

GENERAL MICROBIOLOGY

Fall, 2009
COURSE OUTLINE

- I. Foundations of Microbiology
 - A. Introduction to Microbiology
 - 1. A brief history of microbiology
 - 2. Contemporary microbiology and the roles of microbiologists
 - 3. Microscopy
 - B. General Characteristics of Microorganisms
 - 1. Prokaryotic cells: Bacteria
 - 2. Eukaryotic cells: Algae, fungi and protozoa
 - 3. Viruses
- II. General Microbiology
 - A. Chemical and Functional Anatomy of the Prokaryotic Cell
 - 1. Cell membranes
 - 2. Cell walls
 - 3. Miscellaneous structures (Spores, flagella, pili, capsules, etc.)
 - B. Microbial Nutrition
 - 1. Requirements for growth
 - 2. Diversity in nutritional requirements for growth
 - C. Microbial Cultivation and Growth
 - 1. Population growth
 - 2. Control of growth (Chemical and physical agents)
 - D. Microbial Metabolism
 - 1. Enzymes
 - 2. Mechanisms of energy trapping
 - 3. Biosynthesis
 - E. Microbial Genetics
 - 1. Structure and function of genetic material
 - 2. Regulation of gene expression
 - 3. Genetic mutation
 - 4. Genetic recombination
 - 5. Genetic engineering
- III. Microbial Diversity
 - A. Microbial Evolution and Taxonomy
 - B. Microbial Interactions
- IV. Applied and Environmental Microbiology
 - A. Environmental Microbiology and Biogeochemical Cycling
 - B. Terrestrial Microbiology
 - C. Aquatic Microbiology
 - D. Industrial Microbiology
 - E. Food and Dairy Microbiology
 - F. Water and Sewage Microbiology
- V. Medical Microbiology
 - A. Principles of Infectious Disease
 - B. Host Parasite Relationships
 - 1. Mechanisms of pathogenicity
 - 2. Mechanisms of immunity
 - C. Epidemiology
 - D. Antimicrobial Chemotherapy
 - E. Microbial Diseases
 - 1. Bacterial diseases
 - 2. Viral and Prion diseases
 - 3. Fungal diseases
 - 4. Protozoal diseases