



KOLHAPUR INSTITUTE
OF TECHNOLOGY'S
**COLLEGE OF
ENGINEERING**
(AUTONOMOUS),
KOLHAPUR

**Proposed Structure for
B.Tech in Biotechnology Engineering (As Per NEP)**

(To be implemented w.e.f Academic Year 2024-25)

**Department of Biotechnology Engineering
KIT's College of Engineering(Autonomous) Kolhapur**

(Signature)
06/06/2024
**(Dr. A.R. Thorat
Dean Academics)**

(Signature)
Dr. Pallavi S. Pati)
Head
Department of Biotechnology Engineering,
KIT's College of Engineering (Autonomous), Kolh

B.Tech. Biotechnology Engineering

2024-25

SEMESTER III												
Sr. No.	Category	Course Code	Course Name	L	T	P	Hrs./Week	Credits	Evaluation Scheme			
									Component	Marks		
										Max	Min for Passing	
1.	PC	UBTPC0301	Fluid Mechanics	3	1	0	4	4	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50		
2.	PC	UBTPC0302	Microbiology	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50		
3.	PC	UBTPC0303	Biochemistry	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50		
4.	PC	UBTPC0304	Cell and Molecular Biology	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50		
5.	VEC	UBTVE0305	Constitution of India	2	0	0	2	2	ISE	50	20	
6.	HSSM	UBTEM0306	Industrial Organization and Management	2	0	0	2	2	ESE	50	20	
7.	PC	UBTPC0331	Microbiology Laboratory	0	0	2	2	1	ISE	50	20	
									ESE (POE)	25	10	
8.	PC	UBTPC0332	Biochemistry Laboratory	0	0	2	2	1	ISE	25	10	
9.	PC	UBTPC0333	Cell and Molecular Biology Laboratory	0	0	2	2	1	ISE	25	10	
									ESE(OE)	25	10	
10.	OJT	UBTIL0371	Mini Project-I	0	0	2	2	1	ISE	50	20	
11.	MM	UBTMM03**	Multidisciplinary Minor	2	0	0	2	2	ESE	100	40	
							27	23	Total Marks: 800 TotalCredit:23			

MultiDisciplinary Minor-I(Data Analytics)		MultiDisciplinary Minor-II(Finance)	
UBTMM0341	Computational Statistics	UBTMM0342	Fundamentals of Financial Accounting

SEMESTER IV

Sr. No.	Category	Course Code	Course Name	L	T	P	Hrs./ Week	Credits	Evaluation Scheme			
									Component	Marks		
										Max	Min for Passing	
1	PC	UBTPC0401	Heat Transfer	2	0	0	2	2	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
2	PC	UBTPC0402	Genetic Engineering	3	0	0	3	3	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
3	PC	UBTPC0403	Immunology	3	0	0	3	3	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
4	PC	UBTPC0404	Enzyme Technology	2	0	0	2	2	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
5	PC	UBTPC0405	Bioinformatics	3	0	0	3	3	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
6	VEC	UBTVE0406	Environmental Studies	2	0	0	2	2	ISE	50	20	
7	PC	UBTPC0431	Heat Transfer Laboratory	0	0	2	2	1	ISE	25	10	
									ESE(OE)	25	10	
8	PC	UBTPC0432	Genetic Engineering Laboratory	0	0	2	2	1	ISE	25	10	
									ESE (POE)	25	10	
9	VSEC	UBTVS0433	Immunology Laboratory	0	0	2	2	1	ISE	25	10	
10	CC	UBTCC0434	Co-Curricular Activities-II	0	0	2	2	1	ISE	50	20	
11	OJT	UBTIL0471	Mini Project II	0	0	2	2	1	ISE	25	10	
12	MM	UBTMM04**	Multidisciplinary Minor	3	0	0	3	3	ESE	100	40	
			Total:				28	23	Total Marks: 850 TotalCredit:23			

Multi Disciplinary Minor-I(Data Analytics)		MultiDisciplinary Minor-II(Finance)	
UBTMM0441	Python and R language for data science (MM-I)	UBTMM0442	Cost and Management accounting (MM-II)

SEMESTER V

Sr. No.	Category	Course Code	Course Name	L	T	P	Hrs./ Week	Credits	Evaluation Scheme			
									Component	Marks		
										Max	Min for Passing	
1	PC	UBTPC0501	Bioreaction Engineering	3	0	0	3	3	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
2	PC	UBTPC0502	Mass Transfer	2	0	0	2	2	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
3	PC	UBTPC0503	Fermentation Technology	3	0	0	3	3	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
4	PEC	UBTPE05**	Program Elective I	3	0	0	3	3	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
5	OE	UILOE0527	Open Elective I	3	0	0	3	3	ISE1	10	20	40
									MSE	30		
									ISE2	10		
									ESE	50		
6	AEC	UBTAE0501	Business Communication and Value Science	0	0	2	2	1	ISE	50	20	
7	PC	UBTPC0531	Bioreaction Engineering Laboratory	0	0	2	2	1	ISE	25	10	
									ESE(OE)	25	10	
8	VSEC	UBTVS0532	Fermentation Technology Laboratory	0	0	2	2	1	ISE	25	10	
									ESE (POE)	25	10	
9	PC	UBTPC0533	Bioinformatics Laboratory	0	0	2	2	1	ISE	25	10	
10	CEP	UBTIL0571	Mini Project III	0	0	2	2	1	ISE	25	10	
11	MM	UBTMM05**	Multidisciplinary Minor	3	0	0	3	3	ESE	100	40	
			Total:				28	22	Total Marks: 800			
									TotalCredit:22			

