

BSc 489 Applied Microbiology (3 credit hours)

Instructor: Dr. DongWon Choi, Science 208

Purpose: Although relatively simple and primitive, microorganisms are considered as the most successful form of life. They are virtually everywhere and they are in tight relationship with other forms of life on earth. Unlike macroorganisms (i.e. animals, plants, insects, etc), microorganisms carry out their life processes such as energy metabolism, growth, and reproduction independently from other cells. This unique feature makes microorganisms a great tool to study the nature of life. The course will cover eukaryotic and prokaryotic microbes and viruses, but will emphasize bacteria. .

Student Learning Outcomes:

Upon completion of this course, you should be able to;

1. Compare and distinguish the basic groups of microbes, including prokaryotic microbes (archaea, bacteria), and viruses, and eukaryotic microbes.
2. Understand the processes needed for one bacterium to become two, and understand the mechanisms involved.
3. Compare and contrast major pathways of catabolism, specify the relative energy yield from each pathway, list the key products of each pathway, and describe biochemical pathways used for microbial taxonomy.
4. Compare and contrast major pathways of biosynthesis and list the key products of each pathway.
5. Draw a typical microbial growth curve, and predict the effect of different environmental conditions on microbial growth.
6. Compare and contrast eukaryotic and prokaryotic genomes, and gene expression in each group.
7. Compare and contrast the acquisition of novel genetic information in microbes via mutations and genetic exchange, specifically conjugation, transformation and transduction.
8. Specify the role of microbes in global C, N, S, and P cycles, and list examples of microbes that contribute to key metabolic aspects of these cycles.
9. List different types of symbiotic interactions between microbes and other organisms, including commensalism, mutualism, and parasitism, and provide examples of each.
10. Summarize common features of microbial pathogens, with emphasis on bacterial and viral pathogens.
11. Summarize mechanisms of animal defenses to infection, including primary defenses, innate immunity, and acquired immunity.
12. Have a solid grasp of the scope of microbial life and its central roles in both human activities and the web of life on Earth.

Grading Scheme:

8 Chapter Exams (100 pts each)

800 points total

Exams will be given in exchange of hand-written chapter summary. If students fail to provide the hand-written summary, the corresponding exam will not be given and resulted in Zero grade for the exam.

The final course grade will be assigned based on the following break-down;

90 – 100%	= A
80 – 89%	= B
70 – 79%	= C
60 – 69%	= D
59% and below	= F

Students with Disabilities:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation for their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services,
Texas A&M University – Commerce,
Halladay Student Services Building,
Room 303 A/D,
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
StudentDisabilityServices@tamuc-commercedu

Student Conduct:

All student enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. See Student's Guide Handbook, Policies and Procedures, Conduct.

<http://www.tamuc.edu/studentLife/documents/studentGuidebook.pdf>

Students who are disruptive to class activities will be dropped from the class and may face further disciplinary action.