



GOVERNMENT OF KARNATAKA

Department of Collegiate Education

GOVERNMENT COLLEGE (AUTONOMOUS), KALABURAGI

**DEPARTMENT OF STUDIES AND RESEARCH IN MICROBIOLOGY
(UG)**

I & II SEMESTER SYLLABUS FOR MICROBIOLOGY

UNDER SEP

EFFECT FROM THE ACADEMIC YEAR

2024-25

SUBMITTED TO

GOVERNMENT COLLEGE (AUTONOMOUS) KALABURAGI

APPROVED BY THE BOS COMMITTEE - 2024-25

SEMESTER- I

DSE- PRACTICAL -1

TITLE: GENERAL MICROBIOLOGY: PRACTICAL

1. Microbiological standards and safety measures in Microbiology laboratory.
2. Operation and working principles of light / compound microscope.
3. Applications of basic microbiological tools- (Pipette, Micropipette, Burner, Inoculation loop and Spreader)
4. Demonstration and observation of microorganisms from natural sources (Wet mount preparation).
5. Demonstration of Bacterial motility by hanging drop method.
6. Simple staining technique.
7. Differential staining technique- Gram's staining technique.
8. Staining of Fungi lacto phenol cotton blue.
9. Preparation of Microbiological media- Nutrient Agar, Nutrient Broth, Potato Dextrose Agar Media & SCA (Starch Casein Agar Media).
10. Isolation and enumeration of microbes from soil by serially dilution method.

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Dr. Ramakrishna

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II SEMESTER
TECHNIQUES IN MICROBIOLOGY

DSC-2

Total hours - 50

Uni-1:

14 hrs

Microscopy: working principle, operation and construction different types of Microscopes- Phase Contrast Microscope, Darkfield Microscope, Fluorescence Microscope and Electron Microscope- TEM (Transmission Electron Microscope) and SEM (Scanning Electron Microscope), Micrometry, Photomicrography, chromatography techniques- Paper chromatography, TLC and HPLC

Unit-2

12hrs

Microbiological Media: types, chemical composition, and preparation - Complex media and special media, differential media, indicator media, enriched, enrichment media and transport media. Pure culture Techniques, Maintenance and preservation of microbial cultures- Slant culture, stab culture, soil method, mineral oil overlaying, glycerol preservation, liquid nitrogen, lyophilization method. Types of culture collection centers - NCIM, ATCC, MTCC NCCS.

Unit-3

12hrs

Staining Techniques- Negative staining method, Acid Fast Bacilli staining, Spore staining, Capsule staining, flagella staining, staining of Nucleus and Cytoplasm, Staining of reserve food materials, Fungal staining, Algal wet mount method.

Unit-4

12hrs

Safety measures of microbiological laboratory, levels of laboratory and good laboratory practices. Working principles and operation of instruments used in microbiology- Autoclave, Incubator, Hot air oven, and Laminar air flow. Working principle, operation of equipment and techniques- pH meter, Spectrophotometer, centrifuge and. X-Ray diffraction, NMR.

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SEMESTER- II

DSC- PRACTICAL -2

TITLE: TECHNIQUES IN MICROBIOLOGY: PRACTICAL

1. Demonstration and working principles of Autoclave, Incubator, Hot air oven, Laminar air flow, pH Meter, Centrifuge.
2. Study of Construction and working principle of SEM & TEM
3. Preparation of Microbiological media- Mac conkey's agar media, EMB agar media, Blood agar media Mannitol salt agar media.
4. Demonsiration of Pure Culture techniques - Pour plate method, Spread plate method, Streak plate Method.
5. Isolation and enumeration of microbes from air & water by serial dilution method.
6. Study of Colony characters of bacteria and fungi.
7. Negative staining technique.
8. Demonstration of AFB staining technique.
9. Spores and Capsule staining technique
10. Demonstration/Study of Chromatography Techniques -TLC, Paper chromatography and HPLC

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