****HELLO! WELCOME to:****

****MICR 1010 – Introduction to Microbiology****

***California State University, Los AngelesCollege of Natural and Social Sciences***

# **THE BASICS**

**Instructor**: Dr. Tina Salmassi

**Email**: tsalmas@calstatela.edu

**Lecture Days/Time**: Section 06 – **FULLY ONLINE**

**Lab Days/Time**: Section 07: T/R 9:25 – 10:45 AM in ASCL 266 (Cazares)

 Section 08: T/R 12:15 – 1:30 PM in ASCL 266 (Tzarax)

 Section 09: T/R 1:40 – 2:55 PM in ASCL 242 (Tzarax)

 Section 10: T/R 3:05 – 4:20 PM in ASCL 242 (Bahrami)

**Labs Instructors:** Dr. Cazares, Prof. Tzarax, and Prof. Bahrami

**Office Hours**: **Salmassi Office Hours**

**Zoom**

Wednesday 8 – 9 AM

Meeting Address: <https://calstatela.zoom.us/j/82004775578>

**Cazares Office Hours**

Tuesday 12:15 – 1:30 PM

Meeting Address: <https://laccd.zoom.us/j/6698778973?pwd=enUzSys1TkcxVzFmQzJFME1QYjhXdz09>

Meeting ID: 669 877 8973

Passcode: 999780

**Tzarax Office Hours**

**Join**

Wednesdays 10 – 11 AM

Meeting Address: [**https://calstatela.zoom.us/j/3124391997**](https://calstatela.zoom.us/j/3124391997)

**Bahrami Office Hours**

**Zoom**

Mondays/Wednesdays 8:30 – 9:30

Meeting Address: <https://calstatela.zoom.us/j/6836442653?pwd=Zi9vOGdNaEc4c2RnR1RtbWhJTVVZdz09>

Meeting ID: 683 644 2653

Passcode: 231811

**GE Category**: GE Block B2

# **A BRIEF DESCRIPTION OF THE COURSE**

# Introductory course in microbiology designed for non-majors; content addresses the impact of microorganism on the human experience and the biosphere; laboratory application of selected procedures.  No credit if taken after any other college microbiology.

# **THE OUTCOMES WE HOPE TO ACHIEVE**

1. Learn how microbes affect our world
2. Recognize the diversity and ubiquity of microbes
3. Appreciate our relationship with microbes
4. Identify microbial structures and their functions
5. Understand the factors that control microbial growth
6. Appreciate the benefits of microorganisms in industrial, agricultural, environmental, biotechnological and food science processes
7. Understand the role microbes play in disease

Furthermore, consistent with expectations from the lower division General Education in the Natural Sciences students will also:

1. Think critically about experiments involving microbes.
2. Recognize when and what information is needed as related to microbiology.
3. Develop the ability to locate relevant information and evaluate its validity.
4. Extract accurate information related to microbiology from everyday sources.
5. Disseminate learned material by both oral and written communication methods.
6. Demonstrate an ability to work collaboratively
7. Demonstrate effective reading of primary and secondary sources of scientific information
8. Learn effective oral and written communication of scientific content
9. Integrate scientific knowledge into their everyday lives through project-based experiences

**HOW WE WILL WORK TOGETHER**

This is an **online Lecture** course with **in-person Labs** meeting twice a week. To facilitate online work, we will use Canvas, the Cal State LA learning management system (LMS). Please check your Canvas page daily and read all announcements sent through the course page. We will use **ONLY** the lecture course page, not the lab course page. All lecture and lab content and assignments will come from this SINGLE course shell.

 When posting content online, please familiarize yourself with how to interact with others online (this is called *netiquette)*. You can read more about the rules of netiquette at [15 Rules of Netiquette for Online Discussion Boards](http://blogs.onlineeducation.touro.edu/15-rules-netiquette-online-discussion-boards/).

 Let’s all agree, as members of this learning community, to be respectful of one another and avoid actions that take advantage of other members of our community.

I will make every effort to communicate frequently with you through weekly overview schedules (found in Canvas Modules by week). I will also send regular announcements through Canvas.

