

**Academic Year** 2019-20

**B.P.H.E. Society's  
Ahmednagar College, Ahmednagar  
Internal Quality Assurance Cell  
CO, PO, and PSO Attainment Sheet**

**Department Name** Biotechnology

**Program Name** M.Sc.

**Program Outcomes(PO)**

<b>PO1</b>	To understand structure-functional relation of protein, genome & drugs using bioinformatics tools.	
<b>PO2</b>	To study plant transformation using genetic engineering for developing better varieties of economically & medicinally important.	
<b>PO3</b>	Understanding the mechanism of cloning of micro-organisms, plants & animal cells through genetic engineering & tissue culture tools	
<b>PO4</b>	To develop awareness about patenting & intellectual property rights in the field of life science.	
<b>PO5</b>	To understand breeding mechanism in plants & livestock.	
<b>PO6</b>	To study ultrastructure, classification & cultivation of viruses	
<b>PO7</b>	To aware students about emerging & re-emerging viruses diseases	
<b>PO8</b>	To know about stem cells & its applications in medical field	
<b>PO9</b>	To study differential expression of genes	
<b>PO10</b>	To understand role of biotechnology	
<b>PO11</b>	To help student build-up a progressive	
<b>PO12</b>	The student will be able to identify,	

**Program Specific Outcome(PSO)**

<b>PSO1</b>	To help the students to build	
<b>PSO2</b>	To empower students to excel in various	

PSO3

To inculcate sense of scientific

<b>Academic Year :</b>	<b>2019-20</b>
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Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code		MBT- 101		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name		Advanced Biological Chemistry	CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3
Semester No		1	CO2	2	3	2	3	3	2	3	2	2	2	2	3	2	2	2
Teacher Name		Komal Sonawane	CO3	3	3	3	3	3	2	3	2	2	1	3	3	2	2	2
Course Outcomes			CO4	2	3	3	3	3	2	2	2	3	2	2	3	1	2	3
	CO1	A strong understanding of fundamentals of biochemical process at an advanced level.	CO5															
	CO2	Better understanding of major thrust areas of the discipline	Average	2.40	3.00	2.80	2.80	2.80	2.20	2.40	1.80	2.20	1.80	2.20	3.00	1.60	2.20	2.40
	CO3	Knowhow on current developments in the biochemical research																
	CO4	Capacity to identify, analyze and design safe experimental process to provide efficient solutions by fair interpretation of data																
	CO5	Perfect gain insight into biochemical research ethics for production of quality research and publication.																

Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code	MBT- 102			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Cell & Molecular Biology	CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3	
Semester No	1	CO2	1	3	2	3	3	2	3	2	2	2	2	3	2	1	2	
Teacher Name	Rajashri Bhope	CO3	3	2	3	3	2	2	1	2	2	1	3	3	2	2	2	
Course Outcomes		CO4	2	1	3	3	3	2	2	2	2	1	2	3	1	1	3	
	CO1	The course has been devised to familiarize students with Molecular Biology which chiefly deals with interactions among various systems of the cell, including those between DNA, RNA and proteins and learning how these are regulated	CO5															
	CO2	To gain an understanding of chemical and molecular processes that occurs in and between cells	Average	2.20	2.40	2.60	2.80	2.60	2.20	1.80	1.80	2.00	1.60	2.20	3.00	1.60	1.80	2.40
	CO3	To gain insight into the most significant molecular and cell-based methods used today to expand our understanding of biology.																
	CO4	Will be able to design and implement experimental procedures using relevant techniques																
	CO5	Build knowledge of Cell structure and function in detail.																

Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code	MBT- 103			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Genetics & Immunology	CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3	
Semester No	1	CO2	1	3	2	3	3	2	3	2	2	2	1	3	2	1	2	
Teacher Name	Katke P M & Gavhane A J	CO3	2	2	1	3	2	1	1	2	2	1	1	3	2	2	2	
Course Outcomes		CO4	2	1	3	1	3	3	2	2	2	1	1	3	1	1	3	

	CO1	Knowledge regarding mutation: Causes, agents that are responsible and role in cancer and cell death. Thorough knowledge of immunity and the factors responsible for developing immunity and preventing infection Development of diseases and its prevention Different techniques involved in causing mutation and analyzing antigen and antibody in testing. To introduce and familiarize the undergraduate students with overall concept of immune system, action mechanism and applications in research and biomedical field.	CO5																	
	CO2		Average	2.00	2.40	2.20	2.40	2.60	2.00	1.80	1.80	2.00	1.60	1.20	2.60	1.40	1.80	2.40		
	CO3																			
	CO4																			
	CO5																			

Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code	MBT- 104			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Laboratory Course I - Advanced Biological Chemistry, Cell & Molecular Biology, Immunology		CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3
Semester No	1		CO2	1	3	1	3	3	2	3	2	2	2	2	2	2	1	2
Teacher Name	Sonawane, Katke, Gavhane, Galande		CO3	3	2	2	3	2	2	1	2	2	1	1	3	2	2	2
Course Outcomes			CO4	2	1	1	3	3	2	2	1	2	1	2	3	1	1	3
	CO1	Study and analyze various aspects of Biotechnology with respect to environment	CO5	2	1	2	3	3	2	1	2	2	2	3	2	2	2	
	CO2	Understanding and assimilating the specific concepts and terminology of environmental biotechnology.	Average	2.20	2.00	1.80	2.80	2.60	2.20	1.80	1.60	2.00	1.60	1.80	2.80	1.60	1.80	2.40
	CO3	Finding and managing information from various sources.																

