

BANGALORE UNIVERSITY, BANGALORE
Syllabus for B.Sc. Microbiology (Semester)
Semester I

MBP 101- Basic Microbiology and Control of Microorganisms

Total hours allotted 60

Unit 1 Introduction, History and Scope of Microbiology

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| 1. Microbes and origin of life. | 1 hrs |
| 2. Scope and relevance of microbiology as a modern science. | 1 hrs |
| 3. Branch of Microbiology. | 1 hrs |
| 4. Importance and scope of microbiology as a modern science. | 1 hrs |
| 5. Contribution of Scientists to the field of Microbiology – Antony Von Leewenhoek, Edward Jenner, Lazaro Spallanzani, Louis Pasteur, Joseph Lister, Robert Koch, Alexander Flemming and Iwanovsky. | 10 hrs |

Unit 2 Instruments used in Microbiology

Microscopy

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| 1. Principles of Microscopy – resolving power, numerical aperture, working distance and magnification. | 2 hrs |
| 2. Principles of photomicrography. | 1 hrs |
| 3. Working principles and applications of | |
| a) Dark field microscope. | |
| b) Phase contrast microscope. | |
| c) Fluorescence Microscope. | |
| d) Stereomicroscope. | |
| e) And Electron Microscopy-TEM and SEM. | 8 hrs |

Other instruments

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| 1. Principle, construction and application of Inoculation chamber, incubator, pH meter and nephelometer. | 3 hrs |
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Unit 3 Stains and Staining Techniques

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| 1. Nature of dyes. | |
| 2. Physical and chemical theories of staining. | |
| 3. Staining Techniques-principle, procedure and applications of | |
| 4. Simple staining- negative staining. | |
| 5. Differential staining –Grams and acid fast staining. | |
| 6. Structural staining –cell wall, endospore, flagella and capsular staining. | 8 hrs |

Unit 4 Control of Microorganisms

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| 1. Definition of terms-sterilization, disinfectant, antiseptic, sanitizer, germicide, microbicidal agents, microbiostatics agents and antimicrobial agent. | 1 hrs |
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2. Evaluation of antimicrobial chemical agents-Tube dilution and agar plate techniques-well method and disk plate method. 1 hrs
3. Physical methods of control-Principle, construction and application of Moist heat sterilization-Boiling, Pasteurization, Fractional, sterilization-Tyndallization and Moist heat under pressure-autoclave. Dry heat sterilization-Incineration and hot air oven.
Filtration –Diatomaceous earth filter, seitz filter, membrane filter and laminar air flows
Radiation-Ionizing radiation- γ rays and non-ionizing radiation-UV-rays. 9 hrs