron sheets will be provided, but make sure you bring good-quality #2 pencils with working erasers. If you are late to the exam, you will not be given extra time to finish it. There will be no make-up exams, except for extreme circumstances. If you have a valid, documented reason for missing an exam, it is **your responsibility** to tell me about it and provide valid documentation by the **next class meeting**, otherwise you will not have the opportunity to make up the exam, and will be given a **zero** for that exam.
2. There will be **1 comprehensive final exam** worth **150 points**. It will consist of 75 multiple choice, and will cover all the lecture material covered in the course.
3. There will be **18 on-line** homework assignments worth **10 points** each (**180 points** total). Homework will be due on the date in the schedule listed at 11:59 PM.
4. There will be **10 lab worksheets** worth **10 points** each (**100 points** total). Lab worksheets are due at the end of the lab.
5. There will be **3 scientific thinking activities** that will take place during lab that are worth **40 points** each (**120 points** total).
6. There will be **3 lab reports** worth **50 points** each (**150 points** total). Lab reports are due at the **start** of the lab as outlined on the schedule. Late lab reports will **NOT** be accepted, unless under extreme circumstances. Lab reports will be due for the following labs – Osmosis, Enzymes, and DNA Fingerprinting.
7. There will be **5 on-line** review quizzes for extra credit and they will be due on the date in the schedule listed at 11:59 PM.
8. Spelling and grammar count on all written assignments! You will lose up to **20% of the points** on each assignment if you have excessive spelling or grammatical errors.
9. There will be no make-up assignments, except for extreme circumstances. If you have a valid, documented reason for missing an assignment, it is **your responsibility** to tell me about it and provide valid documentation **as soon as possible (preferably BEFORE it is due)**, otherwise you will not have the opportunity to make it up, and will be given a **zero** for it. Work issues, family issues, travel, or forgetting to turn in assignments do not count as valid excuses.

Course Grading Based on Course Objectives

4 Exams	400 points
1 Comprehensive final exam	150 points
10 lab worksheets	100 points
18 homework assignments	180 points
3 Scientific Thinking Activities	120 points
3 Lab Reports	150 points
Total	1100 points

Grade	Points
A (90%+)	990 – 1100
B (80-89.9%)	880 – 989
C (70-79.9%)	770 – 879
D (60-69.9%)	660 – 769
F (0-59.9%)	0 – 659

Academic Honesty (Artificial Intelligence - AI)

IVC values critical thinking and communication skills and considers academic integrity essential to learning. Using AI tools as a replacement for your own thinking, writing, or quantitative reasoning goes against both our mission and academic honesty policy and will be considered academic dishonesty, or plagiarism unless you have been instructed to do so by your instructor. In case of any uncertainty regarding the ethical use of AI tools, students are encouraged to reach out to their instructors for clarification.



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Course Attendance Policies

- A student who fails to attend the first meeting of a class will be dropped by the instructor as of the first official meeting of that class.
- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absences exceed the number of hours the class is scheduled to meet per week may be dropped. Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.
- Only bottled water allowed in the classroom.
- **Electronic devices must be always turned off!** Ringing cell phones are a distraction both to me and to other students in the class. If you must use your electronic device during class, please take it outside, and then come back in when you are done. You should not be checking/using your electronic devices during lectures. If you are caught, you may be asked to leave for the day.
- **No talking during class!** Talking is a distraction to me and other students in the class. If you have questions during the lecture, please ask me! If you are caught talking, you may be asked to leave for the day.
- Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.
- The deadline for dropping a course without appearing on transcript is **Sunday, August 27**.
- The deadline for dropping a full-term class is **Saturday, November 4**.

