

**Manipal School of Life Sciences**  
**Manipal Academy of Higher Education,**  
**Manipal**

**Program Regulations - 2024**

*Outcomes Based Education (OBE) Framework*

**Undergraduate Program**

**4-Year Full-Time B.Sc. (Honours) in**  
**Biotechnology**

## COURSE OUTLINE

FIRST YEAR: Semester: 1								
Course Code	Course Title	No. of hours per week			Credits	Evaluation Scheme		
		Lecture	Tutorial	Practical		Internal Assessment	University Exam	Total
BBT 1101	Basics of Biotechnology	3	-	-	3	50	50	100
BBT 1103	Biology	3	-	-	3	50	50	100
BBT 1105	Chemistry	3	-	-	3	50	50	100
BBT 1107	Computer Science	3	-	-	3	50	50	100
BBT 1109	Biology	-	-	4	2	50	50	100
BBT 1111	Chemistry	-	-	4	2	50	50	100
BBT 1113	Computer Science	-	-	2	1	50	50	100
BBT 1115	Seminar/Soft skills	-	1	-	1	25	-	25
BBT 1117	*English	2	-	-	2	50	50	100
	<b>Total</b>	<b>14</b>	<b>1</b>	<b>10</b>	<b>20</b>	<b>425</b>	<b>400</b>	<b>825</b>

**\*Not included in CGPA**

FIRST YEAR: Semester: 2								
Course Code	Course Title	No. of hours per week			Credits	Evaluation Scheme		
		Lecture	Tutorial	Practical		Internal Assessment	University Exam	Total
BBT 1202	Cell Biology	3	-	-	3	50	50	100
BBT 1204	Biochemistry	3	-	-	3	50	50	100
BBT 1206	Microbiology	3	-	-	3	50	50	100
BBT 1208 (or) BBT 1210	Physics (or) Advanced Chemistry	3	-	-	3	50	50	100
BBT 1212	Cell Biology	-	-	4	2	50	50	100
BBT 1214	Biochemistry	-	-	4	2	50	50	100
BBT 1216	Microbiology	-	-	4	2	50	50	100
BBT 1218 (or) BBT 1220	Physics (or) Advanced Chemistry	-	-	2	1	50	50	100
BBT 1222	Seminar/Soft skills	-	1	-	1	25	-	25
	<b>Total</b>	<b>12</b>	<b>1</b>	<b>14</b>	<b>20</b>	<b>425</b>	<b>400</b>	<b>825</b>

SECOND YEAR: Semester: 3								
Course Code	Course Title	No. of hours per week			Credits	Evaluation Scheme		
		Lecture	Tutorial	Practical		Internal Assessment	University Exam	Total
BBT 2101	Genetics	3	-	-	3	50	50	100
BBT 2103	Molecular Biology	3	-	-	3	50	50	100
BBT 2105	Cell & Tissue Culture Techniques	3	-	-	3	50	50	100
BBT 2107	Biophysics	3	-	-	3	50	50	100
BBT 2109	Genetics	-	-	4	2	50	50	100
BBT 2111	Molecular Biology	-	-	4	2	50	50	100
BBT 2113	Cell & Tissue Culture Techniques	-	-	4	2	50	50	100
BBT 2115	Biophysics	-	-	2	1	50	50	100
BBT 2117	Seminar/Soft skills	-	1	-	1	25	-	25
	<b>Total</b>	<b>12</b>	<b>1</b>	<b>14</b>	<b>20</b>	<b>425</b>	<b>400</b>	<b>825</b>

