Bio 440: Molecular Genetics
Spring 2021
Department of Biology, CSU Dominguez Hills

Class times & location:	MW 5:30 – 6:45 pm (online)
	[redacted]
Instructor:	Dr. Sonal Singhal
Office hours:	MW 4:30 – 5:30p
	[redacted]
Office:	[redacted]
Phone:	[redacted]
E-mail:	[redacted]

Course Description

This course will use cover all the basics of genetics, but in more detail. How are proteins encoded by DNA? What determines when and where genes are turned on? How do mutations to genes affect gene expression and protein structure? In particular, we will focus on modern approaches to collecting data about genomes, gene expression, and mutations, and you will use these methods to analyze data about coronavirus, rare diseases, and cancer. This is a flipped class. You will review lecture notes and videos on your own time. In class, you will learn concepts by applying them to real data.

From the course catalog: Genome structure in relation to control of gene expression in prokaryotic and eukaryotic cells; interplay between genes and regulatory reactions that control development. Topics include antibody diversity, neoplastic transformation by oncogenes, and pattern formation.

Prerequisites: Bio 320 (Cell Biology) & Bio 340 (Genetics)

Student Learning Objectives

After finishing this class, you should be able to:

- Analyze genomic data to find mutations and interpret the consequences of mutations
- Analyze RNAseq data to determine differences in gene expression
- Use public databases to understand the structure of genomes
- Use public databases to understand the function and role of different genes
- Understand how we use genomic data to better understand basic biology and disease
- Discuss the social and ethical issues of genetics
- Share your ideas with each other & with me in writing and out loud

Materials

Required Material:	None, but if you have a laptop or tablet, please be prepared to use it! You can also check-out a laptop from the school: https://techloaner.csudh.edu/

Classroom Policies

Online learning is hard. I get it. I will try to bring my best energy and be as organized as I can to help make it easier. On your end, come to class or participate on the online groups and turn on video (if you can!) when you come to class. While I do not require attendance, learning by yourself will be less fun and less effective, and it places a lot of burden on your group members.

Grading

Quizzes (best 7 out of 8):	100 points
Tutorials:	300 points
Weekly reflections:	300 points
Tutorial projects:	300 points
Total:	1000 points

Quizzes (10% of grade)*:* At the start of most weeks, I will give you a multiple-choice quiz. This quiz is to motivate you to read any materials and watch any videos that will prepare you for class. You can attempt each quiz twice, and the average of the two attempts will be your quiz grade. Your highest 7 quizzes out of 8 will go towards your quiz score.

Tutorials (30% of grade): You will have 4 assignments, or tutorials, which will give you a chance to practice the ideas we are learning in class on real data. If you manage your time well & ask questions, you will be able to complete these tutorials in class. You will turn in one tutorial per group. I will grade these tutorials for completion. So, if you come to class and work with your group to finish these tutorials, you will get full points.

Weekly reflections (30% of grade): Most weeks, you will write a ~200 word reflection on that week's activities. I will give you a list of suggested prompts to help you complete the reflection. I will be grading these both for completion and content. These reflections will be done independently.

Tutorial projects (30% of grade): At the end of each of our four tutorials, you will work with your group to present what you learned as a project. This can take many forms: an oral presentation, a lab report, something creative. I will give you time in class to work on these projects because that way you can get feedback from me and because I know finding time for group work is hard during online learning.

Extra credit: There will be no extra credit given in this class.

Grades will be assigned on a standard scale:

94 - 100: A	80 - 82: B-	67 - 69: D+
90 - 93: A-	77 - 79: C+	60 - 66: D
87 - 89: B+	73 - 76: C	0 - 59: F
83 - 86: B	70 - 72: C-	

Recommendations for Success

To be successful in class, I recommend:

