Class: Santa Rosa Campus TTh lab 12:30–3:30 pm in Baker 1885, lecture 4–5:30 pm in Lark 2030

Instructor
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Remind: text @micr5f25 to 81010

Office hours in Baker 1812 (hybrid)
By appointment or TTh 5:30–6:30 pm**
Zoom link Meeting ID: 986 5637 6532
Passcode: evidence

*When emailing me, please add to the Subject: MICR 5 F25
** Please let me know if you will be more than 10 minutes late so I will wait for you.

Catalog description

Students will study the following topics: morphology, growth, metabolism, genetics, and control of microorganisms, with emphasis on bacteria and viruses. Includes principles of microbial pathogenicity, and the human immune response. Emphasis on laboratory techniques. Intended for allied health majors considering transfer to CSU or UC.

Prerequisites

- ENGL 1A (OR ESL 10)
- BIO 10 or higher (V7)
- CHEM 60, CHEM 3A (OR CHEM 1A), or higher (V6)

Important dates

See Course Schedule for holidays.

First day of MICR 5 class	T 8/19
Last day to drop with no grade of record	Sun 9/7
Last day to withdraw with W	Sun 11/16
Final Exam	T 12/16 1:00 PM - 3:45 PM

Course level student learning outcomes (SLOs)

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

1. Integrate basic principles of microbial cell structures and processes with evolutionary and ecological concepts.
2. Explain the impact of microbiology on medical, public health and environmental concerns.
3. Demonstrate proficiency in a variety of standard laboratory techniques used for the routine culture, analysis and identification of microorganisms.

Objectives

In order to achieve these learning outcomes, during the course the students will:

1. Outline the history of major microbiological discoveries and describe their contributions to world civilization.
2. State Koch's postulates and apply them to different types of pathogens and to new diseases.
3. Relate basic principles of chemistry and cell biology to structure and function of microbes.
4. Explain how the unity of basic cell processes contributes to difficulties in treating infectious disease.
5. Describe the principles and mechanisms of microbial genetics and coevolution and apply them to the problem of increasing drug resistance in microorganisms.
6. Describe viruses and their relation to cells.
7. Compare and evaluate the various mechanisms of control and prevention of microbial disease.
8. Discuss the mechanisms of pathogenicity in microbes.
9. Compare and contrast the epidemiology of community acquired and hospital acquired infections.
10. Describe the functions of the human immune system, its relations to disease, and how vaccination contributes to immunity.
11. Describe the etiology, epidemiology, treatment and prevention of a variety of important infectious diseases.
12. Safely and aseptically perform a variety of microbiological laboratory techniques.
13. Collect and analyze data.

Required materials

Textbooks

1. *Microbiology*. OpenStax. ISBN-13: 978-1-50669-811-3
    a. Reading assignments are posted in the course schedule and on Canvas.
    b. This is a free online textbook. https://openstax.org/books/microbiology/pages/1-introduction

   c. If you prefer, you can purchase a hardcopy at the SRJC bookstore.
   d. Hardcopies are also available on reserve at Doyle Library. Check it out from the 2nd floor circulation desk.
2. SRJC College lab manual for this course (ISBN-13: 979-8852450227) is available at the bookstore. A hardcopy of the lab manual is required every class unless otherwise announced.

Course supplies

- Cotton lab coat or long-sleeved, cotton shirt
- goggles or safety glasses
- Closed-toed shoes
- pen and pencil
- color pencils (optional)
- Lecture notebook: any style
- Optional organizer for handouts
- Lab notebook: stitch-bound or spiral bound
- Scientific calculator (see **Technology**)
- See **Technology**

Methodology

1. Students will develop a basic understanding of medical microbiology concepts through the following activities.
   a. Reading the course textbook, online content, and articles shared on Canvas
   b. In-person lectures
   c. Laboratory exercises
   d. Homework assignments mostly on Canvas
   e. A written report and an oral presentation on a communication project approved by the instructor
2. Complete reading assignments before lectures and laboratory exercises.
3. Slides and study guide questions are posted on Canvas.
4. Refer to the attached schedules of lecture topics and laboratory exercises**. These may be revised during the semester.**

Workload

- MICRO 5 is a 5-unit course with several prerequisites. **In addition** to 3 hours of lecture and 6 hours of lab on campus, students are expected to spend a **minimum** of **7.5 hours per week** to study course materials and complete assigned reading, homework, and projects.
- If you are not able to devote the required time, I strongly urge you to consider taking it in a future semester when your own schedule fits the demands of this course.
- The single greatest factor in student success is the amount of time and active engagement spent preparing for the course.

