BIOL 2421 – ONLINE
Microbiology (FOR MAJORS)

Western Texas College

I. **Basic Course Information:**
   A. *Course Description*: The course is designed to give the science student an in-depth understanding of the morphology, physiology, and taxonomy of representative groups of microorganisms with emphasis on pathogenesis, disinfection, and sanitation.
   B. *Prerequisites*: There are no official prerequisites. However, the student must be able to read, speak and write proficiently at the college level.

II. **Student Learning Outcomes**
   A. Provide examples of the impact of microorganisms on agriculture, environment, ecosystem, energy, and human health, including biofilms.
   B. Identify unique structures, capabilities, and genetic information flow of microorganisms.
   C. Compare the life cycles and structures of different types of viruses.
   D. Discuss how microscopy has revealed the structure and function of microorganisms.
   E. Give examples of the range of metabolic diversity exhibited by microorganisms, impact of metabolic characteristics on growth, and control of growth.
   F. Describe evidence for the evolution of cells, organelles, and major metabolic pathways from early prokaryotes and how phylogenetic trees reflect evolutionary relationships.
   G. Describe the causes and consequences of mutations on microbial evolution and the generation of diversity as well as human impacts on adaptation.
   H. Classify interactions of microorganisms on human and non-human hosts as neutral, detrimental, or beneficial.
   I. Apply scientific reasoning to investigate questions and utilize scientific tools such as microscopes and laboratory equipment to collect and analyze data.
   J. Use critical thinking and scientific problem-solving to make informed decisions in the laboratory.
   K. Communicate effectively the results of scientific investigations.

III. **Testing Requirements**
   A. All lecture quizzes are online and do not have to be proctored. Students are allowed to use their book and notes while taking lecture quizzes.
   B. The midterm and final exams must both be proctored. The student must take the exams at a local college or university's testing center. The student will be responsible for any fees incurred. Students are not allowed to use their textbook/notes/other resources while taking the proctored lecture midterm and final exam.

IV. **Major Course Requirements**

A. There will be a midterm and final exam.
B. There are weekly quizzes.
C. Six (6) on-campus wet labs (mandatory)

V. **Information on Books and Other Course Materials**

A. **Microbiology with Diseases by Body System Plus MasteringMicrobiology with eText – Access Card Package, 4th Edition**. Bauman. 2014. Pearson Benjamin Cummings. (ISBN: 032191838X)

B. **Microbiology: Laboratory Theory & Application, Brief, 2nd Edition**. Leboffe/Pierce. (ISBN: 978-089582-9474)

VI. **Other Policies, Procedures and Important Dates**

A. The WTC Catalog can be found by accessing the following web address: http://www.wtc.edu/Information/publications.html

VII. **Course Organization and Schedule**

Topic	**Chapter**
Microbiology History; Cell Structure and Function	1, 3
Microbial Metabolism; Microbial Nutrition and Growth	5, 6
Prokaryotes	11
Eukaryotes	12
Viruses, Viroids, and Prions; Infection, Infectious Diseases, and Epidemiology	13, 14
Innate Immunity	15
Adaptive Immunity; Immunization and Immune Testing	16, 17
Diseases of the Skin and Wounds	19
Diseases of the Nervous System and Eyes	20
Cardiovascular and Systemic Diseases; Diseases of the Respiratory System	21, 22
Diseases of the Digestive System	23
Diseases of the Urinary and Reproductive System	24

Disclaimer: As always, circumstances can prevent coverage of the material in this chronology and in the expected time frame