

# Microbiology - Web course

## COURSE OUTLINE

The History and Scope of Microbiology; Microbial Cell structure and function; Microscopic techniques; Microbial nutrition; Microbial growth and control; Microbial Metabolism; Microbial Molecular biology and Genetics; The Diversity of the Microbial World; The Viruses; Microbial pathogenicity and Diseases.

## COURSE DETAIL

Module	Topics and Contents	No. of Lectures
1.	<b>The History and Scope of Microbiology:</b> Discovery of microorganisms, spontaneous generation, germ theory of disease, members of the microbial world, scope and relevance of microbiology, the future of microbiology.	2
2.	<b>Microbial Cell Structure and Function:</b> The prokaryotic cell, size, shape and arrangement of bacterial cells; prokaryotic cell membranes, cytoplasmic matrix, the nucleoid, the prokaryotic cell wall, components external of the cell wall, the bacterial endospore.	4
3.	<b>Microscopic Techniques:</b> The light microscopy, electron microscopy, newer techniques in microscopy, preparation and staining of specimens, simple stains, differential and special stains.	2
4.	<b>Microbial Nutrition:</b> Microbial nutrient requirements, nutritional types of microorganisms, uptake of nutrients by the cell, culture media, isolation and cultivation of pure cultures.	3
5.	<b>Microbial Growth and Control:</b> The growth of bacterial cultures, growth curve, measurement of microbial growth, influence of environmental factors on growth, microbial growth in natural environments, the use of physical and chemical methods in microbial control, antimicrobial chemotherapy.	5
6.	<b>Microbial Metabolism:</b> An overview of metabolism, aerobic metabolism,	5



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## Biotechnology

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	anaerobic metabolism, fermentation, catabolism of carbohydrates, lipids, proteins and amino acids, photosynthesis, biosynthesis.	
7.	<b>Microbial Molecular Biology and Genetics:</b> Structure and function of the genetic material, DNA replication, the genetic code, gene structure, the expression and regulation of genes, mutations and their chemical basis, detection and isolation of mutants, DNA repair, microbial recombination and bacterial plasmids, transposable elements, bacterial conjugation, transformation and transduction.	10
8.	<b>The Diversity of the Microbial World:</b> Microbial taxonomy and phylogeny, Archaea, Bacteria, fungi, slime molds, water molds, algae, protozoa, helminths.	3
9.	<b>The Viruses:</b> Introduction and general characteristics, the bacteriophages, viruses of eukaryotes.	3
10.	<b>Microbial Pathogenicity and Diseases:</b> Pathogenicity of microorganisms, clinical microbiology, the epidemiology of infectious diseases, diseases caused by viruses, bacterial, fungi and protozoa.	5
	<b>Total</b>	42