Please come see us during office hours. If you need to reach me, feel free to text me (818-645-0837). This is my preferred mode of communication is text.

 Let’s make every effort to support one another in this course by communicating regularly and staying on top of deadlines and assignments. I will make every effort to respond to your texts within a few hours but please allow up to 48 hours for a response to your questions.

# **WHAT YOU’LL NEED FOR THIS COURSE**

You will need to have an up-to-date browser, operating system and some additional software on your computer to take this class. Access to Canvas and your Cal State LA email address is critical. You can check t[he ITS Helpdesk Student Resources page](http://www.calstatela.edu/its/helpdesk/studentresources) for instructions and specifics. Some of the documents in this course will be available to you in PDF form. You should download and install [Adobe Acrobat Reader software](http://get.adobe.com/reader/) on your computer so you can work with this format easily.

 In addition to wet labs, we will also do some virtual labs using the tools from **McGraw-Hill Connect**. You will need to purchase access to the lab manual and the virtual labs on McGraw-Hill. Do not purchase a hard copy of the manual as you will need online access for the virtual labs anyway. Follow the links in Canvas to do this.

There is no specific Microbiology textbook for this class, any textbook will do. The Microbiology textbook from OpenStax, ISBN 1938168143, [www.openstax.org/details/microbiology](http://www.openstax.org/details/microbiology) is available for free online, in web view and PDF format. You can also purchase a print version, if you prefer, via the campus bookstore or from OpenStax on Amazon.com. You can use whichever formats you want. Web view is recommended -- the responsive design works seamlessly on any device. If you buy on Amazon, make sure you use the link on your book page on openstax.org so you get the official OpenStax print version. (Simple printouts sold by third parties on Amazon are not verifiable and not as high-quality.)

***So, to summarize: You will need to purchase the online lab manual and access to the McGraw-Hill Connect Virtual Labs! No other textbook is required and in fact, any old microbiology textbook can be used as a resource!***

Additional readings will be made available via Canvas. Here is the list:

* 1. Koch, R. (1876). Untersuchungen ueber Bakterien V. Die Aetiologie der Milzbrand- Krankheit, begruendent auf die Entwicklungsgeschichte des Bacillus Anthracis. Beitrz. Biol. D. Pflanzen 2: 277-310. *Milestones in Microbiology*, *1556*.
	2. Doolittle, W.F. (February 2000). Uprooting the tree of life. *Scientific American* 282 (2): 90-95.
	3. Williams, C. (July 2011). Who are you calling simple? *New Scientist* 211 (2821): 38- 41.
	4. Madigan, M.T. and B.L. Marrs. (April 1997). Extremophiles. *Scientific American* 277 (1): 82-87.
	5. Villarreal, L.P. (December 2004). Are Viruses Alive? *Scientific American* 291 (6): 100-105.
	6. Levy, S.B. (March 1998). The Challenge of Antibiotic Resistance. *Scientific American* 278 (3): 46-53.
	7. Garcon, N. and M. Goldman. (October 2009). Boosting Vaccine Power. *Scientific American* 301 (4): 72-79.
	8. Mallin, M.A. (June 2006). Wading in Waste. *Scientific American* 294 (6): 52-59.
	9. Robbins, J. (2012, Jul 15). Man-made epidemics. *New York Times,* pp. 1-SR.1.

# **OUR ASSIGNMENTS**

## This course has both lecture and laboratory assignments. All assignments will be made available through Canvas and Connect. Please check in REGULARLY using the course Canvas shell and progress weekly as Canvas Modules become visible to you. There are two projects in this course (Sourdough Bread Baking and an Antimicrobic Sensitivity Testing Lab Project)

