

BIOLOGY 211L (formerly Bio 210) Syllabus

Spring 2010

Class Web Site: <http://www.sci.sdsu.edu/classes/biology/bio210/lab/demers/>

PREREQUISITES: Will be enforced. Completion of, or Concurrent Enrollment in Bio 211. Completed Bio 203 and 203L (Formerly 201A) ; or Bio 100 and Chem 100 or Chem 102 or Chem 130.

SAFETY: The laboratory exercises will use chemicals and living microorganisms, both of which could be harmful or infectious if handled improperly. You will be taught how to work in the laboratory properly. **Please follow the instructions that the laboratory instructors provide.** Also, if you have an allergy to fungi or certain chemicals, if you are pregnant, or if you have a compromised immune system, please contact the professor.

LAB ASSIGNMENTS: The lab manual is to be used as a workbook and students are required to **complete all of the laboratory exercises** in the lab manual. This includes the "Evaluation of Results" section (Purpose, Data, Conclusions and Discussions), and the questions, as well as the **Case Histories** in the appendix. The student should use lecture notes, lab notes, the textbook, lab manual and other texts to find the answers to the questions and to work on the Case Histories. Additional questions will be added as needed. The lab quizzes will test your knowledge of all of the material. The **manual** will be checked periodically by the TA. Pop quizzes will be given throughout the semester to assure that students are coming to class prepared. Each student will be required to give an **oral presentation (10-15 minutes, with PowerPoint) on a topic in microbiology, to be decided by the student and TA. A general outline of the presentation must be handed in before the day of the oral, and a detailed outline is due on the day of the presentation.** Students are required to **write two lab reports, following scientific format, on unknown microorganisms. Students are required to turn in both a hard copy and an electronic copy of both lab reports and both outlines for the orals.** If plagiarism is discovered, students are liable to be expelled, suspended or placed on probation, according to Section 41301 of the California Code of Regulations.

EXAMINATIONS: There will be five lab quizzes, worth 40 points each, spread over the 15 week semester. They might include practical lab questions. These will be given during the laboratory portion of the course to individual sections, on the dates listed in the syllabus. The lowest quiz grade will be discarded and **there will be no makeup's.** A missed quiz will count as the lowest grade to be dropped. Please do not discuss the quiz material with other sections of the class, this will only lower your grade. **There will not be any extra credit given.** See grading below.
There will be no changes to an assignment 's grade later than two periods after it is returned.

Cheating, copying or Plagiarism will not be tolerated. *Plagiarism is formal work publicly misrepresented as original; it is any activity wherein one person knowingly, directly, and for lucre, status, recognition, or any public gain resorts to the published or unpublished work of another in order to represent it as one 's own* (Lindey, Alexander. Plagiarism and Originality, 1952).

Students caught cheating, copying or plagiarizing will receive a zero for the assignment or receive an F for the course. This will be dealt with on a case by case basis.

COURSE OBJECTIVES:

(also see the Lab Learning Objectives on class web site for individual lab exercises 1-30)

Upon Successful completion of this course students will be able to:

1. Demonstrate a working knowledge of all safety equipment and procedures in the microbiology laboratory.
2. Properly use a compound microscope to observe bacteria, fungi, protozoa and algae.
3. Perform Aseptic technique as it is used in a microbiology laboratory.
4. Properly use stains such as the Gram stain for identification of bacteria.
5. Demonstrate proper hand washing.
6. Distinguish between select bacterial groups based on physiological and biochemical characteristics.
7. Identify microorganisms in: drinking water, waste water and sewage treatment, production and spoilage of foods, human disease, the production of antibiotics.
8. Recognize the importance of microbes in nature.
9. Recognize the importance of microorganisms to humans, both beneficial and in disease.
10. Use and apply technical skills necessary for the study of immunology in the laboratory.

