

Subject Code: 02MB0102
Subject Name: Basic techniques in Microbiology
B.Sc. Year – I (Sem-I)
Objective: Students should gain knowledge about techniques used in microbiology.

Credits Earned: 5 Credits

Course Outcomes: After completion of this course, student will be able to

- Understands the different method of sterilization.
- Describe and use new and existing methods and technologies in and out of the laboratory setting
- Understands the different types of Microscopy.
- Understands the Mechanism of gram staining

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Term work (TW)	
4	0	2	5	50	30	20	25	25	150

Contents:

Unit	Topics	Contact Hours
1	<u>Principles of sterilization</u> Definition of sterilization, Dry and moist heat, pasteurization, tyndalization; radiation, ultrasonication, filtration. Physical and Chemical methods of sterilization; disinfection, sanitization, antisepsis and fumigation. Determination of phenol coefficient of disinfectant	20
2	<u>Microscopy</u> The Bright-Field Microscope, The Dark-Field Microscope, Microscope Resolution, The Phase-Contrast Microscope, Differential Interference Contrast Microscope, Fluorescence Microscope, Electron microscope.	15
3	<u>Stains and staining methods</u> Definition of auxochrome , chromophores, dyes, Classification of stains, Theories of staining, Mechanism of gram staining, acid fast staining, negative staining, capsule staining, flagella staining, endospore staining.	15

4	<u>Culture media</u> Components of media, natural and synthetic media, chemically defined media, complex media, selective, differential, indicator, enriched and enrichment media.	10
Total Hours		60

Recommended Textbooks:

1. Pelczar MJ, Chan ECS and Krieg NR.(1993).Microbiology 5th edition. McGraw Hill Book Company
2. General Microbiology Stanier, R.Y., Ingraham, J.L., Wheelis, M.L., Painter, R.K. MacMillan Press Ltd., London.
3. Practical Microbiology Dubey. R.C., Maheshwari. D.K., S.Chand & Company Ltd., New Delhi.

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
20%	20%	30%	15%	10%	5%

Instructional Method:

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory