

ESSENTIALS OF MICROBIOLOGY

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VITAL BIOTECH PUBLICATION

Kota, Rajasthan, India

<http://www.vitalbiotech.org/bookpublication/>

An International Publishers

VITAL BIOTECH get Accredited by following International organization



<https://www.portico.org/publishers/vital/>

101 Greenwich Street, 18th Floor
New York, NY 10006

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Published by Vital Biotech Publication

First Edition: 2026

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Product Form:

Digital download, online and hard bound

Edition:

ISBN: 978-81-69356-09-1

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Printed at: Vital Biotech Publication, Kota

Preface

Microbiology is a dynamic and rapidly evolving branch of science that explores the fascinating world of microorganisms and their profound influence on life, health, agriculture, industry, and the environment. From the discovery of microbes to the advent of molecular biology, genomics, and biotechnology, the field has transformed our understanding of biological systems and provided innovative solutions to global challenges, including infectious diseases, food security, environmental sustainability, and industrial production.

Essentials of Microbiology has been written to provide students, educators, researchers, and professionals with a clear, concise, and comprehensive introduction to the fundamental concepts of microbiology. The book presents the structure, classification, physiology, genetics, and diversity of microorganisms, while highlighting their beneficial and harmful roles in nature. Special emphasis has been placed on microbial metabolism, host-microbe interactions, immunology, microbial diseases, laboratory techniques, industrial microbiology, environmental microbiology, and recent advances in molecular diagnostics and microbial biotechnology.

The content has been organized in a logical and student-friendly manner, supported by simple explanations, illustrative examples, diagrams, and up-to-date scientific developments. Care has been taken to balance classical microbiological principles with modern applications, enabling readers to develop both conceptual understanding and practical insight.

This book is intended to serve as a valuable resource for undergraduate and postgraduate students of life sciences, microbiology, biotechnology, agriculture, veterinary science, medicine, pharmacy, environmental science, and allied disciplines. We sincerely hope that it inspires curiosity, promotes scientific thinking, and encourages readers to appreciate the remarkable diversity and significance of the microbial world. Any suggestions from readers for improving future editions will be warmly welcomed.

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Dr. Sahil Girish Kulkarni
Dr. Nazir Ahmad Var
Dr. Priyanka Thakur
Dr. Yeshawant Raghunath Govekar

Date – 30 June, 2026

CONTENTS

S. NO.		PAGE NO.
1.	Introduction to Microbiology and Microbial Diversity <i>Nishu Devi</i>	1-12
2.	History and Development of Microbiology <i>Sahil Girish Kulkarni</i>	13-26
3.	Microbial Cell Structure and Function <i>Nazir Ahmad Var</i>	27-38
4.	Classification and Taxonomy of Microorganisms <i>Priyanka Thakur</i>	39-48
5.	Microbial Nutrition, Growth, and Metabolism <i>Yeshawant Raghunath Govekar</i>	49-60
6.	Microbial Genetics and Molecular Biology <i>Nishu Devi</i>	61-74
7.	Bacteriology: Structure, Physiology, and Importance <i>Sahil Girish Kulkarni</i>	75-84
8.	Virology: Viruses and Their Applications <i>Nazir Ahmad Var</i>	85-96
9.	Mycology: Fungi and Their Significance <i>Priyanka Thakur</i>	97-108
10.	Phycology and Protozoology: Algae and Protozoa <i>Yeshawant Raghunath Govekar</i>	109-120
11.	Microbial Ecology and Environmental Microbiology <i>Nishu Devi, Sahil Girish Kulkarni, Nazir Ahmad Var</i>	121-134

12. Medical Microbiology and Infectious Diseases

135-146

Priyanka Thakur, Yeshawant Raghunath Govekar