

BISC 333 – LABORATORY INFORMATION – FALL 2014

Lab Instructors: Graduate teaching assistants Jason Payne and Satish Adhikari.

Course Instructor: Dr. Patrick Curtis (pdcurtis@olemiss.edu)

Lab location: Shoemaker 523

Lab materials: The course lab manual (The Basics of General Microbiology Laboratory Manual, Colin R. Jackson, 2009) is required for the lab portion of Bisc 333. Laboratory procedures will not be provided in any other format. If neither you nor your lab partner has the lab manual with you in lab, you will not be allowed to do lab activities. We provide all other items that are essential for lab activities.

Lab grades: The lab counts the same amount towards your final course grade as one of the BISC 333 lecture exams (100 points). 50 of these points will be available as lab quizzes that are taken during each lab; 50 will be available as a lab report based on a number of lab exercises that you will perform over the course of the semester.

Lab quizzes: Each lab, there will be a 5-pt lab quiz (11 quizzes total). Your lowest lab quiz grade is dropped and the highest ten quizzes count towards your final grade. Quizzes can cover material from the previous week's lab or that week's lab, but all quiz questions will be taken from the review questions after the exercises in the lab manual. Lab quizzes count for 50 points towards your Bisc 333 grade.

Lab report: You will be assigned an unknown bacterium to work with during the semester. As you perform lab exercises you will determine some of this organism's morphological, biochemical, and metabolic characteristics. Based on your results, you will attempt to identify your unknown bacterium from a list of possible bacteria provided to you. You are required to turn in a report on this bacterium, including the results of all of the tests performed, what they mean, and the identity of your bacterium. The report is worth 50 points of your Bisc 333 grade.

Lab attendance: There are no make-up lab periods - if you miss a lab, you miss the opportunity to learn that material, and the ability to conduct any tests on your unknown bacterium that were scheduled for that lab period. Because of class seating limitations you may only attend the lab section that you are enrolled for unless your instructor has authorized it ahead of time.

Lab behavior and safety: A microbiology lab is a fairly dangerous place to be. As well as the usual danger from chemicals and glassware, you will also be working with live microorganisms. Many of the unknown bacteria that you will be working with are capable of making you or others sick. These can include *Staphylococcus aureus* ("staph"), *Escherichia coli* ("E. coli"), and *Pseudomonas aeruginosa*, all of which are regarded as opportunistic pathogens. You will be trained in the correct methods to work with these bacteria, and will be informed of lab safety rules and policies. If your instructor believes that you are violating these policies you will be penalized in terms of loss of lab points. Continued violation of safety rules will result in you being removed from the lab portion of Bisc 333 and you will be assigned a score of 0 for the lab portion of Bisc 333. Safety should always be your main priority when working in the microbiology lab. While this policy may sound strict, consider that it is in place to protect you and others from microbiological hazards.

<u>Week</u>	<u>Quiz</u>	<u>Date</u>	<u>Exercise (lab manual pages)</u>
1		Aug 25/26	No class
2		Sep 1/2	No class – Labor Day
3	1	Sep 8/9	Introduction and lab safety Ex 1: Microorganisms in the environment (p.1-5) Ex 2: Use of the microscope (p.7-12) Ex 3: Wet mount for live microorganisms (p.13-14)
4	2	Sep 15/16	Ex 1: Microorganisms in the environment (complete) Ex 4: Aseptic technique and working with bacterial cultures (p.15-16) Ex 5: Making and heat-fixing a bacterial smear (p.17-20) Ex 6: Simple staining a bacterial smear (p.21-22)
5	3	Sep 22/23	Ex 5: Making and heat-fixing a bacterial smear (p.17-20) Ex 7: Transferring bacterial cultures and making a streak plate (p.23-26) Ex 8: The Gram stain (p.27-30)
6	4	Sep 29/30	Ex 7: Transferring bacterial cultures and making a streak plate (complete) Ex 10: Assessing bacterial motility using motility agar deeps (p.35-38) Ex 11: General, selective, and differential growth media (p.39-43) Ex 12: The microbial degradation of polymers (p.45-48)
7	5	Oct 6/7	Ex 10: Assessing bacterial motility using motility agar deeps (complete) Ex 11: General, selective, and differential growth media (complete) Ex 12: The microbial degradation of polymers (complete)
8	6	Oct 13/14	Ex 9: The Schaeffer-Fulton spore stain (p.31-34) Ex 13: Testing bacteria for catalase and oxidase activity (p.49-51)
9	7	Oct 20/21	Ex 14: Testing bacteria for their ability to ferment carbohydrates (p.53-56) Ex 15: Testing bacteria for antibiotic sensitivity (p.57-60)
10	8	Oct 27/28	Ex 14: Testing bacteria for their ability to ferment carbohydrates (complete) Ex 15: Testing bacteria for antibiotic sensitivity (complete)
11	9	Nov 3/4	Ex 16: Enumerating the number of bacteria (p.61-66) Ex. 17: Using turbidity to examine a bacterial growth curve (p.67-70) <i>Unknown bacterium reports due in lab</i>
12	10	Nov 10/11	Ex 16: Enumerating the number of bacteria (complete) Ex 18: Routine microbiological testing of water quality (p.71-74)
13	11	Nov 17/18	Ex 18: Routine microbiological testing of water quality (complete)
14		Nov 24/25	No class – Thanksgiving
15		Dec 1/2	No class

