

Course Number and Title: BIO 125 Introductory Microbiology

Campus Location:

Georgetown, Dover, Stanton, Wilmington

Effective Date:

2022-51

Prerequisite:

BIO 120 or (VET 102 or concurrent), SSC 100 or concurrent

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

3.00 lecture hours/week

2.00 lab hours/week

Course Description:

This course introduces microbiology to students in the health sciences. It explores the morphology, physiology, cultivation, and control of microorganisms, a survey of human pathogens, and the fundamental concepts of immunity. Laboratory experiments are an integral part of this course.

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:

None

Schedule Type:

Classroom Course

Hybrid Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Examine microbial morphology and cell function with emphasis on the relationship of cell structure to pathogenicity. (CCC 6)
2. Analyze the interactions and impact of microorganisms on humans. (CCC 6)
3. Explain selected microbial diseases. (CCC 1,5,6)
4. Explain microbial growth processes, requirements, and means of control. (CCC 6)
5. Discuss general procedures for the collection and preservation of specimens as an aid in diagnosis of disease. (CCC 6)
6. Perform and analyze various lab activities related to microbiology and healthcare while following proper safety procedures. (CCC 3,6)
7. Differentiate among various terms and tools used in microbiology. (CCC 6)
8. Identify proper scientific classification and nomenclature systems. (CCC 6)

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. Examine microbial morphology and cell function with emphasis on the relationship of cell structure to pathogenicity.
 1. Compare and contrast prokaryotic and eukaryotic cells.
 2. Describe bacterial morphology.
 3. Describe and state the function of microbial cell structures.
 4. Compare and contrast the composition of Gram positive and Gram negative cell walls and their relationship to the Gram stain reaction.
 5. Compare and contrast cellular and acellular microbes.
 6. Discuss factors related to the pathogenicity of microbes.
2. Analyze the interactions and impact of microorganisms on humans.
 1. Describe the development of normal flora of the body and its role in preventing infection.
 2. Differentiate among various human-microbe relationships.
 3. Explain the relationship among normal flora, hosts, and potential pathogens.
 4. Define and describe the mechanisms and responses of nonspecific defenses.
 5. Define and describe the mechanisms and responses of specific defenses.
 6. Discuss the field of epidemiology.
3. Explain selected microbial diseases.
 1. Describe some examples of diseases that are caused by bacteria, viruses, helminthes, fungi, and/or protozoa for each body system.
 2. Outline the etiologic agent, reservoir, modes of transmission, pathogenesis, treatment, and control measures for the major infectious diseases of each body system.
 3. Discuss the four phases in the infectious disease process.
 4. Discuss healthcare-associated infections and the precautions practiced to prevent them.
4. Examine microbial growth processes, requirements, and means of control.
 1. Categorize microbes according to their energy and carbon sources.
 2. Compare and contrast autotroph and heterotrophesis.
 3. List and describe essential chemicals physical requirements for microbial growth.
 4. Differentiate among biochemical processes within cells.
 5. Discuss the importance of growth control methods related to prevention and treatment of infectious diseases.
 6. Identify and explain the four phases of the bacterial growth curve.
 7. Discuss the effects of antimicrobial agents on hosts and infectious organisms.
 8. Explain mechanisms of action of antimicrobial drugs.
 9. Discuss drug resistance and ways to minimize its development.
5. Discuss general procedures for the collection and preservation of specimens as an aid in diagnosis of disease.
 1. Discuss the variables that can affect the quality of a specimen.
 2. Relate bacterial growth requirements and generation time to specimen collection and processing.
 3. Discuss specimen collection and handling procedures to assist in the diagnosis of an infectious disease.
6. Perform and analyze various lab activities related to microbiology and healthcare while following proper safety procedures.
 1. Identify and describe the parts of a light microscope.
 2. Identify several types of microorganisms using the Gram staining procedure.
 3. Compare and contrast bacterial growth using differential media.
 4. Compare and contrast several means of microbiological control.
7. Differentiate among various terms and tools used in microbiology.
 1. Define microbiology.
 2. Compare and contrast infection and disease.
 3. Compare and contrast various types of microscopes and their uses.
 4. Describe techniques and processes necessary for the microscopic study of bacteria.
 5. Discuss the importance of the Gram stain as a tool used to screen specimen quality, identify microbes, and initiate empiric therapy.
 6. Explain the differences among categories of infections and diseases.
 7. Differentiate among normal flora, opportunists, parasites, pathogens, and carriers.
 8. Define virulence, virulence factors, and pathogenicity.
 9. Differentiate between microbistatic agents and microbicodal agents.
 10. Differentiate among sterilization, disinfection, and sanitization.
 11. Differentiate among sterile, sepsis, antisepsis, and asepsis.
 12. Define chemotherapeutic agent, antibiotic, superinfection, and antimicrobial agents (synthetic and semi-synthetic).
 13. Define terms related to microscopy.
8. Identify proper scientific classification and nomenclature systems.
 1. List the important characteristics of the three domains of life.
 2. Adhere to rules of scientific nomenclature.
 3. Identify the correct taxonomic hierarchy.

Evaluation Criteria/Policies:

The grade will be determined using the Delaware Tech grading system:

90	-	100	=	A
80	-	89	=	B
70	-	79	=	C
0	-	69	=	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):

None

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.