Syllabus

Course Code: BIOL 213 **Title: MICROBIOLOGY**

Institute: STEM **Department: BIOLOGY**

Course Description: The biology of pathogenic microorganisms will be stressed, emphasizing their microscopic and molecular aspects. Students will describe, in detail, the relationship existing between the host-parasite complex during the diseased state. They will also become acquainted with those characteristics which endow certain microbes with a pathogenic nature. Students will be able to list and characterize various pathogenic bacteria, viruses, and eukaryotic parasites (including fungi, algae, protozoa, and helminths). Isolation and identification techniques in microbiology will be mastered by the student in the laboratory. The role of chemotherapy, immunology and serology used to combat pathogens will be examined thoroughly. Finally, the homeostatic defense mechanism of the body, especially those against invading microorganisms, will be discussed in great detail.

Prerequisites: A grade of "C" or higher in BIOL 102 or BIOL 112.

Corequisites: None

Credits: 4 **Lecture Hours:** 3 **Lab/Studio Hours:** 3

Required Textbook/Materials:

Talaro's Foundations in Microbiology, Chess, 12th edition, 2024

Additional Time Requirements:

For information on Brookdale's policy on credit hour requirements and outside class student work refer to Academic Credit Hour Policy.

Additional Support/Labs:

- See https://www.brookdalecc.edu/academic-tutoring/
- BIOL 213 course and laboratory resources are available in CANVAS, Brookdale's Learning Management System, available via the Brookdale website: www.brookdalecc.edu
- Brookdale Biology Department course and program information is available on the Biology Department website: https://www.brookdalecc.edu/stem-institute/biology

Course Learning Outcomes:

- Demonstrate knowledge of pathogenic microorganisms.
- Apply the scientific method in a laboratory research project in the isolation and identification of unknown microorganisms.

- Demonstrate knowledge of how chemotherapy, immunology, and serology are used to combat pathogens.
- (Mathematical/ScientificReasoning/InformationLiteracy)

Course Content:

Unit One: Introduction to Microbiology and Taxonomy
Unit Two: General Characteristics and Representative Examples of Prokaryotic & Eukaryotic Organisms, & Viruses
Unit Three: Microbial Metabolism, Ecology, & Growth
Unit Four: Microbial Genetics
Unit Five: Antimicrobial Actions
Unit Six: Microbe-Human Interactions
Unit Seven: Survey of Microorganisms of Medical Importance

Department Policies:

Attendance/participation during class and laboratory sessions is strongly recommended for optimum performance in biology courses.
Lecture exams will be given during scheduled class time**.**
Laboratory practicals will be given during scheduled laboratory sessions, in accordance with schedules provided by the lab instructors. Exams and practicals must be taken at the times designated by the instructor or laboratory instructor. A student who misses a lecture exam or laboratory practical must provide prior notification and proper documentation in order to take the exam or laboratory practical. The acceptance of said prior notification and proper documentation will be determined by the instructor.
Documentation must be provided within one week of the student's return to the classroom for a make-up exam or laboratory practical to be scheduled. A student who is unable to provide proper documentation for a missed exam or laboratory practical will be given a grade of zero for that exercise. Students may not re-take exams or laboratory practicals on which they perform poorly. Requirements for the completion of laboratory are listed in the laboratory responsibility sheets for individual courses. Requirements for course completion are listed in individual instructor.

Grading Standard:

Active and frequent participation in each chapter is required for optimum performance in this course. Students will be assessed based on their participation and performance in class and laboratory:

Lecture exams and quizzes:	75%
Laboratory assignments, quizzes, technique evaluation, practical exams:	25%

A student must have an average of 65% or higher for the classroom component and an average of 65% or higher for the laboratory component of the course in order to earn a passing grade for the course.