	CO4	Describing the scientific bases that are applied by environmental biotechnology.
	CO5	Learning about water resources and analyzing the waste water as well as solid waste management techniques.

Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code	MBT -105 T			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Environmental Biotechnology		CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3
Semester No	1		CO2	1	1	2	3	3	2	3	2	2	2	2	2	2	1	2
Teacher Name	Jyotsna Galande		CO3	3	2	3	3	2	2	1	2	2	1	3	1	2	2	2
Course Outcomes			CO4	2	1	1	2	3	2	1	2	2	1	2	2	1	1	3
	CO1	Study and analyze various aspects of Biotechnology with respect to environment	CO5	2	3	2	3	3	2	1	2	2	2	2	3	2	2	1
	CO2	Understanding and assimilating the specific concepts and terminology of environmental biotechnology.	Average	2.20	2.00	2.20	2.60	2.60	2.20	1.60	1.80	2.00	1.60	2.20	2.20	1.60	1.80	2.20
	CO3	Finding and managing information from various sources.																
	CO4	Describing the scientific bases that are applied by environmental biotechnology.																
	CO5	Learning about water resources and analyzing the waste water as well as solid waste management techniques.																

Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code	MBT -106 P			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Practical environment		CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3
Semester No	1		CO2	1	3	2	2	1	2	3	2	2	2	2	3	2	1	2
Teacher Name	Jyostna Galande		CO3	1	2	2	3	2	2	1	2	2	1	1	2	2	2	2

Course Outcomes			CO4	2	1	3	2	3	2	2	2	2	1	2	1	1	1	3
	CO1	Study and analyze various aspects of Biotechnology with respect to environment	CO5	2	3	2	3	3	2	1	2	2	2	2	3	2	2	2
	CO2	Understanding and assimilating the specific concepts and terminology of environmental biotechnology.	Average	1.80	2.40	2.40	2.40	2.20	2.20	1.80	1.80	2.00	1.60	1.80	2.40	1.60	1.80	2.40
	CO3	Finding and managing information from various sources.																
	CO4	Describing the scientific bases that are applied by environmental biotechnology.																
	CO5	Learning about water resources and analyzing the waste water as well as solid waste management techniques.																

Class	M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs			
Subject Code	MBT-201		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Subject Name	Genetic Engineering	CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3	
Semester No	2	CO2	1	3	2	1	3	2	3	2	2	3	2	3	2	1	1	
Teacher Name	Bhople R V	CO3	2	2	3	3	2	2	1	1	2	1	3	3	2	2	2	
Course Outcomes		CO4	2	1	3	3	3	2	2	2	2	1	2	3	1	3	3	
	CO1	The students will have knowledge of tools and strategies used in genetic engineering.	CO5	2	3	2	1	3	2	1	2	2	2	3	2	2	2	
	CO2	Understanding of applications of recombinant DNA technology and genetic engineering. from academic and industrial perspective	Average	2.00	2.40	2.60	2.00	2.60	2.20	1.80	1.60	2.00	1.80	2.20	3.00	1.60	2.20	2.20
	CO3	Demonstrate the ability to design recombinant molecules and apply information extracted from various sources.																

	CO4	The students will have knowledge of Molecular techniques and genome editing technologies
	CO5	Can use and apply the knowledge of genetic engineering in problem solving and in practice

Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code	MBT-202			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Bacteriology and Virology	CO1	3	1	3	2	2	3	2	1	2	2	2	3	1	3	3	
Semester No	2	CO2	1	3	2	2	3	1	3	2	1	2	1	3	1	1	3	
Teacher Name	Gavhane A J	CO3	2	2	2	3	2	2	1	1	2	2	3	2	2	3	2	
Course Outcomes		CO4	2	1	3	3	3	2	2	2	2	1	2	3	1	1	3	
	CO1	To understand Taxonomy and Diversity of Bacteria	CO5	2	3	2	1	3	1	1	2	2	2	3	2	2	2	
	CO2	To have Ultrastructure of Bacteria and Archea	Average	2.00	2.00	2.40	2.20	2.60	1.80	1.80	1.60	1.80	1.80	2.00	2.80	1.40	2.00	2.60
	CO3	The students will learn about extremophiles, adaptations in extremophiles, applications in biotechnology																
	CO4	This course emphasis on role of bacteria in medial field, public health, agriculture and as biofuel and bisurfactant																
	CO5	The students will learn viruses, morphology, classification, replication, cultivation and dignosis. It also empasis on animal, plant and poultry viruses																

Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code	MBT-203			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Plant Biotechnology	CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3	
Semester No	2	CO2	1	3	2	3	3	2	3	2	2	2	2	3	2	1	2	



Teacher Name	Galande J S		CO3	3	2	3	3	2	2	1	2	2	1	3	3	2	2	2
Course Outcomes			CO4	2	1	3	3	3	2	2	2	2	1	2	3	1	1	3
	CO1	Knowledge of developing PTC laboratory	CO5	2	3	2	3	3	2	1	2	2	2	2	3	2	2	2
	CO2	Roles of hormones in plant growth and regulation	Average	2.20	2.40	2.60	2.80	2.60	2.20	1.80	1.80	2.00	1.60	2.20	3.00	1.60	1.80	2.40
	CO3	Micropropagation of ornamental plants																
	CO4	Learn applications of transgenic plants																
	CO5	Establish different types of plant cultures.																

