

B.Sc. Life Sciences (NEP-UGCF) VII Semester

DISCIPLINE SPECIFIC ELECTIVE COURSE -18
Semester VII - Zoo-DSE-24
Microbial World

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lectures	Tutorial	Practical/ Practice		
Semester VII-DSE- Microbial World Zoo-DSE-24	04	02	Nil	02	Should have appeared in Semester VI	-

Learning Objectives

The learning objectives of this course are as follows:

- To understand structure, function and diverse roles of Microorganisms in environments.
- To study impact of microorganism on human health, industry & agriculture.

Learning Outcomes

By studying this course, students will be able to

- learn the microbial diversity and their importance in environment and human health.
- have basic understanding of microbiology lab practices & biosafety principles.
- get the hands on experience related to bacteria cultivation & examination under Microscope.

Syllabus:

Semester VII-DSE-25 Microbial World

Unit 1: Overview of Microbiology

Overview of microbiology as a discipline, Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Flemming, Edward Jenner, Introduction to microbial diversity, Microbiological techniques.

Unit 2: Microflora of the human body and host-pathogen interactions

Composition location and functions of microflora in Digestion, nutrient synthesis, immune support and protection from pathogenic microflora, Transient microflora of normal microbiome of skin, throat, gastrointestinal tract, and urogenital tract.

Host-pathogen interactions: Definitions: Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxigenicity, Carriers and their types, Opportunistic infections, Transmission of infection.

Unit 3: Zoonotic diseases

Pathogens, transmission, symptoms and management of Rabies, COVID-19, SARS, Avian influenza, Leptospirosis, Salmonellosis & Ebola.

Unit 4: Applications of Microbes in Healthcare

Diversity of microbiome in human gut and skin, Understanding the therapeutic uses (Prebiotics and Probiotics) in promoting and maintaining human health, Phage Therapy.

Practical

- Microbiology Laboratory Management and Biosafety.
- Preparation of different media: Nutrient agar, Nutrient broth.
- Preparation of culture media for bacterial cultivation.
- Demonstration of presence of microflora on the fingertips.
- Microscopic examination of microbes from human tissues.
- Lab/Industrial visit in for exposure to advanced techniques in microbiology.

References

- Clinical Understanding of the Human Gut Microbiome, 2024 by Mark Pimentel (Editor), Ruchi Mathur (Editor), Gillian M. Barlow (Editor), ISBN-13 978-3031467110, Springer International Publishing
- Pelczar Microbiology. Pelczar, Michael J., Chan, E.C.N, Krieg, Noel R.
- Sastry Apurba S., Essentials of Medical Microbiology, Jaypee Brothers Medical Publishers
- Understanding Your Microbiome: What You Need to Know About Gut Bacteria Kindle Edition.