Upon completion of the course, grades will be assigned as follows:

A :	92 – 100%	B+ :	86 – 88%
A- :	89 - 91%	B :	82 – 85%

B- :	79 - 81%	D :	65 – 69%
C+ :	76 – 78%	F :	<65%
C :	70 – 75%		

College Policies:

As an academic institution, Brookdale facilitates the free exchange of ideas, upholds the virtues of civil discourse, and honors diverse perspectives informed by credible sources. Our College values all students and strives for inclusion and safety regardless of a student's disability, age, sex, gender identity, sexual orientation, race, ethnicity, country of origin, immigration status, religious affiliation, political orientation, socioeconomic standing, and veteran status. For additional information, support services, and engagement opportunities, please visit www.brookdalecc.edu/support.

For information regarding:

- Academic Integrity Code
- Student Conduct Code
- Student Grade Appeal Process

Please refer to the Student Handbook and Catalog**.**

Notification for Students with Disabilities:

Brookdale Community College offers reasonable accommodations and/or services to persons with disabilities. Students with disabilities who wish to self-identify must contact the Accessibility Services Office at 732-224-2730 (voice) or 732-842-4211 (TTY) to provide appropriate documentation of the disability and request specific accommodations or services. If a student qualifies, reasonable accommodations and/or services, which are appropriate for the college level and are recommended in the documentation, can be approved.

Mental Health:

24/7/365 Resources:

- Monmouth Medical Center Psychiatric Emergency Services at **(732) 923-6999**
- 2nd Floor Youth Helpline – Available to talk with you about any problem, distress, or hardship you are experiencing. Call or text at **888-222-2228** or visit the website at https://www.2ndfloor.org/

Faculty Counselors:

- Students who need to make an appointment with a faculty counselor can do so by calling 732-224-1822 (non-emergency line) during business hours. Faculty counselors are licensed mental health professionals who can assist students and refer them to other mental health resources.

Diversity Statement:

Brookdale Community College fosters an environment of inclusion and belonging. We promote a safe and open culture, encourage dialogue respecting diverse perspectives informed by credible sources, and uphold the virtues of civil discourse. We celebrate all identities with the understanding that ultimately, diversity, equity, and inclusion cultivate belonging and make us a stronger Brookdale community.

Syllabus:

Course No: BIOL 213 Title: Microbiology Credits:4

#1 of 7 Units

Name of Unit: **INTRODUCTION TO MICROBIOLOGY AND TAXONOMY**
Textbook: Talaro's Foundations in Microbiology, 12th edition, Chapter 1
Method of Evaluation: Lecture Exams and Quizzes, Laboratory Practicals, Quizzes, and Project

Objectives	Recommended Learning Experiences
The student will be able to:	Class Discussion Textbook Readings: Ch 1
1. Define microbiology	Section 1.1
2. Compare and contrast microorganisms: viruses, Bacteria, protozoa, algae, fungi and helminths	Section 1.2
3. Describe units of measurement used for microorganisms	Figure 1.4
4. Identify various branches in the field of microbiology	Section 1.1; Table 1.1
5. Describe the significance of microorganisms: medically Environmentally, and commercially/economically	Sections 1.2-1.4
6. Recognize the contributions made by scientists to the Field of microbiology, to include:	Section 1.5 & 1.1. Making Connections
Robert Hooke / Paul Ehrlich Anton van Leeuwenhoek / Alexander Fleming Francesco Redi / Ernst Chain/Howard Florey Louis Pasteur / Selman Waksman Robert Koch / Rebecca Lancefield Joseph Lister / Avery, MacLeod & McCarty Edward Jenner / James Watson/Francis Crick Hans Christian Gram / Nathans, Smith & Arber Elie Metchnikoff	
7. Describe the contributions of Carolus Linnaeus (the "Father of Taxonomy"), Robert Whittaker, and Carl Woese to the field of taxonomy	Section 1.6
8. Describe the current system of classification in biology: 3 domains 5 kingdoms further categories	Section 1.6-1.7
9. Describe the classification of prokaryotes and viruses, to include the criteria used to classify microorganisms	Sections: 1.7, 6.1, 6.3
10. Describe classification systems of prokaryotic domains In Bergey's Manual of Systematic Bacteriology, 2nd ed.	Sections: 1.7, 4.6 (Tables 4.3-4.4)

