

Program Schemes for [B.Sc. Microbiology]

Cluster: Basic and Applied Science Institute: UIBT

Department:

Biotechnology Type of Program: UG

First Year				Second Year			
Semester-1	Course Name	Course Category	Credits	Semester-3	Course Name	Course Category	Credits
	General Microbiology	Major Core	4.0		Basic Immunology	Major Core	3
	Cell Biology	Major Core	3.0		Genetic Engineering	Major Core	3
	Biochemistry & Metabolism	Major Core	3.0		Bioinformatics	Major Core	3
	Microbial Techniques	Major Core	3.0		Basic Immunology Lab	Major Core	1.5
	Microbiology Lab	Major Core	1.5		Genetic Engineering Lab	Major Core	1.5
	Cell Biology Lab	Major Core	1.0		Bioinformatics Lab	Major Core	1
	Biochemistry & Metabolism Lab	Major Core	1.5		Soft Skills - 1	Skill Enhancement	1
	General Proficiency-1	Ability Enhancement	1.0		Social Internship	Training	2
	Design Thinking and Creativity for Innovation	Skill Enhancement	1.0		General Proficiency-3	Ability Enhancement	1
Semester -2	Molecular Biology	Major Core	3	Aptitude-1	Ability Enhancement	1	
	Microbial Metabolism & Physiology	Major Core	3	Entrepreneurship mindset	Ability Enhancement	1	
	Mycology and Phycology	Major Core	3	Critical Enquiry and Research Methodology	Ability Enhancement	1	

	Major Core	3		Gender Equity and Empowerment	Value Education	1	
Microbial Genetics							
	Major Core	1.5				1	
Molecular Biology Lab				Open Elective-1	Open Elective		
	Major Core	1.5	Semester-4	Bioprocess and Fermentation Technology	Major Core	3	
Mycology and Phycology lab							3
	Major Core	1			Bioanalytical Techniques	Major Core	3
Microbial Metabolism & Physiology Lab							1.5
	Skill Enhancement	1			Bioprocess & Fermentation Technology Lab	Major Core	1.5
General Proficiency-2							1.5
	Skill Enhancement	1			Bioanalytical Techniques lab	Major Core	2
Communication Skills-1							1
	Ability Enhancement	1			Universal Human Values, Ethics, and Life Skills-2	Value Education	1
Professional Ethics							1
	Minor Core	3			General Proficiency-4	Skill Enhancement	1
AI applications in Microbiology							1
	Value Education	1			Communication Skill-2	Skill Enhancement	1
Universal Human Values, Ethics, and Life Skills-1						1	
				RIE Basket-1	Ability Enhancement	1	
						1	
				RIE Basket-2	Skill Enhancement	1	
						1	
				Minor Project 1	Project	3	
				Open Elective-2	Open Elective		

Third Year				Fourth Year			
Semester -5	Course Name	Course Category	Credits	Semester-7	Course Name	Course Category	Credits
	Research Methodology & Biostatistics	Major Core	3		Microbial Biofuels and circular Bio economy	Major Core	4.0
	Research Methodology & Biostatistics Lab	Major Core	1		Microbial Quality control in Food and Pharma Industry	Major Core	4.0
	Virology	Major Core	3		Data Analytics and OMICS Technology	Major Core	4.0
	Summer Internship	Internship	1		Microbial Diagnosis in Health Clinics	Minor Core	4.0
	Introduction to SDGs	Value Education	1		Nano biotechnology	Minor Core	3.0
	Introduction to AI	Ability Enhancement	1		Entrepreneurship & Microbiology Startups	Minor Core	3.0
	RIE Basket-3	Ability Enhancement	1		Industry Internship	Internship	1.0
	RIE Basket-4	Skill Enhancement	1		Dissertation -1	Project	3.0
	Environmental Science and Management	Value Education	2		Capstone Project - 1	Project	3.0
Semester-6	Environmental Microbiology	Major Core	4	Semester-8	Dissertation-II	Project	12
	Environmental Microbiology Lab	Major Core	1		Introduction to Research Ethics	Project gap course- SE	1
	Industrial Regulatory Affairs and IPR	Minor Core	3		Professional Certification	Professional Certification -SE	1
	RIE Basket-5	Ability Enhancement	1		Capstone Project - II*	Project	12
	RIE Basket-6	Skill Enhancement	1		Good Manufacturing Practices & Quality Systems	Project gap course-SE	1
			1		Professional Certification	Professional Certification -SE	1
	Minor Project	Project	1				



Open Elective-2 Basket	OE	3			
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Elective Basket Name			
Semester	Course Name	Course Category	Credits
Semester -4	Agriculture Microbiology	Major Elective	3
	Medical Microbiology	Major Elective	
	Industrial microbiology	Major Elective	
Semester -5	Plant Microbe Interaction	Minor Elective	3
	Biomedical Diagnosis	Minor Elective	
	Food Microbiology	Minor Elective	
	Biofertilizers and Biopesticide Technology	Minor Elective	3
	Biopharmaceutical Technology	Minor Elective	
	Bioproducts and Biomanufacturing	Minor Elective	
Semester -6	Engineered microbes and Climate Resilient Agriculture	Minor Elective	3
	Clinical Microbiology	Minor Elective	
	Nutraceuticals and Functional Food	Minor Elective	
	Technology of transgenic crops	Minor Elective	3
	Vaccine Technology	Minor Elective	
	Dairy Microbiology	Minor Elective	

4th Year Curriculum Design Framework [For Hons. / Hons. with Research Tracks of Four Year Undergraduate Programs (FYUP)]

Extending Expertise	Credits	Contextualizing Learning	Credits	Experiential Learning	Credits
Semester - 7					
Module-I					
Microbial Biofuels and circular Bio economy	4	Microbial Diagnosis in Health Clinics	4	Industry Internship	1
Microbial Quality control in Food and Pharma Industry	4	Nano biotechnology	3	Dissertation -1	3
Data Analytics and OMICS Technology	4	Entrepreneurship & Microbiology Startups	3		
Module-II					
Microbial Biofuels and circular Bio economy	4	Microbial Diagnosis in Health Clinics	4	Industry Internship	1
Microbial Quality control in Food and Pharma Industry	4	Nano biotechnology	3	Capstone Project -1	3
Data Analytics and OMICS Technology	4	Entrepreneurship & Microbiology Startups	3		
Semester - 8					
Module-I					
				Dissertation-II	12
				Introduction to Research Ethics	1
				Professional Certification	1
Module-II					
				Capstone Project -II	12
				Good Manufacturing Practices & Quality Systems	1
				Professional Certification	1