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BIOM 251N.00: Microbiology for Health Sciences Laboratory

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BIOM 251 Microbiology for Health Sciences Laboratory

Section 01 – HS 404/405, MW 1-3pm **Section 02** – HS404/405, MW 3-5pm

Section 03 – HS 404 MW 10am – 12pm **Section 04** - HS 405 MW 10am – 12pm

Instructor: Dr. Jim Driver. Email - jim.driver@mso.umt.edu. Phone – 243-4669

Office: ISB 017, Electron Microscopy Lab. Office Hours: 10 – 11am Mondays or by appointment.

Teaching Assistants:

Gabriella Weiss. gabriella.weiss@umconnect.umt.edu

Chris Peterson christopher.peterson@umconnect.umt.edu

Polash Biswas polash.biswas@umconnect.umt.edu

Required items:

1. Bound “composition type” lab notebook and pen. Write all observations in ink.
2. Fine-tipped permanent marker
3. Lab coat – worn when performing work with microorganisms in lab class.

Provided items:

The lab manual will be provided in the lab. It will be handed out in the first lab session.

Learning Outcomes, Course Objectives:

1. To learn lab techniques for the handling and cultivating of microorganisms of interest from the environment or found in or on patients. Students will learn sterile technique for safely handling, cultivating, and observing microorganisms and this may include pathogens. Students will also learn the proper and safe operation of typical laboratory equipment commonly used in a microbiology laboratory.
2. Additionally, students will learn how to characterize and identify unknown microorganisms through the use of typical lab tests. These tests will include identification of physiological and morphological traits including antibiotic resistance specific to the microorganisms provided to the students.

Grades:

A (100-90%) B (89-80%) C (79-70%) D (69-60%) F (<60%) (+/- grading not used)

Lab Notebook. Your Lab Notebook will be collected and graded at various times during the semester.

This will be a journal of everything you do in the laboratory during this class.

It should contain enough information so that another student could **easily** understand the purpose of your experiment, replicate your experiment, and also enough information for that student to understand the results you obtained, positive or negative.

The lab notebook will be written in ink. Mistakes will be crossed out and the correct . All lab books contain everything you did right or wrong.

The lab write-up for each exercise should contain:

An **Introduction** containing an explanation of and the objectives for that lab.

A **Materials** section listing the materials you used in that lab.

The exact **Methods** you used to perform the lab experiment or study.

A **Results** section listing all the data you obtained in a chart, list, or graph

A short **Discussion** stating what you learned from the lab including any problems or negative results that you got and the reasons why they were negative. **Negative results must be included. All scientists learn from their mistakes.**

Questions in the Discussion section of labs will be answered at the end of your write-up. Completeness, not neatness is best. But please make it legible. Include any illustrations that could add to or better illustrate the results.

Each lab write-up will be worth 40 points and the discussion questions will be worth 10 points for each lab. **Total; 8 labs x 50 points = 400 points**

Bacterial isolate paper. This will be a research-paper format report describing the isolation, characterization and identification of your Bacterial Isolate from Lab 6. You will use several of the techniques learned in the first part of the course to isolate in pure culture an unknown organism from a mixed culture provided to the class. You will then characterize it based on use of the previous tests and new tests run during Labs 7 and 8. You will then attempt to identify your isolate using the key on page 29 of the course pack and one other microbiological source of your choice. **Details on the required format for the paper are listed in Lab 6 of the course pack and a handout to be given out in class.** This final paper will be worth **150 points**.

Week 1 **1/19**

1/19– Introduction and overview of course and requirements. Lab safety, tools and techniques.

Week 2 **1/24, 1/26.**

1/24 - Introduction to microscopy. Prepared slides. Wet mounts.

1/26 – Exercise 1. Use of microscope (cont.). Pond Water, Hay Infusion. Environmental Streak Plate.

Week 3 **1/31, 2/2.**

1/31 – Exercise 1 (cont.). Observe unknowns from streak plates, characterize growth of colonies and morphology of microorganisms. Streak microorganisms for isolation. Aseptic Technique.

2/2 – Exercise 2. Simple stain. Gram stain

Hand in Lab Notebooks for grading. They will be handed back at beginning of next lab.

Week 4 **2/7, 2/9.**

2/7 – Exercise 3. Capsule stain. Spore stain.

2/9 – Exercise 4. Catalase/oxidase/starch hydrolysis/blood hemolysis. Exercise 5. Carbohydrate fermentation.

Week 5 **2/14, 2/16.**

2/14 – Exercise 6. Isolation and culture of **Bacterial Isolate** from stock culture.

2/16 – Exercise 6 (continued). Obtain **Bacterial Isolate** as pure culture.

Week 6 **2/21, 2/23.**

2/21 – Presidents day. No lab

2/23 – Characterization of your **Bacterial Isolate** by catalase/oxidase/starch hydrolysis and by carbohydrate fermentation.

Hand in Lab Notebooks for grading. They will be handed back at beginning of next lab.

Week 7 **2/28, 3/2.**

2/24 – Exercise 7- Aerobic and anerobic growth. Exercise 8 - Antibiotic resistance. These 2 exercises will use your Bacterial Isolate

2/26 – Collect final data for **Bacterial Isolate** characterization and identification.

Week 8 **3/7, 3/9**

3/1 – Lab Wrap up day. Finish any missing experiments and collect final data.

3/3 – Bacterial Isolate paper due by 5pm. Lab notebooks handed in for final grading.

Classroom attendance, make-up exams.

It is required that you attend every lab if possible. Disruptive behavior such as talking or disturbing other students by leaving lecture early is not acceptable. If you expect to leave class early, please tell me before class begins. **Make-up labs will be permitted only with compelling and supported reasons.** Make-up labs will be scheduled at the convenience of the instructor. Due to the Coronavirus it may be necessary to adjust the lab schedule to complete the entire course. If you contract Coronavirus or are exposed and must quarantine the instructor and the TA's will make every effort to make sure you have a chance to complete this lab course.

Instructor's policy for accommodating disabilities

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at (406) 243-2243, ode@umontana.edu, or visit www.umt.edu/disability for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish. If you would like to request reasonable accommodations, you are advised to provide your ODE verification letter to your instructor in the first week of class so appropriate arrangements can be made. If you decide after the semester begins to disclose your disability and request accommodations, you should provide documentation, if possible, at least 10 days before the upcoming assessment so I may prepare appropriately. It is the responsibility of students to make sure they understand the types of modifications available to them before assessments.

Instructor's policy on academic honesty and plagiarism.

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code.