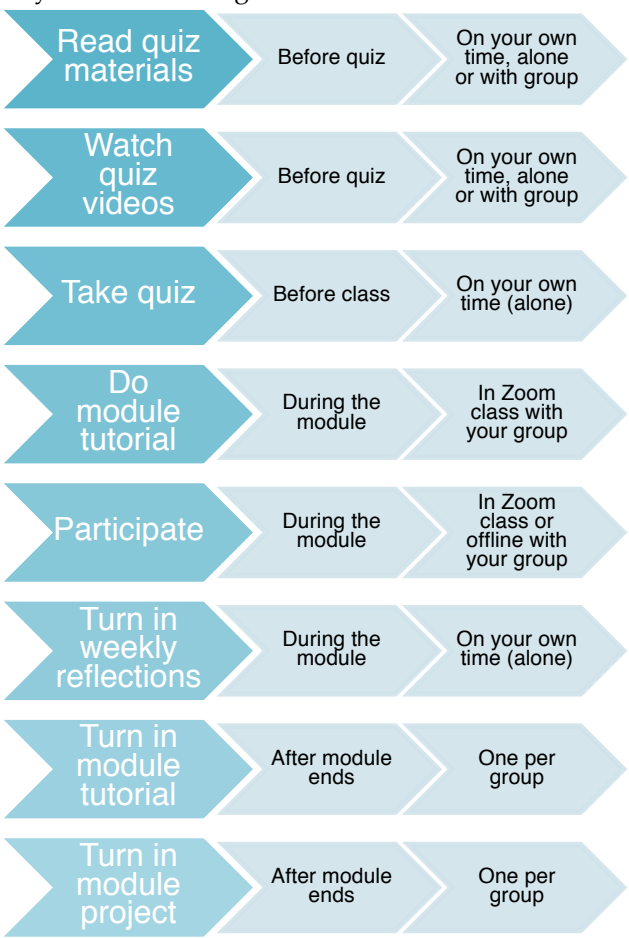
- Reviewing the lecture notes before and after the quiz
- Rewatching videos and reviewing lecture notes for material you find confusing
- Ask questions about tutorials earlier than later
- Make friends – study with them! Do tutorials with them!
- Come to class & participate once you show up
- Attend office hours
- Have fun. Seriously. It is so much easier to learn if you like it.

When stuff goes wrong

- If my Internet cuts out during Zoom class, wait for me to return for at least 5 minutes. If I don't come back, I will email you an update.
- If your Internet cuts out during class, I will miss you while you are gone, but I get it – it happens! Just come back to class if you can.
- If the device you use for schoolwork breaks, let me know! There are resources on campus to help you get new ones.
- If life gets complicated and you can't turn in an assignment in time, let me know. I am here to help you and there are things we can do to make sure you finish the class successfully and with less stress.

How Each Module Works

Each of the modules in class covers a different topic, and each module is set up the same way, because it makes it easier for me and you. Here's a diagram of how it works.



