



**Berkshire Medical Center
School of Medical Laboratory Science**

Course Syllabus

Course No. MEDT 403

Course Title: Clinical Microbiology

Credits: 8 (through affiliated colleges/universities affiliation agreements)

Description:

Introduces the student to the study of bacterial, fungal, parasitic, and viral infections in humans. Discusses transmission, clinical symptoms, specimen collection, and laboratory methods used to identify suspect organisms. Describes the controllable and non-controllable pre-analytical, analytical, and post-analytical variables that can affect testing. Discusses prevention as well as antibiotic susceptibility testing, resistance and therapy. Covers infection control and bioterrorism. The student applies this theory in the clinical lab to isolate and identify pathogens including bacteria, fungi, parasites, and viruses using current technologies, to provide diagnosis and antibiotic sensitivity information, and to correlate test results with disease states.

Primary Didactic Instructor: Lori Moore, M.Ed., MLS(ASCP)

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Additional Instructors/
Clinical Coordinators

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Required text: Textbook of Diagnostic Microbiology, 7th edition, 2022. Mahon and Lehman
Berkshire Medical Center Laboratory Microbiology online procedures

Reference texts:

Medically Important Fungi, 5th edition; Davise H. Larone, 2011

Atlas of Clinically Important Fungi, C. Sciortino,Jr; 2017

Textbook of Medical Mycology, 4th edition; Jagdish Chander, 2018

Medical Parasitology: A Self Instructional Text, 5th ed. Leventhal, Cheadle, 2002

Medical Parasitology, 9th edition; David John and William Petri Jr., 2006

Virology: Principles and Applications, Johh Carter, 2007

Molecular Virology of Human Pathogenic Viruses, 1st ed, W. Shick, 2016

Center for Disease Control (CDC) – parasite and fungal disease index

Lecture: 1 or 2, hour lectures every week - August through March

Additional lectures scheduled as needed

Small modules of parasitology and mycology are included in this course



Laboratory: 7 week clinical rotation in the Microbiology Department.

**See individual student schedule for dates

Course Goals and Objectives

Based on the didactic material and clinical instruction students will score an average of 75% or better on evaluation tools (i.e. exams, unknowns, evaluations, etc) to demonstrate competency of the following objectives.

Upon completion of the Microbiology clinical and didactic course the student will:

1. Develop an entry-level knowledge of Bacteriology, Parasitology, Mycology, and Virology tests used in the clinical laboratory and their importance in the diagnosis and treatment of disease.
2. Discuss the importance of normal flora by body site.
3. Discuss physiological mechanisms that lead to specific microbiology related disorders and disease states.
4. Discuss the current prevention and treatment for pathologic disorders caused by bacteria, fungi, parasites, or viruses.
5. Explain the principles and methods of each test performed in the Microbiology laboratory and the clinical significance.
6. Explain the importance of quality control and apply it in the laboratory setting.
7. Determine appropriate specimen collection, transport, processing, and work-up of patient specimens by following established procedures.
8. Differentiate organisms and cellular material on a Gram smear, stained smear or wet prep including bacteria, fungi, and parasites.
9. Differentiate bacteria and fungi using media, colony morphology, and biochemical testing.
10. Distinguish normal flora from opportunistic or true pathogens growing on various media.
11. Work up bacterial cultures following established procedures that result in successful identification of organisms.
12. Discuss antibiotic sensitivity patterns associated with bacteria identified in the microbiology lab.
13. Discuss the significance of antibiotic resistant organisms to healthcare and patient treatment.
14. Perform manual and automated testing on patient samples that result in valid laboratory results in the Microbiology department.
15. Perform routine maintenance, trouble shooting and quality control on instrumentation in the Microbiology department following established procedures.
16. Evaluate quality control data and determine course of action when quality control falls outside of range.
17. Interpret laboratory data generated from the Microbiology laboratory regarding test accuracy and abnormal findings/values.
18. Evaluate microbiology laboratory data and give possible cause or diagnosis for patient results.
19. Organize workflow for efficiency in lab testing turn-around-times.
20. Describe Infection Control in general terms and discuss the specific components of Berkshire Medical Center's Infection Control Plan and the role of the laboratory.
21. Practice established confidentiality guidelines.
22. Demonstrate professional and ethical conduct with all healthcare professionals, consumers, patients, and other laboratory students.

