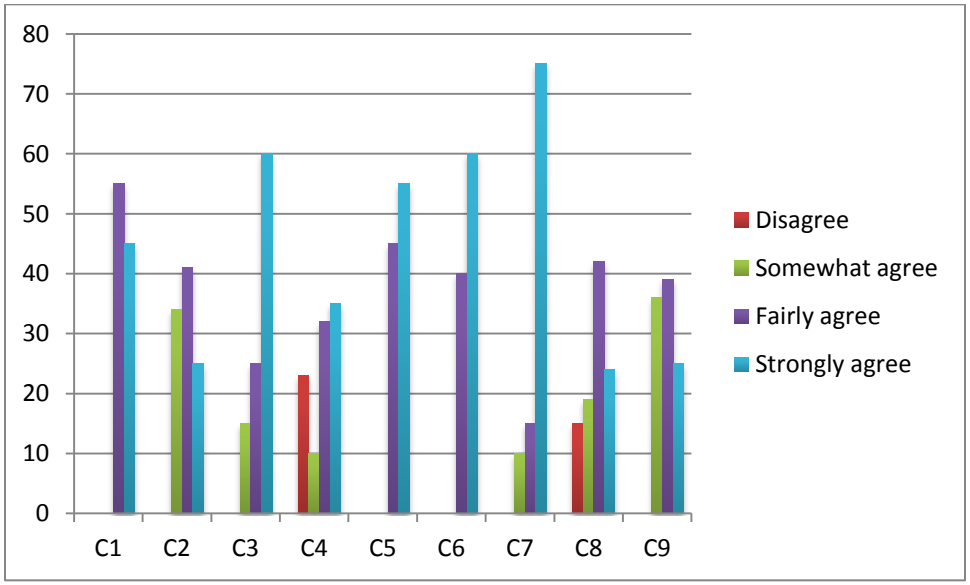
DEPARTMENT OF BIOTECHNOLOGY
FEEDBACK FROM STAKEHOLDERS AND ACTION TAKEN
(2017-18)

Feedback Analysis

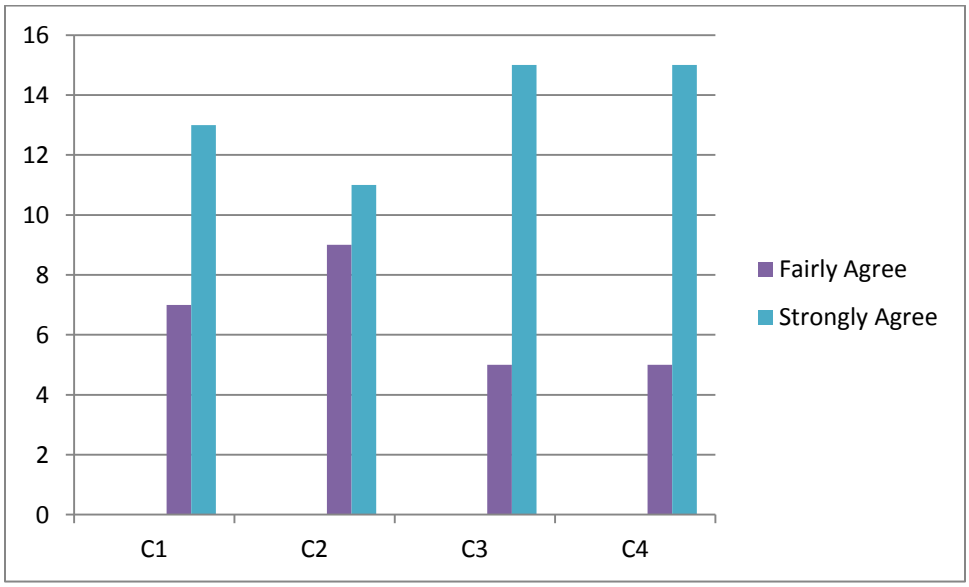
Students Feedback

	Criterion used for analysis
C1	Content of the course suitable to apply the knowledge of mathematics, science and engineering
C2	Course helped to analyze the complex problems in life science
C3	Research tools to arrive at valid conclusions
C4	Use of modern engineering tools for modeling and solving complex problem
C5	Course make more sensitive towards lingering environmental issues
C6	Inculcated ethical principles
C7	Competency in Biotechnology
C8	Ability to design, analyze and interpret experimental data
C9	Design and model bioprocess



