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### BIOM 251.04: Microbiology for Health Sciences Laboratory

James D. Driver

*University of Montana - Missoula*

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**BIOM 251 Microbiology for Health Sciences Laboratory**

**Section 01** – HS 404, MW 1-3pm **Section 02** – HS404, 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](mailto:jim.driver@mso.umt.edu). Phone – 243-4669

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

**Teaching Assistants:**

Adam Drobish. Email: [adam.drobish@umconnect.umt.edu](mailto:adam.drobish@umconnect.umt.edu)

Andreas Eleftheriou. Email: [andreas.eleftheriou@umconnect.umt.edu](mailto:andreas.eleftheriou@umconnect.umt.edu)

**Required items:**

1. Course FacPack available at UM Bookstore
2. Bound “composition type” lab notebook and pen. Write all observations in ink.
3. Fine-tipped permanent marker
4. Lab coat – worn when performing lab work in lab class.

**Learning Outcomes, Course Objectives:**

1. To learn lab techniques for the handling and cultivating of microorganisms of interest from the environment. Students will learn sterile technique for 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 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)

**Grades will be based on:**

**Lab Notebook (collected twice 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 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 can be crossed out. The lab write-up for each exercise should contain the objectives for that lab (introduction), materials you used, the methods you used to perform the lab, the results you obtained, and a short discussion of any problems or negative results and the reasons behind them. The questions in the Discussion section of each lab should be answered also at the end of your write-up. Completeness, not neatness is best. But please make it legible. Include any illustrations that could add to the results.

Each lab write-up will be worth 30 points. **Total; 8 labs x 30 points = 240 points**

**Quizzes.** Three short quizzes will be given before class on February 8<sup>th</sup> (Quiz #1), February 15<sup>th</sup> (Quiz #2), and March 1<sup>st</sup> (Quiz#3). Each quiz will be worth 10 points. **(30 points total)**

**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 some 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 some new tests run during Labs 7 and 8. You will then attempt to identify you isolate using the key on page 29 of the course pack and one other source. Details on the required format for the paper are listed in Lab 6 of the course pack. This final paper will be worth **100 points**.

**Week 1 (1/23, 1/25)**

1/23 – Introduction. Overview of course and requirements

1/25 - Lab safety, tools and techniques. Introduction to microscopy.

**Week 2 (1/30, 2/1)**

1/30 – Exercise 1. Use of microscope, streak plates for unknown microorganisms.

2/1 – Exercise 1 (cont.). Observe unknowns from streak plates, characterize growth.

**Week 3 (2/6, 2/8)**

2/6 – Exercise 2. Simple stain. Gram stain

2/8 – Exercise 3. Capsule stain. Spore stain. **Lab Quiz #1 at beginning of lab. Lab Notebooks turned in at end of class.**

**Week 4 (2/13, 2/15)**

2/13 – Exercise 4. Catalase/oxidase/starch hydrolysis. Exercise 5. Carbohydrate fermentation.

2/15 – Exercise 6. Isolation and culture of **Bacterial Isolate** from stock culture.

2/15 – **Lab Quiz #2 at beginning of lab.**

**Week 5. (2/25 only)**

2/20 – Presidents day. No lab.

2/25 – Exercise 6 (continued). Obtain **Bacterial Isolate** as pure culture. **Lab Notebooks turned in at end of class**

**Week 6. (2/27, 3/1)**

2/27 – Exercise 7. Aerobic, micro-aerophilic, and aerobic growth

3/1 – Exercise 8. Antibiotic resistance. **Lab Quiz #3.**

**Week 7. (3/6, 3/8)**

3/6 – Characterization of **Bacterial Isolate** by catalase/oxidase/starch hydrolysis

3/8 – Characterization of **Bacterial Isolate** by carbohydrate fermentation.

3/8 - Finish **Bacterial Isolate** characterization and identification.

**3/13 – Bacterial isolate paper due. Lab notebooks due.**

**Classroom attendance, make-up exams.**

Please attend lab class on a regular basis. 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 exams will be permitted only with compelling and supported reasons.** Make-up exams will be scheduled at the convenience of the instructor.

**Instructor's policy for accommodating disabilities**

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

**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.