**Lecture Learning Outcomes and Objectives**

**Week 2: Viruses, Bacteria and Archaea**

*Given 2 hours of discussion and assigned reading on the subject, upon an examination and within 70% accuracy, the student should be able to:*

**Viruses**

1. Describe how viruses were discovered
2. List the major components of a virus.
3. List the criteria used to categorize viruses.
4. Explain why viruses are considered to be obligate intracellular parasites.
5. Outline the steps of bacteriophage reproduction, distinguishing between lytic and lysogenic cycles.
6. Outline the steps of animal virus reproduction, explaining how the process differs from that in bacterial cells.
7. Explain why retroviruses are unique.
8. Provide examples of human diseases that are caused by viruses, particularly emerging viruses.
9. Compare and contrast viroids and prions with one another and with viruses.

**The Prokaryotes**

1. Describe the evolutionary history of prokaryotes
2. State the unique characteristics of domain Archaea that led to them being classified separately from the members of domain Bacteria
3. Discuss the diversity of prokaryotes, the distinguishing features of extremophiles
4. Describe the structure of a typical prokaryotic cell.
5. Explain the Gram stain.
6. Explain how prokaryotic cells reproduce.
7. List the means of genetic recombination in prokaryotes.
8. Describe the various nutritional modes of prokaryotes
9. Provide examples of symbiotic relationships between prokaryotes and other organisms.
10. Provide examples of human diseases caused by prokaryotes.
11. List and describe beneficial roles/uses of prokaryotes
12. Be able to use and define the following terminology: acellular, capsid, envelope, reverse transcriptase, bacteriophage, budding, latency, lysis, lytic cycle, oncogenic, prophage, oncolytic, vaccine, antiviral, pathogen, prion, viroid, acidophile, extremophile, biofilm, cyanobacteria, halophile, hydrothermal vent, microbial mat, stromatolite, VBNC (viable but non culturable), capsule, conjugation, Gram negative, Gram positive, peptidoglycan, pilus, transduction, transformation, mutation, chemotroph, decomposer, phototroph, nitrogen fixation, antibiotic, epidemic, superbugs, bioremediation, biotechnology

---