Alumni Feedback

	Criterion used for analysis
C1	Compare modern engineering tools for modeling and solving complex problems.
C2	Have you gained Competency in Biotechnology?
C3	Can you design, analyze, and interpret experimental data?
C4	After the Course, are you confident to design and model Bioprocess?



Action Taken

1) To include contents in tune with competitive exam

Annexure 1

KARUNYA INSTITUTE OF TECHNOLOGY AND SCIENCES
Declared as a deemed to be University under sec.3 of the UGC Act, 1956
Karunya Nagar – 641 114, Coimbatore
DEPARTMENT OF BIOSCIENCES AND TECHNOLOGY

Date: 11.05.2018

Submitted to The Dean (E&T)

Sub: Minutes for Board of Studies Meeting of the Department of Biotechnology held on 11.05.2018- reg.

External Members:

1. Dr. P. Rani, Professor, Department of Biotechnology, PSG College of Technology, Coimbatore (Academia)
2. Mr. J. Rajesh, Senior Scientist, Discovery Biology, Anthem Biosciences Pvt. Limited, Bengaluru (Industry)
3. Mrs. Mercy Nisha Pauline, Assistant Professor, Government College of Technology, Coimbatore (Alumni)

Internal Members Present:

1. Dr.E.J.James, Dean i/c (SABS) and Chairman
2. Dr. V.M. Berlin Grace, Professor & HoD
3. Dr. R. S. David Paul Raj, Assistant Professor, Programme Coordinator (UG)
4. Dr. S. Murugan, Associate Professor
5. Mr. P. Muthusamy, Assistant Professor & Curriculum Coordinator (UG)
6. Dr. RT. Narendirakannan, Assistant Professor & Curriculum Coordinator (UG)
7. Dr. C. Vani, Assistant Professor
8. Dr. Reya Issac, Assistant Professor & Curriculum Coordinator (PG) & Member Secretary
9. Mrs. Anu Jacob, Assistant Professor

The Minutes of Board of Studies Meeting held on 11-05-2018 for the Department of Biotechnology is herewith enclosed for your kind perusal.

The meeting started with an opening prayer by Dr. David Paul Raj and Introduction by HoD (BST). Then the Curriculum Coordinator (UG) presented the proposed Curriculum and Syllabi and discussed as follows:

1. The curriculum and syllabi is revised for B. Tech (Biotechnology) 2018 batch onwards as per AICTE norms to reduce the credits from 192 to 160 and employability discussed.

2. The curriculum structure for B. Tech(Biotechnology) as per AICTE guidelines is as follows.

S.No	Category	Credits Proposed	As per AICTE
1	Humanities & Social Science (Management course)	9	12
2	Basic sciences	27	25
3	Engineering science	23	24
4	Professional core	59	48
5	Professional elective (FSP / HSP)*	18 24	18
6	Open Electives- Other Technical Emerging Subjects	9	18
7	Project work, Summer Internship. In plant Training (FSP / HSP)*	15 9	15
8	Mandatory Courses	0	0
	Total	**160**	**160**

(FSP / HSP)*- Full Semester Project / Half Semester Project

3. The detailed curriculum structure and Syllabi for B. Tech (Biotechnology) 2018-22 batch is attached as Annexure-1.
4. The Semester wise subjects for 2018-22 Batch is attached as Annexure-2
5. The Programme outcomes, Programme Specific outcome and Programme Educational objective were discussed for mapping with each subject and given as Annexure -3

The meeting came to a close with a prayer offered by Mrs. Anu Jacob

Dr. S. Murugan
(Internal Member)

Mr. P. Muthusamy
(Curriculum Coordinator – UG)

Dr. C. Vani
(Internal Member)

