

San Diego Community College District, Miramar College
Tentative Course Syllabus, Spring 2019
Bio 205 General Microbiology



Instructor: Crista DiBernardo-Wagner

Email: _____

Phone: _____

Class Hours: Tuesday/Thursday 1300 – 1740, CRN 71649

The course website can be accessed via the URL <http://www.professorcrista.com/>

Required Materials

Textbooks:

Tortora, Gerard et al. *Microbiology, An Introduction*. Any recent edition, syllabus refers to the 11th edition.

Wagner, Crista D. General Microbiology Lab Manual (purchase at Mira Mesa Copy Center)

Laboratory materials:

1. Lab materials: microscope slides, lens paper, bibulous paper, inoculating loop, inoculating needle, and lab goggles/glasses.
2. Lab materials available at the college bookstore: lab coat.
3. A bound laboratory notebook to be used ONLY for the lab portion of this course. Loose sheets of paper are NOT acceptable.
4. A permanent fine-tipped marker (e.g., a Sharpie®). A "Twin Tip" Sharpie is extra handy.
5. A China Marker/Grease pencil.
6. Painter's tape or small rubber bands.

Additional Materials available for your use during lab

Holt, John et al. *Bergey's Manual of Determinative Bacteriology*

Catalog Description & Prerequisites

This is an introductory course covering the fundamental aspects of microbiology including taxonomy, structure, physiology, reproduction, genetics, control, immunology and host-parasite relations. Basic techniques for culturing, staining, counting and identifying microorganisms are emphasized in the laboratory. This course is designed to meet the requirements to enter para-medical or medical fields. Field trips may be taken during laboratory periods. (FT) Transfer Credit: CSU; UC. The Written English Proficiency (WEP) and a recent college chemistry course with a grade of C or better. Because microbiology is a specialized science, Miramar College requires that you complete a basic life science such as Biology 105 and 106 or Biology 107 AND chemistry before you attempt Microbiology. High School Chemistry and biology is not equivalent. NO PREREQUISITES, NO ADMITTANCE!

Course Objectives

Upon completion of General Microbiology, the student will have:

Recognized terminology, specific facts, experimental methodologies and general concepts associated with the following topics:

1. Development of lab techniques used in microbiology; chemical evolution, microbial diversity and taxonomy; morphology and fine structure of microorganisms; microbial metabolism, physiology and growth; microbial genetics; microbial disease and the immune response; environmental and industrial microbiology.
2. Employed concepts learned when studying the above topics to analyze new situations in microbiology.
3. Demonstrated a proficiency in performing each lab technique and an ability to interpret qualitative and quantitative data generated by these techniques.
4. Distinguished between the principle and purpose of each procedure and diagnostic test introduced in the laboratory.
5. Designed a flow chart incorporating cultural and cellular diagnostic tests to distinguish bacterial species.
6. Inspected the role of research in microbiology and become aware of its impact on society.

Course Student Learning Outcomes (SLOs)

Upon completion of this course, you should be able to achieve the following student learning outcome: Properly utilize and analyze results of common physiological, biochemical, medical, and immunological assays and present these results to identify unknown bacteria.

Disability Support Programs & Services

Students with disabilities who may need academic accommodations are encouraged to discuss their authorized accommodations from Disability Support Programs and Services (DSPS) with their professors early in the semester so that accommodations may be implemented as soon as possible. ♣ The faculty member will work with the DSPS Office to ensure that proper accommodations are made for each student. By law, it is up to the DSPS Office, through the interactive process with the student, to determine which accommodations are appropriate, not the instructor. This includes accommodations in a clinical setting. All information will be kept confidential. Students that need evacuation assistance during campus emergencies should also meet with me as soon as possible to assure the health and safety of all students. Further information is available in the Disability Support Programs & Services (DSPS) department. DSPS is located in building K-204 and can be reached at (619) 388-7312 or <http://dsps.sdccd.edu/>.

Attendance

1. It is the student's responsibility to drop all classes which he/she is no longer attending.
2. Attendance in this course is mandated by the State of California and excessive absences are grounds for being dropped from the course. **For this course, excessive absences are defined as missing more than 3 classes, regardless of the reason.**
3. **Any student who does not attend all class meetings prior to the Census period (add/drop deadline) will be dropped from the course.**
4. **Attending class is defined as a student who is in their seat, ready for class to begin, at the start of the class meeting. Though I provide a 15 minute grace period, three 15 minute late arrivals will be considered an absence.**
5. Students who remain enrolled in a class beyond the published withdrawal deadline, as stated in the published *Class Schedule*, will receive an evaluative letter grade in the class.

