BTY102:MICROBIOLOGY

L:3 T:0 P:0 Credits:3

Course Outcomes: Through this course students should be able to

CO1 :: evaluate the contributions of pioneers in microbiology and the conflict over spontaneous generation

CO2 :: apply criteria and molecular approaches to classify microorganisms and identify bacterial phylogeny and taxonomy

CO3 :: demonstrate the principles and working of bright-field microscopy, including specimen preparation, and perform simple and differential staining.

CO4 :: differentiate the distribution, morphology, and cell structure of major groups of microorganisms such as bacteria, algae, fungi, protozoa, and viruses

CO5 :: investigate methods of isolation, purification, and preservation of microorganisms, and analyze factors affecting bacterial growth and reproduction

CO6 :: evaluate the effectiveness of physical, chemical, and chemotherapeutic agents in controlling microorganisms and describe the stages of sporulation in bacteria

Unit I

History of Microbiology : discovery of microorganisms and the conflict over spontaneous generation, contributions of pioneers towards the development of Microbiology, the relationship between microorganisms and disease, introduction to members of the microbial world, scope of microbiology microorganisms and disease

Classification of Microorganisms : microbial taxonomy, criteria used for identification of microorganisms including molecular approaches, microbial phylogeny, current classification of bacteria

Bright field microscopy : principles and working, specimen preparation, dyes, simple staining, differential staining

Unit II

Microbial Diversity : distribution and characterization of prokaryotic and eukaryotic cells, morphology and cell structure of major groups of microorganisms e.g., bacteria, algae, fungi, protozoa, unique features of viruses

Unit III

Nutrition categories, Cultivation and Maintenance of Microorganisms : nutritional categories of microorganisms, methods of isolation of microorganisms, purification and preservation techniques

Unit IV

Microbial Growth : bacterial growth curve, generation time, synchronous batch and continuous culture, methods for measuring microbial growth and factors affecting the growth of bacteria

Bacterial Reproduction : transformation, transduction and conjugation

Unit V

Control of Microorganisms : Physical agents: heat, filtration,, radiation, desiccation, osmotic pressure, Chemical agents: disinfectants, antiseptics, preservatives, Chemotherapeutic Agents: antibiotics, antifungal agents, antiviral agent,, Endospores: types of endospores, and stages of sporulation in bacteria

Unit VI

Water Microbiology : bacterial pollutants of water, coliforms and non-coliforms, sewage composition, and its disposal,

Food Microbiology : important microorganisms in food microbiology, yeasts, bacteria, and molds, preservation of various types of foods, fermented foods

Text Books:

1. MICROBIOLOGY by PELCZAR M J, CHAN E C S AND KREIG N R, MCGRAW HILL EDUCATION

References:

1. PRESCOTT'S MICROBIOLOGY by JOANNE WILLEY AND LINDA SHERWOOD AND CHRISTOPHER J. WOOLVERTON,, MCGRAW HILL EDUCATION