

## **BIOSCIENCES-MICROBIOLOGY**

### **PROGRAMME OUTCOMES**

**PO-1: Skill Development:** Master academic, technical, managerial and crucial soft skills to qualify for careers in research, industry, education, administration and management or for higher studies where a holistic understanding of applied biosciences is required.

**PO-2: Research:** Develop a scientific mindset with the capacity for analytical and innovative thinking and practical knowhow to formulate, design and ethically implement scientific research in frontier areas of Biochemistry, Biotechnology and Microbiology

**PO-3: Communication:** Acquire effective communication and creative expression skills in the form of writing, design, presentation and networking to convincingly articulate scientific ideas in biosciences and related fields

**PO-4: Employment and Entrepreneurship:** Acquire the necessary knowledge and proficiencies to become employable or get self-employed and thereby create job opportunities through entrepreneurship in health, agriculture, industry, environment and allied areas of applied biosciences and thereby affirmatively contribute to scientific social responsibility.

### **PROGRAMME SPECIFIC OUTCOMES**

**PSO1: Confidence:** Demonstrate a comprehensive understanding of chemical and biological structure, principles, techniques, and applications

**PSO2: Knowledge based Skill:** To develop better understanding and improve skills that would enable them to begin a career in research laboratories, industries as well as to generate self-employability

**PSO3: Scientific Social Responsibility:** To develop linkages between scientific community and society to build trust, partnership and responsibility of science towards achieving social goals

**PSO4: Knowledge of microbial diversity** – Students develop the understanding of microbial life in diverse environmental ecosystems for sustainability and economic benefit.

**PSO5: Molecular diagnostic skills:** Students shall develop and demonstrate competence in laboratory safety, practical quantitative and qualitative research skills that help evaluate the public health research affecting our own community, molecular diagnosis of infectious diseases caused by fungi, viruses and bacteria, Identification of new disease markers, Phage therapy.

**PSO6: Industrial applications** – Students learn to how to scale-up microbial cultures to an industrial set-up for production of medicine, solvents, biofuel, biofertilizers and food - quality control, safety regulations and ethics form an integral part of the same.

## COURSE STRUCTURE-MICROBIOLOGY

### SEMESTER-I

Type	Course code	Course Name	Credits
Theory	BCFB001	Fundamentals of Biochemistry	4
	BTTE0009	Thermodynamics and Enzymology	3
	MBCG0011	Cell Biology and Genetics	4
	BCAT0014	Analytical Techniques	4
Lab	BCFB6009	Fundamentals of Biochemistry Lab	1
	BTTE6009	Thermodynamics and Enzymology Lab	1
	BCAT6010	Analytical Techniques Lab	1
	MBCB6011	Cell Biology and Genetics Lab	1
	BCRT6012	Remedial Teaching & NET Coaching course	NC
	BTIV6011	Industrial/ Laboratory visit	1
	MBNT6013	NPTEL Course	NC
<b>Total credits</b>			<b>20</b>

### SEMESTER-II

Type	Course code	Course Name	Credits
Theory	BCMB0015	Molecular Biology	4
	BTGE0005	Genetic Engineering	3
	BTCA0010	Computer Applications and Bioinformatics	3
	BCFI0016	Fundamentals of Immunology	4
	MBBM0014	Basic Microbiology	2
Lab	BCMB6013	Molecular Biology Lab	1
	BTGE6004	Genetic Engineering Lab	1
	BTCA6010	Computer Applications and Bioinformatics Lab	2
	BCFI6014	Fundamentals of Immunology Lab	1
	MBBM6012	Basic Microbiology Lab	1
<b>Skill Development Courses (any 1)</b>			
	BTFF0013	Fermentation and Food Microbiology	1
	BCHD0017	Herbal Drug Technology	1
	MBWM0012	Waste Management	1
	MBMC0013	Mushroom Cultivation	1
	BCRT6015	Remedial Teaching & NET Coaching	NC
	MBIT6014	Internships/Summer Training	NC
<b>Total credits</b>			<b>23</b>

**SEMESTER -III**

<b>Type</b>	<b>Course code</b>	<b>Course Name</b>	<b>Credits</b>
Theory	BTRM0003	Research Methodology & Biostatistics	4
	MBVM0003	Virology and Mycology	3
	MBEM0009	Environment Microbiology	3
	MBMM0010	Medical Microbiology	3
	MB	Infection and Molecular Diagnostics	3
Lab	MBVM6008	Virology and Mycology Lab	1
	MBEM6009	Environment Microbiology Lab	1
	MBMM6010	Medical Microbiology Lab	1
	MB	Infection and Molecular Diagnostics Lab	1
	MBDI6006	Dissertation Phase I	2
	BT	IPR &Entrepreneurship	1
	BCSL0200	Service Learning- Value added course	1
		Journal Club and scientific communications	1
	BCRT6015	Remedial Teaching & NET Coaching	NC
<b>Total credits</b>			<b>25</b>

**SEMESTER -IV**

<b>Type</b>	<b>Course code</b>	<b>Course Name</b>	<b>Credits</b>
Theory	MB	Industrial and Food Microbiology	4
<b>Elective Courses (any 1)</b>			
	MB	Agriculture Technology	2
	BT	Nanobiology	2
	BC	Bioresource Management	2
Lab	MBDI6007	Dissertation Phase II	16
<b>Total credits</b>			<b>22</b>



Research Methodology & Biostatistics-common	H	H	H	M	M	H	H	M	M	M
Virology & Mycology	H	H	H	H	H	H	H	M	H	L
Environment Microbiology	M	H	H	M		M	M	H		M
Medical Microbiology	M	H	H	M		H	M	L	H	
Infection and Molecular Diagnostics	H	H	H	H	H	H	H	M	H	L
Lab I- Virology & Mycology	H	H	L	H	H	H	H	M	L	L
Lab II- Environment Microbiology	H	H	H	L	L	H		H		M
Lab III- Medical Microbiology	H	H	H	L	L	H			H	
Lab IV- Infection and Molecular Diagnostics	H	H	H	H	H	H	H	M	H	L
Dissertation Phase I	H	H	H	H		H	H		L	L
IPR & Entrepreneurship	M	H	H	H	M	H	M	L	L	M
Journal Club and scientific communications		H	H		H			M		
Service Learning	M		H	M		M	H			
Industrial & Food Microbiology	L	M	H	H		H	L	L		H
Agriculture Technology (Elective )	H	M	M	H	H	H	H	M	M	M
Nanobiology (Elective)	M	H	M	L	H		M			
Bioresource Management (Elective)	H	M	L	M	L	M	M	H	L	L