Office hours

- My favorite part of teaching is working with students one-on-one in office hours.
- *Please arrive at regular weekly office hours within the first 10 minutes, or send me a message and I will wait for you. Otherwise, if there are no students, I may leave after 10 mins.
- To make an appointment, email me with 3–4 dates and times that would work, and whether you can meet on Zoom.

Grading

Grading in this course is based upon a point system. Students will earn points with quizzes, homework and in-class assignments, lecture and lab exams, and a group communication project. Each of these items is described below.

Homework

- Homework assignments are designed to help prepare you to get the most out of class and for exams, or to cover material that is otherwise difficult to assess by exam.
- Most assignments have a suggested due date. For these assignments, submissions will be accepted for full credit until the **close date** the Sunday after the lecture exam. Some assignments have an inflexible due date and are marked with asterisks * in the course schedule.
- Canvas Quizzes are open-book, open-note. Except for the Fundamentals Quiz, the average score of unlimited attempts is kept.
- I offer opportunities to revise your work. Quizzes on Canvas open the day the first lecture content for that quiz is given in class and the average of all attempts before the close date will be your grade. You have unlimited attempts before the close date. Best practice is to review feedback on your first attempt and bring any questions to me before making another submission.

Exams and policies

- No notes are allowed for in-person exams and quizzes.
- There will be 4 lecture exams with a mix of free response and multiple choice questions.
- The last of the lecture exams is a **cumulative** exam given at the time assigned by the College (p. 1 and Course Schedule). The exam will cover **all lecture topics** including those after Lecture Exam 3.
- There will be 3 lab exams for practical skills and lab content. Please see the schedule below for the dates of these important exams.
- There are 2 in-class quizzes on dilutions calculations.
- In addition, there will be skills demonstrations worth a total of 20 points. Detailed instructions and rubrics for each skills test will be given in lab and on Canvas.

- I will not be able to arrange make-up exams for missed lab exams, as they require lab space, lab specimens, and lab equipment but I will work with the Disability Resources Department to ensure any accommodations requirements are met.
- A make-up lecture exam may be possible, but only in the event of unforeseen emergencies. This policy is to protect my time, as proctoring an exam takes hours away from my other work, which is difficult for me to do without advance notice and planning. If you must miss an exam, contact me as soon as possible. I'm here for you!

Notetaking

Unless an alternative is required for a DSPS accommodation, every student signs up to take notes for one lecture per exam for a total of four lectures. Any style is welcome and details for posting your notes for credit are in the Class Notes Discussions on Canvas > Study guides and resources Module.

Lab notebook

- Keeping an updated record of planned, ongoing, and completed lab activities is essential in science and helps to prepare you for detailed documentation that is the standard of care in medicine.
- Set aside an hour before and after each lab to prepare and complete answering questions and recording results.
- At three labs chosen randomly during the semester, I will collect all notebooks and grade them according to instructions given during the first lab. The purpose is to motivate students to keep lab notebooks up to date, so no late work is accepted.

Outreach Communication Project

Student groups will share a 10–12 minute presentation on a microbiology topic of their choosing. Students will also write a group summary of their research and reflections on communication with the public. Detailed instructions for this important assignment will be given later.

Lab entrance and exit points

These are short written or verbal assignments due at the start and end of every lab. Students must be in class at the time the assignments are given to earn points.

Unknowns project

An individual lab project to isolate and to identify bacteria will take place over several weeks toward the end of the semester. A detailed rubric will be provided in Canvas.