Tentative Schedule			
Wk	**Date**	**Topic**	**Assessments**
1	Mon., Jan. 25	Introduction to Class	
1	Wed., Jan. 27	Module 1: Genomes & Genes - The Coronavirus Genome	Quiz 1
2	Mon., Feb. 1	Module 1: Genomes & Genes - The Coronavirus Genome	Reflection 1
2	Wed., Feb. 3	Module 1: Genomes & Genes - The Coronavirus Genome	Quiz 2
3	Mon., Feb. 8	Module 1: Genomes & Genes - The Coronavirus Genome	Reflection 2
3	Wed., Feb. 10	Module 1: Genomes & Genes - The Coronavirus Genome	
4	Mon., Feb. 15	NO CLASS – PRESIDENT'S DAY	
4	Wed., Feb. 17	Class time for Module 1 Project	Reflection 3
5	Mon., Feb. 22	Class time for Module 1 Project	Module 1 Tutorial
5	Wed., Feb. 24	Module 2: Gene Expression - Humans & Coronavirus	Quiz 3 Module 1 Project
6	Mon., Mar. 1	Module 2: Gene Expression - Humans & Coronavirus	Reflection 4
6	Wed., Mar. 3	Module 2: Gene Expression - Humans & Coronavirus	Quiz 4
7	Mon., Mar. 8	Module 2: Gene Expression - Humans & Coronavirus	Reflection 5
7	Wed., Mar. 10	Module 2: Gene Expression - Humans & Coronavirus	
8	Mon., Mar. 15	Class time for Module 2 Project	Reflection 6
8	Wed., Mar. 17	Class time for Module 2 Project	Module 2 Tutorial
9	Mon., Mar. 22	Module 3: Mutations - Personal Genomics	Quiz 5
9	Wed., Mar. 24	Module 3: Mutations - Personal Genomics	Module 2 Project
10	Mon., Mar. 29	NO CLASS - SPRING BREAK	
10	Wed., Mar. 31	NO CLASS - SPRING BREAK	
11	Mon., Apr. 5	Module 3: Mutations - Personal Genomics	Quiz 6 Reflection 7
11	Wed., Apr. 7	Module 3: Mutations - Personal Genomics	
12	Mon., Apr. 12	Module 3: Mutations - Personal Genomics	Reflection 8
12	Wed., Apr. 14	Class time for Module 3 Project	Module 3 Tutorial
13	Mon., Apr. 19	Class time for Module 3 Project	
13	Wed., Apr. 21	Module 4: Effects of Mutations - Cancer Genomics	Quiz 7
14	Mon., Apr. 26	Module 4: Effects of Mutations - Cancer Genomics	Module 3 Project Reflection 9
14	Wed., Apr. 28	Module 4: Effects of Mutations - Cancer Genomics	
15	Mon., May 3	Module 4: Effects of Mutations - Cancer Genomics	Quiz 8 Reflection 10
15	Wed., May 5	Module 4: Effects of Mutations - Cancer Genomics	
16	Mon., May 10	Class time for Module 4 Project	Reflection 11
16	Wed., May 12	Class time for Module 4 Project	Module 4 Tutorial
	Wed., May 19	Module 4 Project Due	

University Policies

Academic Integrity: This course will be conducted in accordance with the University Policy on Academic Integrity (p.14 University Catalog). Any student caught cheating or plagiarizing will receive an F (0 points) on the assignment and will be penalized according to University regulations. Cheating or plagiarism is subject to discipline as provided in Title 5, California Code of Regulations. Plagiarism is a very serious offense. See the University Catalog under Academic Integrity for further information.

Exams: no cellphone use of any kind is allowed during exams. Cellphones will be turned off and secured in your bookbag, which will be placed on the floor for the duration of the exam.

Plagiarism: it is imperative that you cite all your sources on assignments. Academic misconduct of any kind, including cheating on exams and plagiarism, will result in a grade of F for the course, and possibly other sanctions. Once you have completed this course, do not share assignments etc. with students in subsequent semesters. If anyone turns in your assignment in a future semester, you will be held accountable and face sanctions.

*Disruptive Students**:*** Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. The instructor may require a student responsible for disruptive behavior to leave class pending discussion and resolution of the problem and may report a disruptive student to the Student Affairs Office (WH A-410, 310-243-3784) for disciplinary action.

CSUDH adheres to the Americans with Disabilities Act with respect to providing reasonable accommodations for students with temporary and permanent disabilities. To receive accommodations, students with disabilities must register with Students disAbility Resource Center. For more information, please contact their office in Welch Hall D-180 at (310) 243-3660 (voice) or (310) 243-2028 (TDD).

Computer/Information Literacy Expectations for Students enrolled in this class: Students in this class are expected to:

- Use assigned Toromail account or other university approved email.
- Have ability to navigate and use Blackboard.
- Have basic information and computer literacy in one of the computer formats (Windows, Macintosh, or GNU/Linux).
- Upload files in all of the computer formats (.doc, .docx, .jpeg, .ppt, .pdg, .xps).
- Access and choose appropriate library and other scholarly sources of information.
- Search for and find relevant scholarly information effectively.
- Be able to paraphrase concepts without plagiarizing.
- Maintain the minimum computer Hardware requirements*
- Maintain the minimum computer Software requirements*

*Please visit http://www.csudh.edu/academic-technology/instructional-technologyresources/online-courses-tech/ for the most up-to-date Hardware & Software computer requirements