SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: BIO-106 Class/Lect. Hours: 3 Lab Hours: ____ Credits: 3 Dept.: Biology

Course Title: **Principles of Infectious Disease** Semester: F Year: 2019

Course Description, Prerequisite, Corequisite:

Principles of Infectious Disease will provide a broad understanding of the biology of pathogenic (disease causing) organisms and their impact on human health. Designed for the non-biologist, the course will begin with some basic aspects of cell biology before moving on to the major grpouips of pathogens and their characteristics. Through looking at examples from each group, students will be engaged in the exploration of how pathogenic organisms infect individuals and their effects at the level of the cell, organ, organ system and whole organism. Molecular mechanisms of infection and effects of disease causing organisms will be discussed. Additional attention will be paid to prevention of disease for the individual as well as strategies and responses that public health agencies use to manage and prevent disease. Several examples of common human pathogens and their biology will be explored in detail while historical examples of disease outbreaks and their epidemiology will be discussed. Written and oral presentation of student work will be an integral part of the course.

No prerequisites

OBJECTIVES/COMPETENCIES

Course Objectives	Competencies
1. Students will know the basic taxonomical divisions of single-celled organisims. 2. Students will know basic cell biology and understand what distinguishes viruses, prokaryotes and eukaryotes. 3. Students will know the chemicals required for life and link them to cellular metabolism, including cellular respiration.	1. Students will be able to name the major pathogen groups that cause infectious disease (viruses, prokaryotes, single-cell eukaryotes, multi-cellular eukaryotes) and state the distinguishing characteristics of each. 2. Students will be able to state the primary parts of a eukaryotic cell and state the function of each. 3. Students will be able to state the primary parts of a prokaryotic cell and state the function of each. 4. Students will be able to state the primary components of a virus and state the function of each. 5. Students will be able to identify and describe the levels of organization (molecules, organelles, cells, tissues, organs, organism) in pathogens and be able to relate functional aspects at one level to function at another level. 6. Students will state the chemical elements that are required for life and their basic role in cell physiology. 7. Students will demonstrate knowledge of cellular respiration as a molecular phenomenon, and the reactants and products of respiration.

OBJECTIVES/COMPETENCIES

Course Objectives	Competencies
4. Students will be able to describe how pathogens infect us and representative mechanisms by which they ccause disease. 5. Students will describe the major cellular components of the human immune system and state the function of each. 6. Students will describe examples of ways to treat infectious disease and ways to limit the spread of disease. 7. Students will work to develop their ability to present information in written and oral form.	8. Students will be able to explain the general mechanisms of microbial pathogenicity. 9. Students will able to describe the effects of pathogens including how they may cause effects at the level of cells, tissues and organs. 10. Students will be able to discuss basic mechanisms of pathogenesis and natural history of select pathogens from each of the major pathogen groups. 11. Students will be able to name and state the fundamental function of the major cell types of the immune system. 12. Students will be able to describe the basic cellular interactions and mechanisms that lead to the immune response to viruses and eukaryotic and prokaryotic pathogens. 13. Students will be able to describe examples of public health measures taken to limit the spread of infectious diseases. 14. Students will be able to describe the mechanisms of selected treatments for infectious disease.