

**Los Angeles Mission College, Fall 2022 (Reseda CS)**

**Stephen Brown (instructor)**

**Lecture:** Tues 2:30-4:40pm (RCS)

**Email:** brownst@lamission.edu

**Lab:** Thurs 5:15-7:20 (Zoom); Sat 8:30-1:40pm (LAMC)

**Voicemail:** 818-364-7665

**Office Hours:** Sat 1:40-2:00pm (LAMC)

## **Biotech 2 – sections 28521 & 28522 (9/6/22 to 12/17/22)**

**PREREQUISITES:** *none*

**ARTICULATION:** This course is CSU transferrable.

**DROP DATES:** Without a “W” – 10/2/22; With a “W” – 11/22/22

### **Student Learning Outcomes**

1. Examine and apply the fundamentals of cellular and molecular biology concepts to biotechnology research and its practical applications.
2. Develop and maintain laboratory records according to standard scientific and industrial guidelines.
3. Employ mathematical skills and knowledge of chemistry to accurately prepare an aqueous solution with the desired chemical concentrations and pH.

**COURSE DESCRIPTION:** *Biotech 2 provides a foundation for the field of biotechnology. Students examine the fundamentals of cellular and molecular biology and are introduced to basic biotechnology laboratory skills, including documentation, safety, solution and buffer preparation, quality control and bioethics. Students develop proficiency in aseptic technique, spectrophotometry, microscopy and centrifugation.*

**COURSE OBJECTIVES:** By the end of this course each student should be proficient in:

1. Applying principles of lab safety.
2. Keeping accurate records with sufficient information to reproduce what was done.
3. Preparing aqueous solutions of varying composition.
4. Applying core principles of cell and molecular biology.
5. Applying core principles of centrifugation and spectrophotometry.
6. Preparing microbiological media and applying aseptic technique in the culturing of microorganisms.
7. Oral and written communication, maintaining a professional work ethic, and working well with others.

### **Required Books and Materials**

**Open Stax – Biology, Clark et al 2020, 2e (ISBN-13: 978-1947172524) available for free download at:**

**<https://openstax.org/details/books/biology-2e>**

**Biotechnology: A Laboratory Skills Course, Student Edition, J. Kirk Brown, 2e**

**(ISBN 13: 978-0-9832396-3-5, optional)**

**MATERIALS:** bound lab/computation notebook (graph ruled), Sharpie pen (black fine & regular point), ball point blue or black pen, scientific calculator, lab coat, three 882-E Scantrons

## Course Grade

### Point Distribution:

9 Quizzes	18% of Grade (180 points)
Midterm & Final Exams	20% of Grade (200 points)
Oral Presentation	4% of Grade (40 points)
2 Lab Practical Exams	20% of Grade (200 points)
12 Homework Assignments	18% of Grade (180 points)
Lab Notebook	10% of Grade (100 points)
“Soft Skills”	10% of Grade (100 points)
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TOTAL 1000 points	

### Grading Scale:

900+ pts (90-100%)	A
800-899 pts (80-89%)	B
700-799 pts (70-79%)	C
600-699 pts (60-69%)	D
0-599 pts (below 60%)	F

## Recommendations for Success

The main purpose of this class is to help prepare you for employment in the biotechnology industry, so think of this class as a job you really want to keep. Here are some suggestions:

- be on time, stay in class until dismissed
- do **NOT** fall behind in the course, study on a daily basis
- do the assigned reading and turn in assignments on time
- get help when you don't understand something
- take notes, this will help you to mentally organize the material you will be learning
- **know the terminology**
- at a minimum, learn each concept 3 times in order to retain it well for the exams and quizzes:
  - 1) **comprehend** the class material during the lecture
  - 2) **read** the corresponding material in the texts
  - 3) **review** your notes and terminology

**\*\*\*The goal of these biotech courses is to prepare you to find a job, so be sure to act accordingly\*\*\***

## CANVAS website

<https://ilearn.laccd.edu/login/canvas>

-here you can monitor your scores and standing in the course, communicate with your instructor and fellow students, and **submit assignments electronically**

## Biotech 2 COURSE SCHEDULE – Fall 2022

“OS” = Open Stax Biology textbook

Lecture @ Reseda Charter School

Lab on Zoom

Lab @ LAMC (CMS 106)