## GRADING BREAKDOWN

**Course Percentage**

**Lecture**

Canvas Lecture Quizzes 25

Canvas Vaccine & Diagnosing Diseases Worksheets + Quiz + Discussion 5

Lecture Midterm 5

Lecture Final 5

**Projects**

Sourdough Bread Baking Project 10

**Lab**

McGraw-Hill Connect Quizzes 20

Laboratory Midterm 10

Attendance 10

Laboratory Final 5

**Projects**

Antimicrobic Sensitivity Testing Lab Project 5

**Total 100**

## GRADING SCALE

A: 93% or more

 A-: 90% - 92.9%

B+: 86% - 89.9%

 B: 83% - 85.9%

 B-: 80% - 82.9%

 C+: 76% - 79.9%

 C: 70% - 75.9%

 C-: 67% - 69.9%

 D+: 64% - 66.9%

 D: 60% - 63.9%

D-: 55% - 59.9%

 F: below 55%

**HELPFUL STUDENT RESROUCES**

**Technical Resources**

Information on CSULA technical support resources for students: [Technical Support](http://www.calstatela.edu/cetl/technical-support-resources)

**Student Support Services**

Information on CSULA student support resources for students: [Student Services](https://www.calstatela.edu/cetl/student-support-resources)

**Academic Support Services**

Information on CSULA academic support resources for students: [Academic Support](http://www.calstatela.edu/cetl/academic-support-resources)

**Center for Academic Success**

The Center for Academic Success (CAS) supports all students throughout their educational journey. You are encouraged to visit a CAS tutor for STEM, social science, or writing tutoring early in the semester. The academic services CAS provides are inclusive, engaging, challenging, and impactful. CAS tutors offer a one-on-one opportunity to discuss your assignments and will provide you with tools to become an independent scholar. The appointments are 30 minutes long. Log on to the Student Success Collaborative portal [to make an appointment online](http://www.calstatela.edu/undergraduatestudies/student-success-collaborative-ssc).

**Canvas Student Support**

Information for students on how to be a successful online student and how to use Canvas: [Canvas Student Guide](https://community.canvaslms.com/docs/DOC-10701)

**Glazer Family Dreamers Resource Center**

The [Erika J. Glazer Family Dreamers Resource Center](http://www.calstatela.edu/gfdrc) promotes the success of undocumented students and students from mixed-status families at Cal State LA through a variety of resources, services, and community engagement opportunities. Such programs and services are weekly immigration legal clinics, California Dream Act Application for Financial Aid Assistance, and professional and academic development workshops.

**COURSE AND UNIVERSITY POLICIES**

**Student Conduct**

Information on student rights and responsibilities, standards of conduct, etc., can be found by visiting the Cal State LA [University Catalog Appendices](http://ecatalog.calstatela.edu/content.php?catoid=26&navoid=2721).

**Dropping and Adding**

Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Students should be aware of the current deadlines and penalties for adding and dropping classes by visiting the [GET home page](https://get.calstatela.edu/Registrar.htm). (Registrar news and information)

**Americans with Disabilities Act (ADA)**

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. For more information visit the [Office for Students with Disabilities](http://www.calstatela.edu/osd) home page.

**Academic Honesty/Student Conduct**

Many incidents of plagiarism result from students’ lack of understanding about what constitutes plagiarism. However, you are expected to familiarize yourself with the [Cal State LA Academic Honesty Policy](http://ecatalog.calstatela.edu/content.php?catoid=26&navoid=2646) including [Appendix D – Academic Honesty](http://ecatalog.calstatela.edu/content.php?catoid=26&navoid=2646) and [Appendix E - Student Conduct / Student Conduct Procedures](http://ecatalog.calstatela.edu/content.php?catoid=26&navoid=2647). All work you submit must be your own scholarly and creative efforts. Cal State LA plagiarism as follows: “At Cal State LA, plagiarism is defined as the act of using ideas, words, or work of another person or persons as if they were one’s own, without giving proper credit to the original sources.”

**SCHEDULE**

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| **Week** | **Lecture Topic** |
| *1**1/23 – 1/29* | **Lecture Topics (Fully Online):*** *Bad Science TED Talk – Ben Goldacre (complete after first day of lab!)*
* *Introduction to Microbiology with Quiz*

**Lab Topics:***Day 1** *Enrollment*
* *Canvas & Course Organization*
* *McGraw-Hill Connect*
* *What to Expect in Lecture & Lab*
* *General Course Introduction*
* *COVID precautions*

*Day 2** *Introduction to Labs*
* *Bad Science TED Talk – Ben Goldacre – Laboratory Discussion*

