

BIOL 117: BIOLOGY OF INFECTIOUS DISEASES

Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2024
Credits:	3
Total Contact Hours:	54
Lecture Hours :	54
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	108
Total Student Learning Hours:	162
Strongly Recommended:	ENGL 101.
District General Education:	B1. Natural Sciences - Life Sciences
Transferable to CSU:	Yes
Transferable to UC:	Yes - Approved
Grading Method:	Standard Letter

Catalog Course Description

The focus of this course will be infectious diseases. Topics covered will include an overview of disease causing agents including bacteria, fungi, protozoans, helminths, and viruses. Common infectious diseases will be discussed including emerging infectious diseases. The impact of infectious diseases, historical and current, will also be considered along with a discussion on the transmission and spread of infectious diseases and how they can be controlled, prevented, and cured. 54 lecture hours.

Course Objectives

- demonstrate an understanding of the nature of disease causing agents and their roles as non-pathogens and pathogens in the biological world
- identify the most common infectious diseases, their symptoms, and consequences
- demonstrate a basic understanding of the virulence mechanisms of different disease causing agents and the basic principles involved in host resistance
- identify factors important in the transmission and spread of infectious diseases
- apply an understanding of the biological characteristics of disease causing agents in predicting or understanding successful control methods
- apply basic understanding of the human immune system in prevention and treatment of infectious diseases as well as identification of infectious diseases
- demonstrate an understanding of the impact of infectious diseases on the human population

Major Course Content

1. Overview of infectious diseases
2. Overview of prokaryotic pathogens: bacteria
3. Overview of eukaryotic pathogens: fungi, protozoa, and helminths
4. Overview of acellular pathogens: viruses and prions

5. Concepts of microbial disease
6. Epidemiology of infectious diseases
7. Mechanisms of virulence
8. Control of infectious diseases
9. Immune response and the treatment of infectious diseases
 - a. Vaccinations
 - b. Rise of antibiotic resistance
10. Bacterial infections
11. Viral infections
12. Fungal, protozoan, and helminth infections

Suggested Reading Other Than Required Textbook

Current news articles and other on-line sources on infectious diseases.

Examples of Required Writing Assignments

Students are required to complete journal entry assignments that ask students to provide written answers that are well formulated and in complete sentences to course content related questions. Sample questions are provided below:

- 1) In general, how are the eukaryotic pathogens (protozoa, fungi, and helminths) different from bacteria?
- 2) Some protozoa make structures called cysts. What are cysts and what is their overall significance and their connection with the transmission of protozoan infections?
- 3) Among the fungi, molds reproduce using spores. What is the significance of fungal spores made by pathogenic molds in respect to the spread of fungal infectious diseases?
- 4) A general lifecycle of a helminth consists of three stages: egg → larva → adult worm. Briefly discuss how the egg and larva play a role in the transmission of helminth infections.

Examples of Outside Assignments

Students are required to complete homework assignments based on lecture material. Homework assignments include participating in discussion boards, completing journal entries, and/or submitting worksheets.

Here is an example of a discussion board assignment:

This week in lecture you were introduced to eukaryotic pathogens, namely protozoa, fungi, and helminths. Here I am sharing an article about a fungal pathogen, *Coccidioides immitis*, which causes an infectious disease known as Valley Fever. 97% of all reported cases of Valley Fever have been from Arizona and California. Please read the article (LINK) and discuss the questions provided below.

1. After reading the article linked above make one original post and discuss the following points in it:

* Did you know about this pathogen/ infectious disease from before? * If not, what did you find surprising or interesting about this pathogen? * If you already knew about Valley Fever, did you learn something new about it from reading this article? * Comment on the link between climate change and the spread of infectious diseases. Were you aware of this phenomenon from before reading this article? How do you feel about this phenomenon?

2. Come back in a day or two and reply to ONE of your classmates. Your reply should be substantial and meaningful (not simply "Yeah, me too" or "I agree").

Aside from homework assignments mentioned above, students are required to research one infectious disease of interest and prepare a two page infographic on it. The students will then post their infographic on a Canvas discussion board for other students in class to see and provide comments.

Instruction Type(s)

Lecture, Online Education Lecture

IGETC Area 5: Physical and Biological Sciences

5B. Biological Science