

Proposed Structure for B.Tech. in Biotechnology Engineering (To be implemented w.e.f. Academic Year 2022-23)

Department of Biotechnology Engineering

Kolhapur Institute of Technology's

College of Engineering (Autonomous), Kolhapur,

Maharashtra, INDIA



Kolhapur Institute of Technology's College of Engineering (Autonomous), Kolhapur

Teaching and Evaluation scheme for

Second Year B. Tech. Program in Biotechnology Engineering Semester-III

				Hot	ırs/V	Week	Evalua	ation S	cheme		
Course	Course Name	Curriculum							Marks		
Code	Course Name	Component	L	T	P	Credits	Component	Max	Min for		
									Pass	sing	
							ISE I	10			
UBTC0301	Fluid Mechanics	PC	3	_		3	MSE	30	20	40	
OB1C0301	Truid Mechanics	10	3	_	_	3	ISE II	10		40	
							ESE	50	20		
							ISE I	10			
UBTC0302	Microbiology		4	_	_	4	MSE	30	20	40	
OB1C0302	Wherobiology	PC	4	-	_	4	ISE II	10		40	
							ESE	50	20		
							ISE I	10			
LIDTC0202	Die als ausietus		1			4	MSE	30	20	40	
UBTC0303	Biochemistry	PC	4	-	-	4	ISE II	10		40	
							ESE	50	20		
							ISE I	10	20		
LIDTC0204	Enzyme Technology					•	MSE	30		40	
UBTC0304		PC	3	-	-	3	ISE II	10		40	
							ESE	50	20	1	
							ISE I	10			
LIDTC0205	Cell and	DC	4			4	MSE	30	20	40	
UBTC0305	Molecular Biology	BS	4	-	-	4	ISE II	10		40	
							ESE	50	20	1	
	Constitution of										
UBTA0361	India (Audit	HS	2	-	-	-	ESE	100	40	40	
	Course III)										
UBTC0331	Fluid Mechanics	PC	_	_	2	1	ISE	25	1	Λ	
OB1C0331	Laboratory	rc	_	-		1	ISE	23	1	U	
UBTC0332	Microbiology	PC	_	-	2	1	ISE	50	2	0	
UB1C0332	Laboratory	rc	_	-		1	ESE (POE)	25	1		
UBTC0333	Biochemistry	PC		2		1	ISE	50	2		
OBICOSSS	Laboratory					1	ESE (POE)	25	1	0	
	Cell and						ISE	50	2	0	
UBTC0334	Molecular Biology	BS	-	-	2	1	ESE (POE)	25	10	<u> </u>	
	Laboratory										
			20	-	8	22	500 + 250 =	750 + A	udit C	ourse	

