DEPARTMENT OF MICROBIOLOGY				*CLASS: I B.Sc. Microbiology*				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
I	Major Core Practical - I	20U1RMP1	Major Practical - I	2	3	40	60	100

Nature of Course				
Knowledge and skill			Employability oriented	
Skill oriented	✓		Entrepreneurship oriented	

Course Objectives:

1. To familiarize in general microbiology techniques
2. To develop a sufficient background to students about the growth of microbes
3. To explain the ubiquitous nature and characteristics of microbes
4. To prepare different media for culturing microorganisms
5. To identify and differentiate bacteria and fungi using different methods

Course Learning Outcomes:

On successful completion of the programme, the students will be able to

1. Define the principles and application of instruments associated with microbiology
2. Describe the various methods to control microbial growth
3. Elaborate the concepts of microbial cells in terms of growth, division, specialization, motility and interaction
4. Demonstrate the methods for the isolation of bacteria, fungi and algae
5. Exhibit the practical skills in the use of tools, technologies and methods common to microbiology

S.No.	Experiments
1.	Principle, methods of sterilization and safety measures.
2.	Preparation of media (simple and selective media).
3.	Pure culture techniques: streak plate, spread plate and pour plate.
4.	Description of compound microscope and its parts.
5.	Motility determination-Hanging drop method.
6.	Isolation and identification of bacteria and fungi from different environmental samples.
7.	Enumeration of bacteria-viable count (plate count) and total count (Haemocytometer count-yeast cells).
8.	Fungal staining-Lactophenol cotton blue.
9.	Staining methods: simple, Gram's staining, endospore staining, negative and capsule
10.	Measurement of growth rate and generation time by turbidometry method.

Books for Reference

1. Aneja, K.R. (2003). Experiments in Microbiology: Plant Pathology and Tissue Culture. WishwaPrakashan, New Delhi.
2. Cappuccino, J.H and Sherman, N. (2007). Microbiology- A Lab Manual. 7th edition. The Benjamin Publishing Company, Singapore.
3. Gunasekaran, P. (2008). Laboratory Manual in Microbiology. New Age International (P) Ltd. Publishers, New Delhi.

Web Resources

1. https://www.biocourseware.com
2. https://www.microbiologyonline.com
3. https://www.ncbinetwork.com
4. https://www.introduction to microbiology culture.m.youtube.com
5. https://www.practical microbiology.m.youtube.com

Rationale for Nature of the course

The course familiarizes different concepts in general microbiology techniques and to develop a sufficient background to students about the growth of microbes. The ubiquitous nature and characteristics of microbes, different media for culturing microorganisms will be focussed.

Activities having direct bearing on skill development/ employability/entrepreneurship

- Students will be able to observe ubiquitous nature of microbes through microscope.
- Handle various tools, instruments and apply the same for the identification of microbes.
- Identify and differentiate various microorganism based on their characteristics features.

Pedagogy

Demonstration and practical session.

Course Learning Outcomes (CLO)

CLOs	Course Learning Outcomes *On successful completion of the programme, the students will be able to*	Knowledge Level
CLO1	Define the principles and application of instruments associated with microbiology.	Up to K1
CLO2	Describe the various methods for microbial control.	Up to K2
CLO3	Elaborate the concepts of microbial cells in terms of growth, division, specialization, motility and interaction.	Up to K2
CLO4	Demonstrate the methods for the isolation of bacteria, fungi and algae.	Up to K3
CLO5	Exhibit the practical skills in the use of tools, technologies and methods common to microbiology.	Up to K2

K1 –Remembering and recalling facts with specific answers
K2 – Basic understanding of facts and stating main ideas with general answers
K3 – Application oriented – Solving Problems
K4 – Examining, analyzing, presentation and make interferences with evidences

Mapping of Course Learning Outcome with Programme Specific Outcome

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	1	2	2	3	3
CLO2	2	3	3	2	2
CLO3	2	2	2	2	3
CLO4	3	3	3	3	2
CLO5	2	2	2	2	2

Advance application – 3, Intermediate level – 2, Basic level – 1.

Mapping of course outcome with Programme outcome

	PO1	PO2	PO3	PO4	PO5
CLO1	2	2	3	2	2
CLO2	2	3	2	2	2
CLO3	1	2	3	3	3
CLO4	2	3	2	2	2
CLO5	2	2	2	3	3

Advance application – 3, Intermediate level – 2, Basic level – 1

Course designers:

1. Dr. S. Sree Gayathri