# Contents

## PART 1 - BACTERIOLOGY AND GENERAL MICROBIOLOGY


1. Introduction and History ..... 03
2. Microscopy ..... 06
3. Morphology of Bacteria ..... 09
4. Identification of Bacteria/Staining ..... 14
5. Bacterial Growth Factors ..... 18
6. Culture Media ..... 21
7. Control of Microorganisms—Sterilization and Disinfection ..... 27
8. Infections—Nosocomial Infections ..... 35
9. Antimicrobial Therapy ..... 44
10. Systemic Bacteriology ..... 47
11. Immunology ..... 74
12. Immunization ..... 95
13. Serology: Antigen-antibody Reactions ..... 99
14. Virology ..... 107
15. Mycology ..... 126


## PART 2 - PARASITOLOGY


16. Introduction to Medical Parasitology—Amebiasis ..... 133
17. Kala-azar, The Black Sickness ..... 138
18. Malarial Parasites ..... 140
19. Filariasis ..... 144
20. Ascariasis (Roundworm Infection) ..... 146
21. Ancylostomasis (Hookworm Infection) ..... 148
22. Stool Examination ..... 150


## PART 3 - CLINICAL MICROBIOLOGY


23. Normal Microbial Flora of Human Body ..... 155
24. Medical Entomology ..... 157
25. Specimen Collection ..... 163
26. Hospital Waste Management ..... 165


## APPENDICES


Appendix A—Terms to Know ..... 171
Appendix B—Model Semester Question Papers ..... 175
Appendix C—University Question Papers ..... 178
Appendix D—Multiple Choice Questions ..... 190

# INC Microbiology Syllabus

## COURSE DESCRIPTION

This course is designed to enable students to acquire understanding of fundamentals of microbiology and identification of various microorganisms. It also provides opportunities for practicing infection control measures in hospital and community settings.

| Unit | Time (Hour) | | Learning objectives | Content | Teaching/ learning activities | Assessment methods |
|---|---|---|---|---|---|---|
| | Theory | Practical | | | | |
| I | 5 | | Explain concepts and principles of microbiology and their importance in nursing. | Introduction:<br>Importance and relevance to nursing<br>Historical perspective<br>Concepts and terminology<br>Principles of microbiology | Lecture<br>Discussion | Short answers<br>Objective type |
| II | 10 | 5 | Describe structure, classification, morphology and growth of bacteria.<br>Identify microorganisms. | General characteristic of microbes<br>Structure and classification of microbes<br>Morphological types<br>Size and form of bacteria<br>Motility<br>Colonization<br>Growth and nutrition of microbes<br>Temperature<br>Moisture<br>Blood and body fluids<br>Laboratory methods for identification of microorganisms<br>Staining techniques, gram staining, acid-fast staining, hanging drop preparation<br>Culture—various media | Lecture<br>Discussion<br>Demonstration | Short answers<br>Objective type |

| | | | | | | |
|---|---|---|---|---|---|---|
| III | 10 | 2 | Describe the methods of infection control program. | Infection control<br>Infection: sources, portals of entry and exit, transmission<br>Asepsis<br>Disinfection types and methods<br>Sterilization types and methods<br>Chemotherapy and antibiotics<br>Standard safety measures<br>Biomedical waste management<br>Role of nurse<br>Hospital acquired control program<br>Protocols, collection of samples, preparation of report and status of rate of infection in the unit/hospital, nurse's accountability, continuing education, etc. | Lecture<br>Discussion<br>Demonstration<br>Visits to CSSD<br>Clinical practice | Short answers<br>Objective type |
| IV | 12 | 4 | Describe the different disease-producing organisms. | Pathogenic organisms<br>Microorganisms<br>Cocci gram-positive and gram-negative<br>Spirochete<br>*Mycoplasma*<br>*Rickettsia*<br>*Chlamydia*<br>Viruses<br>Superficial fungi and deep mycoses<br>Parasites<br>Rodents and vectors<br>Characteristics, source, portal of entry, transmission of infection<br>Identification of disease-producing microorganisms<br>Collection, handling and transportation of various specimens | Lecture<br>Discussion<br>Demonstration<br>Clinical practice | Short answers<br>Objective type |
| V | 8 | 4 | Explain the concept of immunity, hyper-sensitivity and immunization. | Immunity<br>Immunity types<br>Classification<br>Antigen and antibody reaction<br>Hypersensitivity skin test<br>Serological tests<br>Immunoprophylaxis<br>Vaccines and sera<br>Types and classification, storage and handling, cold chain<br>Immunization for various diseases<br>Immunization schedule | Lecture<br>Discussion<br>Demonstration<br>Clinical practice | Short answers<br>Objective type |