

Micro Biology (Science)

DEGREE STANDARD

Unit 1: History - Methods in microbiology :

Concept of origin of life - abiogenesis - biogenesis - Spontaneous -generation theory Contribution by S.A. Waksman, Louis Pasteur Robertkoch, Winogradsky, Stanely and Edward Jenner - Sterilization techniques-disinfection- isolation - purification - preservation of microorganisms - staining methods - microscopy - micrometry-Different types of culture media.

unit2: Morphology cytology and classification of microorganisms:

Protists - Archaeobacteria - procaryotes - Eucaryotes - morphology and cytology of fungi bacteria and viruses - Outline classification of microorganisms. Chemical nature of cell wall, protoplasm and other cell organel.

Unit 3: Physiology of microorganism:

Growth and metaholism - nutritional groupings- photosynthesis - respiration - metabolism of carbohydrates, proteins - lipids and nucleic acids - Electron transport- microbial enzymes and regulation

Unit 4: Genetics of microorganism:

Mutation techniques - genetics of fungi, bacteria and bacteriophages episomes and Transporans - plasmids - Transformation-Transduction - Conjugation and genetic improvement of microorganisms.

Unit 5: Soil and Agricultural microbiology:

Various groups of soil microorganisms - Factors influening soil microbes - Rhizosphere concept- R:S ratio - Decomposition of organic matter in soil - Biological nitrogen fixation - Biofertilizers and Biopesticides- important diseases affecting cropplants and their control.

Unit 6: Industrial microbiology:

Fermentors - Fermentation process - Production of ethanol and alcoholic beverages - organic acids - polysaccharides - Vitamins-enzymes - Growth regulators - Antibiotics:-types, mechanism of action and uses.

Unit7: Food and Dairy microbiology:

Preparation of Bread and pickles (Sauerkrut) preservation of food - Contamination and spoilage of food - Control of food borne infections - Food toxicity - microbes as food-SCP-Mushrooms etc . Microbiology of milk, Fermented milk products - Preservation and spoilage of milk and milk products.

Unit8: Environmental microbiology:

Microbiology of water - Microbial assessment of water quality - Water borne diseases - Solid and Liquid waste treatment - Activated sludge process - Trickling filter - Effluent treatement and safe disposal. Utilization of liquid wastes for biogas production. Air pollution - Airborne transmission of microbes and diseases - Bioremediation -Biofuels, Biochips and Biofilters and their significance- use of microbes in metal leaching, oil extraction, pesticide degradation. Basic principles of microbial ecology - Interrelationship between microorganisms and biological equilibrium.

Unit 9: Medical microbiology:

Epidemiology, symptoms, diagnosis and treatment of important human and animal diseases- Immunology - Immunue system - Antigen, Antibody reactions, Host - Microbe interactions - Immune response - Hypersensitivity and allergies.

Unit 10: Microbial biotechnology:

Developments in microbial biotechnology - Genetic manipulation - recombinant DNA technology-

Genecloning or Genetic engineering and its applications. Gene Conversions - Genomic library and chimeric genes - PCR and its applications. - Production of antibiotics, enzymes, insulin, Growth hormones - interferons - Monoclonal antibodies. Transgenic plants and their scope in Agriculture.