Miami Dade College

Course Description

MCB4503 | Virology | 3.00 credits

This course will cover general virology, including virus structure, replication cycles, infection and mode of transmission of human diseases. Student will learn the major families of the bacterial (bacteriophages), plant and animal viruses and how they influence infection. Prerequisites: MCB3023, 3023L.

Course Competencies:

Competency 1: The student will demonstrate knowledge of the nature of viruses and different methods of viral study by:

1. Explaining the biological and physical properties of viruses
2. Describing the differences between viruses vs. virions
3. Summarizing the different methods of viral study
4. Explaining tissue and cell culture
5. Discussing cloning genes and genomes, DNA sequencing, and PCR.
6. Listing analysis of components SDS treatment & electrophoresis for nucleic acids

Competency 2: The student will demonstrate knowledge of viral structure by:

1. Discussing the characteristics of the DNA and RNA genomes
2. Listing the characteristics and the structure of the capsid
3. Explaining the characteristics of envelope membrane from the host cell

Competency 3: The student will demonstrate knowledge of viral classification by:

1. Explaining the Baltimore's classification for viruses that infect eukaryotic cells
2. Summarizing the classification by host components and morphology
3. Listing the most important characteristics of DNA Viruses
4. Describing the most important characteristics of RNA viruses
5. Explaining the classification by producing mRNA

Competency 4: The student will demonstrate knowledge of the Leviviridae, Microviridae, Podoviridae, and Myoviridae by:

1. Listing distinguishing characteristics of these viruses
2. Explaining the structure (size, envelope, nucleocapsid, physical genetic map, and capsid) of these viruses. Summarizing classification and characteristic members
3. Analyzing viral multiplication

Competency 5: The student will demonstrate an understanding of distinct structural and physiological characteristics of the Siphoviridae by:

1. Summarizing distinguishing characteristics
2. Describing the structure of the siphoviridae
3. Explaining classification and characteristic members
4. Analyzing viral multiplication
5. Assessing clinical correlations related to lysogeny

Competency 6: The student will demonstrate knowledge of RNA and DNA plant viruses by:

1. Classifying plant viruses as single-stranded RNA (SS RNA), double-strained RNA (DS RNA); single-strained DNA (SS DNA), and double-stranded DNA (DS DNA)
2. Demonstrating knowledge about the genetic composition of plant viruses
3. Demonstrating knowledge of different viruses' shapes (rods, polyhedral, and bullets)

Competency 7: The student will demonstrate knowledge of the epidemiology of selected plant viruses by:

1. Discussing the plant viruses' methods of transmission

2. Listing selected plant viruses and demonstrating knowledge of current methods of detection

Competency 8: The student will demonstrate knowledge of RNA animal viruses by:

1. Describing the structure, replication, and diseases caused by viruses in the families Picornaviridae, Togaviridae, Flaviviridae, Caliciviridae, Astoviridae, Coronaviridae, and Arteriviridae
2. Explaining the structure, replication, and diseases caused by viruses in the families Rhabdoviridae, Paramyxoviridae, Filoviridae, Orthomyxoviridae, and Bunyaviridae

Competency 9: The student will demonstrate knowledge of viruses with Reverse Transcriptases by:

1. Describing the structure, replication, and diseases caused by viruses in the family Retroviridae
2. Describing the structure, replication, and diseases caused by viruses in the family Hepadnaviridae

Competency 10: The student will demonstrate knowledge of DNA animal viruses by:

1. Describing the structure, replication, and diseases caused by viruses in the families Poxviridae, Herpesviridae, Adenoviridae, Poliomaviridae, Papillomaviridae, and Parvoviridae Listingprions, viroids, satellites, satellite viruses, and comparing them to other viruses and bacteria

Competency 11: The student will demonstrate knowledge of prions by:

1. Comparing viruses, viroids, and bacteria
2. Describing infections caused by prions
3. Describing the occurrence, transmission, and epidemiology of diseases caused by prions

Competency 12: The student will demonstrate knowledge of bacteriophages by:

1. Describing the structure, replication, and diseases caused by bacteriophages
2. Listing selected bacteriophages
3. Demonstrating current methods of detection