SECOND YEAR: Semester: 4								
Course Code	Course Title	No. of hours per week			Credits	Evaluation Scheme		
		Lecture	Tutorial	Practical		Internal Assessment	University Exam	Total
BBT 2202	Biostatistics	3	-	-	3	50	50	100
BBT 2204	Plant Biotechnology	3	-	-	3	50	50	100
BBT 2206	Bioinformatics	3	-	-	3	50	50	100
BBT 2208 (or) BBT 2210	Immunology (or) Nanobiotechnology	3	-	-	3	50	50	100
BBT 2212	Plant Biotechnology	-	-	4	2	50	50	100
BBT 2214	Bioinformatics	-	-	4	2	50	50	100
BBT 2216 (or) BBT 2218	Immunology (or) Nanobiotechnology	-	-	4	2	50	50	100

BBT 2220	Seminar/Soft skills	-	2	-	2	25	-	25
	<b>Total</b>	<b>12</b>	<b>2</b>	<b>12</b>	<b>20</b>	<b>375</b>	<b>350</b>	<b>725</b>

**THIRD YEAR: Semester: 5**

Course Code	Course Title	No. of hours per week			Credits	Evaluation Scheme		
		Lecture	Tutorial	Practical		Internal Assessment	University Exam	Total
BBT 3101	Environmental Science	3	-	-	3	50	50	100
BBT 3103	Advanced Genomics	3	-	-	3	50	50	100
BBT 3105	Microbial Biotechnology	3	-	-	3	50	50	100
BBT 3107	Research Methodology	3	-	-	3	50	50	100
BBT 3109	Environmental Science	-	-	2	1	50	50	100
BBT 3111	Advanced Genomics	-	-	4	2	50	50	100
BBT 3113	Microbial Biotechnology		-	4	2	50	50	100
BBT 3115	Seminar/Soft skills	-	1	-	1	25	-	25
BBT 3117	* Introduction to Yoga (or)							
BBT 3119	*Empowering Communities Through Volunteer Service Organization (or)							
BBT 3121	* Introduction to the National Service Scheme (Or) Other Social Service activities (only for the Dubai campus)	-	-	4	*2	50		50
BBT 3123								
	<b>Total</b>	<b>12</b>	<b>1</b>	<b>14</b>	<b>20</b>	<b>425</b>	<b>350</b>	<b>775</b>

**\* Not included in CGPA**

**THIRD YEAR: Semester: 6**

Course Title	No. of hours per week	Credits	Evaluation Scheme
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Course Code		Lecture	Tutorial	Practical		Internal Assessment	University Exam	Total
BBT 3202	Project progress review	-	4	-	4	25	-	25
BBT 3204	High end research facility training	-	-	8	4	25	-	25
BBT 3206	Research Project/ Submission of dissertation/ Submission of manuscript	-	-	24	12	100	250	350
	<b>Total</b>	-	<b>4</b>	<b>32</b>	<b>20</b>	<b>150</b>	<b>250</b>	<b>400</b>

FOURTH YEAR: Semester: 7								
Subject Code	Subject Title	No. of hours per week			Credits	Evaluation Scheme		
		Lecture	Tutorial	Practical		Internal Assessment	University Exam	Total
BBT 4101	Review article submission	-	4	-	4	25	-	25
BBT 4103	Project progress review		4	-	4	25	-	25
BBT 4105	Research Project work progress report I submission/ presentation	-	-	24	12	150	-	150
	<b>Total</b>	-	<b>8</b>	<b>24</b>	<b>20</b>	<b>200</b>	-	<b>200</b>

FOURTH YEAR: Semester: 8								
Subject Code	Subject Title	No. of hours per week			Credits	Evaluation Scheme		
		Lecture	Tutorial	Practical		Internal Assessment	University Exam	Total
BBT 4202	Project progress review	-	4	-	4	50	-	50
BBT 4204	Manuscript submission	-	4	-	4	50	-	50

BBT 4206	Research Project work /Submission of dissertation	-	-	24	12	-	300	300
	<b>Total</b>	-	<b>8</b>	<b>24</b>	<b>20</b>	<b>100</b>	<b>300</b>	<b>400</b>

**Note:** Only 30% of total intake available for 4<sup>th</sup> year, with minimum CGPA of 7.5