J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: MDL 210 **Credits:** 3

Course Title: Immunology and Serology

Course Description: Teaches principles of basic immunology, physiology of the immune system, diseases involving the immune system, and serologic procedures. Prerequisite or Co-requisite: MDL 101. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

General Course Purpose: Provides the student with the theory and principle of immunology testing and immunochemistry testing. Provides theory of the systems in the body that fight infection and provide protection both specific and nonspecific. Explores the largely distributed elements of the immune system and the function and interrelationship of each. Explores many distinct infectious diseases and their effect and role in human pathology. Provides the student with time to observe and perform the actual testing that is done in a laboratory for immunology testing.

Course Prerequisites and Co-requisites:
Prerequisite or Co-requisite: MDL 101

Student Learning Outcomes:
Upon completing the course, the student will be able to

a. Describe the human immune system and its function;
b. Describe the first line of defense, natural immunity, and adaptive immunity as it relates to the body's defense against microbial diseases;
c. Define the term antigen and antibody, phagocytosis;
d. Name and describe the characteristics of the five antibody classes;
e. Name the four phases of the antibody response;
f. Describe the characteristics of a primary and secondary response;
g. Describe the functions of granulocytes, monocytes-macrophages, and lymphocyte-plasma cells as components of the immune system;
h. Discuss the role of monocytes-macrophages in cellular immunity;
i. Name and describe the function of primary and secondary lymphoid tissue;
j. Explain the function of T and B lymphocytes in immunity;
k. Name and compare disorders with immunologic origin;
l. Name and compare the three complement activation pathways;
m. Describe the mechanisms and consequences of complement activation;
n. Describe the principles of immunologic-serologic testing;
o. Describe the principles of agglutination;
p. Describe the characteristics of graded agglutination reactions;
q. Describe the electrophoresis technique;
r. Name and describe the five fractions that serum proteins can be separated into via electrophoresis;
s. Compare immunoelectrophoresis and imunofixation electrophoresis;
t. Describe and compare chemiluminescence, EIA, and immunofluorescent techniques;
u. Explain how the body develops immunity to different types of antigens, i.e., bacterial, fungal, and viral;
v. Discuss the immunologic manifestations and diagnostic evaluation of strep infection;

w. Explain the immunologic manifestations and diagnostic evaluation of syphilis;
x. Explain the immunologic manifestations and diagnostic evaluation of Lyme disease;
y. Explain the immunologic manifestations and diagnostic evaluation of toxoplasmosis;
z. Explain the immunologic manifestations and diagnostic evaluation of cytomegalovirus;
aa. Explain the immunologic manifestations and diagnostic evaluation of infectious mono (IM);
bb. Explain the immunologic manifestations and diagnostic evaluation of viral hepatitis;
cc. Explain the immunologic manifestations and diagnostic evaluation of rubella infection;
dd. Explain the immunologic manifestations and diagnostic evaluation of AIDS;
ee. Compare Types I, II, III, IV hypersensitivity reactions; and
ff. Describe the nature of autoimmune disorders and the diagnostic testing done for them.

Major Topics to Be Included:
a. Antigens and antibodies
b. Cells and cellular activities of the immune system
c. Soluble mediators of the immune system
d. Safety and basic immunological techniques
e. Agglutination methods
f. Electrophoresis techniques
g. Labeling techniques and automation
h. Molecular techniques
i. The immune response in infectious disease
j. Streptococcal infections
k. Syphilis
l. Tick-borne diseases
m. Toxoplasmosis
n. Cytomegalovirus
o. Infectious mononucleosis
p. Viral hepatitis
q. Rubella infection
r. AIDS
s. Hypersensitivity reactions
t. Immunoproliferative disorders
u. Autoimmune disorders

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