ZNLTP Outline

Course No: MCB 018 **Course Name: Microbiology**

Course Aim: To equip students with knowledge of various microorganisms related to human health and disease; and skills on specific procedures in microbiology

Course Objectives

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

1. Describe the characteristics of various microorganisms.
2. Describe the types of microorganisms and their morphology
3. Outline the factors that promote growth and development of microorganisms.
4. Explain the host microbial interactions in the human body.
5. Describe laboratory procedures for identifying and examining microorganisms.
6. Interpret various laboratory findings.
7. Apply the principles of microbiology in infection prevention.

Section Name & Number	Section Objectives	Section Topic and Subtopics Outlines (H1s and H2s)
Unit One: Introduction to Microbiology	At the end of this unit you should be able to: 1.1 Definition of terms. 1.2 The history of microbiology 1.3 Importance of microbiology in nursing	**1.1 Introduction To Microbiology** **1.2 Unit Objectives** 1.1 Definition of Terms 1.2 History of Microbiology 1.2.1 Antonius Van Leeuwenhoek (1676) 1.2.2 Franceco 1.2.3 Lazzare Spallanzani-1776 1.2.4 1796-Edward Jenner 1.2.5 1546-Fracastoro (An Italian Physician) 1.2.6 1847 Semmelewes 1.2.7 1854-John Snow 1.2.8 Loius Pasteur (1822-1895)

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		1.2.9 Robert Koch (1843-1910) 1.2.10 Klebs and Fredrick Loeffler (1852-1920) 1.2.11 Emil Vanbehring (1854-1917) 1.2.12 Jenner 1.2.13 Theillers 1.2.14 Salk and Sabin 1.2.15 Other Microbiologists 1.3 Importance of Microbiology in Nursing 1.4 Unit Summary 1.5 References
Unit Two: Types of Microorganisms	By the end of this unit, you should be able to: 2.1 Describe different types of microorganisms 2.2 Explain in detail the different morphology or shape of types of microorganisms 2.3 Outline the main properties that distinguish viruses from other living microorganism.	**2.1 Introduction** **2.2 Unit Objectives** 2.3 Types of Micro-Organisms 2.3.1 Bacteria 2.3.1 Cell Wall 2.3.2 Cell Membrane 2.3.3 Classification of Bacteria 2.3.4 Classification of Bacteria according to Morphology or Shape 2.3.5 Spherical/Oval/Round-Shaped 2.3.6 Cylindrical or Rod-Shaped 2.3.7 Curved Shaped 2.3.8 Classification according to Oxygen Requirement 2.3.9 Classification according to Gram Staining Reaction 2.3.10 Examples of Gram Positive Bacteria 2.3.11 Examples of Gram-Negative Bacteria 2.4 Main Properties that Distinguish Viruses from Other Living Micro-Organisms 2.4.1 Structure of a Virus 2.4.2 Nucleic Acid

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		2.4.3 Shape 2.4.4 Effects of Viruses on Cells 2.4.5 Classification 2.4.6 Virus Replication or Production 2.4.7 Fungi 2.4.8 Classification 2.4.9 Protozoa 2.4.10 Description of Terms 2.4.11 Structure of Protozoa 2.4.12 Cytoplasm 2.4.13 Reproduction 2.4.14 Classification of Protozoa 2.4.15 Rhizopoza (Amoeba) 2.4.16 Mastigophora 2.4.17 Protozoa 2.4.18 Ciliata 2.4.19 Typhus Group 2.4.20 Scrub Typhus Group 2.4.21 Spotted Fever Group 2.5 Self-Assessment Questions 2.6 Summary 2.7 References
Unit Three: Microscopic Examination.	At the end of this unit, you should be able to: 3.1 Describe types of microscopes 3.2 Explain Microscopic Examination	3.1 Introduction 3.2 Unit objectives 3.3 Types of Microscopes and how they are Used 3.3.1 The Compound Light Microscope 3.3.2 The Stereo Microscope 3.3.3 Digital Microscope 3.3.4 The USB Computer Microscope

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		3.3.5 Pocket Microscope 3.3.6 The Electron Microscope 3.3.7 Scanning Probe Microscope (SPM) The Acoustic Microscope 3.4 Microscopic Examination 3.4.1 Staining 3.4.2 Stain 3.4.3 Mordant 3.4.4 Decolourisation 3.4.5 Counter Stain 3.4.6 Making of Smears or Preparation of Films 3.4.7 Staining of Films 3.4.8 Staining Methods 3.4.9 Leoffler's Alkaline Methylene Blue 3.4.10 Method 3.4.11 Gram's Stain 3.4.12 Method 3.4.13 Results 3.4.14 Ziehl-Neelsen's Stain (Acid-Fast Stain) 3.4.15 Solution 3.4.16 Method 3.4.17 Results 3.4.18 Other Differential Stain 3.5 Self-assessment Questions 3.6 Summary 3.7 References
Unit Four: Collection and Examination of Specimens	At the end of this unit, you should be able to: 4.1 Describe types of specimens 4.2 Explain cultivation and identification of microorganisms 4.3 Explain anti-microbial susceptibility	4.1 Introduction 4.2 Unit Objectives 4.3 Types of Specimens 4.3.1 Collection of Specimens 4.3.2 Types of Specimens

