MICRB 107

Elementary Microbiology Laboratory

Sample Syllabus

Description

This course seeks to approximate the lab experience a student would have in a physical laboratory setting on a college campus. While it is not possible to provide students with a hands on lab experience for most activities, the essential learning process remains the same. This course will emphasize the learning and problem solving skills acquired in any laboratory course at the expense of tactile handling of materials. In some ways this will be an advantage as this experience will allow for lab activities that would not normally be possible in an introductory course. Students will learn about and "handle" pathogenic organisms and laboratory equipment not normally seen outside of advanced microbiology labs.

Each week students will complete laboratory activities using state of the art simulation technology that is web based so having good access to the internet is necessary. Students will learn microbiology concepts and terminology, engage in various learning activities and take weekly quizzes.

Objectives

By the end of this course, the student will have learned:

- How to handle, culture, observe and classify microbes
- How to quantify, identfy and classify microbes isolated from diverse sources
- How environmental factors influence microbial growth
- How to control/prevent microbial growth
- How to isolate and characterize medically important microbes from the human body

Course Format

Each lab section will administered by a Teaching Assistant (TA). All issues pertaining to the course should be handled directly with your TA. In the highly unlikely event of difficulties, do not hesitate to contact the Course Coordinator. Your TA is responible for grading all quizzes, exams, practicums, etc. However, final letter grades will be assigned by the Coordiator.

All course material will be posted on Canvas. Thus, you are required to print and bring this material to class. At the beginning of each lab, your instructor will provide some background information for each of the exercises. Nevertheless, it will serve you well to read and understand the material posted on Canvas for prior to arriving for lab.

Course Schedule

Week	Topic(s)
1	Syllabus Lab Safety Using a Microscope / Slide Preparation
2	Microbial Smears & Simple Staining Aseptic Transfer of Microbial Cultures Streak Plate The Autoclave Pouring Agar Plates
3	Streak Plate Pour Plate Gram Stain
4	Aseptic Transfer into Broth Cultures Streak for Isolation of Single Colonies Review Session Quiz 1
5	Dilutions Day / Spread Plate Water Testing Enzymes and Nutrition – Casein and Starch Hydrolysis

6	Water Testing Enzymes and Nutrition – Casein and Starch Hydrolysis Carbohydrate Fermentation Assay Water Testing Microbes in the Environment
7	Microbes in the Environment Review: Gram Stain
8	Microbes in the Environment Review Quiz 2
9	Effect of Temperature on Growth of Microbes Effect of Osmotic Pressure on Growth of Microbes
10	Effect of Temperature on Growth of Microbes Effect of pH on Growth of Microbes Effect of Oxygen on Growth of Microbes
11	Oxygen on Growth of Microbes Disinfectants and Antiseptics Antibiotic Sensitivity Test UV Light
12	UV Light Review Session Quiz 3
13	Lytic Effect of Saliva Milk Microbiology – Pasteurization The Streptococci The Streptococci The Staphylococci
14	The Streptococci The Staphylococci Making Yogurt
15	Making Yogurt The Staphylococci Quiz 4

Lab Reports / Questions

Each lab exercise includes a lab report with questions that should be completed and handed in to your TA on the required day (your TA will inform you of this). If you do not hand in your lab reports on the required day, the following penalties will be applied:

Two/thirds of your points will be deducted for each incomplete lab reportYou will be awarded 0 points for each late submission

You must hand this material directly to your instructor.

Quizzes

Several TA-designed quizzes will be administered over the course of the semester. The quizzes will be based on information from the course web site and the introduction given by the TA at the beginning of each class. The quiz will also include content derived from lab procedures and results of experiments

Practicum

This will involve demonstrating your proficiency in a few common laboratory procedures. These include performing the Gram stain, streaking agar plates to isolate single colonies, demonstrating the aseptic transfer of microbial cultures, and problems sets that focus on making dilutions. You will have many opportunities during the lab periods to practice these procedures throughout the semester.

Instructor Evaluation

Your general performance and behavior in class will be evaluated by your TA. This evaluation will be based on the following:

- Arriving on time
- Following safety rules
- Following the directions of the TA
- Keeping your work area clean - points will be deducted each time a TA has to clean up your work space at the end of the period
- Taking care of equipment

- Paying attention to all directions given in the procedures and by the TA - don't make your TA’s constantly repeat themselves by not paying attention

Attendance

Since this is a laboratory class, attendance is mandatory. Due the fact that we will be working with microbial cultures of limited lifespan, we do not have the resources to provide make up labs. Moreover, since many of the exercises involve working in pairs, your absence will negatively impact your partner.

Unexcused absences are not permitted and will result in a loss of 2% of your final grade.

f you have a legitimate reason to miss class (an illness or a death in the family), you will be required to bring supporting documentation and you must inform your TA by email (or the next lab period at the latest) to explain the reason for your absence.

If you miss more than 5 classes for whatever reason, you should consider dropping the course or you will be awarded an F: in a laboratory course, we cannot assign a grade unless you complete the required exercises.

Grading

Assignment	% Score
Quizzes	40%
Lab Reports	30%
Practicums	20%
TA Evaluation	10%
Total	100%

Grading Scale

Letter Grade	% Score
A	90-100%
B	80-89%
C	70-79%
D	60-69%
F	< 59%

The class mean will be the approximate dividing line between B and B- grades.

Academic Integrity

Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment by all members of the University community not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

Accommodating Disabilities

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The Student Disability Resources (SDR) website provides contact information for every Penn State campus . For further information, please visit Student Disability Resources website.

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: See documentation guidelines . If the documentation supports your request for reasonable accommodations, your campus disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early as possible. You must follow this process for every semester that you request accommodations.

Counseling and Psychological Services

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

- Counseling and Psychological Services at University Park (CAPS): 814-863-0395
- Counseling and Psychological Services at Commonwealth Campuses
- Penn State Crisis Line (Available 24 hrs, 7 days a week): 877-229-6400
- Crisis Text Line (Available 24 hrs, 7 days a week): Text LIONS to 741741

Educational Equity / Report Bias

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the Report Bias website.