BISC 333 Lab Safety Policies (Shoemaker 523)

Note that violation of these policies will result in a reduction in your grade and/or your removal from the lab portion of BISC 333.

ATTIRE AND PROTECTION

Open-toed shoes (sandals), shorts, and/or loose-flowing clothing are allowed but not recommended. For a few weeks of the class we will be working with chemicals that can permanently stain clothing - so I'd recommend wearing older clothes if possible. You are welcome to wear a lab coat or scrubs if you would like (but do not wear scrubs that you also wear in another setting - we will be working with potential pathogens). While you will be trained in the correct way to handle stains, chemicals, and microorganisms, if you are concerned about skin contact you are welcome to bring latex gloves to class (use "powder free" gloves if possible).

FOOD AND DRINK

Food and drink are never allowed in the laboratory. Any food items or trash must be disposed of in hallway trashcans (not those in the lab) before entering the laboratory. This includes bottled water.

WORK AREAS AND LABORATORY BENCHES

All work areas and benches must be kept clean and free of all unnecessary items at all times. Personal items should be kept in areas safe from contamination (e.g. tucked under the benches). At the start of every lab period you should wipe down your lab bench with disinfectant (located on each bench, paper towels are near the sink), and you should repeat this procedure following any lab spills. If any lab spill occurs notify your instructor. At the end of each lab period you must thoroughly disinfect your lab bench.

WASTE DISPOSAL

There are various types of waste disposal containers in the laboratory. Regular trash cans are for paper towels, loose paper and other regular trash. Glassware (slides, culture tubes etc.) that has not been used when working with live microorganisms is disposed of in the broken glass trash container. Any items that have been potentially contaminated by microorganisms (e.g. used agar plates, cultures, swabs) must be disposed of in the red biohazard container (non-glass items such as plates, swabs etc.) or in a biohazard glass waste box designated by your instructor (culture tubes etc.).

HAND WASHING

You are required to wash your hands before leaving the laboratory, and may also wish to do so at other times if you believe that you have contaminated them. It is also recommended that you wash your hands just before coming to class (use the sinks in the restrooms).

FIRE AND OTHER HAZARDS

Many of our lab activities will involve the use of Bunsen burners to sterilize lab materials. When burners are not in use, turn off the gas supply. If you're having trouble getting the burner to light, turn off the gas and ask the instructor for help. If you smell gas, check to see if burners nearby have been left on. Be aware that people around you may be using open flames, and take appropriate precautions. You may wish to tie back long hair, and avoid wearing loose, flowing clothing to minimize the chance of fire.

In the event of a fire in the laboratory, a fire extinguisher is located on the wall near the microscopes (small fires may be extinguished without the extinguisher). In the event of a fire on a person, follow the "drop and roll" rule (drop the person to the ground, and roll them to snuff out the flames). In the event of fire in the building (fire alarm) evacuate the laboratory and use stairs to exit the building.

SPILLS

Notify the instructor of any spills or broken glass. Bacterial spills should be covered with a paper towel and disinfectant for 5 minutes before clean up. Broken glass must carefully be placed in the broken glass waste container.

LABORATORY ACCESS

You are only allowed in the laboratory during class time or if you are accompanied by the course instructor.

GENERAL LAB BEHAVIOR AND CONDUCT

Use common sense when working in the laboratory. Many of the safety procedures that we follow are there to protect you. Think about what you are doing and everything will go fine.

Work with your lab partner or group. Some exercises are designed for pairs; others may be for larger groups. This is to make the work manageable within the scheduled lab time. If you're having problems with a lab partner or group, talk to your instructor about it.

Only students registered for BISC 333 are allowed in the laboratory. If you are not registered you may not attend the lab. Do not bring friends, family, children, or other individuals to the laboratory.

Practical jokes, rowdy behavior, or any other “goofing off” is not allowed in the laboratory, and potentially endangers other students or lab personnel. Show respect and consideration for other students.

No cell phones or other distracting electronic devices are allowed in the laboratory (turn them off and keep them in your pack). There is a clock on the wall for any experiments that need to be timed – don't use the clock on your cell phone. You will be penalized severely if your phone is seen or heard in the laboratory.