THIRUVALLUVAR UNIVERSITY
VELLORE – 632115
CENTRE FOR RESEARCH
SYLLABUS FOR COMMON ENTRANCE TEST
OF M. PHIL AND PHD

APPLIED MICROBIOLOGY

Unit-1

Discovery of Microbial world.Microscopy - Its principles and applicationsBacterial morphology, structure and characterization - cellular components of bacteria - sporulation and its mechanicsClassification of bacteria and salient features according to Bergey's manual of determinative Bacteriology.Basic concepts of metabolism.Introduction: Infection, immunity, types of immunity. Antigens and ImmunogenicityAntibodies - B cell receptors.Acquired immune response:Prophylaxis

Unit-2

Importance of studying food and dairy microbiology. Microbiology of fermented milk .Distribution of soil microorganisms in soil.Biogeochemical. Air pollution - sources, major pollutants, adverse effect on living organisms -acid rain and its impact on ecosystem-gaseous emission - Green house effect -Global warming - Ozone layer depletion and its effect - Droplet neuclei -Aerosol - Assessment of air quality - Airbonedisesases, their symptoms and preventive measures. Types of wastes, characterization of solid and liquid waste. Solid waste treatment - saccharification - pyrolysis - composting. Water pollution - sources and nature of pollutants in

water - Sewage - industrial effluent - agrochemicals - Eutrophication - waterborne diseases. Potable water. Assessment of microbiological quality of water. Brief account on bioterrorism.

Unit -3

Respiratory System (RS) and Special Sensory Organs (SSS)Gastro Intestinal (GI) System and Lympho-reticular System (LRS)Musculoskeletal System (MSS), Skin and Nervous System (NS)Circulatory System (CS) and Endocrine System (ES)Reproductive System (RS) and Urinary System (US)

Unit -4

Basics in Medical microbiologyDiagnosis of microbial diseases, Bacteriology, Virology, Mycology.

Unit- 5

General principles of Microbial Pharmacology**Systemic** Pharmacology including recent advances of drug affecting:Central Nervous System. Gastro Intestinal System, Hormones and Hormone Antagonists, Chemotherapy of Neoplastic Diseases- Antihypertensives – Analgesics. Antiepileptics - Antiulcer drugs, antiinflammatory drugs, Principles and application of biostatics, Essential drug concepts, Drug addiction and drug abuse, important interactions and their mechanisms.

Unit-6

Biology in the computer ageSequence analysis - pairwise sequence comparison. Protein Data Bank, Swiss-prot, Genbank - sequence queries against biological databases, Genomics and Proteomics, Predicting Protein structure and function, Biostatistics.

Unit – 7

Introduction to identification of Genetic Material, Gene Transfer Mechanisms, Biology of PlasmidsTransposable genetic elements and Gene Mapping, Concept of gene and Gene regulation

Unit- 8

Basics of DNA cloning, Methods of DNA and protein analysis, Polymerase Chain Reaction, Genome sequencing, Protein engineering and proteome analysis

Unit-9

Industrially important microorganisms, Industrial fermentation, Industrial Production, Algal biotechnology, Nanobiotechnology.

Unit- 10

Microscopy, Electromagnetic radiation, Radioactivity, Chromatography, Molecular Techniques