Subject: MICROBIOLOGY I

SYLLABUS for BOPT and BESS

Semester: III **No. of credits: 02**

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1) INTRODUCTION TO MEDICAL MICROBIOLOGY (One hour)

i) Historical introduction to microbiology
ii) Contributions of
    (a) Louis Pasteur
    (b) Robert Koch
iii) Classification of microorganisms
iv) Branches of microbiology and their significance

2) BACTERIAL ANATOMY AND CLASSIFICATION (Two hour)

i) Bacterial cell structure, organelles and their functions
ii) Bacterial envelope of gram positive and gram negative bacteria
iii) Cytoplasm
    (a) Ribosomes
    (b) Mesosomes
    (c) Nucleoid
    (d) Inclusion granules
iv) Flagella, Pili and Capsule
v) Plasmid, Spores and their significance
vi) Classification of bacteria based on morphology and nutrition

3) GROWTH, CULTIVATION AND IDENTIFICATION OF BACTERIA (Two hour)

i) Bacterial growth and growth curve
ii) Cultivation of bacteria
    (1) Culture media
    (2) Culture methods
iii) Identification of bacteria
    (1) Brief introduction to various methods of;
        (a) Microscopy and Staining techniques
        (b) Biochemical reactions
        (c) Serology
        (d) Molecular techniques

4) ANTIMICROBIAL SUSCEPTIBILITY (one hour)

Disc diffusion methods – Kirby Bauer's and E - test

5) INTRODUCTION TO VIROLOGY, MYCOLOGY & PARASITOLOGY (Three hour)

i) General features of viruses
ii) Virion structure
iii) Classification of viruses
iv) Diagnosis of viral diseases
v) General properties and classification of fungi (morphological classification)
vi) Infections produced by fungi and their diagnosis
vii) General properties and classification of parasites
viii) Parasitic infections and their diagnosis

6) STERILIZATION AND DISINFECTION (Three hour)

i) Classification of sterilization methods
ii) Physical: Heat
iii) Sterilization by heat
iv) Dry heat sterilization – Hot air oven and incinerator
v) Moist heat sterilization
vi) Methods that employ moist heat
    (a) Below 100 ^{o}C, at 100 ^{o}C and above 100 ^{o}C
vii) Classification of disinfectants used in hospital and their mechanism of action

7) INFECTION & IMMUNITY (Two hour)

i) Infection
    (1) List the types, sources, routes and spread of infectious diseases
ii) Immunity
    (1) Classification and mechanism
    (2) Immunization
        a. Types of vaccines
        b. Immunization schedule in India

8) ANTIGEN & ANTIBODY (One hour)

- i) Definition
- ii) Classification of antibodies
- iii) Functions of antibodies
- iv) Diagnostic importance of antigen-antibody reactions
  - (1) Agglutination
  - (2) Immunofluorescence
  - (3) ELISA

9) IMMUNE RESPONSE (Two hour)

- i) Cells of immune system
- ii) Humoral Immunity
  - (1) Primary and secondary immune response
- iii) Cell mediated Immunity
  - (1) Constituents of cell mediated immunity
  - (2) Significance of cell mediated immunity

10) HYPERSENSITIVITY (Two hour)

- i) Classification
- ii) Immediate hypersensitivity
  - (a) Anaphylaxis and atopy
  - (b) Mechanisms and mediators
- iii) Cytotoxic hypersensitivity-Mechanism and associated disorders
- iv) Immune complex hypersensitivity-
  - (a) Arthus reaction, serum sickness and immune complex diseases
- v) Delayed type hypersensitivity-
  - (a) Contact dermatitis and tuberculin type hypersensitivity
  - (b) Mechanism and clinical aspects

11) AUTOIMMUNITY (One hour)

- i) Autoimmunity
  - (1) Mechanisms of autoimmunity
  - (2) List the diseases involving predominantly one type of cell or organs
  - (3) List the diseases involving multiple organs (systemic)

12) NOSOCOMIAL INFECTIONS (One hour)

- i) Common hospital acquired infections
- ii) Causes of hospital acquired infections
- iii) Sources and routes of spread of nosocomial infections
- iv) Hospital acquired infections: Host and risk factors
- v) MRSA and its importance
- vi) Prevention of hospital acquired infections
- vii) Investigation of hospital acquired infections

13) STANDARD PRECAUTIONS AND OVERVIEW OF LABORATORY DIAGNOSIS OF MICROBIAL INFECTIONS (Three hour)

14) REVISION & TUTORIAL: (06 hours)

References:

1. **Textbook of Microbiology for Dental students, Prof: C.P. Baweja**
2. **Medical Parasitology, D. R. Arora and D. Arora**