

**18BP033**

# PHARMACEUTICAL MICROBIOLOGY

Hours Per Week :

L	T	P	CP	CL
3	1	4	2	4

Total Hours :

L	T	P	WA/RA	SSH/HS	CS	SA	S	BS
45	1	60						

**SCOPE:**

Study of all categories of microorganisms especially for the production of alcohol antibiotics, vaccines, vitamins enzymes etc.

**COURSE OUTCOMES:**

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs	PSOs
1	Understand methods of identification, cultivation and preservation of various microorganisms	1,4	1,2
2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry	1,4	1,2
3	Learn sterility testing of pharmaceutical products.	1,4	1,2
4	Understand microbiological standardization of Pharmaceuticals.	1,4	1,2
5	Apply microbiological testing tools in pharmaceutical products.	2,4	1,2

**UNIT-I****10HOURS**

Introduction, history of microbiology, its branches, scope and its importance. Introduction to Prokaryotes and Eukaryotes; Study of ultra-structure and morphological classification of bacteria, nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve, isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count). Study of different types of phase constricts microscopy, dark field microscopy and electron microscopy.

**UNIT-II****10HOURS**

Identification of bacteria, using staining techniques (simple, Gram's & acid fast staining) and biochemical tests (IM Vic). Study of principle, procedure, merits, demerits and applications of physical, chemical gaseous, radiation and mechanical method of sterilization. Evaluation of the efficiency of sterilization methods. Equipments employed in large scale sterilization. Sterility indicators.

**UNIT-III****10HOURS**

Study of morphology, Classification, reproduction/replication and cultivation of Fungi and Viruses. Classification and mode of action of disinfectants. Factors influencing disinfection, antiseptics and their evaluation. For Bacterio static and bactericidal actions. Evaluation of bactericidal & Bacterio static. Sterility testing of products (solids, liquids, ophthalmic and other sterile products) according to IP, BP and USP.

**UNIT - IV****08HOURS**

Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean are a classification. Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids. Assessment of a new anti-biotic.

**UNIT - V****07HOURS**

Types of spoilage, Factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage. Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations. Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures. Application of cell cultures in pharmaceutical industry and research.