Class	M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs			
Subject Code	MBT-204		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Subject Name	Laboratory Course II - Genetic Engineering, Bacteriology and Virology, Plant Biotechnology	CO1	1	2	1	2	2	3	2	1	1	2	2	3	1	3	3	
Semester No	2	CO2	1	3	2	3	3	2	3	2	2	2	3	3	2	1	2	
Teacher Name	Bhople, Galande, Gavhane, Katke	CO3	3	2	3	3	2	1	1	2	2	1	3	3	2	2	1	
Course Outcomes		CO4	2	1	3	3	3	2	2	2	1	1	2	3	1	1	3	
	CO1	The student are able to isolate and identify the bacteria from nature.the students will aquire skill for cultivation techniques to islate differeent kinds of bacteria and idetify upto genus level.	CO5	2	3	2	3	3	2	1	2	2	2	1	2	2	1	2
	CO2	Understanding of tools and techniques involved in molecular cloning	Average	1.80	2.20	2.20	2.80	2.60	2.00	1.80	1.80	1.60	1.60	2.20	2.80	1.60	1.60	2.20
	CO3	The morphology, cultural, biochemical and other biological properties and characteristics of medically important bacteria.																
	CO4	The mechanism of virulence and pathogenesis and pathology.																

	CO5	To develop an understanding about practical aspects of components of immune system as well as their function
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Class		M.Sc. Biotech Part-I	Course Outcomes	Program Outcomes												PSOs		
Subject Code	MBT-206			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Medical Biotechnology		CO1	3	3	3	2	2	3	2	1	2	2	2	3	1	3	3
Semester No	2		CO2	1	3	2	3	3	2	3	2	2	2	2	3	2	1	2
Teacher Name	Bhope Rajashri		CO3	3	2	3	3	2	2	1	2	2	1	3	3	2	2	2
Course Outcomes			CO4	2	1	3	3	3	2	2	2	2	1	2	3	1	1	3
	CO1	Students after completing this course can become entrepreneurs in the most demanding sector of medical biotechnology such as diagnostics, drug designing, stem cell biology etc.	CO5	2	3	2	3	3	2	1	2	2	2	2	3	2	2	2
	CO2	Students will develop an ability to identify, organize and answer problems in Medical Biotechnology Students will develop an ability to use skills and modern technological tools necessary for medical biotechnological practices	Average	2.20	2.40	2.60	2.80	2.60	2.20	1.80	1.80	2.00	1.60	2.20	3.00	1.60	1.80	2.40
	CO3	Perfrom independent as well as team work to accomplish lab based tasks.																
	CO4	Become a part of mission-Skill India- to develop researcher and scientists to uncover advance biology problems.																

	CO5	Hands-on training and mandatory research projects will help our students by providing knowledge and technical experience of problem-solving in a research environment
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<b>Academic Year :</b>	<b>2019-20</b>
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Class		M.Sc 2 Biotech	Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT 301			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Animal Biotechnology		CO1	3	1	3	2	2	3	2	1	2	2	2	3	1	3	3
Semester No	1		CO2	1	3	2	2	3	1	3	2	1	2	1	3	1	1	3
Teacher Name	Prashant katke		CO3	2	2	2	3	2	2	1	1	2	2	3	2	2	3	2
Course Outcomes			CO4	2	1	3	3	3	2	2	2	2	1	2	3	1	1	3
	CO1	Course contains introduction of Tissue/Cell Culture and techniques which includes various systems of tissue cultures.	CO5	2	3	2	1	3	1	1	2	2	2	2	3	2	2	2
	CO2	it also include Establishing primary cell culture, Organ culture and cell lines with their Methodology.	Average	2.00	2.00	2.40	2.20	2.60	1.80	1.80	1.60	1.80	1.80	2.00	2.80	1.40	2.00	2.60
	CO3	program contains Stem cells technology and its applications																
	CO4	Transgenic animal and their strategies gives broad ideas to students for experimental studies.																
	CO5	program also includes Study of animal husbandry and their application																

Class		M.Sc 2 Biotech	Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT 302			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Bioprocess engineering & Fermentation Technology		CO1	3	1	3	2	2	3	2	1	2	2	3	2	1	1	3
Semester No	1		CO2	1	3	2	2	3	1	3	2	2	3	1	3	2	3	2
Teacher Name	Asmita gavhane		CO3	2	2	2	3	2	2	1	1	3	2	2	1	1	2	2
Course Outcomes			CO4	2	1	3	3	3	2	2	2	3	3	2	2	2	1	3

	CO1	This course empasis various aspects of bioprocess engineering, concept of fermentation and various types,bioprocess,Role of boitechnology in development of bioprocess	CO5																
	CO2	The student will learn about methods of screening and strain improvment programs for industrially imporatan microoranisms and their preservation methods,inoculu develpent programs	Average	2.00	2.00	2.40	2.20	2.60	1.80	1.80	1.60	2.20	2.60	1.80	1.80	1.60	2.00	2.40	
	CO3	The student will learn about methods of screening and strain improvment programs for industrially imporatan microoranisms and their preservation methods,inoculu develpent programs																	
	CO4	This course empasis on selection of media components ,media formulation, optimization and sterilization methods for media ,fermenter and air																	
	CO5	he students will understand about design of bioractors and parts and various types .It helps to know about monitring and control various parameters to monitor and control fermentation process It gives knowledge about all upstream and downstream processing. the students also learn about QC and QA aspect and product recovery,purification and testing with various examples.																	