*Online** *Virtual Lab Tutorial via McGraw-Hill Connect*
* *Lab Safety Hand Washing via McGraw-Hill Connect*
* *Lab Safety Personal Safety via McGraw-Hill Connect*
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| *2**1/30 – 2/05* | **Lecture Topics (Fully Online):*** *Reading – Koch, R. (1876)*
* *Microbiology – Historical Perspectives with Quiz*

**Lab Topics:***Day 1** *Check-in & Housekeeping*
* *COVID Discussion*

*Day 2** *McGraw-Hill Connect Revisited*
* *Enrollment completed*
* *Hand Washing and Safety Discussion*

*Online** *Reading – Lab Manual Aseptic Technique (Exercise 8)*
* *Aseptic Technique Broth Culture to Sterile Broth via McGraw-Hill Connect*
* *Aseptic Technique Broth Culture to Sterile Agar Plate via McGraw-Hill Connect*
* *Aseptic Technique Slant Culture to Sterile Agar Slant via McGraw-Hill Connect*
 |
| *3**2/06 – 2/12* | **Lecture Topics (Fully Online):*** *Reading – Doolittle, W.F. (2000)*
* *Seeing the Unseen with Quiz*
* *The Tree of Life with Quiz*

**Lab Topics:***Day 1** *Aseptic Technique Lab – Day 1 (Lab Manual Exercise 8)*

*Day 2** *Aseptic Technique Lab – Day 2 (Lab Manual Exercise 8)*

*Online** *Reading – Lab Manual Pure Culture Techniques (Exercise 9)*
* *Reading – Lab Manual Ubiquity of Bacteria (Exercise 6)*
* *Isolation Methods – Quadrant Streakvia McGraw-Hill Connect*
* *Isolation Methods – Subculturing of Bacteria via McGraw-Hill Connect*
* *Ubiquity of Microorganisms – Sampling Surfaces for Bacteria via McGraw-Hill Connect*
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| *4**2/13 – 2/19* | **Lecture Topics (Fully Online):*** *Reading – Williams, C. (2011)*
* *Bacteria with Quiz*

**Lab Topics:***Day 1** *Pure Culture Technique Lab – Day 1 (Lab Manual Exercise 9)*
* *Ubiquity of Bacteria Lab – Day 1 (Lab Manual Exercise 6)*

*Day 2** *Pure Culture Technique Lab – Day 2 (Lab Manual Exercise 9)*
* *Ubiquity of Bacteria Lab – Day 2 (Lab Manual Exercise 6)*

*Online** *Reading – Lab Manual Brightfield Microscopy (Exercise 1)*
* *Reading – Lab Manual Microbiology of Pond Water (Exercise 5)*
* *Microscopy – Operation of Brightfield Microscope via McGraw-Hill Connect*
* *Microscopy Oil Immersion via McGraw-Hill Connect*
* *Microscopy Pond Water Wet Mount via McGraw-Hill Connect*

**Projects:**Projects Introduced |
| *5**2/20 – 2/26* | **Lecture Topics (Fully Online):*** *Protists with Quiz*
* *Algae with Quiz*

**Lab Topics:***Day 1** *Brightfield Microscopy Lab (Lab Manual Exercise 1)*

*Day 2** *Pond Water Lab (Lab Manual Exercise 5)*

*Online/At Home** *Reading – Lab Manual Fungi (Exercise 7)*
* *Reading – Lab Manual Smear Preparation (Exercise 10)*
* *Reading – Lab Manual Simple Staining (Exercise 11)*
* *Staining – Preparing a Smear Sample from a Bacterial Sample via McGraw-Hill Connect*

**Projects:*** *Sourdough Bread Project Unit I Begins*
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| *6**2/27 – 3/05* | **Lecture Topics (Fully Online):*** *Reading – Villarreal, L.P. (2004)*
* *Fungi with Quiz*
* *Still Life*
* *Viruses with Quiz*
* *Bacteria vs. Virus*

**Lab Topics:***Day 1** *Fungi Lab (Lab Manual Exercise 7)*

*Day 2** *Smear Preparation Lab (Lab Manual Exercise 10)*
* *Simple Stain Lab (Lab Manual Exercise 11)*