Total Credits - 22, Total Contact hours - 28



Kolhapur Institute of Technology's College of Engineering (Autonomous), Kolhapur

Teaching and Evaluation scheme for

Second Year B. Tech. Program in Biotechnology Engineering Semester-IV

Course Code Course Name Curriculum Component Component L T P Credits Component Component Immunology Mose of the part of					Но	urs/\	Week	Evalua	tion Sc	heme		
Component Comp	Course	Course Name	Curriculum						I	Marks		
UBTC0401 Biostatistics PC 3 1 - 4	Code	Course Name	Component	L	T	P	Credits	Component	Max		-	
UBTC0401 Biostatistics PC 3 1 - 4 MSE 30 20 40								ISE I	10			
UBTC0402 Heat Transfer PC	IID#G0404	T	D.C.	2				MSE		20	40	
UBTC0402 Heat Transfer	UBTC0401	Biostatistics	PC	3	1	-	4	ISE II	10	_,	40	
Heat Transfer PC								ESE	50	20		
Heat Iransfer								ISE I	10			
UBTC0403 Immunology BS 3 3	LIDECO 402		D.C.	4				MSE	30	20	40	
UBTC0403 Immunology BS 3 - - 3	UB1C0402	Heat Transfer	PC	4	-	-	4	ISE II	10		40	
UBTC0403 Immunology BS 3 - - 3 MSE 30 20 40								ESE	50	20		
UBTC0403								ISE I	10			
UBTC0404 Genetic Engineering PC 3 - - 3	LIDTC0402	T 1	D.C.	2			2	MSE	30	20	40	
UBTC0404 Genetic Engineering PC	UB1C0403	Immunology	BS	3	-	-	3	ISE II	10		40	
UBTC0404 Genetic Engineering PC 3 - - 3								ESE	50	20		
UBTC0405 Bioinformatics PC 3 - - 3 ISE II 10 ESE 50 20		Genetic Engineering						ISE I	10			
UBTC0405 Bioinformatics PC 3 - - 3	LIDTC0404		D.C.	2			2	MSE	30		40	
UBTC0405 Bioinformatics PC 3 - - 3	UB1C0404		PC	3	-	-	3	ISE II	10		40	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$								ESE	50	20		
Section Comparison Compar		D: : 6	PC					ISE I	10	20		
UBTA0461 Environmental Studies (Audit Course IV) BS 2 - - ESE 100 40 40	LIDTC0405			3			3	MSE	30		40	
UBTA0461 Environmental Studies (Audit Course IV) BS 2 - - ESE 100 40 40 UBTC0431 Heat Transfer Laboratory PC - - - 2 1 ISE 50 20 UBTC0432 Immunology Laboratory BS - - 2 1 ISE 25 10 UBTC0433 Genetic Engineering Laboratory PC - - 2 1 ISE 25 10 UBTC0434 Bioinformatics Laboratory PC - - 2 1 ISE 50 20 UBTC0441 Mini Project I PW - - 2 1 ISE 50 20	UB1C0405	Bioinformatics			-	-		ISE II	10		40	
UBTC0431 Heat Transfer Laboratory PC - - 2 1 ISE 50 20								ESE	50	20		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	UBTA0461		BS	2	-	-	-	ESE	100	40	40	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	UBTC0431	Heat Transfer Laboratory	PC	-	-	2	1	ISE	50	20)	
UBTC0433 Genetic Engineering Laboratory PC - - - 2 1 ESE (POE) 25 10 UBTC0434 Bioinformatics Laboratory PC - - - 2 1 ISE 25 10 UBTC0434 Bioinformatics Laboratory PC - - - 2 1 ISE 50 20 UBTC0441 Mini Project I PW - - 2 1 ISE 50 20	LIDTC0422	-	DC			2	1	ISE	25	10)	
UBTC0433 Laboratory PC - - 2 1 ESE (POE) 25 10 UBTC0434 Bioinformatics Laboratory PC - - - 2 1 ISE 50 20 UBTC0441 Mini Project I PW - - 2 1 ISE 50 20	UB1C0432	Immunology Laboratory	BS	-	-	2	1	ESE (POE)	25	1()	
UBTC0433 Laboratory PC - - 2 1 ESE (POE) 25 10 UBTC0434 Bioinformatics Laboratory PC - - - 2 1 ISE 50 20 UBTC0441 Mini Project I PW - - 2 1 ISE 50 20	LIDTC0422	Genetic Engineering	DC.			2	1	ISE	25	10)	
UBTC0434 Laboratory PC - - 2 1 ISE 50 20 UBTC0441 Mini Project I PW - - 2 1 ISE 50 20	UB1C0433		PC	-	-	2	1	ESE (POE)	25	10)	
UBTC0441 Mini Project I PW - - 2 1 ISE 50 20	UBTC0434		PC	-	-	2	1	ISE	50	20)	
	UBTC0441	Ť	PW	_	_	2.	1	ISE	50	20)	
18 1 10 22 500 + 250 = 750 + Audit Course	32130111	1	1 * ''	18	1	10	22					

Total Credits - 22, Total Contact hours - 29



Kolhapur Institute of Technology's College of Engineering (Autonomous), Kolhapur

Teaching and Evaluation scheme for

Third Year B. Tech. Program in Biotechnology Engineering Semester- V

				Hr	s/We	ek	Evalua	tion Sch	eme			
Course	Course Name	Curriculum						N	Iark	S		
Code	Course Name	Component	L	T	P	Credits	Component	Max	Min for Passing			
							ISE I	10				
UBTC0501	Mass Transfer	PC	4	_	_	4	MSE	30	20	40		
CDICOSOI	Wass Transfer	10				-	ISE II	10		10		
							ESE	50	20			
							ISE I	10				
UBTC0502	Bioreaction	PC	4	_	_	4	MSE	30	20	40		
CB1C0302	Engineering	10	_			-	ISE II	10		40		
							ESE	50	20			
							ISE I	10				
UBTC0503	Fermentation	PC	4	_	_	4	MSE	30	20	40		
OB1C0303	Technology	PC	4	-	-	, ,	'	4	ISE II	10		40
							ESE	50	20			
	Program Elective I	PE					ISE I	10	20			
LIDTEOCAY			2	1		4	MSE	30		40		
UBTE05**		PE	3	1	-		ISE II	10		40		
							ESE	50				
							ISE I	10				
LIDTOOCYY		OF	2			3	MSE	30	20	40		
UBTO05**	Open Elective I	OE	3	-	-		3	ISE II	10		40	
							ESE	50	20			
UBTA0561	Biological Thermodynamics (Audit Course V)	PC	3	-	-	-	ESE	100	40	40		
	Bioreaction						ISE	50		20		
UBTC0531	Engineering Laboratory	PC	-	-	2	1	ESE (POE)	50		10		
UBTC0532	Fermentation	PC	_	-	2	1	ISE	50		10		
OBTC0332	TechnologyLaboratory	rC	_	_		1	ESE (POE)	50		10		
UBTC0541	Mini Project II	PW	-	-	2	1	ISE	50		20		
_		-	21	1	6	22	500 + 250 = 75	50 + Au	dit C	ourse		