Additional Help

1. Make sure you come on time to all lectures and labs! Arriving late or missing a class for any reason (excused or unexcused) can cause you to miss lecture and lab material, and will only put you at a disadvantage in this class.
2. Make sure you know what will be happening each day for class! Keep the class schedule handy.
3. Skim through or read the chapter before coming to lecture, and lab activities before coming to lab. You will have a general feel for the subject matter, which will help your understanding of the material during lecture. You will also be more prepared to do the lab activity, and you can perform it better, quicker, and will be able to easily understand what is happening in the lab.
4. Pay attention during lectures! I will say things during lecture that are not written on the PowerPoint slides or the board that will be on the exams. Make sure you take good notes during lecture. Don't just mindlessly write down word-for-word what is on the slides. Listen to what I have to say, and take notes on that also!
5. Study, study, study! You should spend at least 6 hours studying for this class each week. You should study in an area where there are no distractions (television, radio, computers, music, other people, etc.). However, you should also spend time studying with other students (online, of course!). Nothing makes you learn the material better than having to explain it to someone else!
6. Spend time doing the online homework! It is there to help you learn the material, so not doing it, or waiting until the due date to start the homework will only hurt your grade in the class.
7. Don't cram! It is better to spend some time each day studying as compared to saving it all until the night before the exam.
8. It is not enough just to memorize facts! On the exams, you will be responsible for using the information learned and applying it to new situations. You need to understand what these facts mean!

IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit <http://www.imperial.edu/studentresources> or click the heart icon in Canvas.

Anticipated Class Schedule/Calendar

Week	Lecture (Monday)	Lab (Tuesday)	Lecture (Wednesday)
8/14	Introduction to the Class	Introduction to the Lab Scientific Thinking Activity 1	Ch. 1.1,3,4 – Themes in the Study of Life
8/21	Ch. 2.1-3 – Chemical Context of Life	Metrics Lab	Ch. 2.1-3 – Chemical Context of Life Study of Life HW due
8/28	Ch. 3.1-3 – Water	Ch. 4.2,3 – Carbon Chemical Context HW due	Ch. 5.1-5 – Macromolecules Water HW due
9/4	LABOR DAY – NO CLASS	Pipets Lab Carbon HW due <u>Exam 1 review due online</u>	Exam 1 – Ch. 1 – 4
9/11	Ch. 5.1-5 – Macromolecules	Got Protein? Lab	Ch. 6.2-7 – Cells
9/18	Ch. 6.2-7 – Cells Macromolecules HW due	Microscope and Cells Lab (1, 2, 5C)	Ch. 7.1-5 – Membranes
9/25	Ch. 7.1-5 – Membranes Cells HW due	Osmosis Lab (3A)	Ch. 8.1-5 – Metabolism
10/2	Ch. 9.1-4 – Cellular Respiration Membranes HW due	Scientific Thinking Activity 2 Osmosis Lab Report due	Ch. 9.1-4 – Cellular Respiration Metabolism HW due
10/9	Ch. 10.1-3 – Photosynthesis Cellular Respiration HW due	Enzymes Lab (1, 2) <u>Exam 2 review due online</u>	Exam 2 – Ch. 5 – 9
10/16	Ch. 10.1-3 – Photosynthesis	Cell Respiration Lab (2A) Enzymes Lab Report due	Ch. 11.1-4 – Cell Signaling Photosynthesis HW due
10/23	Ch. 12.1-3 – Cell Cycle Cell Signaling HW due	Ch. 13.1-4 – Meiosis	Ch. 16.1-2 – DNA Cell Cycle HW due
10/30	Ch. 17.1-5 – Gene to Protein Meiosis HW due	Scientific Thinking Activity 3 <u>Exam 3 review due online</u>	Exam 3 – Ch. 10 – 13, 16
11/6	Ch. 17.1-5 – Gene to Protein DNA HW due	DNA Fingerprinting Lab (Ch. 20.1 – Restriction enzymes, Gel electrophoresis)	Ch. 14.1-4 – Mendel and the Gene Idea
11/13	Ch. 14.1-4 – Mendel and the Gene Idea Gene to Protein HW due	pGLO Lab 1 (Ch. 20.1 – Bacterial transformation) DNA Fingerprinting Lab Report due	Ch. 15.2-5 – Chromosomes Mendel HW due
11/20	THANKSGIVING BREAK	THANKSGIVING BREAK	THANKSGIVING BREAK
11/27	Ch. 20.1,2,4 & 21.1,2 – DNA Technology & Genomes Chromosomes HW due	PV92 Lab (Ch. 20.1 – PCR) pGLO Lab 2 DNA Technology HW due <u>Exam 4 review due online</u>	Exam 4 – Ch. 17, 14, 15, 20/21
12/4	<u>Final exam review due online</u>	PV92 Lab 2	Comprehensive Final (all chapters)