IMPERIAL VALLEY COLLEGE

## Basic Course Information

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|---|---|---|---|
| Semester: | **Fall 2022** | Instructor Name: | **Dr. Daniel Gilison** |
| Course Title & #: | **General Biology: Molecules, Cells, and Genetics – BIOL 180** | Email: | **daniel.gilison@imperial.edu** |
| CRN #: | **10530/10758** | Webpage (optional): | **http://www.imperial.edu/students/canvas** |
| Classroom: | **Online** | Office #: | **2770** |
| Class Dates: | **8/15 – 12/8** | Office Hours: | **M – R 9-10 AM** |
| Class Days: | **M - R** | Office Phone #: | **(760) 355-5759** |
| Class Times: | **Asynchronous online** | Emergency Contact: | **(760) 355-5759 or daniel.gilison@imperial.edu** |
| Units: | **4** | Class Format: | **Asynchronous online** |

## 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)

Appropriate placement as defined by AB705; or MATH 098 or MATH 091 with a grade of "C" or better.

## 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.

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## 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
- IVC Bookstore: https://www.bkstr.com/imperialvalleystore/home
- Online textbook: https://console.pearsoned.com/enrollment/3ui9iv

## Course Requirements and Instructional Methods

1. There will be **4 on-line** exams, worth **100 points** each (**400 points** total). Exams will last 60 minutes, and will consist of 50 multiple choice dealing with lecture material. Figures from the lectures and textbook will appear on the exams. **Exams will use Honorlock and will need to be taken using Google Chrome.**
2. There will be **1 on-line** comprehensive final exam worth **150 points**. It will consist of 75 multiple choice, and will cover all of 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 **13 on-line** lab worksheets worth **10 points** each (**130 points** total). Lab worksheets will be due on the date in the schedule listed at 11:59 PM.
5. 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. **Review quizzes will use Honorlock and will need to be taken using Google Chrome.**
6. 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.
7. 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

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|---|---|
| 4 Exams | 400 points |
| 1 Comprehensive final exam | 150 points |
| 12 lab worksheets | 120 points |
| 19 homework assignments | 190 points |
| **Total** | **860 points** |

| Grade | Points |
|---|---|
| A | 774 - 860 points |
| B | 688 - 773 points |
| C | 602 - 687 points |
| D | 516 - 601 points |
| F | 0 - 515 points |

## Course Attendance Policies

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class.
- For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- The deadline for dropping a course without appearing on transcript is **Sunday, August 28**.
- The deadline for dropping a full-term class is **Saturday, November 5**.

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## Additional Help

1. Make sure you watch all lectures and labs! Not watching the lecture or lab videos, or just skipping through them, 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 watching the lectures, and lab activities before watching the labs. You will have a general feel for the subject matter, which will help your understanding of the material during lecture. You will also 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 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!

**ONLINE CLASSES:**

1. Online classes are typically harder, not easier, for most students. You need to be self-sufficient with studying and keeping up with the material and work needed to be done for the class.
2. I will be sending out constant announcements about when lectures are available and when assignments are due. However, this is not a substitute for reading the syllabus and class schedule.
3. **Check your IVC email** constantly! All announcements and major forms of communication will be sent to it.
4. Exams and review quizzes will use **Honorlock**. You have to have Google Chrome to use Honorlock and after downloading it, you need to add the Honorlock extension. I will give you a practice quiz first to check that everything works for you so there are no problems with the review quizzes or exams.
5. You need to **watch the full lectures** – and probably multiple times! Don't treat lectures like regular videos that you can just skip through. You need to treat the online lecture videos as if you were really in the classroom listening to the lecture. Not doing so will hurt your grade in this class.
6. Any questions about the course material or anything else about the class? Ask me! DO NOT rely on Google or random websites to get the information. If you are confused about something in the class, your primary resources should be the lecture videos, lecture notes, textbook, and myself.