Extra Credit

For equity, there is no extra credit for this course. Ask me about equity in grading in office hours!

Grades summary table

Item	Number	Points each	Item Total	% of grade
Current events	1	10	10	1
Lecture notes	4	5	20	2
Lab entrance and exit points[s]	approx. 21	1–6	80	8
Unknown project	1	40	40	4
Canvas quizzes[s]	12	10	120	12
Lecture exams and final exam	4	100	400	40
Lab exams	3	46–54	150	15
Dilutions quizzes	2	10–20	30	3
Lab skills tests	2	25	50	5
Lab Notebook Checks	3	10	30	3
Outreach project	1	70	70	7
		Course Total	**1000**	**100**

[s] These categories support your learning either lecture or lab content and will be replaced with a higher lecture or lab exam score at the end of each unit. Ask me about equitable grading!

Letter grades are based upon the percentage of possible points using the following scale.

A	89.51%	**895.1 points or more**
B	79.51%	**795.1 to 895** points
C	69.51%	**695.1 to 795** points
D	59.51%	**595.1 to 695** points

Grades are transferred directly from Canvas into the final grade system, so what shows in Canvas is accurate.

You can use the What If? grade function in Canvas to set specific goals on assignments - it will show you how your grade will change given an assignment grade you enter. Here is a link to learn about this tool: What If Grades in Canvas.

Accommodations, Health, and Resources

Accommodations and Adjustments

Access and Accommodations: It is the mission of the Santa Rosa Junior College to support inclusive learning environments. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or to accurate assessment of achievement—such as time-limited exams, inaccessible web content, or the use of non-captioned videos—please notify the instructor as soon as possible. Students are also welcome to contact the Disability Resources Department (DRD). DRD is a resource for students that provides authorization for academic accommodations, training and access to assistive technology, and collaborates on strategies for academic success.

Students with disabilities who need or may need accommodations in this class are encouraged to contact Disability Resources (527-4278), disabilityinfo@santarosa.edu as soon as possible to better ensure such accommodations are implemented in a timely fashion. You will need to provide the Authorization for Academic Accommodations (AAA letter) from the Disability Resources Department (DRD) to receive accommodations each semester.

I want you to have what you need to succeed, so if you may be eligible, please seek all accommodations you are entitled to even if you have not done so in previous classes.

Physical & Mental Health

From Student Health Services:

> Should you experience any physical or mental health issues, know that all of us at SRJC care about your well-being. Did you know that you have free access to nurses, counseling, and certain testing and medications because you pay a student health fee? SHS offers confidential, in-person or secure remote services for all SRJC students, and some providers can converse with you in Spanish if you prefer. They also have on-site COVID rapid testing and vaccinations available, all at no cost.
>
> To start the process for any type of physical or mental health appointment contact Student Health at 707-527-4445 or email studenthealthservices@santarosa.edu

Sonoma County Crisis hotline: (707) 576-8181

National Lifeline: 9-8-8

Additional resources for success

- Student Success Team – student coaches
- Tutorial Centers
- Library resources - Librarians are available online. Go to "online chat" or "zoom appointments." Libraries are open in person this semester (check website for hours)

- Need A Laptop or other equipment? Borrow from SRJC Library
- Apply for Crisis Financial Assistance: Emergency grant application
- Accessing Online Student Services
- Basic Needs – Student Resource Center supports meeting student needs for food, housing, transportation, and much more

Conduct and Integrity

We deserve appropriate instructions, warnings, and chances to improve. I am learning how to make our classroom reflect this value and commit to rehabilitative rather than punitive consequences for mistakes. Please help me co-create this restorative learning environment with your suggestions and observations!

