

**DEPARTMENT OF PHARMACEUTICAL MICROBIOLOGY
FACULTY OF PHARMACY**

B. PHARM. COURSE CONTENTS

COURSE CODE: PMB 201

COURSE TITLE: Introductory Pharmaceutical Microbiology

UNITS: 1+0+3/2; 1+0+3/2 = 3 units

Objectives:

The student at the end of the course must be able to:

- (i) Identify and recognise various forms of bacteria morphologically.
- (ii) Demonstrate phases of growth of bacteria in various environment
- (iii) Describe the formation of colonies of bacteria,
- (iv) Effectively determine the population of bacteria or fungal spores in a culture
- (v) Develop and grow micro-organisms in appropriate media and environment
- (vi) Know the properties of viruses as well as the methods of cultivation.
- (vii) Know the basis of classification
- (viii) Know common animal parasites and the diseases caused.

Course Content:

- (1) Morphology of bacteria and fungi.
- (2) Cultivation of bacteria and fungi.
- (3) Growth and death in bacteria populations.
- (4) Quantitative analysis of bacterial suspensions.
- (5) Metabolism in microbial systems.
- (6) Viruses.
- (7) Systematics.
- (8) Introductory parasitology.

Practical

Laboratory exposure for handling, identification and cultivation of micro-organisms as well as various experiments to bring out salient properties of micro-organisms.

COURSE CODE: PMB 301

COURSE TITLE: Pharmaceutical Microbiology I

UNITS: 2+0+3/2; 0 + 0 +0= 2 ^{1/2} units

Objectives:

At the end of the course, the student should be able to:

- (i) know the principles, properties and mode of action as well as conditions under which different agents of sterilization function.
- (ii) predict the effects of sterilization procedure on the chemical and physical properties of sterilized materials.
- (iii) manage and control the sterilization unit of a hospital or industrial concern.
- (iv) detect any failures in the sterilization process.
- (v) to choose appropriate control mechanisms for different agents of sterilization

Course Content:

- (1) Sterilization - principles and processes.
- (2) Sterilization - equipment.
- (3) Heat - Dry and moist heat.
- (4) Radiation.
- (5) Filtration.
- (6) Gaseous sterilization.
- (7) Heating with a bactericide.
- (8) Biological and Chemical controls of sterilization
- (9) Asepsis and aseptic transfer – environments, products and materials

Practical:

To provide exposure for topics covered in PMB 301

COURSE CODE: PMB 302

COURSE TITLE: Pharmaceutical Microbiology II

UNITS: 0+0+0; 1+0+3/2 = 1 ^{1/2} units

Objectives:

At the end of the course, the student must be able to:

- (i) know the sources, treatment and preparation of water as a pharmaceutical vehicle.
- (ii) avoid Pyrogens in IV solutions and carry out pyrogen testing.
- (iii) appreciate the need for sterile medicament and medical appliances.
- (iv) determine and evaluate an appropriate sterilization process for any product.
- (v) determine the necessary packaging.
- (vi) know the principle and basis for sterility testing

Course Content:

- (1) Water - Sources, treatment and examination
- (2) Pyrogens and pyrogen testing
- (3) Sterile Pharmaceutical products including:
 - (a) Injections
 - (b) Non-injectable sterile fluids
 - (c) Ophthalmic preparations
 - (d) Ligatures
 - (e) Sutures and dressings
 - (f) Haemostatics
- (4) Sterility Test
- (5) Evaluation of microbial contents of pharmaceutical preparations and products.

Practical:

To provide practical exposure for topics covered in PMB 302

COURSE CODE: PMB 401

COURSE TITLE: Pharmaceutical Microbiology III

UNITS: 1+0+3/2; 1 +0+ 3/2 =3 units

Objectives:

The student at the end of the course must be able to:

- (i) know the properties, mechanisms of action and uses of the different classes of disinfectants and antiseptics that are in pharmaceutical practice.
- (ii) discuss the need for the use of preservatives and make the correct choice under a given set of conditions.
- (iii) design and carry out tests for the evaluation of preservative activity.
- (iv) relate Good Manufacturing Practice (GMP) to the preparation of effectively preserved pharmaceutical products.
- (v) consider the selection of organisms, types of fermenters and adequate media for the most appropriate production process for solvents, antibiotics steroids etc.

Course Contents:

- (1) Antimicrobial Agents - Definitions, types and properties.
- (2) Factors affecting activity of antimicrobial agents.
- (3) Evaluation of the activity of such antimicrobial agents.
- (4) Preservation - Contamination sources and hazards and properties of preservatives.
- (5) Preservation of pharmaceutical products including multiphase systems.
- (6) Introduction to genetics.
- (7) Industrial uses of microorganisms - production of solvents, steroids, antibiotics. Choice of media and fermenters.
- (8) Yield of products.
- (9) Factors affecting production.

Practical

To provide practical exposure for PMB 401. To include evaluation of disinfectants and antiseptics; effect of various factors on activity and evaluation of antibiotic activity and demonstration of bacterial resistance to antibiotics

COURSE CODE: PMB 501

COURSE TITLE: Pharmaceutical Microbiology IV

UNITS: 0+0+0; 2 +0 + 0=2units

Objectives:

At the end of the course the student should be able to:

- (i) enumerate the properties and uses of whole blood and blood fractions;
- (ii) give necessary advice on the preservation and uses of whole blood and blood products;
- (iii) show an understanding of the need and use of plasma substitutes;
- (iv) define hapten, antigen and antibody; specific and non-specific defense mechanisms;
- (v) describe humoral and cell mediated immune responses;
- (vi) describe primary and secondary response and relate to immunity to disease,
- (vii) demonstrate an understanding of the role of immunological products in the prevention and cure of diseases.
- (viii) enumerate the cause of hypersensitivity and describe the involvement of drugs in the reaction.
- (ix) recognise causes of allergy and the reactions developed.

Course Content:

1. Blood and Blood Products

- (a) Properties and uses of whole blood and fractions
- (b) Preservation of whole blood and blood fractions.

2. Introductory Immunology

- (a) Specific and non-specific defence mechanisms.
- (b) Humoral immunity.
- (c) Monoclonal antibodies - production and application.
- (d) Cell mediated immunity
- (e) Hypersensitivity.
- (f) Tissue transplantation.
- (g) Immunological products - vaccines, immunosera and human immunoglobulins.