

PHARMACEUTICAL MICROBIOLOGY (Theory)

Course content:

Unit I

10 Hours

Introduction, history of microbiology, its branches, scope and its importance.

- a) Introduction to Prokaryotes and Eukaryotes
- b) 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).
- c) Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy.

Unit II

10 Hours

- a) Identification of bacteria using staining techniques (simple, Gram's & Acid fast staining) and biochemical tests (IMViC).
- b) Study of principle, procedure, merits, demerits and applications of Physical, chemical and mechanical method of sterilization.
- c) Evaluation of the efficiency of sterilization methods.
- d) Equipments employed in large scale sterilization. Sterility indicators.

Unit III

10 Hours

- a) Study of morphology, classification, reproduction/replication and cultivation of Fungi and Virus.
- b) Classification and mode of action of disinfectants
- c) Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions
- d) Evaluation of bactericidal & Bacteriostatic.
- e) Sterility testing of products (solids, liquids, ophthalmic and other sterile products) according to IP, BP and USP.

Unit IV

08 Hours

Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification.

- a) Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids.
- b) Assessment of a new antibiotic and testing of antimicrobial activity of a new substance.
- c) General aspects-environmental cleanliness.

Unit V

07Hours

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

Recommended Books (Latest edition)

1. W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London.
2. Prescott and Dunn., Industrial Microbiology, 4th edition, CBS Publishers & Distributors, Delhi.
3. Pelczar, Chan Kreig, Microbiology, Tata McGraw Hill edn.
4. Malcolm Harris, Balliere Tindall and Cox: Pharmaceutical Microbiology.
5. Rose: Industrial Microbiology.
6. Probisher, Hinsdill et al: Fundamentals of Microbiology, 9th ed. Japan
7. Cooper and Gunn's: Tutorial Pharmacy, CBS Publisher and Distribution.
8. Pepler: Microbial Technology.
9. I.P., B.P., U.S.P.- latest editions.
10. Ananthnarayan : Text Book of Microbiology, Orient-Longman, Chennai
11. Edward: Fundamentals of Microbiology.
12. N.K.Jain: Pharmaceutical Microbiology, Vallabh Prakashan, Delhi
13. Bergeys manual of systematic bacteriology, Williams and Wilkins- A Waverly company