

UNIVERSITY OF DELHI

CNC-II/093/1/Misc./2025/14

Dated: 16.09.2025

**NOTIFICATION**

**Sub: Amendment to Ordinance V**

Following addition be made to Appendix-II-A to the Ordinance V (2-A) of the Ordinances of the University;

**Add the following:**

The syllabi of the following DSEs for Semester-VII/VIII for the students of UGCF opting Life Sciences in 4<sup>th</sup> year to make a major in Zoology, are notified herewith for the information of all concerned as per **Annexure-1**:

- (i) Microbial World - DSE 24 - Semester-VII
- (ii) Medical Diagnostics and Healthcare - DSE 25 - Semester-VIII

*nhc*  
*16/9/25*

REGISTRAR

## 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.

## B.Sc. Life Sciences (NEP-UGCF) VIII Semester

### DISCIPLINE SPECIFIC ELECTIVE COURSE -18 Semester VIII-DSE-Medical Diagnostics and Healthcare Zoo-DSE-25

#### 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 VIII-DSE-Medical Diagnostics and Healthcare Zoo-DSE-25	04	02	Nil	02	Should have appeared in Semester VI	-

#### Learning Objectives

The learning objectives of this course are as follows:

- To provide an understanding of basic principles and applications of medical diagnostics in healthcare.
- To acquaint students with common diagnostic tools, techniques, and their significance in disease detection.
- To introduce preventive healthcare practices and their importance in lifestyle disease management.
- To provide hands-on exposure to selected diagnostic techniques in laboratory settings.

#### Learning Outcomes

By studying this course, students will be able to

- To explain the principles and working mechanisms of advanced diagnostics.
- To demonstrate proficiency in operating instruments like PCR machines, ELIZA.
- To analyze data Medical Diagnostics and Healthcare.
- To solve problems in diagnostics, genomics, proteomics, and drug discovery.

**Syllabus:**

**Semester VIII-DSE-25 Medical Diagnostics and Healthcare**

**Unit I: Introduction to Medical Diagnostics**

Concept and scope of medical diagnostics and healthcare, Types of diagnostic methods: Invasive vs. Non-invasive, Ethical issues and safety in medical diagnostics, Role of diagnostics in preventive and curative medicine.

**Unit II: Clinical Laboratory Diagnostics**

Blood analysis: CBC, blood sugar, lipid profile, liver and kidney function tests. Urine analysis: physical, chemical, microscopic. Serological tests: ELISA, Widal test, VDRL, Molecular diagnostics: PCR, RT-PCR, DNA-based detection of pathogens.

**Unit III: Imaging and Instrumental Diagnostics**

X-ray, CT scan, MRI: principle and applications. Ultrasound and echocardiography. Endoscopy and colonoscopy, ECG and EEG: principle and interpretation basics.

**Unit IV: Healthcare and Preventive Medicine**

Vaccines and immunization programs. Screening programs: cancer, tuberculosis, diabetes, hypertension. Lifestyle diseases: causes, diagnosis, and preventive strategies (diabetes, cardiovascular disease, obesity, etc.). Recent advances in personalized medicine and telemedicine.

**Practical Exercises (Any 4–5)**

1. Urine Analysis (Chemical tests protein, glucose, ketones).
2. Estimation of Blood Glucose and cholesterol using kits.
3. Demonstration of ELISA using kits.
4. Study of normal ECG and identification of basic abnormalities (provided sample traces).

**Suggested Readings**

1. Cheesbrough, M. (2012), District Laboratory Practice in Tropical Countries, Cambridge University Press.
2. Godkar, P. B., & Godkar, D. P. (2014), Textbook of Medical Laboratory Technology. Bhalani Publishing.
3. Kumar, P. J., & Clark, M. (2020), Kumar and Clark's Clinical Medicine. Elsevier.
4. McPherson, R. A., & Pincus, M. R. (2021), Henry's Clinical Diagnosis and Management by Laboratory Methods, Elsevier.