



Course Number and Title: MLT 250 Clinical Microbiology I

Campus Location:

Georgetown

Effective Date:

2018-51

Prerequisite:

BIO 121, CHM 110 or CHM 150

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

3.00 lecture hours/week

4.00 lab hours/week

Course Description:

This course covers microbial structure, growth, and control. Pathogenesis of infectious disease and interactions between microbes and humans are studied. The processes of isolation, identification, and susceptibility testing of clinically significant microbes are learned. This course also covers clinically significant pathogens, the diseases associated with them, and the role of the clinical microbiology laboratory in their diagnoses.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

Lab coat, gloves, permanent marker. Refer to information provided by instructor

Schedule Type:

Classroom Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Relate microbial physiology to the infectious disease process and the diagnostic procedures of the clinical microbiology laboratory. (CCC 1, 2, 6; PGC 4, 6)
2. Identify indigenous and clinically significant microbes that may be encountered in human clinical specimens. (CCC 1, 2, 6; PGC 6)
3. Describe methodologies that are used to cultivate, identify, and test susceptibility of microbes in clinical specimens, and identify variables that can affect laboratory results. (CCC 1, 2, 3, 6; PGC 1, 2, 3, 4, 5)
4. Describe laboratory operations as related to the clinical microbiology laboratory to include requirements for quality assurance and safety of personnel. (CCC 1, 2, 4; PGC 2, 5, 7)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Relate microbial physiology to the infectious disease process and the diagnostic procedures of the clinical microbiology laboratory.
 1. Describe structures of cellular components of microbes and the functions and differences between eukaryotic and prokaryotic components.
 2. Explain the importance of the chemical composition of the cell wall to cell morphology, survival, and staining reaction.
 3. List and describe chemical, physical, and nutritional factors that influence microbial growth.
 4. Describe the phases of microbial growth, and relate them to the infectious disease process.
 5. Identify the steps in the replication cycle of viruses.
 6. Describe how specific virulence factors contribute to the infectious disease process.
 7. Explain the physiological cellular processes as determined by the growth patterns in or on various media.
 8. Relate the chain of infection and modes of prevention to clinically significant microbes.
2. Identify indigenous and clinically significant microbes that may be encountered in human clinical specimens.
 1. Differentiate among symbiotic relationships between microbes and humans such as mutualism, commensalism, and parasitism.
 2. Categorize an organism as indigenous, opportunistic, or pathogenic according to species and specimen source.
 3. Identify obligate intracellular pathogens and the infectious diseases they cause.
 4. Identify bacterial pathogens and the infectious diseases they cause.
 5. Discuss emerging infectious diseases, and relate epidemiology terms to a particular disease.
3. Describe methodologies that are used to cultivate, identify, and test susceptibility of microbes in clinical specimens and identify variables that can affect laboratory results.
 1. Describe various stains and microscopic procedures used in the clinical microbiology laboratory.
 2. Perform biochemical testing, and explain the reactions that occur in relation to identifying microbes.
 3. Differentiate among the various methods of susceptibility testing, and discuss whether each is capable of determining minimum inhibitory concentration or minimum bactericidal concentration.
 4. Perform antibiotic susceptibility testing on bacterial species, and interpret the results to include whether the antibiotics used were narrow spectrum, broad spectrum, bacteriostatic, or bactericidal.
 5. Determine the composition of the various media used to culture specimens, the categories of them, and the purpose of using them in cultivating pathogens from clinical specimens.
 6. Describe standard immunological and serological procedures used in the clinical microbiology laboratory.
4. Describe laboratory operations as related to the clinical microbiology laboratory to include requirements for quality assurance and safety of personnel.
 1. Describe the role of quality assurance in the clinical microbiology laboratory.
 2. Perform and record quality control on organisms, media, equipment, and/or reagents used in the microbiology laboratory, and determine the cause of any outliers.
 3. Discuss the role of quality assurance to quality control and continuous quality improvement.
 4. Use aseptic technique while handling stock cultures.
 5. Explain techniques used to prevent disease transmission in healthcare facilities and in the clinical laboratory.
 6. Use appropriate personal protective equipment in the microbiology laboratory.

Evaluation Criteria/Policies:

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Collect, process and analyze biological specimens and other related substances.
2. Recognize factors that affect procedures and results, and take appropriate actions within predetermined limits and corrections are indicated.
3. Perform and monitor quality control within predetermined limits.
4. Apply basic scientific principles for application in medical laboratory procedures and methodologies.
5. Employ safety principles according to health and environmental regulations.
6. Correlate laboratory results with common disease processes and treatments for diagnosis.
7. Demonstrate professional conduct and interpersonal communication skills with patients, laboratory personnel, other healthcare personnel and the public.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.