



**PERIYAR
MANIAMMAI**
INSTITUTE OF SCIENCE & TECHNOLOGY
(Deemed to be University)
Established Under Sec. 3 of UGC Act, 1956 • NAAC Accredited
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Criterion 1 – Curricular Aspects

Key Indicator	1.2	Academic Flexibility
Metric	1.2.2	Percentage of Programmes in which Choice Based Credit System (CBCS)/elective course system has been implemented (Data for the latest completed academic year)

DEPARTMENT OF BIO TECHNOLOGY

STRUCTURE OF THE PROGRAM CLEARLY INDICATING COURSES, CREDITS/ELECTIVES

Programmes offered

1. B.Tech Bio Technology
2. M.Phil Bio technology

1. B.Tech Biotechnology

REGULATION 2018 - B.Tech Biotechnology

SEMESTER-WISE STRUCTURE OF CURRICULUM

REGULATIONS – 2018(Applicable to the students admitted from the Academic year 2018-19)

SEMESTER I

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XMA101	BS	Calculus and Linear Algebra	3	1	0	4
XES102	BS	Environmental Sciences	3*	0	0	0
XBE103	ES	Electrical and Electronics Engineering Systems	2	1	2	5
XAP104	BS	Applied Physics for Engineers	3	1	2	6
XEG105	ES	Engineering Graphics	0	0	3	3
TOTAL			11	3	7	18

*Non credit Hours

SEMESTER II

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XMA201	BS	Calculus, Ordinary Differential Equations and Complex variables	3	1	0	4
XCP202	ES	Programming for Problem Solving	3	0	2	5
XGS203	HS	English	2	0	1	3
XAC 204	BS	Applied Chemistry for Engineers	3	1	1	5
XWP205	ES	Workshop Practices	1	0	2	3
TOTAL			12	2	6	20

SEMESTER III

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XPS301	BS	Probability and Statistics	3	1	0	4
XBT302	PC	Material and Energy Balance	2	1	0	3
XBT303	PC	Biochemistry	3	1	0	4
XBT304	PC	Microbiology	3	0	2	4
XBT305	PC	Unit operations	3	1	2	5
XUM306	MC	Human Ethics	2*	1	0	0
XBT307	PROJ	In-Plant training-I	0	0	0	0

		TOTAL	16	5	4	20
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***Non credit Hours**

SEMESTER IV

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XES401	ES	Material Science	3	0	0	3
XBT402	PC	Genetics	3	1	0	4
XBT403	PC	Cell Biology	3	1	2	5
XBT404	PC	Bioenergetics and Metabolism	3	1	2	5
XBT405	PC	Chemical Engineering Thermodynamics	3	1	0	4
XUM406	HS	Entrepreneurship Development	3	0	0	3
XUM407	MC	Constitution of India	3*	0	0	0
		TOTAL	21	4	4	24

***Non credit Hours**

SEMESTER V

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XBT501	PC	Bioinstrumentation	3	0	2	4
XBT502	PC	Molecular Biology	2	1	0	3
XBT503	PC	Bioprocess Engineering	3	1	2	5
XBT504	PE	Core Elective- I	3	0	0	3
XBT505	OE	Open Elective- I	3	0	0	3
XUM506	HS	Employability Skills and report writing	3	0	0	3
XUM507	MC	Essence of Indian Traditional Knowledge	3*	0	0	0
XBT508	PROJ	In-Plant training-II	0	0	0	0
XBTM01	PMC	Minor Course - I	0	0	0	0
		TOTAL	20	2	4	21

***Non credit Hours**

SEMESTER VI

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XUM601	HS	Economics for Engineers	3	0	0	3
XBT602	PC	Bioreactor Design	3	1	2	5
XBT603	PC	Recombinant DNA Technology	3	1	2	5
XBT604	PC	Immunology	3	0	0	3
XBT605	PE	Core Elective- II	3	0	0	3
XBT606	OE	Open Elective- II	3	0	0	3
XBTM02	PMC	Minor Course - II	0	0	0	0

		TOTAL	18	2	4	22
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SEMESTER VII

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XBT701	PE	Core Elective- III	3	0	0	3
XBT702	PC	Bioinformatics and Computational Biology	2	0	2	3
XBT703	PC	Downstream processing	3	1	2	5
XBT704	PE	Core Elective- IV	3	0	0	3
XBT705	OE	Open Elective- III	3	0	0	3
XUM706	PMC	Cyber security	3	0	0	0
XBT707	PROJ	In-Plant training-III	0	0	0	1
XBTM03	PMC	Minor Course - III	0	0	0	0
		Total	17	1	4	18

SEMESTER VIII

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
XBT801	PROJ	Project work	0	0	24	12
XBT802	OE	Open Elective- IV	3	0	0	3
		TOTAL	3	3	24	15

PROFESSIONAL ELECTIVE COURSES

The following Professional Specialized courses were identified to offer as electives.