Dr. RT. Narendirakannan
(Curriculum Coordinator – UG)

Dr. Reya Issac
(Curriculum coordinator – PG)

Mrs. Anu Jacob
(Internal Member)

Dr. P. Rani
(External Member)

Mr. J. Rajesh
(External Member- Industry)

Mrs. J. Mercy Nisha Pauline
(Alumni)

11/9/18

Dr. R.S. David Paul Raj
(Internal Member/PC)

11/5/18

Dr. V.M. Berlin Grace
(HOD, BST)

Dr. E.A. James
Dean i/c, Chariman

2) To focus on skill development

Annexure 2

Table 4

Category	S.No	Course Code	Name of the Course	Credits [L:T:P:C]
4.Professional core	1	18BT2006	Biochemistry	3:1:0:4
	2	18BT2007	Biochemistry Lab	0:0:3:1.5
	3	18BT2008	Microbiology	3:0:0:3
	4	18BT2009	Microbiology Lab	0:0:3:1.5
	5	18BT2010	Fluid Mechanics	3:1:0:4
	6	18BT2011	Fluid Mechanics & Heat transfer Lab	0:0:3:1.5
	7	18BT2012	Bioprocess Principles	3:0:0:3
	8	18BT2013	Bioprocess Lab	0:0:3:1.5
	9	18BT2014	Molecular Biology	3:0:0:3
	10	18BT2015	Genetic Engineering and Bioethics	3:0:0:3
	11	18BT2016	Molecular biology & Genetic Engineering Lab	0:0:3:1.5
	12	18BT2017	Bioprocess Engineering	3:0:0:3
	13	18BT2018	Enzyme Engineering & Technology	3:0:0:3
	14	18BT2019	Heat & Mass transfer	3:1:0:4
	15	18BT2020	Downstream Processing	3:0:0:3
	16	18BT2021	Downstream Processing Lab	0:0:3:1.5
	17	18BT2022	Immunology	3:0:0:3
	18	18BT2023	Cell biology & Immunology Lab	0:0:3:1.5
	19	18BT2024	Chemical Reaction Engineering	3:1:0:4
	20	18BT2025	Mass transfer & Chemical Reaction Engineering Lab	0:0:3:1.5
	21	18BT2026	Biochemical Thermodynamics	3:1:0:4
	22	18BT2027	Basics of Bioinformatics	2:0:0:2
	23	18BT2028	Bioinformatics Lab	0:0:2:1
			Total credits	**59**

COURSE COMPONENTS

Table 1

PROFESSIONAL CORE COURSES

S. No.	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
1	18MA3005	Foundations of Mathematics and Statistics	3	0	0	3
2	18BT3001	Advances in Biopolymer and Applications	3	0	0	3
3	18BT3002	Genetic Engineering and Recombinant Products	3	0	0	3
4	18BT3003	Bioprocess Modelling and Simulation	3	0	0	3
5	18BT3004	Lab - I Analytical Techniques in Biotechnology Lab	0	0	4	2
6	18BT3005	Lab – II Animal and Plant Tissue Culture Lab	0	0	4	2
7	18BT3006	Lab - III Advanced Process Equipment Design and Drawing Lab	0	0	4	2