Class	Msc 2 biotechnology	Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT 303		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Data Base Management and IPR in Biotechnology	CO1	3	1	3	2	2	3	3	2	2	3	1	3	2	1	3

Semester No	1	CO2	1	3	2	2	3	1	2	2	3	1	3	2	2	3	2	
Teacher Name	Jyostna galande and sushila kambale	CO3	2	2	2	3	2	2	2	3	2	2	2	2	3	2	2	
Course Outcomes		CO4	2	1	3	3	3	2	3	3	3	2	1	3	3	1	3	
	CO1	Identify the fundamental elements of relational database management system	CO5	2	3	2	1	3	1	2	1	3	2	3	2	1	3	2
	CO2	Design and explain the basic concepts of relational data model, entity-relationship model, and relational database design	Average	2.00	2.00	2.40	2.20	2.60	1.80	2.40	2.20	2.60	2.00	2.00	2.40	2.20	2.00	2.40
	CO3	Identify the use of normalization and functional dependency in database design.																
	CO4	Identify different types of Intellectual Properties																
	CO5	Identify activities and constitute IP infringements and the remedies available																

Class	MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs			
Subject Code	BT 304		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Subject Name	Advanced Genetics	CO1	1	3	3	1	3	2	3	3	1	3	2	2	1	3	2	
Semester No	1	CO2	3	2	1	3	2	2	2	1	3	2	2	1	3	2	2	
Teacher Name	Sushila kambale	CO3	2	2	2	2	2	3	2	2	2	2	3	3	2	2	3	
Course Outcomes		CO4	1	3	2	1	3	3	3	2	1	3	2	3	1	3	2	
	CO1	Understand the concepts of population and quantitative genetics.	CO5	3	2	2	3	2	1	2	2	3	2	1	2	3	2	1
	CO2	Knowledge regarding mutation: Causes, agents that are responsible and role in cancer and cell death.	Average	2.00	2.40	2.00	2.00	2.40	2.20	2.40	2.00	2.00	2.40	2.00	2.20	2.00	2.40	2.00
	CO3	Thorough knowledge of immunity and the factors responsible for developing immunity and preventing infection																
	CO4	Development of diseases and its prevention																

	CO5	Different techniques involved in causing mutation and analyzing antigen and antibody in testing.
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Class		MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs		
Subject Code	Bt- 305			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Bioinformatics		CO1	1	3	3	1	3	2	3	3	1	3	2	2	1	3	2
Semester No	1		CO2	3	2	1	3	2	2	2	1	3	2	2	1	3	2	2
Teacher Name	Prashant katke and Jyostna Galande		CO3	2	2	2	2	2	3	2	2	2	2	3	3	2	2	3
Course Outcomes			CO4	1	3	2	1	3	3	3	2	1	3	2	3	1	3	2
	CO1	Course objective is to learn Major Bioinformatics Resources and Biological databases and Basic Concepts in Biological sequence Analysis	CO5											1	2			1
	CO2	Student also learn Structural Bioinformatics, Pharmacophore modelling and Chemoinformatics and Molecular Modeling.	Average	2.00	2.40	2.00	2.00	2.40	2.20	2.40	2.00	2.00	2.40	2.00	2.20	2.00	2.40	2.00
	CO3	Student also learn Biostatistic in this course which includes Sampling, distribution and presentation, Hypothesis Testing (with biological examples) and Design, correlation and regression analysis.																
	CO4	Student also learns to use several Statistical Methods such as Analysis of variance table (ANOVA), Post hoc Tests, Tukey's test for pairwise comparison of treatments , Dunnet's test for comparison of treatment means with control, Duncan's multiple range test, Mann-Whitney U test																
	CO5	Students get aquatinted to the computational aspect of Biotechnology																

Class		MSc 2 Biotechnology		Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT-306		PO1		PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Subject Name	Exercise in animal biotechnology		CO1	2	3	2	3	2	2	3	2	2	2	3	2	3	2	3	
Semester No	1		CO2	2	3	3	3	3	2	3	3	3	2	3	3	3	3	3	
Teacher Name	Prashant katke		CO3	1	2	2	2	2	1	2	2	2	1	2	2	2	2	2	
Course Outcomes			CO4	2	3	3	1	2	2	3	3	2	2	3	3	3	3	1	
	CO1	The students will able to carry out screening and preservation of industrially important microorganisms.	CO5	1	1	2	2	2	1	1	2	1	1	1	2	1	2	2	
	CO2	The student will carry out fermentation at laboratory scale and product assay	Average	1.60	2.40	2.40	2.20	2.20	1.60	2.40	2.40	2.00	1.60	2.40	2.40	2.40	2.40	2.20	
	CO3	They will also able to formulate and optimize medium for fermentation																	
	CO4	The student can produce fermentation product at laboratory scale and carry out qualitative and quantitative testings of the product.																	
	CO5	Course objective is to learn Major Bioinformatics Resources and Biological databases and Basic Concepts in Biological sequence Analysis																	

