



PARUL UNIVERSITY
FACULTY OF ENGINEERING AND TECHNOLOGY
PARUL INSTITUTE OF TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY
TEACHING SCHEME - 2023-24
B.TECH BIOTECHNOLOGY

Semester - 1

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303105102	Programming for Problem Solving	4	3	2	0	20	20	20	60	30	40	25	150
303107153	Electronic Workshop	1	0	2	0	-	50	-	-	50	-	50	100
303109102	Elements of Mechanical Engineering	4	3	2	0	20	20	20	60	30	40	25	150
303144102	Remedial Biology	3	3	0	0	20	-	20	60	-	40	-	100
303144101	Basics of Biotechnology	3	3	0	0	20	-	20	60	-	40	-	100
303191101	Mathematics-I	4	4	-	-	20	-	20	60	-	40	-	100
303193103	Communication Skills	2	-	-	2	-	-	100	0	0	40	0	100
Total		21	16	6	2								800

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical
Theory Passing % : 40 Practical Passing % : 50

Semester - 2

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303104105	Environmental Science	0	1	0	0	0	-	50	0	-	20	-	50
303109101	Engineering Graphics	4	2	4	0	20	20	20	60	30	40	25	150
303120101	Chemistry	4	3	2	0	20	20	20	60	30	40	25	150
303144153	Fundamentals of Electrical and Electronics Engineering	4	3	2	0	20	20	20	60	30	40	25	150
303144155	Cell Biology	2	2	0	0	20	-	20	60	-	40	-	100
303191151	Mathematics-II	4	4	-	-	20	-	20	60	-	40	-	100
303192102	Engineering Physics-II	4	3	2	0	20	20	20	60	30	40	25	150
303193152	Advanced Communication & Technical Writing	2	-	-	2	-	-	100	0	0	40	0	100
Total		24	18	10	2								950

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical
Theory Passing % : 40 Practical Passing % : 50

Semester - 3

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144201	Genetics and Molecular Biology	3	3	0	0	20	-	20	60	-	40	-	100
303144202	Genetics and Molecular Biology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144203	Basics of Microbiology	3	3	0	0	20	-	20	60	-	40	-	100
303144204	Basics of Microbiology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144205	Biochemistry	3	3	0	0	20	-	20	60	-	40	-	100
303144206	Biochemistry Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144208	Biological Reaction Engineering	3	3	0	0	20	-	20	60	-	40	-	100
303144209	Introduction to Python Programming	2	2	0	0	20	-	20	60	-	40	-	100

303144210	Introduction to Python Programming Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144212	Product Realization	1	0	2	0	-	50	-	-	0	-	25	50
303193203	Professional Communication Skills	2	-	-	2	-	-	100	0	0	40	0	100
	Total	21	14	10	2								850

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical
Theory Passing % : 40 Practical Passing % : 50

Semester - 4

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144251	Immunology and Immunotechnology	3	3	0	0	20	-	20	60	-	40	-	100
303144252	Immunology and Immunotechnology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144253	Techniques in Biotechnology	3	3	0	0	20	-	20	60	-	40	-	100
303144254	Techniques in Biotechnology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144255	Enzymology and Enzyme Technology	3	3	0	0	20	-	20	60	-	40	-	100
303144256	Enzymology and Enzyme Technology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144258	Transport Phenomena	3	3	0	0	20	-	20	60	-	40	-	100
303144259	Biostatistics	4	4	0	0	20	-	20	60	-	40	-	100
303193252	Professional Grooming and Personality Development	1	-	-	1	-	-	100	0	0	40	0	100
	Total	20	16	6	1								750

Lect - Lecture, **Tut** - Tutorial, **Lab** - Lab, **T** - Theory, **P** - Practical, **CE** - CE, **T** - Theory, **P** - Practical
Theory Passing % : 40 Practical Passing % : 50

Semester - 5 Open Elective 01

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303101331	Basic Aircraft Science	2	2	-	-	20	-	20	60	-	40	-	100
303104311	Disaster Preparedness and Planning	2	2	0	0	20	-	20	60	-	40	-	100
303105304	Cyber Security	2	2	0	0	20	-	20	60	-	40	-	100
303105305	Internet of Things	2	2	0	0	20	-	20	60	-	40	-	100
303107346	Fundamentals of Communication Engineering	2	2	0	0	20	-	20	60	-	40	-	100
303109346	Renewable Energy Sources	2	2	0	0	20	-	20	60	0	40	0	100

Semester - 5

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144301	Bioinformatics and Computational Biology	3	3	0	0	20	-	20	60	-	40	-	100
303144302	Bioinformatics and Computational Biology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144303	Metabolic Engineering	2	2	0	0	20	-	20	60	-	40	-	100
303144304	Animal Biotechnology	2	2	0	0	20	-	20	60	-	40	-	100
303144305	Genetic Engineering	3	3	0	0	20	-	20	60	-	40	-	100
303144306	Genetic Engineering Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144307	Industrial Biotechnology	2	2	0	0	20	-	20	60	-	40	-	100
303144308	Industrial Biotechnology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144309	Summer Internship - I	2	0	0	0	-	50	-	-	-	-	25	50
303193304	Professionalism & Corporate Ethics	1	-	-	1	-	-	100	0	0	40	0	100
	Open Elective 01 (Compulsory Subjects :1)	2	2	0	0	40	-	-	60	-	-	-	100