Basis for Student Evaluation

Lecture evaluation will consist of exams and assigned exercises. The laboratory evaluation will consist of clinical performance, written exams, affective evaluation and identification of bacterial unknowns. The final grade will be composed of 50% lecture and 50% laboratory. See Microbiology grade sheet for specific breakdown.

Microbiology Lectures

August - April

1 An Overview of Bacterial Cell Structure, Physiology, Metabolism, and Genetics

2 Host-Parasite Interaction

3 The Laboratory/Microbiology Role in Infection Control

4 Control of Microorganisms

QUIZ

5 Specimen Collection/Processing

6 Packaging & Shipping

7 Media

8 Microscopic Examination

QUIZ

9 Colony Morphology

10 Immunodiagnosis

QUIZ

11 Biochemicals Part 1

12 Biochemicals Part 2

QUIZ

13 Antimicrobial Agents

14 Antimicrobial Resistance

15 Antimicrobial Susceptibility Testing

QUIZ

16 Staphylococcus Part 1

17 Staphylococcus Part 2

18 Streptococcus Part 1

19 Streptococcus Part 2

QUIZ

MIDTERM

20 Gram Positive Rods Part 1

21 Gram Positive Rods Part 2

QUIZ

22 Neisseria

23 HACEK Group

QUIZ

24 Enterobacteriaceae Part 1

25 Enterobacteriaceae Part 2

QUIZ

26 Vibrio, Aeromonas, Plesiomonas, and Campylobacter Species

27 Nonfermenting/Misc. GNR

28 The Ella's – Pasteurella, Bartonella, Legionella, etc

QUIZ

29 Anaerobes

QUIZ

- 30 Spirochetes
- 31 Obligate Intracellular and Nonculturable Bacterial Agents

- 32 Mycoplasma

QUIZ

- 33 Mycobacterium

- 34 Agents of Bioterrorism

QUIZ

- 35 Virology

Take Home Quiz

Micro Review Presentations

Final

Affective behaviors

Didactic

Following appropriate training, during didactic instruction the student will:

1. Exhibit professional behavior during didactic instruction.
2. Attend lectures in a timely manner.
3. Respect other students and members of the laboratory.
4. Contribute to a positive learning environment.
5. Demonstrate an interest in the subject matter.
6. Comply with hospital and laboratory dress code and personal appearance policies.
7. Comply with institutional policies concerning safety and confidentiality.
8. Cooperate when situations arise and there is a necessary change in lecture schedule.
9. Participate in creating an inclusive learning environment.

Clinical

Following appropriate training, during clinical instruction the student will:

1. Comply with all hospital, laboratory, and school policies.
2. Demonstrate phone etiquette using BHS customer service standards.
3. Maintain a neat, clean, and orderly work area in the Microbiology department.
4. Value the advice and opinion of others.
5. Accept responsibility for their own actions notifying the instructor or supervisor of any errors.
6. Be dependable and punctual for the clinical experience.
7. Organize their time to complete assignments and daily training.
8. Accept constructive feedback and use it as a tool for improved performance.
9. Establish a good rapport with departmental staff and uphold the concept of teamwork.
10. Cooperate when situations arise and there is a necessary change in lecture schedule.
11. Comply with hospital and laboratory dress code and personal appearance policies.
12. Contribute to a positive, inclusive clinical training environment.

Attendance

Students follow the School of MLS attendance policy. Students are allotted 80 hours for personal time and sick time during the course of the internship. The Program Director and clinical department must be notified of any sudden absence as soon as possible. The main lab number may be called 24 hours a day to notify the lab of an absence. The Program Director should be emailed to document the absence.

Any coursework or clinical training missed over the 80 hours allowed, will require consultation with the Program Director as to the course of action to make up lost training time.

Snow days

Cancellation of classes or clinical training due to inclement weather will be at the discretion of the Program Director.