Class		MSc 2 Biotechnology		Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT- 307		PO1		PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Subject Name	Exercise in Bioprocess Engineering		CO1	2	3	2	2	3	2	2	2	2	2	3	2	2	3		
Semester No	1		CO2	3	3	3	2	3	3	3	3	3	2	3	3	3	3		
Teacher Name	Asmita Gavhane		CO3	2	2	2	1	2	2	2	2	2	1	2	2	2	2		
Course Outcomes			CO4	3	1	2	2	3	3	2	3	2	2	3	3	2	1		
	CO1	The students will able to carry out screening and preservation of industrially important microorganisms.	CO5	2	2	2	1	1	2	1	2	1	2	1	1	2	1	2	
	CO2	The student will carry out fermentation at laboratory scale and product assay	Average	2.40	2.20	2.20	1.60	2.40	2.40	2.00	2.40	2.00	2.20	1.60	2.40	2.40	2.00	2.20	



	CO3	They will also able to formulate and optimize medium for fermentation
	CO4	The student can produce fermentation product at laboratory scale and carry out qualitative and quantitative testings of the product.
	CO5	Course objective is to learn Major Bioinformatics Resources and Biological databases and Basic Concepts in Biological sequence Analysis

Class		MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT- 308			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Exercise in Bioinformatics		CO1	3	1	3	2	2	3	2	1	2	2	2	3	1	3	3
Semester No	1		CO2	1	3	2	2	3	1	3	2	1	2	1	3	1	1	3
Teacher Name	Prashant katke		CO3	2	2	2	3	2	2	1	1	2	2	3	2	2	3	2
Course Outcomes			CO4	2	1	3	3	3	2	2	2	2	1	2	3	1	1	3
	CO1	The students will able to carry out screening and preservation of industrially important microorganisms.	CO5	2	3	2	1	3	1	1	2	2	2	2	3	2	2	2
	CO2	The student will carry out fermentation at laboratory scale and product assay	Average	2.00	2.00	2.40	2.20	2.60	1.80	1.80	1.60	1.80	1.80	2.00	2.80	1.40	2.00	2.60
	CO3	They will also able to formulate and optimize medium for fermentation																
	CO4	The student can produce fermentation product at laboratory scale and carry out qualitative and quantitative testings of the product.																
	CO5	Course objective is to learn Major Bioinformatics Resources and Biological databases and Basic Concepts in Biological sequence Analysis																

Class		MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT-309			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

Subject Name	Seminars, Term paper writing	CO1	1	3	3	1	3	2	2	3	3	1	3	2	2	3	3	
Semester No	1	CO2	3	2	1	3	2	2	3	1	1	3	2	2	3	1	1	
Teacher Name	-----	CO3	2	2	2	2	2	3	2	2	2	2	2	3	2	2	2	
Course Outcomes		CO4	1	3	2	1	3	3	3	2	2	1	3	3	3	2	2	
	CO1	Student will learn how to present new idea	CO5	3	2	2	3	2	1	3	1	2	3	2	1	3	1	2
	CO2	Students enhance their soft skills	Average	2.00	2.40	2.00	2.00	2.40	2.20	2.60	1.80	2.00	2.00	2.40	2.20	2.60	1.80	2.00
	CO3	critical thinking																
	CO4	Student will able to integrate																
	CO5	Students will learn presentation of research paper																

Class	MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs			
Subject Code	BT-401		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Subject Name	Genomics and Proteomics	CO1	3	3	3	1	3	2	2	3	3	1	3	2	2	3	3	
Semester No	2	CO2	3	2	1	3	2	2	3	1	1	3	2	2	3	1	3	
Teacher Name	Rajashri bhope and Prashant katke	CO3	2	2	2	2	2	3	2	2	2	2	2	2	3	2	2	
Course Outcomes		CO4	2	2	2	1	2	3	3	3	2	1	3	3	3	2	2	
	CO1	Students learns about Genomics, Transcriptomics, Microarray and application of genomics	CO5	3	2	2	3	3	1	3	1	2	3	2	1	3	1	2
	CO2	In proteomics section students aware about Introduction & concept of proteomics,	Average	2.60	2.20	2.00	2.00	2.40	2.20	2.60	2.00	2.00	2.00	2.40	2.00	2.80	1.80	2.40
	CO3	Protein structure-function relationship,																
	CO4	Students understand various Techniques in Proteomics like MS, MalDI-tof, protein separation techniques																
	CO5	Student understand application of proteomics in biological systems																

Class	MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT- 402		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Biochemical and biophysical techniques	CO1	1	3	3	1	3	2	2	3	3	1	3	2	3	3	3
Semester No	2	CO2	3	2	1	3	2	2	3	1	1	3	2	2	1	1	1
Teacher Name	Komal Sonawane	CO3	2	2	2	2	2	3	2	2	2	2	2	3	2	2	2
Course Outcomes		CO4	1	3	2	1	3	3	3	2	2	1	3	3	2	2	2