GRADING: BASED ON A TOTAL OF 300 POINTS: (THERE IS NO EXTRA CREDIT)

160	Lab quizzes; 5 (40 pt. each), drop one	20	Performance evaluation
5	Unknown take home	20	Lab Manual
15	Lab Report # 1 (First Unknown)	15	Case Histories: (5 x 3 pt each)
30	Lab Report # 2 (Second Unknown)	15	Pop quizzes: (3 X 5 pt each)
20	Oral report		

BIO 211 GRADING BREAKDOWN

Grade	%	Points
A	93 - 100	279-300
A-	90 - 92.9	270-278.9
B+	87 - 89.9	261-269.9
B	83 - 86.9	249-260.0
B-	80 - 82.9	240-248.9
C+	77 - 79.9	231-239.9
C	73 - 76.9	219-230.9
C-	70 - 72.9	210-218.9
D	60 - 69.9	180-209.9
F	< 60	<180

ATTENDANCE: Laboratory attendance is mandatory. If you are absent or late, or leave before the assigned work is completed, you are letting your lab partners down and compromising your own grade, by losing performance evaluation points. . You **WILL NOT PASS** the course if you miss more than 2 periods without a valid medical excuse. Arriving late (more than 15 minutes) consistently (more than 2) or leaving early before the lab work is completed will be counted as an unexcused absence.

REPORTS: take home quizzes, written reports, etc. All written reports are due on the dates listed in the syllabus. The oral reports are due on the date decided between you and your TA. Points will be lost for handing in late work. **The penalty for late work will be 10% per lab day.**

LAB PERFORMANCE: This grade is determined by attendance, ability to master the technical skills, preparation before coming to class, professionalism, your ability to accept responsibility and work well with your partners, and your attitude and cooperation in class. Lab checks (pop quizzes) will be instituted to enforce your preparation before lab.

FINAL GRADES: An independent letter grade will be assigned for both lab (Bio 211L) and lecture (Bio 211). Proof of payment of lab fees are required for a final grade. **Final grades cannot be changed after they are submitted to the registrar.**

LABORATORY SCHEDULE (Tentative)

BIO 211L (formerly Bio 210) Spring 2010

Prepared by Marlene DeMers

Web Site: <http://www.sci.sdsu.edu/classes/biology/bio210/lab/demers/>

You are required to read the Assigned Readings listed below in your lab manual and textbook, before coming to each class. Laboratory Manuals (required): *Fundamentals of Microbiology*, 7th edition revised, DeMers *A photographic Atlas for the Microbiology Laboratory*; 3rd edition; Leboffe & Pierce

Lecture Text (required): Tortora, et al; *Microbiology An Introduction*, Tenth Edition

Please note exercise numbers and Appendices refer to the Laboratory Manual by DeMers. Use the Atlas by Leboffe to find references to the lab exercises. Use the Tortora index (and other textbooks) to find references to the lab exercises.

Bio 211L LAB SECTION MEETING TIMES [all labs meet in NLS 416]

{Last day to add 2/4 by 6 PM, Last day to drop 2/2 by 6PM}

Bio 211 LECTURE (20347) (GMCS 333)	Friday 1100 - 1250
SECTION 1 (20348)	MW 0900 - 1140
SECTION 2 (20349)	MW 1200 - 1440
SECTION 3 (20350)	MW 1500 - 1740
SECTION 4 (20351)	MW 1800 - 2040
SECTION 5 (20352)	TTH 0800 - 1040
SECTION 6 (20353)	TTH 1100 - 1340
SECTION 7 (20354)	TTH 1400 - 1640
SECTION 8 (20355)	TTH 1700 - 1940

Note: Due to the current CSU Budget Crisis, Faculty and Staff must take two Furlough days off per month without pay. The Prep Room will be closed on the Furlough dates that are listed below.

TENTATIVE

READINGS:

LAB # DATE

EXERCISE

Lab Manual

LAB #	DATE	EXERCISE	Lab Manual
1	1/20, 21 W, Th	First Day of classes: Labs begin: Crash Lists, Introduction, Laboratory description, Overview of course (Includes Microbiology oral topics discussion); Necessary supplies, Lab Safety. Review of calculations	Handouts Safety DVD &; vi-ix Handout
2	1/25, 26 M, T	Check in (keys, lockers & drawers) for enrolled students and crashers with add codes Enrollment continued, add codes, etc. Digital Video: Lab Safety continued 1: Brightfield microscopy (prepared slides) Troubleshooting the microscope Digital Video (lab manual): Using the Microscope 2: Other Microscopes; (darkfield, phase) 3: Observing Protozoa, Hay Infusion, Cyanobacteria 4: Observing Yeast (wet mounts only)	Add codes given out after Attendance DVD & Safety; vi-ix Ex. 1 Microscope DVD Appendix A DVD Ex. 2 Ex. 3 Ex. 4
3	1/27, 28 W, Th	4: Observing Fungi and Yeast prepared slides & plates Introduction to Case Histories (practice with #1)	Ex. 4 Appendix N: Case History # 1
4	2/1, 2 M, T Drop deadline 2/2 6PM	4, con't.: Fungi con't. (if necessary) 5: Observing Bacteria; Gallery of microorganisms; cell shape & arrangement 6: Aseptic Technique (inoculations) Case History # 6 Due	Ex. 4, con't Ex. 5 Ex. 6 (DVD) Web site / Blackboard
5	2/3, 4 W, Th Add by 2/4 6PM Fri, 2/5 Furlough	6: Aseptic Technique (smears from inoculations) 7: Smear preparation 8: Simple staining 11: Culture media preparation Note: Fri, 2/5 Furlough Preproom Closed	Ex. 6, con't. Ex. 7 (DVD) Ex. 8 (DVD) Ex. 11, Appendix L