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	4.4 Outline serological tests	4.4 Cultivation and Identification of Microorganisms 4.4.1 Growth and Reproduction of Bacteria 4.4.2 Growth of Bacteria 4.4.3 Hydrogen and Oxygen 4.4.4 Carbon 4.4.5 Nitrogen 4.4.6 Organic Growth Factors 4.4.7 Other Growth Factors 4.4.8 Environmental Growth Requirements 4.4.9 Stages of Bacteria Growth 4.4.10 The Importance of the Stages of Bacteria Growth 4.4.11 Reproduction in Bacteria 4.4.12 Janice Haney Carr or CDC 4.4.13 Spore Formation 4.4.14 Types of Spores 4.4.15 Viruses 4.4.16 Types of Culture Media 4.4.17 Common Specimens and their Culture Methods 4.4.18 Urine 4.4.19 Culture Media 4.4.20 Common Pathogens 4.4.21 Stool 4.4.22 Common Pathogens 4.4.23 High Vaginal Swab (H.V.S)-Sterile 4.4.24 Culture Media 4.4.25 Common Pathogens 4.4.26 Pus Swab 4.4.27 Culture Media 4.4.28 Cultivation of Viruses 4.5 Antimicrobial Susceptibility and Sensitivity

Section Name & Number	Section Objectives	Section Topic and Subtopics Outlines (H1s and H2s)
		Testing 4.5.1 Sensitivity 4.5.2 Serological Test 4.6 Self – Assessment Questions 4.7 Summary 4.8 References
Unit Five: Infections and Defence Mechanism (Immunity)	At the end of this unit, you should be able to: 5.1 Define the key terms 5.2 Identify Sources of infections 5.3 Outline mode of entry and transmission 5.4 Explain the body's reaction to infection 5.5 Immunity • Define immunity • Describe the types of body immunity • Explain antibody-antigen reaction 5.6 Explain the defence mechanisms of the body 5.7 Describe nosocomial and opportunistic infections	**5.1 Introduction** **5.2 Unit Objectives** **5.3** Definition of Key Terms 5.3.1 Sources of Infection 5.3.2 Factors Determining the Development and Spread of Infection 5.4 Mode of Entry and Transmission of Infection 5.4.1 Mode of Entry 5.4.2 Mode of Transmission 5.5 Body Reaction to Infection 5.6 Defence Mechanisms 5.6.1 The Skin and Mucous Membranes 5.6.2 Mucous Membranes or Surfaces 5.6.3 Secretions 5.6.4 Second Line of Defence 5.6.5 Phagocytosis 5.6.6 Complement System 5.6.7 Specific Defence Mechanism 5.6.8 Organs and Tissues 5.6.9 Inflammation (Inflammatory Reaction) 5.6.10 The Lymphatic System 5.6.11 Humoral 5.6.12 Humoral immunity 5.6.13 Characteristics 5.6.14 Prevention of Entry of Organisms 5.6.15 Prevention of Stasis

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		5.6.16 Non-Specific Elimination of Microorganisms 5.6.17 Normal Body Flora 5.6.18 Normal Flora's Relationship to the Body 5.6.19 Types of Normal Flora 5.6.20 Elements that Alter the Growth of Normal Flora 5.6.21 Positive Effects of Normal Flora 5.6.22 Negative Effects of Normal Flora 5.6.23 Micro-Flora of the Skin 5.6.24 Respiratory Tract 5.6.25 Nose 5.6.26 Oral Pharyox: Streptococco Viridians 5.6.27 Gastro-Intestinal Tract 5.6.28 Genital Urinary Tract 5.6.29 Female: Vulva 5.6.30 Vagina 5.6.31 Male and Female 5.7 Nosocomial and Opportunistic Infections 5.7.1 Nosocomial infections 5.7.2 Methods of Transmission of Nosocomial Infection 5.7.3 Hospital-Acquired Pneumonia and Gastroenteritis 5.7.4 Prevention of Nosocomial Infections 5.7.5 Hand Washing 5.7.6 Hygiene and Uniform 5.7.7 Equipment Safety 5.7.8 Point-of-Use Care 5.7.9 Cleaning/Decontamination 5.7.10 Isolation 5.7.11 Opportunistic Infections 5.8 Self-Assessment Test 5.9 Summary

Section Name & Number	Section Objectives	Section Topic and Subtopics Outlines (H1s and H2s)
		5.10 References