SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: MLT-214 Department: Clinical Lab Science

Course Title: Medical Microbiology II Semester: Fall Year: 2021

COURSE OBJECTIVES: The student, upon completion, will have a thorough understanding of infectious disease, including bacteria, parasites, fungus, and viruses. In laboratory the student will demonstrate techniques used to identify bacteria, parasites and fungi discussed in lecture, and identify unknown organisms through extensive use of the microscope.
Prerequisite MLT-118,120,124, & 126 Co-Requisite MLT-214L

Student Learning Outcomes

Topic	Learning Outcomes
Upon the completion of each lecture section, the student will be able to fulfill the section objectives as outlined in the assigned text and materials and/or defined by verbal instruction to the level identified in the MLT Program Matriculation Policy.	
The Spirochetes	• List the diseases caused by Spirochete infections and correlate with pathogenic species • List and describe the stages of Syphilis • Determine the appropriate laboratory testing for screening and confirmation of Syphilis • Describe the characteristics of Lyme disease • Name the vector that transmits Lyme disease • Identify the morphology of the spirochete in a Gram stain
Obligate Intracellular and Non-culturable Bacterial Agents	• Compare the physical structure of Mycoplasma and Ureaplasma with that of other bacterial agents • Discuss the methods of replication possible for these organisms • List and discuss the disease states caused by these organisms • List and discuss any special laboratory testing used to diagnose these disease states.

Cell Wall deficient bacteria	• Identify the genera in each family of organisms • State the important characteristics of Chlamydia and Rickettsia • Describe the intracellular development cycle of Chlamydia and name both stages • List pathogenic species of each genus • List and discuss diseases caused by each • Categorize the Rickettsial diseases by typhus group and spotted fever group • Name the insect vector involved in the spread of Rickettsia • List special requirements for laboratory collection and processing of samples for testing
Immune Response to Infectious disease	• describe important characteristics of infectious disease • describe the body's response to infectious disease • differentiate the response of the immune system to intracellular and extracellular organisms • List specific examples of bacterial and viral infections and describe the body's immune response
Concepts in Virology	• Discuss methods of classification of viruses • List the viral families and give an example of a virus found in each • Describe the primary disease state caused by each virus discussed • List and describe structures and morphology of viruses (ex, icosahedral, capsid, envelope) • Identify characteristic CPE from images and correlate with viral species (Ex. Owl's eye with CMV infections) • Explain the steps of viral pathogenesis • List the steps of replication and describe what happens at each step • Discuss special collection and storage issues with laboratory specimens • Outline the traditional laboratory testing used to diagnose viral illnesses; cell culture, hemadsorption, Tzanck smear, immunological, serological and molecular methods • describe important characteristics of infectious disease • describe the body's response to infectious disease

	• differentiate the response of the immune system to intracellular and extracellular organisms • List specific examples of bacterial and viral infections and describe the body's immune response • Interpret test results in regards to evidence of exposure, current illness, etc… • Name the commonly used antiviral agents
Basic Concepts and Identification techniques for Mycology	• Identify the characteristics of fungi from an illustration • List the important structural features of fungi and differentiate them from one another • Compare the cultural and structural aspects of fungus and bacteria • List the types of media used to grow fungi and describe specific colony morphologies • List and describe the staining methods for fungal species • Differentiate between superficial, subcutaneous, systemic, and opportunistic fungal infections and name a pathogenic species involved in each • List and discuss any unique testing for identification of causative agents (Ex. serological or molecular) • Demonstrate the identification of fungal structures microscopically in the lab with 100 % accuracy. • Perform microscopic preparations of fungi using KOH, saline and stains.
Parasitology preparation and Identification	• Discuss safety and proper collection and processing of stool specimens for parasitic identification • List and describe types of symbiotic relationships • List types of replication and determine which are sexual or asexual • List types of hosts for parasites (definitive, intermediate, etc..) • Describe the flotation and sedimentation method of stool concentration • Describe the procedure used to perform a wet preparation for Ova and Parasite identification • List the stains and reagents used for parasitic microscopic identification

Llife cycles and laboratory identification of clinically significant protozoa, ciliate, flagellates, blood and tissue parasites, nematodes, cestodes, trematodes	• For each parasite listed, students will List the following:
	  ○ Scientific and common name
	  ○ Geographical location
	  ○ Method of identification
	  ○ Types of slides, stains, specimens
	  ○ Stages of development
	  ○ life cycles phases
	  ○ The disease caused by them and pathological conditions to man.
	  ○ Identify the stages of development using illustrations, pictures, kodachromes, and microscopic slides.
	  ○ Identify with 100 % accuracy a microscopic slide of these parasites.

Infections by body site	• Compile information for a body site project requiring knowledge of all normal and pathogenic bacteria, viruses, fungi, and parasites by specimen type • Analyze biochemical testing information and flowcharts to identify bacterial pathogens • Identify microscopic features of parasites and fungi for identification • Interpret results from CPE from cell cultures, serological and molecular testing, analyze and correlate findings to diagnose viral illnesses. • Correlate laboratory findings with patient signs and symptoms