6	2/8, 9 M, T	QUIZ # 1 (Exercises; 1,2,3,4,5,6,7,8) 9: The Gram Stain (start) Appendix B: Troubleshooting the Gram Stain 11, con't: Culture media preparation con't	Ex. 9 Appendix B Ex. 11, con't
7	2/10, 11 W, Th	9, con't: Gram staining, con't. 10: Miscellaneous staining: Acid-Fast staining, Capsule 12: Streak Plate Technique (day 1) 13: Specimen transport (collection) 14: Hand Washing	Ex. 9, con't. Ex. 10 Ex. 12 Ex. 13. Ex. 14
8	2/15, 16 M, T	10: Miscellaneous staining, continued, Endospore 12 con't: Culture techniques con't. (day 2) 13, con't: Specimen Transport (inoculation) 14, con't: Hand Washing con't. 15: Bacterial plate counts Appendix C: Dilutions	Ex. 10, con't Ex. 12, con't Ex. 13, con't Ex. 14, con't Ex. 15 App. C
9	2/17, 18 W, Th Fri, 2/19 Furlough	13, con't: Specimen transport con't. (results) 15, con't. Bacterial counts con't. (results) Appendix C: Dilution 's 16: Bacterial Growth Characteristics: Osmotic Pressure, Oxygen, Pigment production, pH, Temperature (A-E) (Day 1: Inoculations) 24: Unknown #1 – (day 1) (streak plates) Note: Fri, 2/19 Furlough Preproom Closed	Ex. 13, con't Ex. 15, con't App. C Ex. 16 A - E Ex. 24, App. D - I
10	2/22, 23 M, T	12, con't: Culture techniques, con't. (day 4) 16, con't: Bacterial Growth Characteristics con't. (A-E) (Results and Interpretations) 24: Unk #1, con't. – (day 2) (Gram stain & inoculation on to TSA slant only) 18: Staphylococci (day 1) 24: Take home unknown quiz available on line	Ex. 12, con't Ex. 16, con't. Ex. 24, con't Ex. 18 Ex. 24, App. D - I
11	2/24, 25 W, Th	QUIZ # 2 (Exercises; 9,10,11,12,13,14,15,16) 17: Selected Physiological and Biochemical Tests Introduction to Gram Negative Rods, (B-E) 24: Unk # 1, con't. – (day 3) Inoculate C, D, E 18, con't: Staphylococci, con't. (day 2)	Ex. 17 A - E 24, con't Ex. 18,con't
12	3/1, 2 M, T	17, B-E con't: Physiological and Biochemical tests 17, F-K start: Physiological and Biochemical tests 24, Unk # 1, con't. – (day 4) Inoculate F, G, H, I, J, K 18, con't: Staphylococci, con't. (day 3) Case History # 2 Due	Ex. 17, con't Ex. 17 F-K 24, con't Ex. 18,con't Appendix N
13	3/3, 4 W, Th	17, con't: Physiological and Biochemical tests, con't. B-K 18, con't: Staphylococci, con't. (day 4) 21: Antiseptics & Disinfectants 22: Antibiotic sensitivity testing 24: Unk #1, con't. – (day 5)(results) Unknown take home quiz Due	Ex. 17, con't Ex. 18, con't Ex. 21 Ex. 22 Ex. 24, con't