11. Describe the classification of eukaryotic organisms to include criteria used for each group — Section 1.7
12. Correctly use the universal system of scientific naming Of organisms—binomial nomenclature — Section 1.6
13. Demonstrate the ability to use dichotomous keys in the Identification of microorganisms

Course No: **BIOL 213** **Title:** **Microbiology** **Credits:4**

#2 of 7 Units

Name of Unit: **GENERAL CHARACTERISTICS AND REPRESENTATIVE EXAMPLES OF PROKARYOTIC AND EUKARYOTIC ORGANISMS, AND VIRUSES**

Textbook: Talaro's Foundations in Microbiology, 12th edition, Chapters 4,5, 6

Method of Evaluation: Lecture Exams and Quizzes, Laboratory Practicals, Quizzes, and Project

Objectives	Recommended Learning Experiences
The student will be able to:	Class Discussion Textbook Readings: Ch 4-6
1. Compare properties and cell structures in prokaryotes And eukaryotes	Section 4.1, Table 5.4
2. Describe sizes, shapes and arrangement of prokaryotes	Section 4.5
3. Describe the following prokaryotic cell structures and Their related functions: a. Structures external to cell wall a. Flagella b. Axial Filaments (periplasmic flagella) c. Pili and Fimbriae d. Glycocalyx i. capsule ii. slime layer b. Cell wall a. Functions b. Composition & characteristics c. Gram stain d. Negative Stain c. Structures internal to cell wall a. Plasma membrane b. Cytoplasm c. Nucleoid – chromosome d. Plasmid e. Ribosomes f. Inclusions g. Endospores	Sections 4.1-4.4
4. Describe biofilms and explain their significance	Section 4.2, Process Fig. 4.12
5. Survey prokaryotic groups with unusual characteristics	Section 4.7
6. Describe the history of eukaryotic cells including the Endosymbiotic theory	Section 5.1

7. Review eukaryotic cell structures and their functions -external -internal	Sections 5.2-5.3
8. Describe the basic characteristics of the Kingdom Fungi including general types of cells and organisms, structure, and nutrition; differentiate between yeasts and molds, types of fungal spores; importance in medicine, nature and industry.	Section 5.5
9. Discuss general characteristics of algae, and importance	Section 5.6
10. Discuss general characteristics of protozoa, and importance	Section 5.7
11. Discuss general characteristics of, basic morphology of major Groups of parasitic helminths, life cycles, reproduction	Section 5.8
12. Describe viral origin, history, characteristics, structure, Morphology and importance	Sections 6.1-6.3
13. Describe viral multiplication including: Multiplication of animal viruses (DNA and RNA); damage to Host cell Bacteriophage multiplication, lysogeny	Sections 6.4-6.5
14. Discuss cultivation, detection and treatment of viruses	Sections 6.6-6.7
15. Describe nonviral infectious particles: prions and viroids	Section 6.8

Course No: BIOL 213 **Title: Microbiology** **Credits:4**

#3 of 7 Units

Name of Unit: **MICROBIAL METABOLISM, ECOLOGY AND GROWTH**
Textbook: Talaro's Foundations in Microbiology, 12th edition, Chapters 2, 7, 8
Method of Evaluation: Lecture Exams and Quizzes, Laboratory Practicals, Quizzes, and Project

Objectives	Recommended Learning Experiences
The student will be able to:	Class Discussion Textbook Readings: Ch 2, 7, 8
1. Review composition, properties, and functions of macromolecules	Ch 2
2) Describe major categories of nutritional types among organisms	Sections 7.1-7.2, Table 7.2
3) Define requirements for microbial growth, including: -Micronutrients, macronutrients, essential nutrients -Physical and chemical requirements Carbon, oxygen, water, phosphate, nitrogen, sulfur Temperature Osmotic pressure pH	Sections 7.1, 7.4, Table 7.1
4) Define bacterial growth	Section 7.6
5) Define generation time or doubling time in prokaryotes	Section 7.6
6) Name and describe the stages in the bacterial growth curve	Section 7.6, Fig. 7.18
7) Discuss direct and indirect methods of analyzing bacterial Population growth	Section 7.6
8) Discuss the range of ecological associations among microbes And interrelationships between microbes and humans	Section 7.5
9) Describe the development and significance of biofilms	Section 7.5, Process fig. 4.12
10) Define metabolism. Describe the following: Catabolism and anabolism Role of ATP Metabolic pathways Enzymes and enzyme action Factors influencing enzymatic activity	Sections 8.1-8.2
11) Demonstrate and understanding of the following metabolic pathways In microorganisms -Carbohydrate catabolism -Glycolysis -Aerobic respiration Bridge reaction (transition or preparatory step) Krebs cycle Electron transport chain	Sections 8.3-8.5, Appendix A