Special Notes for General Microbiology

The study of microbiology requires even the beginning student to learn and put into practice a series of difficult techniques and concepts. As a staff, we will constantly be evaluating your grasp of these fundamentals; your ability to follow both written and verbal directions; and your observational and analytical skills. It is estimated that you will, on average, spend 3-5 hours outside of class for every hour the class is scheduled.

I am aware that every student enrolled in this course has done so to advance toward a specific career goal, and I am aware that low grades may prohibit your advancement into your chosen field. As health care professionals, you will be expected to provide safe and appropriate care to your patients. I take my part in preparing you to be that responsible person seriously. As such, grades are assigned solely based on your performance in this class. **If you need an A or B grade, make sure you earn it. There will be no extra credit, alternative assignments or special circumstances made to raise grades.**

Special Announcements

There are many Rights and Responsibilities afforded to students at San Diego Miramar College. If you are unaware of these, it is your responsibility to make yourself knowledgeable. This syllabus is not intended to be all-inclusive in its discussion of these areas of the academic relationship between student, faculty & staff, and the college. Behavior construed as harmful/disruptive to the learning environment of this classroom will not be tolerated. Situations will be dealt with according to the policies outlined in the District Procedures. Please note that this can include removal from the class and suspension from the San Diego Community College District.

Any cheating or plagiarism for any assignment or examination will result in a grade of zero for the assignment (make-up assignments will not be accepted) and may result in a lowering of your course grade by one full letter grade. In addition, the use of unauthorized materials (including cell phones or other electronic devices) during exams or quizzes is strictly prohibited and is considered cheating. Further disciplinary action may be taken if it is deemed necessary by your instructor, including the reporting of cheating and/or plagiarism to the Dean of Student Affairs. For further information, you may refer to the School District's policies on Honest Academic Conduct, contained in District Procedures, section 3100.

Exams, quizzes and assignments are timed to allow for both lecture and laboratory components to be completed during the allotted class hours. Unless otherwise noted in this syllabus, any assignment that is not turned in at/before its deadline will not be graded and will receive an automatic grade of zero.

Safety

The techniques practiced in this course are very similar to those you will encounter in the clinical setting. They are designed to help you develop the confidence, dexterity, and understanding to apply proper sterile technique both in this lab and in your career. Your work will be observed and evaluated according to 1) the appropriate use and mastery of these techniques and 2) your ability to work independently. Any student displaying careless, hazardous, or faulty techniques will be warned and directed to improve. If there is no improvement, steps will be taken to initiate a drop.

Although several Laboratory Exercises in this course require you to work in groups, you are responsible for understanding all of the experiments done in class. Additionally, you are expected to complete your own lab reports and unknown assignments.

Information concerning safe laboratory practices can be found in your Lab Manual. This will be discussed in detail during class.

Assignments & Student Evaluation

Exam Make ups

Make up exams and/or quizzes are not offered for the lecture portion of this course, regardless of circumstance. As an alternative, you may choose to take the optional cumulative lecture exam. If the score on this cumulative exam is higher than a previous lecture exam or quiz score, you may choose to replace that score with the cumulative exam score. Your score on this exam can only take the place of any ONE of your previous lecture exam/quiz grades (including a missed exam). **Laboratory midterm exams make ups are allowed ONLY** with a document attesting to the emergent nature of the student's absence (i.e., an emergency room visit or a police report). This does not include visits to the doctor for treatment of non-emergent illnesses, is subject to the sole discretion of the instructor and in any case will not include the practical portions of the missed exam. There are no make ups for laboratory quizzes.

Late Assignments

Late assignments will receive a 10% deduction in points for each day (including non-class days) they are late. Electronic copies of assignments turned in outside of class must be emailed as a PDF FILE. Unless otherwise noted, assignments are due by midnight.

Lecture & Laboratory: Exams

Exams are based on the units in the schedule found at the end of the syllabus and are not cumulative. As in many courses, however, concepts build on each other and so exams may include references to relevant information from past units.

Lecture: Microbial Diversity Presentations & Diversity Quiz

You will be required to present a PowerPoint mini-lecture to the class. This presentation will cover a specific section of the microbial community and will be chosen from a list provided by your instructor. More information will be given to you as this assignment draws near. Your mastery of the material covered during these diversity presentations will be evaluated as part of the Diversity Quiz.

Lecture: Case Studies of Microbial Diseases & Case Study Quiz

You will work independently using a technique called "differential diagnosis" on a series of Case Studies which will present a patient's symptoms and various laboratory test results. More information will be given to you as this assignment draws near. Your mastery of the material covered during the case studies will be evaluated using the Case Study Quiz.