Sub. Code	Category	Name of the Course	Hours per week			C
			L	T	P	
Core Elective – I Options						
XBT504 A	PE	Plant biotechnology	2	1	0	3
XBT504 B	PE	Food Technology	3	0	0	3
XBT504 C	PE	Chemical Reaction Engineering	3	0	0	3
Core Elective – II Options						
XBT604 A	PE	Animal biotechnology	3	0	0	3
XBT604 B	PE	Nanobiotechnology	3	0	0	3
XBT604 C	PE	Heat Transfer	3	0	0	3
Core Elective – III Options						
XBT701 A	PE	Protein Engineering	3	0	0	3
XBT701 B	PE	Pharmaceutical Biotechnology	3	0	0	3
XBT701 C	PE	Mass Transfer Fundamentals	3	0	0	3

Core Elective – IV Options						
XBT704 A	PE	Cancer Biology	3	0	0	3
XBT704 B	PE	Stem cell biotechnology	3	0	0	3
XBT704 C	PE	Metabolic Engineering	3	0	0	3

2. M. PhilBiotechnology

Semester I

Code No	Course Title	L	T	P	C
ZBC 101	Guide Paper	2	2	2	6
ZBC 102	Thesis/Dissertation/Project	-	-	32	16

Semester I Credit = 18

SEMSTER II

Code No	Course Title	L	T	P	C
ZBC 101	Guide Paper	2	2	2	6
ZBC 102	Thesis/Dissertation/Project	-	-	32	16

Semester II Credit = 22

Total Credits (I + II) – 40

1. Scanned copy of the BoS minutes

Department of Biotechnology

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Established Under Act No. 7 of 1962, Act, 1962 - UGC Act No. 1962
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MINUTES OF BOARD OF STUDIES FOR B. TECH BIOTECHNOLOGY, REGULATION 2018

VENUE: DEAN RESEARCH OFFICE

DATE: 29.04.2019

AGENDA POINTS:

Minutes Discussed

- Dr. S. Kumaran, Associate Professor and head of the department started with a welcome note and introduced the invited expertise and students.
- The curriculum and syllabus of (III –VIII) for B. Tech Biotechnology for Regulation 2018, Revision-I, was reviewed and finalised.
- The major changes put forward by the academic expert is as follows
 1. The basic analytical skills are lacking in the undergraduate students. So it was advised to give special attention to solve the analytical problems. This will enhance the quality of research experiments.
 2. Incorporation of biological techniques in XBT 403 Analytical Techniques, such as MALDI TOF, Bio imaging, Sequencing Techniques etc and changing the course name into “XBT 501 Bioinstrumentation”.
 3. It was recommended to revise the syllabus and suggested to have the title “XBT 601 Bioreactor Design and Analysis” instead of “XBT 601 Biochemical Engineering”.
 4. In XBT 404 Biochemistry II has been changed as “XBT 404 Bioenergetics and Metabolism”. In that metabolic disorders topic was added.
 5. It was suggested to split XBT 305 Cell Biology and Microbiology, in to Cell Biology and Microbiology separately. It was also advised to incorporate the topics such as mutualism, paracytism, Amansalism, symbiosism and to include Industrial Microbiology relevant topics such as Environmental aspects, biofuel, bioremediation, microbial fuel cells in the Microbiology course. Thus necessary changes have been made in the XBT 304 Microbiology and XBT403 Cell Biology courses.
 6. Special lectures for GATE have to be arranged for coaching the students.
- The suggestions given by industrial expert:
 1. As far as industry is concerned, a technologist should be able to do the trouble shooting in process units. So it has been included in Unit Operations, Bioprocess Engineering, Bioreactor Design and Downstream Processing.
 2. In general, the undergraduate students are lacking with basic calculations/problem solving skills while doing their In-plant training, hereby it is

suggested to practise all necessary basics such as Mass and energy balance, etc. during the lab hours itself.

3. In order to emphasize the current scenario the Biosimilars is suggested by members to be included. Hence it is incorporated in skill oriented course list.
4. It was recommended to include topics related to clinical trials, drug designing in the elective subjects. Hence it is included in the core elective, Pharmaceutical Biotechnology course.
5. The production of Biofuels, Biopolymers, Industrial enzyme process are suggested to be incorporated in the curriculum. Thus it is included in the Microbiology course.

- Suggestions given by alumnus :

1. As per suggestion in feedback of alumni chemical engineering based subjects such as Mass transfer and Heat transfer are included in the curriculum.

- Suggestions given by parents :

Parents emphasize to reduce the CA3 components to minimum number but effectively.