	CO1	Students will know the principle and application of various instruments.	CO5	3	2	2	3	2	1	3	2	2	3	2	2	1	1	2
	CO2	Students will be able to make a strategy on molecular techniques for the improvement in any trait or its well being based on the techniques learned during this course.	Average	2.00	2.40	2.00	2.00	2.40	2.20	2.60	2.00	2.00	2.00	2.40	2.40	1.80	1.80	2.00
	CO3	This course can use the knowledge for designing a project for research and execute it.																
	CO4	Students will be able develop competence in handling various chromatographic techniques and apply them in isolating and characterizing different biological molecules.																
	CO5	:Understanding the applications of centrifugation and chromatography in biological investigations																

Class		MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs		
Subject Code	BT_405			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
Subject Name	Stem Cell Technology and Regenerative Medicines		CO1	1	3	3	1	3	2	2	3	3	1	3	2	2	3	3
Semester No	2		CO2	3	2	1	3	2	2	3	1	1	3	2	2	3	1	1
Teacher Name	Prashant katke		CO3	2	2	2	2	2	3	2	2	2	2	2	3	2	2	2
Course Outcomes			CO4	1	3	2	1	3	3	3	2	2	1	3	3	3	2	2
	CO1	Course contains introduction of Tissue/Cell Culture and techniques which includes various systems of tissue cultures.	CO5	3	2	2	3	2	1	3	1	2	3	2	1	3	1	2
	CO2	it also include Establishing primary cell culture, Organ culture and cell lines with their Methodology.	Average	2.00	2.40	2.00	2.00	2.40	2.20	2.60	1.80	2.00	2.00	2.40	2.20	2.60	1.80	2.00
	CO3	program contains Stem cells technology and its applications																

	CO4	Transgenic animal and their strategies gives broad ideas to students for experimental studies.
	CO5	program also includes Study of animal husbandry and their application

Class		MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs			
Subject Code	BT-406			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Subject Name	Agricultural Biotechnology			CO1	1	3	3	1	3	2	2	3	3	1	3	2	2	3	3
Semester No	2			CO2	3	2	1	3	2	2	3	1	1	3	2	2	3	1	1
Teacher Name	Prashant katke			CO3	2	2	2	2	2	3	2	2	2	2	3	2	2	2	2
Course Outcomes				CO4	1	3	2	1	3	3	3	2	2	1	3	3	3	2	2
	CO1	The students will learn about applications of biotechnology in agriculture	CO5	3	2	2	3	2	1	3	1	2	3	2	1	3	1	2	
	CO2	The student will learn about plant bioreactor and use	Average	2.00	2.40	2.00	2.00	2.40	2.20	2.60	1.80	2.00	2.00	2.40	2.20	2.60	1.80	2.00	
	CO3	The student also learn about production of biofertilizers, plant growth promoter and formulations																	
	CO4	Understand the gene manipulation techniques Knowledge to plants																	
	CO5	Analyze the different applications of genetically modified organisms related issues																	

Class		MSc 2 Biotechnology	Course Outcomes	Program Outcomes												PSOs			
Subject Code	BT- 407			PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
Subject Name	Project			CO1	3	3	3	1	3	2	2	3	3	1	3	2	2	3	3
Semester No	2			CO2	3	3	1	3	1	2	3	1	1	3	2	1	3	2	1
Teacher Name	-----			CO3	2	2	2	1	1	3	2	2	3	2	2	3	2	2	3
Course Outcomes				CO4	1	3	2	1	3	3	3	2	2	1	3	3	3	2	2
	CO1	Students will be able to think from the research point of view	CO5	3	2	2	3	2	1	3	1	2	3	2	1	3	1	2	
	CO2	Students will be able to search research paper on web	Average	2.40	2.60	2.00	1.80	2.00	2.20	2.60	1.80	2.20	2.00	2.40	2.00	2.60	2.00	2.20	

	CO3	Students analytical view develops
	CO4	try to develop research aptitude
	CO5	Able to learn new techniques