Laboratory: Quizzes

You will be given short quizzes during the first 5 minutes of lab. These quizzes will test your general knowledge of the laboratory activity performed during previous lab sessions as well as the introductory/methodology information for that day's lab experiments. If you are late or you miss lab, you will not be allowed to make up these assignments. You may use your Laboratory Notebook (discussed below) during these quizzes, but you may not use the printed Lab Exercises nor any Lab Manual.

Laboratory: Notebook

You will be required to maintain a laboratory notebook throughout the semester. You should use this notebook to keep records of all of your experiments and as incentive, you will be allowed to use this laboratory notebook during your timed laboratory quizzes. Though a sample lab entry is available in your Lab Manual, you are welcome to maintain this lab notebook with any format or structure you like. This lab notebook can be used during your Lab Quizzes, but will not be graded otherwise. NOTE: with the exception of data tables, figures and diagrams **there is to be absolutely no photocopying of the text from your Lab Manual into your lab notebook.** If you use unsuitable photocopied information during your lab quiz, your quiz will be given a score of zero.

Laboratory: Technique & Cleanliness Points

Lab technique points are based on good, safe lab practices, being a good "lab citizen" and preparation for lab and clean up. Proper disposal of microbes and clean-up are emphasized. These points also include maintenance of your equipment and supplies as well as the timely completion of laboratory exercises.

Laboratory: Unknown Reports

More information will be given to you as these assignments draw near. You will be required to turn in one Minor Unknown, a set of SSE (Streptococcal/Staphylococcal/Enteric) Unknowns and two Major Unknowns.

Grading

General Microbiology is a 5 total unit course, 3 units of work are derived from lecture and 2 units from lab. Grades are based on a straight percentage scale, there is no curve or extra credit given. As such, A= $\geq 90\%$; B= 89.99-80%; C= 79.99-70%; D= 69.99-60%; and F= $< 60\%$.

Your individual assignment and/or course grade will be affected by the timely completion of all assignments including exams, quizzes, written assignments and the online submission of data.

Please keep all of your graded assignments until the semester is complete and your official grades have been submitted. Additionally, when you submit data online, please print out and save the Form Confirmation your web browser is automatically redirected to for proof of data submission.

| Assignment | Total Points |
|---|-----------------|
| Exams | |
| Lecture Midterms I & II (200 pts each) | 400 pts |
| Lab Exams I | 45 points |
| Lab Exam II | 45 pts |
| Lab Exam III | 40 pts |
| Written Assignments | |
| Minor Unknown | 25 pts |
| Streptococcal/Staphylococcal/Enteric Unknowns | 45 pts |
| Major Unknown Reports (30 points each) | 60 pts |
| Quizzes | |
| Laboratory Quizzes (23 @ 5 points each) | 115 pts |
| Lecture Diversity Quiz | 75 pts |
| Lecture Diversity Presentation Quiz | 25 pts |
| Case Study Quiz | 50 pts |
| Laboratory Technique & Cleanliness | 25 pts |
| Diversity Presentation | 50 pts |
| Course Total | 1000 pts |

Conflict Resolution

If you feel that you have valid grounds to challenge a grade, you must first attempt to resolve your problem informally with your instructor. If the grade challenge cannot be resolved, you must file a petition for grade challenge with the Dean of Business, Math & Science who will work with the Department Chair to help resolve the issue. If resolution does not occur, your next step is to file an appeal with the Vice President of Instruction. The Grade Challenge Procedure can be found in the college catalogue.

Letters of Recommendation

I reserve the right to deny student requests for letters of recommendation and only requests from students who have earned an 87% in this course will be considered. If you wish to request a letter of recommendation, you must email me a request when final course grades have been calculated, and prior to the start of the next semester. I will write the letter and keep an electronic copy on file until you need it.

PLEASE NOTE: It is your responsibility to read and understand this Course Syllabus in its entirety. Ignorance of the stated policies and/or College policies is not an excuse for failing to adhere to the guidelines outlined therein.