Total Credits - 22, Total Contact hours - 28

Program Elec	ctive I (PE-I)	Open Elective I (OE-I)				
UBTE0521	Cell Culture Technology(PE-I)	UBTO0501	Introduction to Bioinformatics(OE-I)			
UBTE0522	Vaccine Technology(PE-I)	UBTO0502	Bioterrorism and National			
			Security(OE-I)			



Kolhapur Institute of Technology's College of Engineering (Autonomous), Kolhapur Teaching and Evaluation scheme for

Third Year B. Tech. Program in Biotechnology Engineering Semester- VI

			7	each	ing S	cheme	Evalua	tion Sc	heme	;
Course	Course Name	Curriculum							Mark	KS .
Code	Course Name	Component	L	Т	P	Credits	Components	Max		in for assing
							ISE I	10		
UBTC0601	Bioprocess	PC	4	_	_	4	ISE II	10	20	40
CDTCOOOT	Calculations	10	7			7	MSE	30		70
							ESE	50	20	
	Bioprocess						ISEI	10		
UBTC0602	Equipment	PC	4	_	_	4	ISE II	10	20	40
OB1C0002	Design	10	7	_	_	7	MSE	30		40
	Design						ESE	50	20	
							ISE I	10		
UBTC0603	Bioseparation	PC	4		_	4	ISE II	10	20	40
0110003	Processes	rc	4	_	_	4	MSE	30		40
							ESE	50	20	
							ISE I	10		
UBTE06**	Program	PE	3			3	ISE II	10	20	40
OBIEU0	Elective II	PE	3	-	-	3	MSE	30		40
							ESE	50	20	
							ISE I	10		
UBTO06**	Open Elective II	OE	3			3	ISE II	10	20	40
061000			3	-	-	3	MSE	30		40
							ESE	50	20	
UBTA0661	Drug Development Process (Audit Course VI)	PC	3	-	-	-	ESE	100	40	40
	Bioprocess						ISE	50		20
UBTC0631	Equipment Design Laboratory	PC	-	-	2	1	ESE (POE)	25		10
	Bioseparation						ISE	50		20
UBTC0632	Processes Laboratory	PC	-	-	2	1	ESE (POE)	25		10
	Program				ISE	25		10		
UBTE06**	Elective II Laboratory	PE	-	-	2 1 ESE		ESE (OE)	25		10
UBTC0641	Mini Project III	PW	-	-	2	1	ISE	50		20
			21	-	8	22	500 + 250 = 75	50 + A11	dit C	ourse

Total Credits - 22, Total Contact hours – 29

	Total Cicuits - 22, Total Contact hours - 25											
Program Ele	ective II (PE-II)	Program Electi	ve II Laboratory	Open Elective II (OE-II)								
UBTE0621	Effluent	UBTE0633	Effluent Treatment	UBTO0601	Food							
	Treatment(PE-II)		Laboratory		Technology							
					(OE-II)							
UBTE0622	Green	UBTE0634	Green Technology	UBTO0602	Bioenergy							
	Technology(PE-		Laboratory		(OE-II)							
	II)											