*Online/At Home** *Reading – Lab Manual Gram Staining (Exercise 14)*
* *Staining – Gram Staining sample via McGraw-Hill Connect*

**Projects:***Sourdough Bread Project Unit I Cont’d*  |

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| *7**3/06 – 3/12* | **Lecture Topics (Fully Online):*** *Reading – Madigan, M.T. and B.L. Marrs. (1997)*
* *Life and Growth with Quiz*

**Lab Topics:***Day 1** *LABORATORY MIDTERM EXAM I (in-class exam with all in-person and virtual content through/including Week 6)*

*Day 2** *Gram Staining Lab (Lab Manual Exercise 14*

*Online/At Home** *Reading – Lab Manual Capsule Staining (Exercise 13)*
* *Reading – Lab Manual Endospore Staining (Exercise 15)*
* *Staining – Capsule Staining via McGraw-Hill Connect*
* *Staining – Spore Staining via McGraw-Hill Connect*

**Projects:***Sourdough Bread Project Unit I Cont’d*  |
| *8**3/13 – 3/19* | **Lecture Topics (Fully Online):*** *LECTURE MIDTERM EXAM (online, Canvas-based exam with all content through/including Week 7)*

**Lab Topics:***Day 1** *Capsule Staining (Lab Manual Exercise 13)*

*Day 2** *Spore Staining (Lab Manual Exercise 15)*

*Online/At Home** *Reading – Lab Manual Environmental Influence on Microbial Growth, Effects of Oxygen (Exercise 24)*
* *Reading – Lab Manual Temperature Effects (Exercise 25)*
* *Reading – Lab Manual pH and Microbial Growth (Exercise 26)*
* *Reading – Lab Manual Water Activity (Exercise 27)*
* *Metric Measurements Length via McGraw-Hill Connect*
* *Microbial Growth – Oxygen Requirements and Anaerobic Jar via McGraw-Hill Connect*
* *Microbial Growth – Oxygen Requirements and Fluid Thioglycolate via McGraw-Hill Connect*
* *Microbial Growth – Effects of Temperature via McGraw-Hill Connect*
* *Microbial Growth – Effects of pH via McGraw-Hill Connect*
* *Microbial Growth – Effects of Osmotic Pressure via McGraw-Hill Connect*

**Projects:***Sourdough Bread Project Unit I Cont’d* |

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| *9**3/20 – 3/26* | **Lecture Topics (Fully Online):*** *Reading – Levy, S.B. (1998)*
* *Microbial Control with Quiz*

**Lab Topics:***Day 1** *Temperature Effects Lab – Day 1 (Lab Manual Exercise 25)*
* *pH Effects Lab – Day 1 (Lab Manual Exercise 26)*

*Day 2** *Temperature Effects Lab – Day 2 (Lab Manual Exercise 25)*
* *pH Effects Lab – Day 2 (Lab Manual Exercise 26)*

*Online/At Home** *Reading – Lab Manual Evaluation of Alcohol (Exercise 30)*
* *Reading – Lab Manual Ultraviolet Light (Exercise 28)*
* *Reading – Lab Manual Evaluation of Antiseptics (Exercise 32)*
* *Control of Microbial Growth – Effect of Ultraviolet Light via McGraw-Hill Connect*
* *Control of Microbial Growth – Effect of Antiseptics and Disinfectants via McGraw-Hill Connect*

**Projects:*** *Sourdough Bread Project Unit I DUE (Don’t toss out your culture! You’re going to need it for Unit II)*
* *Sourdough Bread Project Unit II Begins*
 |
|  | *SPRING BREAK* |
| *10**4/03 – 4/09* | **Lecture Topics (Fully Online):*** *Food Microbiology with Quiz*

**Lab Topics:***Day 1** *Alcohol Lab – Day 1 (Lab Manual Exercise 30)*
* *Ultraviolet Lab – Day 1 (Lab Manual Exercise 28)*

*Day 2** *Alcohol Lab – Day 2 (Lab Manual Exercise 30)*
* *Ultraviolet Lab – Day 2 (Lab Manual Exercise 28)*