14	3/8, 9 M, T	19: Streptococci (day 1)(throat cultures) 21, con't: Antiseptics & Disinfectants, day 2 22, con't: Antibiotics day 2 23: Isolation of Antibiotic Resistant Mutants (day 1) 24, con't: Unknown #1, con't. How to write the report 30: Isolation of antibiotic producer from soil; collection	Ex. 19 Ex. 21, con't Ex. 22, con't Ex. 23 Ex. 24, con't Ex. 30
15	3/10, 11 W, Th	19: Streptococci, con't. (day 2) 23: Isolation of Antibiotic Resistant Mutants (day 2) 30: Isolation of antibiotic producer from soil, day 1 Choice of Microbiology oral topic & date DUE	Ex. 19, con't Ex. 23, con't Ex. 30, con't
16	3/15, 16 M, T	QUIZ # 3 (Exercises; 16,17,18,21,21,22,24) 19, con't: Streptococci, con't. (day 3) Brief Outline of Oral Due	Ex. 19, con't
17	3/17, 18 W, Th	19, con't: Streptococci, con't. (day 4) 20: Urine cultures, day 1 24: BEGIN UNKNOWN #2 (day 1)(streak plates) Case History # 3 Due	Ex. 19, con't Ex. 20
18	3/22, 23 M, T	20, con't: Urine cultures, day 2 24, con't: Unknown #2, con't (day 2)(Gram stains) 30,con't: Isolation of antibiotic producer from soil, day 2 Lab Report # 1 Due (unknown #1)	Ex. 20, con't Ex. 30, con't Appendix N
19	3/24, 25 W, Th	24, con't: Unknown #2, continued (day 3) 30,con't: Isolation of antibiotic producer from soil, day 3 Case History # 5 Due	Ex. 24, con't Ex. 30, con't Appendix N
	3/29 - 4/2	No Classes, Laboratory Closed Happy Spring Break!	
20	4/5, 6 M, T	24, con't: Unknown #2, continued (day 4) 30,con't: Isolation of antibiotic producer from soil, day 4 Begin Oral presentations NOTE: Detailed Outlines Due on the day of oral	Ex. 24, App. D - I Ex. 30, con't
21	4/7, 8 W, Th	24, con't: Unknown #2, continued (day 5) 26: Water Microbiology - Presumptive test (day 1), Membrane filter method demonstration 28: Microbiology of Wine Making (day 1) Oral presentations continued	Ex. 24, App. D - I Ex. 26 Ex. 28
22	4/12, 13 M, T	QUIZ # 4 (Exercises; 19, 20, 23, 24, 30) 24, con't: Unknown #2, continued (day 6) 25: Immunology: Agglutinations: Slide & Tube agglutinations & demonstrations 26, con't: Water Microbio., con't., Confirmed test (day 2) Oral presentations continued	Ex. 24, App. D - I Ex. 25 Ex. 26, con't

23	4/14, 15 W, Th	25: Immunology: Agglutinations continued 26, con't: Water Microbiology (day 3) 27: Spoilage of meat (day 1) (inoculations) Case History # 4 Due Oral presentations continued	Ex. 25, con't Ex. 26, con't Ex. 27 Appendix N
24	4/19, 20 M, T	26, con't: Water Microbiology (day 4) 27, con't: Spoilage of Meat, con't. (day 2) 29: Microbiology of Milk(day 1): Standard plate count of milk, Reductase test demonstration, Fermented milk products (yogurt) Start Cleanup Oral presentations continued	Ex. 26, con't Ex. 27, con't Ex. 29
25	4/21, 22 W, Th	28, con 't: Microbiology of Wine Making, con't. (day 2) 29, con't.: Fermented Milk Products (day 2) (plate counts) (yogurt tasting) Finish Cleanup before tasting Oral presentations continued	Ex. 28, con't Ex. 29, con't
26	4/26, 27 M, T	Continue Cleanup Oral presentations continued Unknown #2 Written Lab Report Due	
27	4/28, 29 W, Th	Quiz # 5 (Exercises; 24,25,26,27,28,29) Finish Cleanup Oral presentations continued	
28	5/3, 4 M, T	Final Cleanup before check out Lab Coats Wrapped and Autoclaved <hr/> Lab Check Out <hr/> KEYS DUE! ** Oral presentations continued	
29	5/5, 6 W, Th	Oral presentations continued	
30	5/10, 11 M, T	LAST DAY OF CLASSES Oral presentations continued (if necessary)	
		Bio 211 Lecture Final: Monday, May 17 0800-1000	

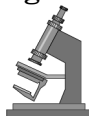
**** You must follow the check out procedure and turn in your lab keys BEFORE Grades are due, Or you will receive an Incomplete!**

PLEASE NOTE: Lab Coats may be picked up UNTIL the end of finals week ONLY!

After finals week, they are considered donated,

Thank you! Marlene & Tom, 4th floor prep room

Have a great summer break!



Spring 2010