Multi Disciplinary Minor-I(Data Analytics)		MultiDisciplinary Minor–II(Finance)	
UBTMM0541	Fundamentals of data science (MM-I)	UBTMM0542	Taxation and Audit (MM-II)

Program Elective-I	
UBTPE0511	Cell Culture Technology (PE-I)
UBTPE0512	Biological Thermodynamics (PE-I)

SEMESTER VI													
Sr. No.	Category	Course Code	Course Name	L	T	P	Hrs./ Week	Credits	Evaluation Scheme				
									Component	Marks			
										Max	Min for Passing		
1	PC	UBTPC0601	Bioseparations	3	0	0	3	3	ISE1	10		40	
									MSE	30			
									ISE2	10			
									ESE	50	20		
2	PC	UBTPC0602	Process Calculations	3	0	0	3	3	ISE1	10		40	
									MSE	30			
									ISE2	10			
									ESE	50	20		
3	PC	UBTPC0603	Bioprocess Equipment Design	2	0	0	2	2	ISE1	10		40	
									MSE	30			
									ISE2	10			
									ESE	50	20		
4	PEC	UBTPE06**	Program Elective II	3	0	0	3	3	ISE1	10		40	
									MSE	30			
									ISE2	10			
									ESE	50	20		
5	OE	UILOE0628	Open Elective II	3	0	0	3	3	ISE1	10		40	
									MSE	30			
									ISE2	10			
									ESE	50	20		
6	HSSM	UBTEM0601	Biotech Industry: Practices and Entrepreneurship	2	0	0	2	2	ESE	50	20		
7	PC	UBTPC0631	Bioseparations Laboratory	0	0	2	2	1	ISE	25	10		
									ESE (POE)	25	10		
8	PC	UBTPC0632	Bioprocess Equipment Design Laboratory	0	0	2	2	1	ISE	25	10		
									ESE(OE)	25	10		
9	PC	UBTPC0633	Effluent Treatment Laboratory	0	0	2	2	1	ISE	25	10		
10	CC	UBTCC0634	Co-Curricular Activities-III	0	0	2	2	1	ISE	50	20		
11	FP	UBTIL0671	Mini project IV	0	0	2	2	1	ISE	25	10		
12	MM	UBTMM06**	Multidisciplinary Minor	3	0	0	3	3	ESE	100	40		
							28	24	Total Marks: 850 TotalCredit:24				

MultiDisciplinary Minor-I (Data Analytics)		MultiDisciplinary Minor-II (Finance)	
UBTMM0641	Data Mining (MM-I)	UBTMM0642	Financial Management (MM-II)
Program Elective-II			
UBTPPE0611		Plant Biotechnology (PE-II)	
UBTPPE0612		Bioprocesses (PE-II)	

SEMESTER VII

Sr. No .	Category	Course Code	Course Name	L	T	P	Hrs./ Week	Cr e dits	Evaluation Scheme			
									Component	Marks		
										Max	Min for Passing	
1	PC	UBTPC0701	Analytical Techniques in Biotechnology	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50	20	
2	PC	UBTPC0702	Good Manufacturing Practices	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50	20	
3	PC	UBTPC0703	Process Engineering Costing and Plant design	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50	20	
4	PEC	UBTPE07**	Program Elective III	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50	20	
5	OE	UILOE0723	Open Elective III	2	0	0	2	2	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50	20	
6	PC	UBTPC0731	Analytical Techniques Laboratory	0	0	2	2	1	ISE	25	10	
									OE	25	10	
7	PC	UBTPC0732	Professional Certification	0	0	2	2	1	ISE	50	20	
8	RM	UBTIL0771	Project–I	0	0	8	8	4	ISE	50	20	
									ESE(OE)	50	20	
9	MM	UBTMM07**	Multidisciplina ry Minor	3	0	0	3	3	ESE	100	40	
			Total:				29	23	Total Marks: 800 Total Credit:23			

MultiDisciplinary Minor-I (Data Analytics)		MultiDisciplinary Minor-II (Finance)	
UBTMM0741	Data Visualization and analytics (MM- I)	UBTMM0742	Banking and Financial Services (MM-II)

Program Elective-III	
UBTPE0711	Biopharmaceuticals (PE- III)
UBTPE0712	Food Technology (PE-III)