Classroom policies

1. **Only come to class if you feel healthy and have no COVID-19 symptoms.** We have to work together to continue having in-person class. If you test positive for COVID-19 and may have been on campus, contact your instructors immediately. Follow county guidelines and you don't need to test negative to return to campus.
2. Lecture and lab together are 4.5 hours. **It's better to be late than absent.** If you miss part of lab including instructions, **please observe hands-off** and ask me to catch you up if there is an opportunity. There may be safety concerns, so please wait for my instructions, not those of your classmates.
3. Help co-create a positive learning environment. Ask questions and offer responses in class, organize a group office hour with other students, post study guide questions and answers, or let me know when a classmate helped you. Unprofessional behavior, such as inappropriate language or missing appointments repeatedly, may result in penalties.
4. You are invited to have your laptop or tablet in class to work on assignments and access digital resources in class and lab.
5. Keep your phone silenced in your bag or at the front of the classroom during class. **If you must use a digital device for anything unrelated to class, step outside to support a positive learning environment in the classroom**.

Present your own creative, original work

I trust you and believe that no student sets out to plagiarize (copy) the work of others. This can happen due to unbearable stress, mistake, or confusion about what counts as plagiarism.

Plagiarism is not just submitting someone else's paper as your own. It's taking sentences, even short phrases directly from another source or sources without proper attribution. You are a creative, intelligent, capable person and you can communicate in your own original way with

your own words. If you're not doing original work, all the assigned work is really just busywork and is not a useful learning tool. Copy/paste is not worth your valuable time. I encourage students to share information and ideas, but not their work.

All work for this class must be original (in your own words) and completed individually (each student submits their own unique work) unless otherwise specified in the assignment details. Quotes, even if properly attributed, are not permitted in any assignment unless otherwise specified in the assignment details.

My best advice for avoiding plagiarism is to always take notes in your own words, and never look at the original source while doing your work. If you're ever unsure whether you're writing in your own words or not, come to office hours or the writing center. We'd all love to help you!

To learn more, including specific examples, see these links on Plagiarism: SRJC Writing Center Lessons on avoiding plagiarism SRJC's policy on Academic Integrity

SRJC Standards of Conduct

Students who register in SRJC classes are required to abide by the SRJC Student Conduct Standards. Violation of the Standards is basis for referral to the Vice President of Student Services or dismissal from class or from the College. See the Student Code of Conduct page.

Netiquette, or Why Is It Harder to Be Polite Online?

Netiquette refers to using common courtesy in online communication.

In our first week of classes, we will come up with shared classroom goals and values. In the meantime, please use these guidelines for discussions and communications through Canvas:

- Forward emails and other private messages only with a writer's permission.
- Be considerate of others' feelings and use language carefully.
- Cite all quotations, references, and sources (otherwise, it is plagiarism).
- Use humor carefully. It is hard to "read" tone; sometimes humor can be misread as criticism or personal attack.
- To ensure that others can understand you, use complete sentences to compose posts. Review work before submitting it.
    - Abbreviations, such as "ur" for "your" or "ru" for "are you" etc., are confusing for many people, so please use full words.
    - If you don't understand what someone else has said, try asking for clarification.
    - If you notice wording that is confusing in an assignment or from me (the instructor), ask for clarification so I can fix it for everyone.
- Focus on impact first, not intent. If something you communicate has a negative impact (hurts someone for example), try to understand the impact and change your behavior first, before communicating what your intent was. Curious about this idea? Read this Scientific American blog post.

How to succeed in this course

- Go to Week 0 Module > Advice from former students. Find 2 pieces of advice to keep in mind. Revisit this page of wisdom often -- my students put it better than I.
- Try different ways of organizing and managing your time. Checklists, calendar reminders, and apps can benefit different students for different courses, and the only way to find ways that work for you is to try it.
- Review learning objectives before and after each reading or lab unit. Know how well you understand each topic and take “not sure” as a positive signal that you are taking control of your own learning. Follow up appropriately.
- Complete the study guides on Canvas. Form a study group with other students. Divide up the study guides and present the answers to your study group.
- Write down questions as you read and do homework and ask them in class.
- Use memory devices such as creating a mind palace to remember sequences or flashcards to help memorize the meaning of unfamiliar terms. Practice explaining the terms to your friends, classmates, study-group members, siblings, parents, pets, or stuffed animals.
- Write test-style questions for each important concept and quiz your study-group members. Engaging with the material creatively and actively is the best way to learn it -- and to notice when you don’t fully understand something!
- **Ask questions as soon as you find you do not understand something.** I celebrate awareness of your own learning needs. I also welcome general questions related to navigating school, work-life balance, and career options. Ultimately clarity around these topics can motivate you as a scholar and professional and prevent burnout.
- Ask questions right away when you feel unsure about instructions, especially in lab.