-Anaerobic respiration
-Fermentation reactions
-Lipid and protein catabolism
-Anabolic pathways

Course No: BIOL 213 **Title: Microbiology** **Credits:4**

#4 of 7 Units

Name of Unit: **MICROBIAL GENETICS**
Textbook: Talaro's Foundations in Microbiology, 12th edition, Chapters 2, 9, 10
Method of Evaluation: Lecture Exams and Quizzes, Laboratory Practicals, Quizzes, and Project

Objectives The student will be able to:	Recommended Learning Experiences Class Discussion Textbook Readings: Ch 2, 9,10
1. Describe the structure of the nucleic acids – DNA & RNA	Sections 2.8, 9.1 Figure 9.6
2. Describe the relationships among DNA, gene, genome, chromosome, genotype, phenotype	Section 9.1
3. Compare the genome of prokaryotes to that of eukaryotes	Section 9.1
4. Describe the process of DNA replication in prokaryotes	Section 9.1
5. Describe the process of RNA replication in prokaryotes	Section 9.2
6. Describe the process of protein synthesis in prokaryotes	Section 9.2
7. Explain the operon model of gene expression. Describe regulation of gene expression in bacteria by induction and repression.	Section 9.3
8. Define mutation. Describe types of mutations and categories Of mutagens	Section 9.4
9. Compare the mechanisms of genetic recombination in bacteria. Differentiate between horizontal and vertical gene transfer	Section 9.5
10. Describe the functions of vectors (plasmids, phages) and Transposons	Section 9.5
11. Compare replication strategies in DNA and RNA viruses	Section 9.6
12. Describe methods and applications of genetic engineering	Ch 10

Course No: BIOL 213 **Title: Microbiology** **Credits:4**

#5 of 7 Units

Name of Unit: **ANTIMICROBIAL ACTiONS**
Textbook: Talaro's Foundations in Microbiology, 12th edition, Chapters 11 & 12
Method of Evaluation: Lecture Exams and Quizzes, Laboratory Practicals, Quizzes, and Project

Objectives	Recommended Learning Experiences
The student will be able to:	Class Discussion Textbook Readings: Ch 11, 12
1. Define and differentiate among the major terms for Microbial control, including o Sterilization o Disinfection o Antiseptic o Sanitization o Degermation	Section 11.1, Table 11.2
2. Identify factors that influence effectiveness of antimicrobial Agents or methods	Section 11.1
3. Identify the targets of antimicrobial control agents	Section 11.1
4. Describe the actions and effects of physical and chemical Agents or methods used to control microbial growth	Section 11.2-11.4
5. Describe antimicrobial drugs and distinguish between Antibiotics, synthetics and semisynthetics	Section 12.1; Table 12.3
6. Identify the primary sources of antibiotics	Section 12.1; Table 12.2
7. Identify characteristics of ideal antimicrobial drugs	Table 12.1
8. Describe the mechanisms of action of antimicrobial drugs	Section 12.1;Table 12.4
9. Identify commonly used antibacterial drugs according to mode Of action	Section 12.1; Fig. 12.2
10. Identify the modes of action and representative examples of Major antimicrobial groups including: o Antibacterial drugs o Antifungal drugs o Antiparasitic drugs o Antiviral drugs	Section 12.1-12.3, Table 12.4
11. Describe the mechanism of drug resistance	Section 12.4

