DEPARTMENT OF MICROBIOLOGY				*CLASS: I B.Sc. Microbiology*				
Sem	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
II	Major Core Practical	20U2RMP2	Major Practical - II	2	3	40	60	100

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

Course Objectives:

1. To gain competence in the broad scientific theory and application of techniques associated with molecular biology and microbial genetics.
2. To identify the basic microbial metabolism.
3. To explore different stages of mitosis, meiosis and to isolate genomic DNA.
4. To study bacterial taxonomy by using bacterial morphology and biochemical tests.
5. To cultivate fungi by slide culture method

Course Learning Outcomes:

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

1. Familiarize with the basic techniques associated with microbial taxonomy
2. Develop and apply the protocols for basic experimental work in the field of cell and molecular biology
3. Outline the most significant molecular and cell based methods used today to extend their knowledge of biology
4. Illustrate the stages of mitosis and meiosis
5. Isolate the genomic and plasmid DNA from bacteria.

S.No.	Experiments
1.	Mitosis in onion root meristem - Squash technique.
2.	Chromosomal behaviour and Meiosis in flower bud-*Rhoeo.sp*. - Squash technique.
3.	Isolation of chloroplast from spinach leaves.
4.	Isolation and Demonstration of plasmid DNA from bacteria.
5.	Isolation and Demonstration of genomic DNA from bacteria.
6.	Collection and identification of algae
7.	Study of colony characteristics of Bacteria.
8.	Study of bacterial taxonomy by using biochemical tests.
9.	Fungi slide culture technique
10.	Measurement of fungal growth rate – colony diameter method

Books for Reference

1. Cooper, G.M and Hausman, R.E. (2009). The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C; Sinauer Associates, MA.
2. Karp, G. (2010). Cell and Molecular Biology: Concepts and Experiments. 6th edition. John Wiley &Sons.Inc. New Jersey.
3. De Robertis, EDP and De Robertis, EMF. (2006). Cell and Molecular Biology. 8th edition. Lipincott Williams and Wilkins, Philadelphia.
4. Gunasekaran, P. (2008). Laboratory Manual in Microbiology, New Age International (P) Ltd. Publishers, New Delhi.
5. Brown, T.A. (1998). Molecular Biology Lab; Gene Analysis, Academic Press, London.

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

Student become competent in the application of techniques associated with molecular biology. Identifying various physiological processes and molecular characterization of microorganisms. The taxonomical position of microbes can be determined based on the morphological and biochemical characteristics.

Activities having direct bearing on skill development/ employability/entrepreneurship

- Able to isolate and analyse the genomic DNA from prokaryotes and eukaryotes.
- Knowledge gained could be applied for further studies.
- Classify microorganisms based on its morphology and cultural characteristics.

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	Familiarize with the basic techniques associated with microbial taxonomy	Up to K1
CLO2	Develop and apply the protocols for basic experimental work in the field of cell and molecular biology	Up to K2
CLO3	Outline the most significant molecular and cell based methods used today to extend their knowledge of biology	Up to K2
CLO4	Illustrate the stages of mitosis and meiosis	Up to K3
CLO5	Isolate the genomic and plasmid DNA from bacteria.	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	2	2	2	2	3
CLO2	2	3	2	3	2
CLO3	3	3	3	2	3
CLO4	2	2	2	2	2
CLO5	3	2	2	2	3

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	3
CLO3	3	2	3	3	2
CLO4	2	3	2	2	3
CLO5	2	2	2	2	2

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

Course designers:

1. **Dr. S. Sree Gayathri**