Kolhapur Institute of Technology's College of Engineering (Autonomous), Kolhapur

Teaching and Evaluation scheme for

Final Year B. Tech. Program in Biotechnology Engineering Semester-VII

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Course	Course Name	Curriculum							arks	
Code	Course Name	Component	L	Т	P	Credits	Components	Max		n for ssing
							ISE I	10		
IIDEG0501	Bioprocess Modelling	D.C.	2			•	MSE	30	20	40
UBTC0701	and Simulation	PC	3	-	-	3	ISE II	10	_	40
							ESE	50	20	
	A 1 . 1						ISE I	10		
LIDEGOGO	Analytical	D.C.	2			•	MSE	30	20	40
UBTC0702	Techniques in	PC	3	-	-	3	ISE II	10		40
	Biotechnology						ESE	50	20	
							ISE I	10		
***********	7.	200					MSE	30	20	4.0
UBTC0703	Bioprocesses	PC	4	-	-	4	ISE II	10		40
							ESE	50	20	
							ISE I	10		
***********	Good Manufacturing	200				2	MSE	30	20	4.0
UBTC0704	Practices	PC	3	-	-	3	ISE II	10	1	40
							ESE	50	20	
							ISE I	10		
LIDEEOGAA	D 11 .: 111	DE	_			•	MSE	30	20	40
UBTE07**	Program Elective III	PE	3	-	-	3	ISE II	10		40
							ESE	50	20	
UBTA0761	Professional Certifications (Audit Course V)*	PC	-	-	2	-	ISE	100	40	40
	Bioprocess Modelling						ISE	50		20
UBTC0731	and Simulation Laboratory	PC	-	-	2	1	ESE (POE)	25		10
UBTC0732	Analytical Techniques in	PC	_	-	2	1	ISE	50		20
22120732	Biotechnology Laboratory				_	1	ESE (OE)	25		10
UBTC0751	Project Phase I	PW	_	_	4	2	ISE I	50		20
OBICO/SI	1 Toject I Hase I	1 44	_	_			ISE II	50		20
$\begin{vmatrix} 17 & - & 10 & 20 & 500 + 250 = 750 + \text{Audit C} \end{vmatrix}$								Cou	rse	

Total Credits – 20, Total Contact hours – 27

Program Electi	Program Elective III (PE-III)									
UBTE0721	Biopharmaceuticals (PE-III)									
UBTE0722	Biomedical Engineering(PE-III)									

^{*}Note – Minimum 12 weeks certifications courses (single or multiple courses with summation of minimum 12 weeks) to be completed by each students and submit the final certificates and scores to exam cell. The average scores of all certifications should be above 40% for passing. These certification courses offering agencies can be NPTEL, Coursera etc.



Kolhapur Institute of Technology's

College of Engineering (Autonomous), Kolhapur Teaching and Evaluation scheme for

Final Year B. Tech. Program in Biotechnology Engineering Semester-VIII

			T	eacl	ning	Scheme	Evalua	tion Sc	heme	
Course	Course Name	Curriculum						Marks		
Code		Component	L	Т	P	Credits	Components	Max	Min f Passii	
							ISE-I	10		
UBTE08**	Drogram Elective IV	PE	3			3	ISE-II	10	20	40
OBIEGO	Program Elective IV		3	-	-	3	MSE	30		40
							ESE	50	20	
	Program Elective V	PE					ISE-I	10	20	
LIDTE00**			3			2	ISE-II	10		40
UBTE08**			3	-	-	3	MSE	30		40
							ESE	50	20	
LIDTC0041					4	2	ISE I	50	20	
UBTC0841	Internship	PW	-	-	4	<u> </u>	ISE II	50	20	
							ISE I	50	20	
UBTC0851			-	-	8	4	ISE II	50	20	
	Project Phase II	PW					ESE (OE)	100	40	
			6	-	12	12	200 +	300 =	500	

Total Credits-12, Total Contact hours – 18

Program Elec	tive IV (PE-IV)	Program Elective V (PE-V)				
UBTE0821	Industrial Management and Process	UBTE0823	Food and Nutrition			
	Costing(PE-IV)		Technology(PE-V)			
UBTE0822	Plant Biotechnology(PE-IV)	UBTE0824	Biosensors(PE-V)			



Kolhapur Institute of Technology's College of Engineering (Autonomous), Kolhapur B. Tech. Program in Biotechnology Engineering

Total Credits Distribution from F.Y.B.Tech to Final Year B.Tech in Biotechnology Engineering

Cumioulum Component	F.Y.I	3.Tech	S.Y.B	.Tech	T.Y.I	3.Tech	Final Ye	ar B.Tech	Total	~Percentage
Curriculum Component	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Sem VII	Sem VIII	Credits	Distribution
Humanities (HS)	3	-	-	-	-	-	3	-	6	4
Basic Sciences (BS)	8	8	5	4	-	-	-	-	25	15
Engineering Sciences (ES)	9	12	-	-	-	-	-	-	21	13
Program Core (PC)	-	-	17	17	14	14	12	-	74	46
Program Elective (PE)	-	-	-	-	4	4	3	6	17	11
Open Elective (OE)	-	-	-	-	3	3	-	-	6	4
Project Work (PW)	-	-	-	1	1	1	2	6	11	7
Mandatory Audit Course	ED	UHV	CI	EVS	ВТ	DDP	PC	-	Non-Credit Courses	-
Total Credits	20	20	22	22	22	22	20	12	160	100

Note for Mandatory Audit Courses (MAC):

ED: Entrepreneurship Development, UHV: Universal Human Values, EVS: Environmental Studies, IC: Indian Constitution,

BT: Biological Thermodynamics, DDP: Drug Development Process, PC: Professional Certifications