12. Identify side effects of antimicrobial drug use in humans	Section 12.5; Table 12.9
13. Discuss the effects of combining antimicrobial drugs	Section 12.6
14. Describe tests for microbial susceptibility to antimicrobial drugs.	Section 12.6

Course No: BIOL 213 **Title: Microbiology** **Credits:4**

#6 of 7 Units

Name of Unit: **MICROBE-HUMAN INTERACTIONS**
Textbook: Talaro's Foundations in Microbiology, 12th edition, Chapters 13
Method of Evaluation: Lecture Exams and Quizzes, Laboratory Practicals, Quizzes, and Project

Objectives The student will be able to:	Recommended Learning Experiences Class Discussion Textbook Readings: Ch 13
1. Define the terms associated with infectious diseases.	Section 13.1
2. Define normal microbiota. Distinguish between resident and transient microbiota. Identify sites that harbor normal microbiota and those that are microbe-free	Tables 13.1-13.3
3. Discuss the major factors in the development of an infection including entry, adhesion, multiplication, effects. Compare endotoxins and exotoxins	Section 13.2
4. Describe the clinical stages of disease	Section 13.3
5. Discuss the patterns of infection and distinguish between localized and systemic, focal and mixed, primary and secondary, endogenous and exogenous infections	Section 13.3
6. Use correct terminology to explain the manifestations (signs and symptoms) of infections and inflammation	Section 13.3
7. Describe the transmission of disease by identifying reservoirs Of infection, distinguishing between types of vectors, and types of Carriers. Define zoonoses	Section 13.4
8. Describe the transmission of disease. Distinguish between Communicable, noncommunicable and contagious diseases	Section 13.4
9. Define nosocomial infections (HAIs) and explain their significance	Section 13.5
10. Define epidemiology and explain the major methods of tracking Infections and diseases in a population	Section 13.5
11. Differentiate among patterns of disease outbreaks according to Frequency, number, location and duration	Section 13.5

12. Demonstrate a thorough understanding of Koch's Postulates	13.5 Making Connections

Course No: BIOL 213 **Title: Microbiology** **Credits:4**

#7 of 7 Units

Name of Unit: **SURVEY OF MICROORGANISMS OF MEDICAL IMPORTANCE**
Textbook: Talaro's Foundations in Microbiology, 12th edition, Chapters 17-25
Method of Evaluation: Lecture Exams and Quizzes, Laboratory Practicals, Quizzes, and Project

Objectives	Recommended Learning Experiences
The student will be able to:	Class Discussion Textbook Readings: Ch 17-25
1. Summarize common procedures used for identifying pathogens and diagnosing infections.	Ch 17
2. Describe each of the following bacteria to include: • general characteristics: structure, arrangement, staining properties • metabolic and pathogenic properties • diseases caused in humans and locations in body	
A. Gram-Positive cocci	
1.) Staphylococcus	Section 18.1
2.) Streptococcus	Section 18.2
3.) Enterococcus	Section 18.2
B. Gram-Negative cocci	
1.) Neisseria	Section 18.3
2.) Moraxella	Section 18.3
C. Gram-Positive endospore forming bacilli	
1.) Bacillus	Section 19.2
2.) Clostridium	Section 19.2
D. Gram-Positive Regular Non-spore-forming bacilli	
1.) Listeria	Section 19.3
E. Gram-Positive Irregular Non-spore-forming bacilli	
1.) Corynebacterium	Section 19.4
2.) Propionibacterium	Section 19.4
F. Mycobacterium: Acid-Fast Bacilli	
1.) M. tuberculosis	Section 19.5
2.) M. leprae	Section 19.5
G. Actinomycetes: Filamentous bacilli	
1.) Actinomyces	Section 19.6
2.) Nocardia	Section 19.6

H. Gram-Negative Aerobic Bacilli

1.) Pseudomonas		Sections 20.1-20.2
2.) Burkholderia, Acinetobacter		
3.) Brucella		
4.) Francisella		
5.) Bordetella		
6.) Legionella		