*Online/At Home** *Reading – Lab Manual Antimicrobic Sensitivity (Exercise 31)*
* *Control of Microbial Growth – Antimicrobic Sensitivity Testing via McGraw-Hill Connect*

**Projects:*** *Sourdough Bread Project Unit II DUE*
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| *11**4/10 – 4/16* | **Lecture Topics (Fully Online):*** *Microbes in Agriculture with Quiz*

**Lab Topics:***Day 1** *Antimicrobic Sensitivity Lab – Day 1 (Lab Manual Exercise 31)*

*Day 2** *Antimicrobic Sensitivity Lab – Day 2 (Lab Manual Exercise 31)*

*Online/At Home** *Reading – Lab Manual Pure Culture Techniques (Exercise 9 – repeated from last time)*
* *Reading – Lab Manual Enumeration of Bacteria (Exercise 19)*
* *Reading – Lab Manual Bacterial Counts of Food (Exercise 43)*
* *Isolation Methods – Optical Density via McGraw-Hill Connect*
* *Isolation Methods – Pour Plate Methods via McGraw-Hill Connect*
* *Isolation Methods – Qualification by Colony Counting via McGraw-Hill Connect*
* *Isolation Methods – Quantification Dilution of Bacteria via McGraw-Hill Connect*

**Projects:*** *Project II Introduced*
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| *12**4/17 – 4/23* | **Lecture Topics (Fully Online):*** *Reading – Garcon, N. and M. Goldman. (2009)*
* *Biotechnology with Quiz*
* *Vaccines Worksheet with Quiz*

**Lab Topics:***BRING IN A FOOD ITEM FOR THIS WEEK’S LAB (Suggestions: Ground Beef, Lettuce, Yogurt)**Day 1** *Food Microbiology Lab – Day 1 (Lab Manual Exercise 43)*

*Day 2** *Food Microbiology Lab – Day 2 (Lab Manual Exercise 43)*

*Online/At Home** *Reading – Lab Manual Polymerase Chain Reaction (Exercise 50)*
* *DNA Biology and Technology – Isolation of DNA via McGraw-Hill Connect*
* *DNA Biology and Technology – Gel Electrophoresis via McGraw-Hill Connect*
* *Bacterial Genetics – DNA Profiling via McGraw-Hill Connect*
* *Bacterial Genetics – PCR via McGraw-Hill Connect*

**Projects:*** *Project 2 – Antimicrobials Lab Project DUE*
 |
| *13**4/24 – 4/30* | **Lecture Topics (Fully Online):*** *Reading – Mallin, M.A. (June 2006)*
* *Environmental Microbiology with Quiz*

**Lab Topics:***Day 1** *Review/Project 2 Q&A*

*Day 2** *LABORATORY MIDTERM EXAM II (In-class exam with all in-person and virtual content beginning in Week 7 and through/including Week 11)*

*Online/At Home** *Reading – Bacterial Examination of Water (Exercise 44)*
* *Natural Selection – Antibiotic-resistant Bacteria via McGraw-Hill Connect*
 |
| *14**5/01 – 5/07* | **Lecture Topics (Fully Online):*** *Reading – Robbins, J. (2012)*
* *Microbial Ecology with Quiz*

**Lab Topics:***Day 1** *Water Lab – Day 1 (Lab Manual Exercise 44)*

*Day 2** *Water Lab – Day 2 (Lab Manual Exercise 44)*

*Online** *Reading – A Synthetic Epidemic (Exercise 56)*
 |
| *15**5/08 – 5/14* | **Lecture Topics (Fully Online):*** *The Immune System with Quiz*
* *Diagnosing Diseases Worksheet with Quiz*

**Lab Topics:***Day 1** *A Synthetic Epidemic Lab (Lab Manual Exercise 56)*
* *Review*

*Day 2** *LAB FINAL EXAM (Cumulative, all in-person and virtual lab content)*
 |
| *Finals Week* | *LECTURE FINAL EXAM (180 minutes, cumulative)**Exam opens on Monday 5/15 at midnight and closes on* ***SATURDAY*** *5/20 just before midnight* |