## 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.

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**Anticipated Class Schedule/Calendar**

| Week | Lecture (Mondays) | Lab (Tuesdays) | Lecture (Wednesdays) | Assignments (Thursdays) |
|---|---|---|---|---|
| 8/15 | Intro to class | Intro to lab | Ch. 1.1,3,4 – Study of Life | **Intro to Class quiz due** |
| 8/22 | Ch. 2.1-3 – Chemical Context of Life | Metrics Lab 1 | Ch. 2.1-3 – Chemical Context of Life<br>**Study of Life Homework due** | **Metrics Lab 1 worksheet due** |
| 8/29 | Ch 3.1-3 – Water | Metrics Lab 2 | Ch 4.2,3 – Carbon<br>**Chemical Context Homework due** | **Metrics Lab 2 worksheet due**<br>**Water Homework due** |
| 9/5 | **LABOR DAY – NO CLASS** | Pipets Lab<br>**Carbon Homework due**<br>**Exam 1 review due** | **Exam 1 – Ch. 1 – 4** | **Pipets Lab worksheet due** |
| 9/12 | Ch. 5.1-5 – Macromolecules | Got Protein? Lab | Ch. 5.1-5 – Macromolecules | **Got Protein? Lab Worksheet due** |
| 9/19 | Ch. 6.2-7 – Cells | Microscope and Cells lab | Ch. 6.2-7 – Cells<br>**Macromolecules Homework due** | **Microscope and Cells lab worksheet due** |
| 9/26 | Ch. 7.1-5 – Membranes | Osmosis lab | Ch. 8.1-5 – Metabolism<br>**Cells Homework due** | **Osmosis lab worksheet due** |
| 10/3 | Ch. 9.1-4 – Cell Respiration<br>**Membranes Homework due** | Enzymes lab | Ch. 10.1-3 – Photosynthesis<br>**Metabolism Homework due** | **Enzymes lab worksheet due** |
| 10/10 | Ch. 11.1-4 – Cell Signaling<br>**Cell Respiration Homework due** | **Exam 2 review due** | **Exam 2 – Ch. 5 – 9** | **Photosynthesis Homework due** |
| 10/17 | Ch. 12.1-3 – Cell Cycle | Mitosis lab | Ch. 13.1-4 – Meiosis<br>**Cell Signaling Homework due** | **Mitosis lab worksheet due** |
| 10/24 | Ch. 16.1-2 – DNA<br>**Cell Cycle Homework due** | DNA Fingerprint lab (Ch. 20.1 – Restriction enzymes) | Ch. 17.1-5 – Gene to Protein<br>**Meiosis Homework due** | **DNA Fingerprint lab worksheet due** |
| 10/31 | Ch. 17.1-5 – Gene to Protein<br>**DNA Homework due** | **Exam 3 review due** | **Exam 3 – Ch. 10 – 13, 16** | No lab worksheet due |
| 11/7 | Ch. 14.1-4 – Mendel and the Gene Idea | pGLO lab (Ch. 20.1 – Bacterial transformation) | Ch. 14.1-4 – Mendel and the Gene Idea<br>**Gene to Protein Homework due** | **pGLO lab worksheet due** |
| 11/14 | Ch. 15.2-5 – Chromosomes | Human Genetics lab | Ch. 20.1,2,4 & 21.1,2 – DNA Technology & Genomes<br>**Mendel Homework due** | **Human Genetics lab worksheet due** |
| 11/21 | **THANKSGIVING** | **THANKSGIVING** | **THANKSGIVING** | **THANKSGIVING** |
| 11/28 | **Chromosomes Homework due**<br>**DNA Technology Homework due** | PV92 lab (Ch. 20.1 – PCR<br>**Exam 4 review due** | **Exam 4 – Ch. 17, 14, 15, 20, 21** | **PV92 lab worksheet due** |
| 12/5 | Final exam review | **Final exam review due** | **Comprehensive Final (all chapters)** | No lab worksheet due |