PROFESSIONAL ELECTIVE COURSES

S. No.	Course Code	Course Name	Hours per Week			Credits
			L	T	P	
Elective - I						
1	18BT3009	Enzyme Technology and Industrial Applications	3	0	0	3
2	18BT3010	Microbial Biotechnology	3	0	0	3
3	18BT3011	Agriculture and Food Biotechnology	3	0	0	3
4	18BT3012	Big Data Analytics	3	0	0	3
5	18BT3013	Bioethics and Biosafety	3	0	0	3
Elective - II						
1	18BT3014	Chemical Process Technology	3	0	0	3
2	18BT3015	Immunotechnology	3	0	0	3
3	18BT3016	Computational Biology	3	0	0	3
4	18BT3017	Metabolic Regulation and Engineering	3	0	0	3
5	18BT3018	Clinical trials and Bioethics	3	0	0	3
Elective - III						
1	18BT3019	Sustainable Bioprocess Development	3	0	0	3
2	18BT3020	Advanced Animal Biotechnology & Tissue Culture	3	0	0	3
3	18BT3021	Molecular Diagnostics	3	0	0	3
4	18BT3022	Drug Design and Discovery	3	0	0	3
Elective - IV						
1	18BT3023	Transport Phenomena	3	0	0	3
2	18BT3024	Pharmaceutical Biotechnology	3	0	0	3
3	18BT3025	Bioreactor Engineering	3	0	0	3
4	18BT3026	Stem Cell Therapeutics	3	0	0	3
5	18BT3027	Nanobiotechnology	3	0	0	3
Elective - V						
1	18BT3028	Advanced Plant Biotechnology	3	0	0	3
2	18BT3029	Cancer Management Techniques	3	0	0	3
3	18BT3030	Genomics and Proteomics	3	0	0	3
4	18BT3031	Advanced Environmental Biotechnology	3	0	0	3

(3) To include curriculum to improve English grammatical skills and communication

Annexure 3

Table 1

Category	S.No	Course Code	Name of the Course	Credits [L:T:P:C]
01.Humanities & Social Science	1	18EN1001	English	3:0:0:3
	2	18EN1002	English Language Lab	0:0:2:1
	3	18MS2004	Total Quality Management	3:0:0:3
	4	18MS2005	Managerial Skills	3:0:0:3
			Total credits	**10**

Table 4

	Audit Course (Mandatory courses) – 2 Course					
Code	**Course Name**		**L**	**T**	**P**	**C**
1	18VE3001	Value Education	0	0	2	0
2	18EN3001	English for Research Paper Writing	2	0	0	0
3	18MS3105	Constitution of India	2	0	0	0
4	18CE3083	Disaster Management	2	0	0	0

(4) To include modern engineering tools for modeling and solving complex problems

Annexure 4

18BT3003	**Bioprocess Modelling & Simulation**	**L**	**T**	**P**	**C**
		3	0	0	3

Course Objectives:

To improve knowledge on

1. Principles and frameworks of data driven modeling
2. Mathematical models relevant to industrial and environmental bioprocess systems
3. Basics of MATLAB required for formalization of Bioprocess models and its simulation

Course Outcome:

The students will be able to

1. Discretize a given bioprocess system into a set of key mathematical expressions
2. Design required data collection scheme for identification of bioprocess parameters
3. Apply MATLAB for numerical modelling with coupled differential or algebraic equations
4. Perform parameter sensitivity and confidence interval estimation
5. Predict future trend and suggest remedial measures to have sustainable bioprocess
6. Select and Implement appropriate modelling framework depending on bioprocess system

Module I: Introduction to Bioprocess modelling **(7 Hours)**

Basic modeling principles – Purpose of modelling transient or steady state behaviour – types of mathematical models and modelling approaches. Fundamental laws guiding modelling framework – mass

(5) More training required for design, analyze and interpret experimental data.

Annexure 5

18BT2045	RESEARCH METHODOLOGY	L	T	P	C
		3	0	0	3

Course Objective:

1. To intend the students with the knowledge about the basic research methods, applications in conducting research, various data collection and analysis techniques.
2. To gain insights into scientific research.
3. To help in critical review of literature and assessing the research trends, quality and extension potential of research and equip students to undertake research.

Course Outcome:

1. To understand the basic principles of research
2. Illustrate the different methods of sample design
3. Classify the various techniques of data collection and analysis
4. Elaborate the steps involved in thesis and report writing
5. Analyze the importance of biosafety in research
6. Evaluate the importance of ethics in research

Module I: RESEARCH PROBLEMS (5)

Definition and characteristics of research, Basic Concepts- Validity, reliability, Variables- Dependent, Independent and Intervening, Types-Basic and applied- Interdisciplinary - formulation of research problem,

Module II: RESEARCH DESIGN AND EXPERIMENTAL DESIGN (4)

research design -Hypothesis: formulation- Types: Descriptive,relational and explanatory- Methods of Research: descriptive, comparative, experimental- clinical research- controlled clinical trials

Module III: SAMPLE DESIGN, MEASUREMENT AND SCALING TECHNIQUES (9)

Steps in sample design, Criteria for selecting a sample procedure, Characteristics of Good sampling Procedure, Types of Sample Design, Selecting Random Samples, Complex random sampling Design, Measurement Scales, Sources of Errors in measurement, Tests of Second measurement, Technique of developing Measurement Tools, Scaling-Classification and design.