Course Schedule

Week	**Date**	**Lab** Complete notebook set-up required for chapters with *	**Lecture**	**Reading/Assignments** (suggested due date) *inflexible close date*
1	8/19	Safety/Sanitation, Aseptic techniques, Ubiquity I	Introduction Overview of Microbe Groups	Ch. 1 intro and 1.1–3 ● Quiz 1: Fundamentals *8/24* ● Welcome survey *8/24*
	8/21	Aseptic techniques II, *Streak plate I, Microscope I	History and microscopy	Ch 2.1 (Magnification, Resolution, and Contrast), 2.3 (Brightfield Microscopes), 3.1–2 ● Quiz 2 (8/24)
2	8/26	Ubiquity II, Microscope II: Eukaryotes: fungi; Streak plate II	Prokaryotic cells 1	Ch 3.3 (through Nucleoid, and Plasma Membrane through the end), 4.6
	8/28	Microscope II: Eukaryotes: protists and Microscope III: Bacteria and simple staining, hanging drop	Prokaryotic cells 2	Ch 2.4 (through Endospore Staining) ● Quiz 3 (8/31)
3	9/2	Microscope IV: *Gram stain, *Koch's I, Microscope II: Eukaryotes: Animals	Epidemiology	Ch 15.1 (Signs and symptoms, Periods of Disease, Acute and Chronic Diseases), 15.2 (Stages of Pathogenesis: Exposure, Koch's postulates), 16.1–3, WHO Weekly Epidemiological Update
	9/4	Koch's II, *Media/Sterilization I, Micropipettor	Biochemistry 1	Ch 7.1, 8.1, 9.6
4	9/9	Koch's III, Media/Sterilization II, review	Biochemistry 2	● Quiz 4 (9/14)

Week	**Date**	**Lab** Complete notebook set-up required for chapters with *	**Lecture**	**Reading/Assignments** (suggested due date) *inflexible close date*
	9/11	**Lab exam 1**	Review	
5	9/16	Koch's IV, *Food Safety I, *Isolation from Soil I, Dilution technique tutorial	**Lecture exam 1**	***Lecture close date is Sun 9/21 at 11:59 pm*** ● Dilution post-lab on Canvas *11:59 pm 9/21*
	9/18	Streak plate practice, *Disinfectants I, Food Safety II, Media/Sterilization III, Endospore stain	Microbial control 1	Ch. 13 ● Quiz 5 (9/21)
6	9/23	Colony Morphology, Disinfectants II, Isolation from Soil II, dilution clinic	Bacterial growth, quantitation, and nutrition	Ch 9 intro and 9.1 (through Indirect cell counts)–9.5 ● Quiz 6 (9/28)
	9/25	Clinical Microbiology, *PCR I, *Antibiotics I, *instructions for group project*	Microbial metabolism 1	Ch 8.2–4, 8.7 ● Sign up for Outreach project *10/3* ● Dilutions practice 2 due *10/5*
7	9/30	PCR II, Antibiotics II, Isolation from Soil III, group work and dilution clinic	Microbial metabolism 2	● Quiz 7 (10/5)
	10/2	*Transformation I, Gram stain practice, Streak plate practice, *media & biochemical tests lab lecture, unknowns project intro*	Biofilms and endospores	Ch 9.5 (Biofilms), 15.2 (Adhesion), 3.3 (Endospores), 4.4 (Clostridia and Bacilli)
8	10/7	**Gram stain skills test**, Isolation from Soil IV, Feedback on practice streak plates	Pathogenesis	Ch 15 intro and 15.1 (Classifications of Disease), 15.2 (Pathogenicity and

