



Gujarat University
B.Sc. Microbiology Syllabus
First Year B. Sc. Semester II, Microbiology
(Multidisciplinary Course)
Effective from June-2023

Paper Code: MDC- MIC-124T (Theory)
Paper Name: Vedic Microbiology & Bacterial Cell Structure
Credits:02 (02 hrs/week, Total: 30 hrs)

Unit-1 Introduction to Vedic Microbiology **Teaching hrs: 15**

- 1.1 Contribution of Rishi – Kanva, Sushruta and Charak
- 1.2 Microbial diversity based on pH, temperature, oxygen and hydrostatic pressure
- 1.3 Occurrence of krimis in the environment
 - (a) Prevalence of krimis in water
 - (b) Prevalence of krimis in milk, whey and food
 - (c) Prevalence of krimis on/in human body
- 1.4 Method of counting the number of krimis
- 1.5 Shape and color of krimis

Unit-2 Structural Organization of a Bacterial cell **Teaching hrs: 15**

- 2.1 Surface appendages
 - (a) Flagella
 - (b) Pili and Fimbriae
 - (c) Prosthecae and Stalks
- 2.2 Surface layers
 - (a) Capsule and Slime layer
 - (b) Cell wall, Differential staining – Gram staining and Acid-fast staining
 - (c) Cytoplasmic membrane and Mesosomes
- 2.3 Cytoplasm and Cell organelles
 - (a) Cytoplasm
 - (b) Ribosomes
 - (c) Nuclear material and Plasmid
 - (d) Cellular reserve food material
 - (e) Bacterial Endospore – structure, sporulation and germination

References:

1. **Microbiology**, Pelczar JR., Chan ECS, Krieg NR, 5th Edition (1993), McGraw-Hill Book Company, NY.
2. **Principles of Microbiology**, R. M. Atlas, 2nd Edition (Indian Edition) (2015) McGraw Hill Education (India) Private Limited, New Delhi, India
3. **Vedic Microbiology – A Scientific Approach**, Dr. R. C. Dubey, 1st Edition (2021), Motilal Banarsidass International, Delhi, India.

Paper Code: MDC-MIC-124P (Practicals)
Paper Name: Microbiology Practicals (Multidisciplinary)
Credits:02 (04 hrs/week, Total: 60 hrs)

1. Differential staining of bacteria: Gram stain method
2. Structural staining techniques
 - (a) Endospore staining by Dorner's method
 - (b) Cell wall staining by Dyar's method
 - (c) Capsule staining by Hiss's method
 - (d) Metachromatic granule staining by Albert's method