B.Sc. Microbiology (CBCS PATTERN) – Proposed curriculum

Semester-I

MB-101: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY (THEORY)

TOTAL HOURS: 60 CREDITS: 4

Unit 1 History of Development of Microbiology No. of Hours: 16

Development of microbiology as a discipline. Spontaneous generation vs. biogenesis. Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming Role of microorganisms in fermentation, Germ theory of disease, Development of various microbiological techniques and golden era of microbiology, Development of the field of soil microbiology: Contributions of Martinus W. Beijerinck, Sergei N. Winogradsky, Selman A.Waksman. Establishment of fields of medical microbiology and immunology through the work of Paul Ehrlich, Elie Metchnikoff, Edward Jenner

Unit 2 Diversity of Microorganisms No. of Hours: 16

Systems of classification: Binomial nomenclature, Whittaker's five kingdom and Carl Woese's three kingdom classification systems and their utility General characteristics of different groups: Acellular microorganisms (Viruses, Viroids, Prions) and Cellular microorganisms (Prokarya: Archaea and Bacteria, Eukarya : Algae, Fungi and Protozoa) giving definitions and citing examples Protozoa : Methods of nutrition, locomotion & reproduction - Amoeba, *Paramecium* and *Plasmodium*

Unit 3 Techniques in Microbiology

A. Microscopy No. of Hours: 10

Bright Field Microscope, Dark Field Microscope, Phase Contrast Microscope, Fluorescence Microscope,Transmission Electron Microscope, Scanning Electron Microscope

B. Control of microorganisms No. of Hours: 10

Physical *methods of microbial contro l*: Moist Heat, Autoclave, Dry Heat, Hot Air Oven, Tyndallization, Filtration, Radiation

Chemical methods of microbial control: disinfectants, types and mode of action

Unit 4 An overview of Scope of Microbiology No. of Hours: 8

UGGESTED READING

1. Tortora GJ, Funke BR and Case CL. (2008). Microbiology: An Introduction. 9th edition. Pearson Education.
2. Madigan MT, Martinko JM, Dunlap PV and Clark DP. (2014). Brock Biology of Microorganisms. 14th edition. Pearson International Edition
3. Cappucino J and Sherman N. (2010). Microbiology: A Laboratory Manual. 9th edition. Pearson Education Limited. Wiley JM, Sherwood LM and Woolverton CJ. (2013) Prescott's Microbiology. 9th Edition. McGraw Hill International ,
4. Atlas RM. (1997). Principles of Microbiology. 2nd edition. WM.T.Brown Publishers.
5. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw Hill Book Company.
6. Stanier RY, Ingraham JL, Wheelis ML, and Painter PR. (2005). General Microbiology. 5th edition. McMillan.

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B.Sc. Microbiology (CBCS PATTERN) – Proposed curriculum

Semester-1

SEMESTER –I (PRACTICALS)

TOTAL HOURS: 60 CREDITS: 2

Microbiology Good Laboratory Practices and Biosafety.

To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory.

Preparation of culture media for bacterial cultivation.

Sterilization of medium using Autoclave and assessment for sterility

Sterilization of glassware using Hot Air Oven and assessment for sterility

Sterilization of heat sensitive material by membrane filtration and assessment for sterility

Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air.

Study of *Rhizopus*, *Penicillium*, *Aspergillus* using temporary mounts

Study of *Spirogyra* and *Chlamydomonas*, *Volvox* using temporary Mounts

Study of the following protozoans using permanent mounts/photographs: *Amoeba*, *Entamoeba*, *Paramecium* and *Plasmodium*

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