

# Common Course Outline

BIOL 222

Medical Laboratory Techniques III: Microbiology, Body Fluids,  
Parasitology

4 Credits

## The Community College of Baltimore County

### Description

#### **Medical Laboratory Techniques III: Microbiology, Body Fluids, Parasitology**

Provides preparation for clinical internships (MLTC 240, 241) in microbiology laboratories; includes clinical microbiology, parasitology, and examination of body fluids other than urine.

4 credits: 8 lecture hours and 8 laboratory hours per week.

Prerequisite: BIOL 110, CHEM 107, 108, MATH 135, MLTC 101, BIOL 230 Hepatitis B vaccination and health insurance. (Offered Summer, day only).

### Overall Course Objectives

Upon completion of this course, students will be able to perform routine tests in medical microbiology and to identify common human parasites. Also included in the course is a short unit dealing with testing body fluids ( other than urine) for the presence of cells, bacteria, chemical constituents, and crystals.

#### 1. Safety

Students will understand and practice basic principles of laboratory safety, especially as related to microbiology. They will practice safe handling of specimens and disposal of potentially infectious materials.

Students will be required to purchase disposable lab coats and face shields. Standard Precautions principles will be observed at all times.

#### 2. Microbiology

Students will learn about many different types of bacteriological media, including proper use of each medium, organisms that grow well on each medium, and major components of each medium.

Students will be able to give examples of organisms that are aerobic, anaerobic, capnophilic, and facultatively anaerobic. They will be able to explain the use of candle jars, anaerobic containers, and CO<sub>2</sub> incubator.

Students will be able to identify common human pathogens and normal microflora based on Gram stain results, growth on specific media, and results of biochemical tests. They will be able to list organisms commonly isolated as pathogens and as normal microflora from the following body sites: skin, upper respiratory tract, lower respiratory tract, intestinal tract, urinary tract, and CSF and other fluids. Students will demonstrate their knowledge of microbiological techniques by identifying unknown organisms in a laboratory practical examination.

Students will be able to explain the principles of Kirby-Bauer drug susceptibility testing, including the concepts of MIC and zone of inhibition sizes.

3. Mycology

Students will perform Gram and lactophenol cotton blue stains of fungal organisms. They will be able to discuss principles of other fungal stains such as KOH preps, calcofluor white, and modified acid-fast staining.

Students will be able to list media commonly used for mycology cultures and describe growth characteristics that would allow preliminary identification of organisms.

Students will be able to list organisms commonly isolated as pathogens from the following body sites: respiratory tract, skin, systemic infections.

4. Mycobacteriology

Students will be able to explain the principle of acid-fast staining, both traditional stains and fluorescent stains. They will be able to discuss culture techniques, media, and growth requirements for mycobacterial species. They will be able to explain identification techniques for common species of mycobacteria, with particular attention to *Mycobacterium tuberculosis*.

5. Body Fluids

For each of the following types of body fluid, students will be able to describe routine laboratory analyses done for each type of fluid and list normal values of common lab tests: CSF, pleural fluid, abdominal fluid, amniotic fluid, seminal fluid, and sweat.

6. Parasitology

Students will be able to describe fecal concentration and staining methods used in routine parasitology.

Students will be able to identify common intestinal parasites (see list below) from 2x2 projected slides and commercially prepared microscope slides, based on morphology and staining characteristics.

Students will be able to describe the life cycle of intestinal parasites: intestinal round worms, microfilariae, intestinal tapeworms and flukes, blood flukes, intestinal amoebae, blood and intestinal flagellates.

Students will be able to identify malarial and other sporozoan blood parasites and describe life cycles as related to specimen collection and preparation.

**Major Topics**

Specimen Collection, Transport, Processing  
Antimicrobial Susceptibility Testing  
Staphylococci & Micrococci  
Streptococci  
Neisseria  
Enterobacteriaceae  
Nonfermenters  
Haemophilus  
Miscellaneous Gram-negative Bacilli  
Spirochetes  
Gram-Positive Bacilli

Mycobacteria  
Chlamydia/Mycoplasma/Rickettsia  
Introduction to Virology  
Introduction to Medical Mycology  
Parasitology  
Protozoa  
Nematodes  
Cestodes  
Trematodes

Anaerobes

### **Course Requirements**

Students will be expected to submit:  
lab reports, study sheets, and one research paper

There will be 4 unit examinations, competency testing and a comprehensive final examination.

### **Other Course Information**

Prior to beginning any lab exercises, students are required to present proof of current health insurance and hepatitis B vaccine certificate or waiver.