**MICROBIOLOGY**

**MID-1 SYLLABUS(2019-2020)**

**SEMESTER – I**

**MBT- 101 INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY**

UNIT-I

History and mile stones in microbiology. Contributions of Anton von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky. Importance and applications of microbiology. Classification of microorganisms – Haeckel’s three Kingdom concept, Whittaker’s five kingdom concept, three domain concept of Carl Woese. Outline classification of bacteria as per the second edition of Bergey’s Manual of Systematic Bacteriology.

UNIT – II

General characteristics of Bacteria, Archaea, Mycoplasmas and Cyanobacteria. Ultra structure of Prokaryotic cell- Variant components and invariant components. General characteristics of viruses. Morphology, Structure and replication of TMV and HIV.

UNIT-III

General characteristics and outline classification of Fungi, Algae and Protozoa

**SEMESTER – III**

MBT- 301 MICROBIAL GENETICS AND MOLECULAR BIOLOGY TOTAL

UNIT-I : DNA and RNA as genetic material. Structure and organization of prokaryotic DNA. Extrachromosomal genetic elements – Plasmids and transposons in bacteria. Replication of DNA – Semi conservative mechanism, Enzymes involved in replication.

UNIT-II :Mutations – spontaneous and induced, base pair changes, frame shifts, deletions, inversions, tandem duplications, insertions. Mutagens - Physical and Chemical mutagens. Outlines of DNA damage and repair mechanisms. Genetic recombination in bacteria – Conjugation, Transformation and Transduction. UNIT-III :Types of RNA and their functions.

**SEMESTER-V(A)**

**MBT- 501 ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY**

UNIT - I Terrestrial Environment: Soil profile and soil microflora Aquatic Environment: Microflora of fresh water and marine habitats Atmosphere: Aeromicroflora and dispersal of microbes

UNIT – II Role of microorganisms in nutrient cycling (Carbon, nitrogen, phosphorus). Treatment and safety of drinking (potable) water, methods to detect potability of water samples: (a) standard qualitative procedure: presumptive test/MPN test, confirmed and completed tests for faecal coliforms (b) Membrane filter technique.Microbial interactions – mutualism, commensalism, antagonism, competition, parasitism, predation.

UNIT – III No. of hours: 6 Outlines of Solid Waste management: Sources and types of solid waste, Methods of solid waste disposal (composting and sanitary landfill).

**SEMESTER-V(B)**

**MBT- 601: FOOD AND INDUSTRIAL MICROBIOLOGY**

UNIT- I No. of hours: 8 Intrinsic and extrinsic parameters that affect microbial growth in food Microbial spoilage of food - fruits, vegetables, milk, meat, egg, bread and canned foods Food intoxication (botulism). Food-borne diseases (salmonellosis) and their detection.

UNIT – II Principles of food preservation - Physical and chemical methods. Fermented Dairy foods – cheese and yogurt. Microorganisms as food – SCP, edible mushrooms (white button, oyster and paddy straw). Probiotics and their benefits.

UNIT – III Microorganisms of industrial importance – yeasts,(Saccharomyces cerevisiae) moulds,(Aspergillus niger ) Bacteria(E.coli), actinomycetes (Streptomyces griseus).