WEEK	DATE	LECTURE TOPIC (textbook reading)
1	Sep 6	The Field of Biotechnology; Lab Safety
	Sep 8	Safety Data Sheets (Zoom)
	Sep 10	Lab Orientation; Inventory; Map the Lab; Lab Safety
2	Sep 13	Laboratory Math; Documentation; Metrology
	Sep 15	Lab Math Exercises (Zoom)
	Sep 17	Making Yogurt Lab (handout); Lab Notebook; *Lab Math
3	Sep 20	Atomic & Molecular Structure (OS 29-42)
	Sep 22	Quiz Metrology Lab Overview (Zoom)
	Sep 24	Metrology – *Measuring Weight, Distance, Temperature; Micropipetting
4	Sep 27	Properties of Water, pH (OS 42-48); Scientific Method (OS 10-16)
	Sep 29	Quiz Measuring Volume, Making “X” Solutions & pH Overview (Zoom)
	Oct 1	Metrology – *Measuring Volume, Making “X” solutions, *Adjusting pH
5	Oct 4	Macromolecules & Polymers; Carbohydrates & Lipids (OS 59-76)
	Oct 6	Quiz Making Solutions Overview (Zoom)
	Oct 8	*Making Percent, Mass/Vol, Vol/Vol & Molar Solutions
6	Oct 11	Polypeptides, Protein Structure & Enzymes (OS 76-85, 168-73)
	Oct 13	Quiz Overview of pH Buffered Solutions, Serial Dilutions (Zoom)
	Oct 15	Making pH Buffered Solutions; *Dilutions & Serial Dilutions
7	Oct 18	Nucleic Acids, Cell Division (OS 85-89, 253-63); Centrifugation
	Oct 20	Quiz Lab Practical Exam Overview; Centrifugation Overview (Zoom)
	Oct 22	LAB PRACTICAL EXAM 1; *Centrifugation – Precipitation of DNA
8	Oct 25	Restriction Enzymes (handout)
	Oct 27	MIDTERM EXAM Overview of Restriction Enzyme & Electrophoresis Lab
	Oct 29	*Restriction Enzyme Digestion of DNA; Agarose Gel Electrophoresis
9	Nov 1	DNA Replication; Polymerase Chain Reaction (OS 271-73, 354-58)
	Nov 3	Quiz Overview of Polymerase Chain Reaction (PCR) Lab
	Nov 5	*PCR Amplification of DNA, Agarose Gel Electrophoresis
10	Nov 8	Gene Expression, Mutations (OS 369-76, 380-82, 384-88); Eukaryotic Cells (OS 101-112)
	Nov 10	Quiz Overview of DNA Modeling, Bacterial Culture Lab
	Nov 12	Modeling DNA Replication, Gene Expression, Mutations; Bacterial Media Preparation, Aseptic Techniques
11	Nov 15	Prokaryotic Cells, Viruses (OS 97-100, 505-518); Principles of Microscopy (OS 95-97); Spectrophotometry (handout)
	Nov 17	Quiz Overview of Microscopy, Spectrophotometry Lab (Zoom)
	Nov 19	Analysis of Bacterial Cultures; *Determining Bacterial Cell & DNA Concentrations; *Writing an SOP

<b>12</b>	<b>Nov 21-26</b>	<b>THANKSGIVING WEEK</b> <b>No Class</b>
<b>13</b>	<b>Nov 29</b>	Bioethics & Quality; *Writing a Resume
	<b>Dec 1</b>	<b>Quiz</b> Overview of, Gram Stain Lab (Zoom)
	<b>Dec 3</b>	Gram Stain of Bacteria, Use of the Microscope
<b>14</b>	<b>Dec 6</b>	Mammalian Cell Culture ( <b>handout</b> )
	<b>Dec 8</b>	Overview of Lab Practical, Mammalian Cell Culture Lab
	<b>Dec 10</b>	<b>LAB PRACTICAL EXAM 2</b> ; Culturing Mammalian Cells
<b>15</b>	<b>Dec 13</b>	Biotech Company Oral Presentations
	<b>Dec 15</b>	<b>FINAL EXAM</b>
	<b>Dec 17</b>	Culturing Mammalian Cells (cont'd)

**Quiz** A short 20 point quiz will be given at the beginning of lecture.

\*This lab has a 15 point homework assignment due by **Saturday the following week**.

### **COVID Policy**

We will follow LAUSD policies while on the Reseda Charter School campus, and LACCD policies while on the LA Mission College campus (**12890 Harding St, Sylmar CA, 91342**). The current LACCD policies are that students are not required to be vaccinated or to wear masks, however, this is highly recommended.

### **Tutoring**

You should all feel free to take advantage of the LAMC tutoring services, which are available online, that can be accessed [here](#). Also, don't forget to take advantage of my office hours, and I'm also available by appointment.

### **Academic Integrity**

By enrolling in this course, you commit to integrity in all aspects of your work, whether quiz, exam or other assignment. Unless your instructor explicitly states otherwise, the work you submit should be your own and convey what you yourself have actually learned. This also means that you agree to follow the Standards of Student Conduct from the 2021-22 college catalog (pages 178-180) and will not engage in: copying another's work; allowing someone else's work to be submitted as if it was your own; using resources the instructor does not allow during assessments; submitting material without properly citing sources; or self-plagiarism, including submitting work completed for a previous attempt or another course. Evidence of breaking this commitment will result in serious consequences and formal documentation of the incident. If you are unsure if an act constitutes plagiarism or any other violation of academic integrity, be sure to ask your instructor or librarian for clarification.