Week	**Date**	**Lab** Complete notebook set-up required for chapters with *	**Lecture**	**Reading/Assignments** (suggested due date) *inflexible close date*
				Virulence through Stages of Pathogenesis, invasion to end), 15.3 (bacteria only) ● Quiz 8 (10/12)
	10/9	Isolation from Soil V, Coliform prelab assignment, Unknowns Project: Streak Plating, Review	Microbial genetics 1	Ch 10.2–4, 11.1–4 ● Outreach first draft **hardcopies due *in lab 12/2***
9	10/14	**Lab exam 2, Dilutions Quiz 1, and streak plate skills test**	Microbial genetics 2	Ch 11.7, 11.5 ● Outreach Presentation flyer due *noon 12/9*
	10/16	Coliform I, Transformation II, Unknowns Project: Isolation I	Microbial genetics 3 and review	● Quiz 9 (10/19)
10	10/21	Coliform II, Unknowns Project: Isolation II (confirmation), Guest: intro to research	**Lecture exam 2**	***Lecture close date is Sun 10/26***
	10/23	Coliform III, Unknowns Project: Biochemical Testing I	Biotechnology	Ch 11.6, 12.1 (through Molecular Cloning using Transformation), 12.2 (Agarose Gel Electrophoresis and Amplification-Based DNA Analysis Methods)
11	10/28	Coliform IV, Unknowns Project: Biochemical Testing II, MRSA pre-lab	Microbiome	Ch 4.1 (Prokaryote Habitats and Functions and Symbiotic Relationships), 17.1 (Microbiome), 17.2 (Chemical and Enzymatic Mediators)
	10/30	Unknown Project: Biochemical Testing III,	Microbial control 2:	Ch 14 intro, 14.1–3, 14.5 and articles on

Week	**Date**	**Lab** Complete notebook set-up required for chapters with *	**Lecture**	**Reading/Assignments** (suggested due date) *inflexible close date*
		handout: PCR practice	Antibiotics	Canvas
12	11/4	*MRSA I, Indigenous Microbiota I, Unknowns Project: Biochemical Testing IV	Antibiotics	● Quiz 10 (11/9) ● Unknowns report (11/18)
	11/6	MRSA II, Indigenous Microbiota II, lecture in Lark	Viruses: introduction	Ch 6 intro, 6.1–2
13	11/11	*Holiday: campus closed*		
	11/13	*Meet in Lark*: CRISPR intro and film	Viruses: HIV, Rabies, antivirals, herpesviruses	Ch 25.3 (Infectious Mononucleosis and Burkitt Lymphoma, Cytomegalovirus, and HIV), 14.4 (antiviral drugs), 26 intro and 26.3 (rabies), 21.3 (Oral Herpes), 23.4 (Genital Herpes) ● Quiz 11 (11/16)
14	11/18	MRSA III, *CRISPR I	**Lecture exam 3**	***Lecture 3 close date is Sun 11/23***
	11/20	MRSA IV and group work	Immune system overview and innate immunity 1	Ch 17 intro and 17.1–5
15	11/25	**Dilutions Quiz 2,** CRISPR II, Tracking a disease with ELISA	Innate immunity 2	
	11/27	*Holiday, campus closed*		
16	12/2	*Meet in Lark*: Peer reviews and review for lab exam	Adaptive immunity 1	Ch. 18 intro, 18.1–4 ● Outreach report final draft due

Week	**Date**	**Lab** Complete notebook set-up required for chapters with *	**Lecture**	**Reading/Assignments** (suggested due date) *inflexible close date*
				Friday *12/19*
	12/4	**Lab exam 3**	Adaptive immunity 2	***Final lab close date is 12/7 at 11:59 pm*** ● Peer evaluation *12/19*
17	12/9	*Meet in Lark*: Outreach projects Presentations	Vaccines and immunological methods of ID	Ch. 18.5, 20.1 (Producing Monoclonal Antibodies), 20.4 ● Quiz 12 (12/14)
	12/11	*Meet in Lark*: *presentations and film*	Review	
18	**12/16**	*No lab*	**Cumulative final exam 1:00 PM - 3:45 PM**	***Final course close date is Friday 12/19 at 11:59 pm***