Tentative Course Schedule

| Date | Week | LECTURE TOPIC & TORTORA CHAPTER # | LAB EXERCISE (LE) NUMBER |
|------|------|---|--|
| 1/29 | 1 | Course Introduction & Description Introduction to Microbiology (1) Microscopy (3) | Microbiological Safety & Guidance LE 1: The Microscope |
| 1/31 | | History of Microbiology (1) The Prokaryotic Cell (4) Laboratory Culture & Aseptic Technique (3) | LE 2: Aseptic Technique LE 3: Microbial Ubiquity |
| 2/5 | 2 | The Prokaryotic Cell (4) Microscopy & Staining (3) | LE 4: The Smear and Simple Staining LE 5: Pure Culture Techniques |
| 2/7 | | Microbial Metabolism (5) | LE 6: The Gram Stain LE 7: Microbial Motility Add/Drop Deadline: February 8 |
| 2/12 | 3 | Microbial Metabolism (5) | Practice Gram staining & Streak Plate for Isolation |
| 2/14 | | Microbial Growth (6) | LE 8: Differential & Special Staining |
| 2/19 | 4 | Microbial Growth (6) The Control of Microbial Growth (7) | The Control of Microbial Growth (7) |
| 2/21 | | Microbial Genetics (8) | LE 9: Using the Spectrophotometer and Micropipetter |
| 2/26 | 5 | Microbial Genetics (8) Biotechnology and Recombinant DNA (9) | LAB EXAM I (LE 1-8) |
| 2/28 | | Biotechnology and Recombinant DNA (9) Mutations (8) | LE10: A Population Growth Study of Bacteria |
| 3/5 | 6 | Assignment of Diversity Presentation Topics Classification of Microorganisms (10) The Prokaryotes: Bacteria & Archaea (11) | LE 11: Physical Growth Requirements |
| 3/7 | | MIDTERM EXAM I at 8:00 (1-9) | LE 12: Physical Growth Control |
| 3/12 | 7 | The Eukaryotes: Fungi, Protists, Protozoans & Helminths (12) Viruses, Viroids and Prions (13) | LE 13: Chemical Growth Control LE 15: DNA Fingerprinting- Polymerase Chain Reaction |
| 3/14 | | Microbial Diversity (27 & 28) | LE 16: RFLP & Agarose Gel Electrophoresis (Appendix II: Making RFLPs) |
| 3/19 | 8 | Principles of Disease & Epidemiology (14) Student Diversity Presentations due | LE 18: Data Analysis (Labs 10-13, 16) LE 20: Examining Water Quality: Most Probable Number & Colilert® Test Kit Lab |
| 3/21 | | DIVERSITY QUIZ at 8:00 (10-13, 27-28) | LE 14: pAra Transformation (Appendix I: Making a Recombinant Plasmid) LE 17: Therapeutic Phage Typing of <i>E. coli</i> |
| 3/26 | 9 | Spring Break | Spring Break |
| 3/28 | | Spring Break | Spring Break |

| Date | Week | LECTURE TOPIC & TORTORA CHAPTER # | LAB EXERCISE (LE) NUMBER |
|------|------|--|--|
| 4/2 | 10 | Student Diversity Presentations | LE 19: Minor Unknowns: Day 1, Morphological & Cultural Characteristics |
| 4/4 | | Principles of Disease & Epidemiology (14) Nonspecific Defenses of the Host (16) | Minor Unknown: Day 2: Respiration, Storage Molecule, Protein |
| 4/9 | 11 | DIVERSITY PRESENTATION QUIZ Nonspecific Defenses of the Host (16) Specific Defenses: The Immune Response (17) | Minor Unknown Day 3: Fermentative, IMViC & Multi-Test Media LE 21: Simulating an Influenza Epidemic |
| 4/11 | | Specific Defenses: The Immune Response (17) | Minor Unknown Due Date 1 LE 22: SSE Unknowns: Day 1 Withdrawal Deadline: April 12 |
| 4/16 | 12 | Specific Defenses: The Immune Response (17) | LAB EXAM II (LE 9–18, 20) SSE Unknowns: Day 2 |
| 4/18 | | Practical Applications of Immunology (18) | Minor Unknown Due Date 2 LE 24: ELISA: Simulated HIV Diagnosis |
| 4/23 | 13 | Microbial Mechanisms of Pathogenicity (15) | SSE Unknowns: Day 3 |
| 4/25 | | Antimicrobial Drugs (20) | Complete SSE Unknowns LE 23: The Major Unknown |
| 4/30 | 14 | Disorders Associated with the Immune System (19) | Major Unknown |
| 5/2 | | MIDTERM EXAM II (14–20) | SSE Unknowns Due Major Unknown |
| 5/7 | 15 | Case Study Introduction | Major Unknown |
| 5/9 | | Case Studies | Major Unknown |
| 5/14 | 16 | Case Studies | Major Unknown- LAST DAY TO INOCULATE MEDIA Clean out personal boxes, community supplies |
| 5/16 | | Case Studies | Complete Major Unknowns Discard ALL media & inoculations |
| 5/21 | | CASE STUDY QUIZ (CS 1–9) | OPTIONAL CUMULATIVE LECTURE EXAM Major Unknowns Due |
| 5/23 | | No Lecture | LAB EXAM III (LE 19, 21–24) Clean up Personal & Community Boxes |

* Dates and assignments may be changed at the discretion of the instructor.