SEMESTER VIII

Sr. No.	Category	Course Code	Course Name	L	T	P	Hrs . / We ek	Cre dits	Evaluation Scheme			
									Component	Marks		
										Max	Min for Passing	
1	PEC	UBTPE08**	Program Elective IV	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50	20	
2	PEC	UBTPE08**	Program Elective V	3	0	0	3	3	ISE1	10		40
									MSE	30		
									ISE2	10		
									ESE	50	20	
3	RM	UBTIL0871	Project–II	0	0	8	8	4	ISE	50	20	
									ESE(OE)	50	20	
4	FP	UBTIL0872	Internship	0	0	12	12	6	ISE I	75	30	
									ISE II	75	30	
5	CC	UBTCC0831	Co-Curricular Activities-IV	0	0	2	2	1	ISE	50	20	
			Total:				28	17	Total Marks: 500 TotalCredit:17			

Program Elective IV		Program Elective V	
UBTPE0811	Tissue Engineering and Organ Printing (PE-IV)	UBTPE0813	Next generation Sequencing and Analysis (PE-V)
UBTPE0812	Green Technology (PE-IV)	UBTPE0814	Drug Development process (PE-V)

MultiDisciplinary Minor– I Data analytics

Sr. No.	Category	Course Code	Course Name	L	T	P	Hrs./ Week	Credits
1	MM-I	UBTMM0341	Computational Statistics	2	0	0	2	2
2	MM-I	UBTMM0441	Python and R language for data science	3	0	0	3	3
3	MM-I	UBTMM0541	Fundamentals of data science	3	0	0	3	3
4	MM-I	UBTMM0641	Data Mining	3	0	0	3	3
5	MM-I	UBTMM0741	Data Visualization and analytics	3	0	0	3	3
Total:							14	14

MultiDisciplinary Minor-II Finance

Sr. No.	Category	Course Code	Course Name	L	T	P	Hrs./ Week	Credits
1	MM-II	UBTMM0342	Fundamentals of Financial Accounting	2	0	0	2	2
2	MM-II	UBTMM0442	Cost and Management accounting	3	0	0	3	3
3	MM-II	UBTMM0542	Taxation and Audit	3	0	0	3	3
4	MM-II	UBTMM0642	Financial Management	3	0	0	3	3
5	MM-II	UBTMM0742	Banking and Financial Services	3	0	0	3	3
Total:							14	14

Emerging minor-I Bioinformatics

Sr. No.	Course Code	Course Name	L	T	P	Hrs./ Week	Credits	Evaluation Scheme			Category
								Component	Marks		
									Max	Min for Passing	
1	UBTMN0361	Biology for Engineers	3	1	0	4	4	ESE	100	40	MN
2	UBTMN0461	Fundamentals of Biomolecules	3	1	0	4	4	ESE	100	40	MN
3	UBTMN0561	Basics of Bioinformatics	3	1	0	4	4	ESE	100	40	MN
4	UBTMN0661	Structural Bioinformatics and Proteome based Technology	3	1	0	4	4	ESE	100	40	MN
5	UBTMN0761	Genomics and Proteomics	2	0	0	2	2	ESE	100	40	MN
Total:						18	18	Total Marks: 500 TotalCredit:18			

B.Tech(Hons.) Biotechnology Engineering with Specialization in Biosimilar Technology

Sr. No .	Course Code	Course Name	L	T	P	Hrs./ Week	Credits	Evaluation Scheme			Cate gory
								Component	Marks		
									Max	Min for Passing	
1	UBTHN0351	Biosimilar Therapeutics : Introduction	3	1	0	4	4	ESE	100	40	HN
2	UBTHN0451	Biosimilar Manufacturing Technology-I	3	1	0	4	4	ESE	100	40	HN
3	UBTHN0551	Biosimilar Manufacturing Technology-II	3	1	0	4	4	ESE	100	40	HN
4	UBTHN0651	Biosimilar Therapeutics: Characterization	3	1	0	4	4	ESE	100	40	HN
5	UBTHN0751	Biosimilar Therapeutics: Regulatory Approval Processes	2	0	0	2	2	ESE	100	40	HN
		Total:				18	18	Total Marks: 500 TotalCredit:18			

EXIT COURSES-Courses after Second year exit

Sr. No.	Course Code	Course Name	L	T	P	Hr s./ W ee k	Cred its	Evaluation Scheme			Cat e gor y
								Compo nent	Marks		
									Max	Min	
1	UBTEX0491	Agricultural Biotechnology	3	0	0	3	3	ISE	50	20	MEES
2	UBTEX0492	Introduction to Plant tissue culture	3	0	0	3	3	ISE	50	20	MEES
3	UBTEX0493	Training	0	0	2	2	2	ISE	50	20	MEES
		Total:				8	8	Total Marks: 150 Total Credit: 8			

EXIT COURSES-Courses After Third year exit

Sr. No.	Course Code	Course Name	L	T	P	Hr s./ W ee k	Cred its	Evaluation Scheme			Cat e gor y
								Compo nent	Marks		
									Max	Min	
1	UBTEX0691	Upstream Processing	3	0	0	3	3	ISE	50	20	MEES
2	UBTEX0692	Downstream Processing	3	0	0	3	3	ISE	50	20	MEES
3	UBTEX0693	Training	0	0	2	2	2	ISE	50	20	MEES
		Total:				8	8	Total Marks: 150 Total Credit: 8			