<b>CO-PO Mapping</b>
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		Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
FY	FY	1 MBT- 101	2.40	3.00	2.80	2.80	2.80	2.20	2.40	1.80	2.20	1.80	2.20	3.00
		2 MBT- 102	2.20	2.40	2.60	2.80	2.60	2.20	1.80	1.80	2.00	1.60	2.20	3.00
		3 MBT- 103	2.00	2.40	2.20	2.40	2.60	2.00	1.80	1.80	2.00	1.60	1.20	2.60
		4 MBT- 104	2.20	2.00	1.80	2.80	2.60	2.20	1.80	1.60	2.00	1.60	1.80	2.80
		5 MBT -105 T	2.20	2.00	2.20	2.60	2.60	2.20	1.60	1.80	2.00	1.60	2.20	2.20
		6 MBT -106 P	1.80	2.40	2.40	2.40	2.20	2.20	1.80	1.80	2.00	1.60	1.80	2.40
		7 MBT-201	2.00	2.40	2.60	2.00	2.60	2.20	1.80	1.60	2.00	1.80	2.20	3.00
		8 MBT-202	2.00	2.00	2.40	2.20	2.60	1.80	1.80	1.60	1.80	1.80	2.00	2.80
		9 MBT-203	2.20	2.40	2.60	2.80	2.60	2.20	1.80	1.80	2.00	1.60	2.20	3.00
		10 MBT-204	1.80	2.20	2.20	2.80	2.60	2.00	1.80	1.80	1.60	1.60	2.20	2.80
		11 MBT-206	2.00	3.00	2.00	3.00	3.00	2.00	1.00	2.00	2.00	2.00	2.00	3.00
SY	SY	1 BT 301	2.00	2.00	2.40	2.20	2.60	1.80	1.80	1.60	1.80	1.80	2.00	2.80
		2 BT 302	2.00	2.00	2.40	2.20	2.60	1.80	1.80	1.60	2.20	2.60	1.80	1.80
		3 BT 303	2.00	2.00	2.40	2.20	2.60	1.80	2.40	2.20	2.60	2.00	2.00	2.40
		4 BT 304	2.00	2.40	2.00	2.00	2.40	2.20	2.40	2.00	2.00	2.40	2.00	2.20
		5 Bt- 305	2.00	2.40	2.00	2.00	2.40	2.20	2.40	2.00	2.00	2.40	2.00	2.20
		6 BT-306	1.60	2.40	2.40	2.20	2.20	1.60	2.40	2.40	2.00	1.60	2.40	2.40
		7 BT- 307	2.40	2.20	2.20	1.60	2.40	2.40	2.00	2.40	2.00	2.20	1.60	2.40
		8 BT- 308	2.00	2.00	2.40	2.20	2.60	1.80	1.80	1.60	1.80	1.80	2.00	2.80
		9 BT-309	2.00	2.40	2.00	2.00	2.40	2.20	2.60	1.80	2.00	2.00	2.40	2.20
		10 BT-401	2.60	2.20	2.00	2.00	2.40	2.20	2.60	2.00	2.00	2.00	2.40	2.00
		11 BT- 402	2.00	2.40	2.00	2.00	2.40	2.20	2.60	2.00	2.00	2.00	2.40	2.40
		12 BT_405	2.00	2.40	2.00	2.00	2.40	2.20	2.60	1.80	2.00	2.00	2.40	2.20
		13 BT-406	2.00	2.40	2.00	2.00	2.40	2.20	2.60	1.80	2.00	2.00	2.40	2.20
		14 BT- 407	2.40	2.60	2.00	1.80	2.00	2.20	2.60	1.80	2.20	2.00	2.40	2.00

<b>CO-PO ATTAINMENT</b>
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PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
2.4	3	2.8	2.8	2.8	2.2	2.4	1.8	2.2	1.8	2.2	3
1.496	1.632	1.768	1.904	1.768	1.496	1.224	1.224	1.36	1.088	1.496	2.04
1.36	1.632	1.496	1.632	1.768	1.36	1.224	1.224	1.36	1.088	0.816	1.768
2.2	2	1.8	2.8	2.6	2.2	1.8	1.6	2	1.6	1.8	2.8
1.496	1.36	1.496	1.768	1.768	1.496	1.088	1.224	1.36	1.088	1.496	1.496
1.8	2.4	2.4	2.4	2.2	2.2	1.8	1.8	2	1.6	1.8	2.4
2	2.4	2.6	2	2.6	2.2	1.8	1.6	2	1.8	2.2	3
1.36	1.36	1.632	1.496	1.768	1.224	1.224	1.088	1.224	1.224	1.36	1.904
2.2	2.4	2.6	2.8	2.6	2.2	1.8	1.8	2	1.6	2.2	3
1.8	2.2	2.2	2.8	2.6	2	1.8	1.8	1.6	1.6	2.2	2.8
1.36	2.04	1.36	2.04	2.04	1.36	0.68	1.36	1.36	1.36	1.36	2.04
2	2	2.4	2.2	2.6	1.8	1.8	1.6	1.8	1.8	2	2.8
2	2	2.4	2.2	2.6	1.8	1.8	1.6	2.2	2.6	1.8	1.8
1.36	1.36	1.632	1.496	1.768	1.224	1.632	1.496	1.768	1.36	1.36	1.632
2	2.4	2	2	2.4	2.2	2.4	2	2	2.4	2	2.2
1.36	1.632	1.36	1.36	1.632	1.496	1.632	1.36	1.36	1.632	1.36	1.496
0.832	1.248	1.248	1.144	1.144	0.832	1.248	1.248	1.04	0.832	1.248	1.248
2.4	2.2	2.2	1.6	2.4	2.4	2	2.4	2	2.2	1.6	2.4
1.36	1.36	1.632	1.496	1.768	1.224	1.224	1.088	1.224	1.224	1.36	1.904
1.36	1.632	1.36	1.36	1.632	1.496	1.768	1.224	1.36	1.36	1.632	1.496
1.352	1.144	1.04	1.04	1.248	1.144	1.352	1.04	1.04	1.04	1.248	1.04
2	2.4	2	2	2.4	2.2	2.6	2	2	2	2.4	2.4
1.36	1.632	1.36	1.36	1.632	1.496	1.768	1.224	1.36	1.36	1.632	1.496
1.04	1.248	1.04	1.04	1.248	1.144	1.352	0.936	1.04	1.04	1.248	1.144
1.632	1.768	1.36	1.224	1.36	1.496	1.768	1.224	1.496	1.36	1.632	1.36