I. Gram negative Facultative Anaerobic Bacilli

--Family Enterobacteriaceae

1) Coliform Enteric Organisms:	*E. coli*	Sections 20.3-20.4
	Serratia	
	Klebsiella	
	Enterobacter	
	Citrobacter	
2) Noncoliform Enteric Organisms:	*Proteus*	Section 20.5
	Providencia	
	Morganella	
3)True Enteric Pathogens:	*Salmonella*	*Section 20.5*
	Shigella	
	Yersinia enterocolitica	
4*.)* Nonenteric Organism*:*	*Yersinia pestis*	

--Family Pasteurellaceae

1) *Pasteurella*		Section 20.5
2) *Haemophilus*		

J. The Spirochetes		Section 21.1
1.) Treponema		
2.) Leptospira		
3.) Borrelia		
K. Curviform Gram-Negative Bacteria		Section 21.2
1.) Vibrio		
2.) Campylobacter		
3.) Helicobacter		
L. Order Rickettsiales		Section 21.3
1.) Rickettsia		
2.) Ehrlichia		
3.) Anaplasma		
4.) Coxiella		
5.) Bartonella		

M. Family Chlamydiaciae — Section 21.3
- *1.) Chlamydia*
- *2.) Chlamydophila*

N. Cell-Wall-Deficient Bacteria — Section 21.4
- 1.) *Mycoplasma*

3. Describe Fungi of Medical Importance to include: — Chapter 22
- • general characteristics
- • degree of pathogenicity
- • nature of infection (primary or secondary; true or opportunistic)and infecting form
- • habitat and geographic location
- • metabolic and pathogenic properties
- • organization of fungal diseases (mycoses)
- • characteristics of common antifungal drugs

A. Systemic Fungal Pathogens — Section 22.2
- 1.) *Histoplasma*
- *2.) Coccidioides*
- *3.) Blastomyces*

B. Subcutaneous Fungal Pathogens — Section 22.3
- 1.) *Sporothrix*

C. Cutaneous Fungal Pathogens (Dermatophytes) — Section 22.4
- *1.) Tricophyton*
- *2.) Microsporum*
- *3.) Epidermophyton*

D. Opportunistic Fungal Pathogens — Section 22.6
- *1.) Candida*
- *2.) Cryptococcus*
- *3.) Pneumocystis*
- *4.) Aspergillus*

4. Define terms associated with parasitology — Chapter 23

5. Describe Parasites of Medical Importance to include — Chapter 23
- • general characteristics of each group of parasitic pathogens
- • portals of entry, habitat, geographic location
- • diseases caused in humans and location in the body
- • antiparasitic drugs of choice

A. Protozoan Pathogens
- 1.) Amoeboid Protozoa — Section 23.2
  - *a. Entamoeba*
  - *b. Naegleria*

2.) Ciliate Protozoan — Section 23.2
- *a. Balantidium coli*

3.) Flagellate (Mastigophoran) Protozoa — Section 23.3
- *a. Trichomonas*
- *b. Giardia*
- *c. Trypanosoma*
- *d. Leishmania*

4.) Apicomplexan Protozoa — Section 23.4
- *a. Plasmodium*
- *b. Toxoplasma*
- *c. Cryptosporidium*
- *d. Cyclospora*
- *e. Babesia*

B. Helminthic Pathogens — Section 23.5

1.) Nematodes (Roundworms) — Section 23.6
- *a. Ascaris*
- *b. Trichuris trichiura*
- *c. Enterobius*
- *d. Trichinella*
- *e. Wuchereria*
- *f. Onchocerca*
- *g. Loa loa*
- *h. Necator americanus*
- *i. Dracunculus*

2.) Trematodes or Flukes (Flatworms) — Section 23.7
- *a. Schistosoma*
- *b. Fasciola*
- *c. Paragonimus*

3.) Cestodes or Tapeworms (Flatworms) — Section 23.7
- *a. Taenia solium, T. saginata*
- *b. Diphyllobothrium*
- *c. Echinococcus*

