Veer Narmad South Gujarat University, Surat
M. Sc. Semester I
MB 1001: MICROBIAL DIVERSITY

1. Course Code & Title

Course code: Core course 1
Course title: Microbial diversity
Course type: Core
Course credits: 04

2. Course overview and Course Objectives

The main aspect of this course is to study the diverse forms of microorganisms and principles underlying its classification, study of major phyla of the domain bacteria and archaea. The paper also includes the study of viruses, fungi and algae.

Course Objectives

- To study classification and identification of prokaryotic organism.
- To learn characteristics of archea and proteobacteria.
- To study structure, replication of viruses and emerging viral diseases.
- To increase understanding of classification and characterization of fungi and algae.

3. Course Content

UNIT 1	PROKARYOTIC TAXONOMY
1.1	Prokaryotic domain
1.2	Classification of prokaryotic organisms
1.3	Identification of prokaryotes
1.4	Numerical and polyphasic taxonomy
1.5	Prokaryotic systematic
1.6	Bacterial nomenclature
1.7	Taxonomic framework for prokaryotic systematic
1.8	Intellectual property of prokaryotes

UNIT 2	ARCHAEA AND PROTEOBACTERIA
2.1	The *Archaea* 2.1.1 Overview of *Archaea* 2.1.2 Phylum *Creanarchaeota,* 2.1.3 Phylum *Euarcheaeota*
2.2	The Proteobacteria 2.2.1 *Alphaproteobacteria*

	2.2.2 *Betaproteobacteria* 2.2.3 *Gammaproteobacteria* 2.2.4 *Deltaproteobacteria* 2.2.5 *Epsilonproteobacteria*

UNIT 3	VIROLOGY
3.1	Principles of virus structure
3.2	virus replication strategies
3.3	Viral conquest of the host cell
3.4	Emerging viral diseases
3.5	Viroids and prions
3.6	Plant phages: TMV
3.7	Protists viruses: Chlorella viruses
3.8	Animal viruses: HIVs and their replication
3.9	Bacteriophages: phage λ, phage Mu-1

UNIT 4	MYCOLOGY AND PHYCOLOGY
4.1	Natural classification of fungi 4.1.1 Members of kingdom Fungi 4.1.2 The species concept in fungi 4.1.3 The untrue fungi 4.1.4 Ecosystem mycology
4.2	Hyphal cell biology: Mycelium: the hyphal mode of growth, Spore germination and dormancy, The fungal lifestyle: colony formation, Mycelium growth kinetics
4.3	Fungal cell and tissue differentiation: Mycelial differentiation, Making spores
4.4	Arbuscular (AM) endomycorrhizas
4.5	Characteristics of algae 4.5.1 Structure of algal cell 4.5.2 Nutrition of algae 4.5.3 Classification of algae
4.6	Cyanobacteria 4.6.1 Ecology of Cyanobacteria 4.6.2 Classification

4. Course Learning Outcomes/Student's Learning Outcomes (SLO)

Unit 1: Students shall learn the principles of prokaryotic classification and bacterial nomenclature as well as the IPR of prokaryotes.

Unit 2: Students shall gain knowledge of few phyla of archea as well as proteobacteria

Unit 3: Students will gain an understanding of virus structure, replication as well as emerging viral diseases. They shall learn important virus of plant, animal and bacteria.

Unit 4: Students shall develop an understanding of classification and characterization of fungi, mycorrhiza, algae and cynaobacteria.

Recommended Learning Resources:

- Bergey's manual of systematic bacteriology, (2009) 2nd edition, vol 1 Springer. (ISBN; 978-0387-95041-9).
- Wiley J., Sherwood I., (2011), Prescott, Harley and Kleins Microbiology, 9th edition., Mc Graw Hill. (ISBN; 978-0073402406)
- David M. Knipe, Peter M. Howley, (2007). 5th edition., vol. 1, Fields Virology. (ISBN; 978-07817-6060-7)
- David Moore, Geoffrey Robson, Anthony Trinci, (2011) 21st century guidebook to fungi, Cambridge University Press. (ISBN; 978-0-521-18695-7)
- Robert Edward Lee, (2008) Phycology, Cambridge University Press. (ISBN; 978-0-521-14144-4).