Module IV: COLLECTION, PROCESSING AND ANALYSIS OF DATA (9)

Data collection: methods and types- Processing Operations-Editing, coding, tabulation, Data Analysis, Statistics in Research, Measures of Central Tendency, Dispersion, Asymmetry, relationship. Regression Analysis, Correlation Analysis, Software for statistical analysis- SPSS- features

Module V: MANUSCRIPT/THESIS WRITING (9)

18BT2055	MATLAB PROGRAMMING	L	T	P	C
		3	0	0	3

Course Objective:

1. To ensure students to having strong foundation in matlab installation, configuration and basic syntax.
2. To introduce them to various string operations, functions and advanced matlab modules for plotting and graphics.
3. To understand the applications of Matlab modules for various biological applications.

Course Outcome:

1. Acquire knowledge on installation, configuration and environmental setup of Matlab and Matlab modules, which help them to understand the customization of any matlab modules.
2. Acquire knowledge on basic syntax and fundamentals of matlab, which help them to understand structure of matlab program and to apply in scripting.
3. Acquire knowledge on data types, operators and control structures, which aids them define data and operate on data.
4. Ability to plot and generate different types of graphs for any given experimental data.
5. Ability to import and export data from matlab to external environments.
6. Proficient in various biological applications such as sequence processing, retrieval, and sequence analysis.

Module-I FUNDAMENTALS (9)

Matlab Local Environment Setup - Set up GNU Octave, Basic Syntax - Commonly used Operators and Special Characters, Variables, Naming Variables, Multiple Assignments - Long Assignments, Creating Vectors - Creating Matrices.

Module-II MATLAB COMMANDS (9)

Commands for Managing a Session - Commands for Working with the System-Input and Output Commands-Vector, Matrix and Array Commands - Plotting Commands, M-Files - Creating and Running Script File.

Module-III DATA TYPES,OPERATORS (4)

Data Types Available in MATLAB - Data Type Conversion - Determination of Data Types, Operators,

Module-IV CONTROL STRUCTURES (5)

Control structures - Decision Making, Loops - Loop Control Statements.

Module-V ADVANCED MATLAB (9)

Strings, Functions - Primary and Sub-Functions, Nested Functions, Private Functions, Global

Action Taken Report

Faculty feedback	
To include contents in tune with competitive exam	2018 curriculum was mapped with AICTE recommendation and the syllabi were revised majorly. Curriculum was mapped with National and International institute of relevance. (Annexure 1)
To focus on skill development	Courses introduced for UG: Bioprocess Calculations(18BT2003), Basics of Bioinformatics (18BT2027), Biochemical Engineering Lab (18BT2036), Plant & Animal Biotechnology (18BT2040), Research Methodology (18BT2045), Matlab Programming (18BT2055), Courses introduced for PG: Bioprocess Modelling and Simulation (18BT3003), Animal and Plant Tissue Culture Lab (18BT3005), Big Data Analytics (18BT3012), Drug Design and Discovery (18BT3022). (Annexure 2)
Employer Feedback	
To include curriculum to improve English grammatical skills and communication	English Theory and English Laboratory were introduced in 2018 curriculum (Annexure 3)
Students Feedback	
To include modern engineering tools for modeling and solving complex problems	Bioprocess Modeling and Simulation (18BT3003) was introduced (Annexure 4)
More training required for design, analyze and interpret experimental data.	Research Methodology (18BT2045), Matlab Programming (18BT2055), Bioprocess Modeling and Simulation (18BT3003) were introduced (Annexure 5)