6. Differentiate among the Arthropod vectors of infectious disease — Section 23.8

7. Describe DNA and RNA Viruses that infect humans. Discuss — Chapter 24
- • general characteristics, identification, diagnosis, classification, effects of infection on host cells
- • diseases and location in the body

A. Enveloped Double-stranded DNA Viruses

1.) Poxviruses (Poxviridae) Section 24.2
   a. *Variola, Vaccinia*

2.) Herpesviruses (Herpesviridae) Section 24.3
   a. *Herpes simplex virus* (HSV-1 and HSV-2)
   b. *Varicella-Zoster Virus (VZV)*
   c. Epstein-Barr Virus (EBV)
   d. Cytomegalovirus (CMV)
   e. Herpesviruses 6, 7, 8

3.) Hepadnaviruses (Hepadnaviridae) Section 24.4
   a*. Hepatitis B Virus* (HBV)

B. Nonenveloped Double-stranded DNA Viruses

1.) Papillomaviruses (Papillomaviridae) Section 24.5
   a. *Human Papillomavirus* (HPV)

C. Nonenveloped Single-stranded DNA Viruses

1.) Parvoviruses (Parvoviridae) Section 24.5
   a*. Parvovirus* (Erythrovirus) Fifth's Disease

D. Enveloped Segmented Single-stranded RNA Viruses

1.) Orthomyxoviruses (Orthomyxoviridae) (ss-) Section 25.1
   a. *Influenza virus A, B, C*

2.) Bunyaviruses (Bunyaviridae) (ss-) Section 25.1
   a. *Hantavirus*

E. Enveloped Nonsegmented Single-stranded RNA Viruses

1.) Paramyxoviruses (Paramyxoviridae) (ss-) Section 25.2
   a. *Paramyxovirus* (parainfluenza virus types 1-5 and mumps virus)
   b. *Morbillivirus* (measles/rubeola virus) (ss-)
   c. *Pneumovirus* (respiratory syncytial virus (RSV) (ss-)

2.) Rhabdoviruses (Rhabdoviridae) (ss-) Section 25.2
   a. *Lyssavirus* (Rabies virus)

3.) Filoviruses (Filoviridae) (ss-) Section 25.2
   a. Ebola virus
   b. Marburg virus

4.) Coronaviruses (Coronaviridae) (ss+) Section 25.3
   a. Coronavirus /*Severe Acute*

Respiratory Syndrome Virus (SARS) (ss+)

5.) Togaviruses (Togaviridae) (ss+) Section 25.4
a. *Rubivirus* (Rubella/ German Measles))
b. *Alphavirus* (Yellow Fever, Eastern & Western Equine Encephalitis, Chikungunya virus, Zika) Section 25.5

6.) Flaviviruses (Flaviviridae) (ss+) Section 25.5
a. *Flavivirus* (Dengue Fever virus, West Nile Fever virus, Hepatitis C virus (HCV))

7.) Picornaviruses (Picornaviridae) (ss+) Section 25.7
a. *Enterovirus* (Poliovirus, Coxsackie virus)
b. *Hepatovirus* (Hepatitis A virus (HAV))
c. *Rhinovirus* (Common Cold virus)

8.) Caliciviruses (Caliciviridae) (ss+) Section 25.7
a. *Calicivirus* / *Norovirus* (Norwalk agent)

F. Double-stranded Nonenveloped RNA viruses
1.) Reoviruses (Reoviridae) Section 25.7
a. *Rotavirus*

G. Double-stranded Enveloped RNA viruses
(produce DNA using Reverse transcriptase
1.) Retroviruses (Retroviridae) Section 25.6
a. *Lentivirus* (HIV)
b. *Oncornavirus* (Human T-Cell Lymphotropic virus I) (HTLV-1) (Leukemia)

8. Define Arbovirus; describe the pathology and mode of Transmission of arboviruses Section 25.5

9. Explain the pathogenesis, transmission, and epidemiology of prion disease Section 25.7

**The syllabus is intended to give student guidance in what may be covered during the semester and will be followed as closely as possible. However, the faculty member reserves the right to modify, supplement, and make changes as the need arise.*