<b>Percentage CO-PO ATTAINMENT</b>
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PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
100	100	100	100	100	100	100	100	100	100	100	100
68	68	68	68	68	68	68	68	68	68	68	68
68	68	68	68	68	68	68	68	68	68	68	68
100	100	100	100	100	100	100	100	100	100	100	100
68	68	68	68	68	68	68	68	68	68	68	68
100	100	100	100	100	100	100	100	100	100	100	100
100	100	100	100	100	100	100	100	100	100	100	100
68	68	68	68	68	68	68	68	68	68	68	68
100	100	100	100	100	100	100	100	100	100	100	100
100	100	100	100	100	100	100	100	100	100	100	100
68	68	68	68	68	68	68	68	68	68	68	68
100	100	100	100	100	100	100	100	100	100	100	100
100	100	100	100	100	100	100	100	100	100	100	100
68	68	68	68	68	68	68	68	68	68	68	68
100	100	100	100	100	100	100	100	100	100	100	100
68	68	68	68	68	68	68	68	68	68	68	68
52	52	52	52	52	52	52	52	52	52	52	52
100	100	100	100	100	100	100	100	100	100	100	100
68	68	68	68	68	68	68	68	68	68	68	68
68	68	68	68	68	68	68	68	68	68	68	68
52	52	52	52	52	52	52	52	52	52	52	52
100	100	100	100	100	100	100	100	100	100	100	100
68	68	68	68	68	68	68	68	68	68	68	68
52	52	52	52	52	52	52	52	52	52	52	52
68	68	68	68	68	68	68	68	68	68	68	68



## CO-PSO MAPPING

	Course	PSO1	PSO2	PSO3
1	MBT- 101	1.60	2.20	2.40
2	MBT- 102	1.60	1.80	2.40
3	MBT- 103	1.40	1.80	2.40
4	MBT- 104	1.60	1.80	2.40
5	MBT -105	1.60	1.80	2.20
6	MBT -106	1.60	1.80	2.40
7	MBT-201	1.60	2.20	2.20
8	MBT-202	1.40	2.00	2.60
9	MBT-203	1.60	1.80	2.40
10	MBT-204	1.60	1.60	2.20
11	MBT-206	2.00	2.00	2.00
1	BT 301	1.40	2.00	2.60
2	BT 302	1.60	2.00	2.40
3	BT 303	2.20	2.00	2.40
4	BT 304	2.00	2.40	2.00
5	Bt- 305	2.00	2.40	2.00
6	BT-306	2.40	2.40	2.20
7	BT- 307	2.40	2.00	2.20
8	BT- 308	1.40	2.00	2.60
9	BT-309	2.60	1.80	2.00
10	BT-401	2.80	1.80	2.40
11	BT- 402	1.80	1.80	2.00
12	BT_405	2.60	1.80	2.00
13	BT-406	2.60	1.80	2.00
14	BT- 407	2.60	2.00	2.20

## CO-PSO ATTAINMENT

	Course	PSO1	PSO2	PSO3
	MBT- 101	1.6	2.2	2.4
	MBT- 102	1.088	1.224	1.632
	MBT- 103	0.952	1.224	1.632
	MBT- 104	1.6	1.8	2.4
	MBT -105 T	1.088	1.224	1.496
	MBT -106 P	1.6	1.8	2.4
	MBT-201	1.6	2.2	2.2
	MBT-202	0.952	1.36	1.768
	MBT-203	1.6	1.8	2.4
	MBT-204	1.6	1.6	2.2
	MBT-206	1.36	1.36	1.36
	BT 301	1.4	2	2.6
	BT 302	1.6	2	2.4
	BT 303	1.496	1.36	1.632
	BT 304	2	2.4	2
	Bt- 305	1.36	1.632	1.36
	BT-306	1.248	1.248	1.144
	BT- 307	2.4	2	2.2
	BT- 308	0.952	1.36	1.768
	BT-309	1.768	1.224	1.36
	BT-401	1.456	0.936	1.248
	BT- 402	1.8	1.8	2
	BT_405	1.768	1.224	1.36
	BT-406	1.352	0.936	1.04
	BT- 407	1.768	1.36	1.496

## Percentage CO-PSO ATTAINMENT

	Course	PSO1	PSO2	PSO3
	MBT- 101	100	100	100
	MBT- 102	68	68	68
	MBT- 103	68	68	68
	MBT- 104	100	100	100
	MBT -105	68	68	68
	MBT -106	100	100	100
	MBT-201	100	100	100
	MBT-202	68	68	68
	MBT-203	100	100	100
	MBT-204	100	100	100
	MBT-206	68	68	68
	BT 301	100	100	100
	BT 302	100	100	100
	BT 303	68	68	68
	BT 304	100	100	100
	Bt- 305	68	68	68
	BT-306	52	52	52
	BT- 307	100	100	100
	BT- 308	68	68	68
	BT-309	68	68	68
	BT-401	52	52	52
	BT- 402	100	100	100
	BT_405	68	68	68
	BT-406	52	52	52
	BT- 407	68	68	68

FY

SY