

Microbiology Course Case Study List

Microbiology Unit 1: Structure and Behavior of Microorganisms

Name of Case Study	Content
FM CS #3: Tools of the Laboratory: The Methods of Studying Microorganisms	<ul style="list-style-type: none"> • The handling of biological samples to be used for diagnostic testing. • The importance of Gram stain in microbial identification. • The use and limits of light microscopy. • The growth and isolation of pure bacterial cultures. • The importance of media type in the isolation and identification of microorganisms.
FM CS #4: An Introduction to the Prokaryotic Cells, Its Organization, and Members	<ul style="list-style-type: none"> • Prokaryotic Cell Structure • Capsule Structure
A Case Study Approach CS #9-Simple Staining, Negative Staining, and Gram Staining	<ul style="list-style-type: none"> • Prokaryotic Cell Structure Differences • Staining Techniques
FM CS #5: Eukaryotic Cells and Microbiology	<ul style="list-style-type: none"> • Eukaryotic • Protozoan Life Cycle • Cysts
FM CS #6: An Introduction to Viruses	<ul style="list-style-type: none"> • Identification of viruses • Isolation of viruses
FM CS # 10: Genetic Engineering: A Revolution in Molecular Biology	<ul style="list-style-type: none"> • The diagnostic role that genetic techniques may play in clinical cases. • The limits of our current genetic techniques. • The relative fragility of genetic

	information outside of living organisms.
Microbiology Unit 2: Industrial Benefits of Microorganisms	
Name of Case Study	Content
FM CS #2: The Chemistry of Biology	<ul style="list-style-type: none"> • The utility of some microbial products for industrial processes. • The role that microbes play in the cycling of carbon and other elements in the environment. • The resistance of some compounds to microbial degradation.
FM CS #7: Elements of Microbial Nutrition, Ecology, and Growth	<ul style="list-style-type: none"> • The importance of microbes in the environment. • The potential roles of microbes in bioremediation of contaminated sites.
FM CS #8: An Introduction to Microbial Metabolism: The Chemical Crossroads of Life	<ul style="list-style-type: none"> • The importance of normal microbial flora. • The bactericidal effect of certain microbial by-products of metabolism.
FM CS #11: Physical and Chemical Agents for Microbial Control	<ul style="list-style-type: none"> • The mode of action of various antimicrobial chemicals. • Factors that affect the germicidal activity of chemicals.
FM CS #12: Drugs, Microbes, Host – The Elements of Chemotherapy	<ul style="list-style-type: none"> • The concept of antimicrobial chemotherapy. • The characteristics of different types of antibiotics.
FM CS #26: Environmental and Applied Microbiology	<ul style="list-style-type: none"> • The goals of bioremediation. • Nutritional and environmental

	<p>requirements of microorganisms used in environmental cleanup.</p> <ul style="list-style-type: none"> • The requirements for successful biodegradation. • The role of microorganisms in ecosystems.
FM CS #27: Applied and Industrial Microbiology	<ul style="list-style-type: none"> • The limits of traditional microbiological techniques. • The use of genetic fingerprinting to characterize bacterial species.

Microbiology Unit 3: Infection and Methods of Destruction

Name of Case Study	Content
FM CS #4: An Introduction to the Prokaryotic Cells, Its Organization, and Members	<ul style="list-style-type: none"> • Immune response • How use of vaccines can reduce the spread of disease
FM CS #5: Eukaryotic Cells and Microbiology	<ul style="list-style-type: none"> • Cysts • Cyst formation and resistance to disinfectants • Control of eukaryotic infections
FM CS #6: An Introduction to Viruses	<ul style="list-style-type: none"> • How are antibiotics are ineffective against viruses. • How viruses are spread in populations and how the <i>type</i> of population impacts the extent of the spread.
FM CS #8: An Introduction to Microbial Metabolism: The Chemical Crossroads of Life	<ul style="list-style-type: none"> • The consequences of prolonged antibiotic treatment.

<p>FM CS #9: Microbial Genetics</p>	<ul style="list-style-type: none"> • How mutations arise and how random changes in DNA can confer unexpected phenotypic changes. • The transfer of genes between species. • How environmental conditions, such as the use of antibiotics, can select for survival cells carrying a specific trait.
<p>FM CS #12: Drugs, Microbes, Host – The Elements of Chemotherapy</p>	<ul style="list-style-type: none"> • The use of multi-drug therapy to combat the development of resistance.
<p>FM CS #27: Applied and Industrial Microbiology</p>	<ul style="list-style-type: none"> • Epidemiology of infection disease. • The limits of traditional microbiological techniques. • The use of genetic fingerprinting to characterize bacterial species.