	PEC 01 (Compulsory Subjects :1)	3	3	0	0	40	-	-	60	-	-	-	100
	Total	23	17	6	1								1000
Semester - 5 PEC 01													
						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144331	Pharmaceutical Biotechnology	3	3	0	0	20	-	20	60	-	40	-	100
303144332	Nano Biotechnology	3	3	0	0	20	-	20	60	-	40	-	100
303144333	Biofuels and Alcohol Technology	3	3	0	0	20	-	20	60	-	40	-	100
Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical Theory Passing % : 40 Practical Passing % : 50													
Semester - 6 Open Elective 02													
						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303100351	Programme Management and Entrepreneurship	2	2	0	0	20	-	20	60	-	40	-	100
303100352	Life Sciences	2	2	0	0	20	-	20	60	-	40	-	100
303100353	Fundamentals of Management	2	2	0	0	20	-	20	60	-	40	-	100
303100354	Constitution of India	2	2	0	0	20	-	20	60	-	40	-	100
Semester - 6													
						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144351	Plant Biotechnology	4	4	0	0	20	-	20	60	-	40	-	100
303144352	Plant Biotechnology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144353	Bioprocess Engineering	4	4	0	0	20	-	20	60	-	40	-	100
303144354	Bioprocess Engineering Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144355	Food Biotechnology	4	4	0	0	20	-	20	60	-	40	-	100
303144356	Food Biotechnology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144357	Mini Project	1	0	2	0	-	20	-	-	30	-	25	50
303193353	Employability Skills	1	-	-	1	-	-	100	0	0	40	0	100
	Open Elective 02 (Compulsory Subjects :1)	2	2	0	0	40	-	-	60	-	-	-	100
	PEC 02 (Compulsory Subjects :1)	3	3	0	0	40	-	-	60	-	-	-	100
	Total	22	17	8	1								800
Semester - 6 PEC 02													
						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144381	3-D Printing	3	3	0	0	20	-	20	60	-	40	-	100
303144382	Virology	3	3	0	0	20	-	20	60	-	40	-	100
303144383	Cancer Biology	3	3	0	0	20	-	20	60	-	40	-	100
Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical Theory Passing % : 40 Practical Passing % : 50													
Semester - 7													
						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144401	Environmental Biotechnology	4	3	0	0	20	-	20	60	-	40	-	100

303144402	Environmental Biotechnology Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144403	Bioseparation and Downstream Processing	4	3	0	0	20	-	20	60	-	40	-	100
303144404	Bioseparation and Downstream Processing Lab	1	0	2	0	-	20	-	-	30	-	25	50
303144405	Biosafety, Bioethics, IPR & Patents	3	3	0	0	20	-	20	60	-	40	-	100
303144406	Project-I	6	0	12	0	-	100	-	-	100	-	100	200
303144407	Summer Internship - II	2	0	0	0	-	50	-	-	0	-	25	50
	PEC 03 (Compulsory Subjects :1)	3	3	0	0	40	-	-	60	-	-	-	100
	Total	24	12	16	0								750

Semester - 7 PEC 03

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144431	Tissue Engineering	3	3	0	0	20	-	20	60	-	40	-	100
303144433	Genomics and Proteomics	3	3	0	0	20	-	20	60	-	40	-	100
303144435	Quality Control and Regulatory Affairs	3	3	0	0	20	-	20	60	-	40	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

Theory Passing % : 40 Practical Passing % : 50

Semester - 8

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144451	Protein Engineering	3	3	0	0	20	-	20	60	-	40	-	100
303144454	Project-II	6	0	12	0	-	100	-	-	100	-	100	200
	PEC 04 (Compulsory Subjects :1)	3	3	0	0	40	-	-	60	-	-	-	100
	Total	12	6	12	0								400

Semester - 8 PEC 04

						Internal Marks			External Marks		Passing Marks (Theory + CE)	Passing Marks (Practical)	Total Marks
Code	Subject	Credit	Lect	Lab	Tut	T	P	CE	T	P	Int. + Ext.	Int. + Ext.	
303144481	Stem Cell Technology	3	3	0	0	20	-	20	60	-	40	-	100
303144483	Agriculture Biotechnology	3	3	0	0	20	-	20	60	-	40	-	100
303144485	Biomaterials	3	3	0	0	20	-	20	60	-	40	-	100

Lect - Lecture, Tut - Tutorial, Lab - Lab, T - Theory, P - Practical, CE - CE, T - Theory, P - Practical

SEMESTER	CREDIT
1	21
2	24
3	21
4	20
5	23
6	22
7	24
8	12
TOTAL CREDIT	167