



BIOTECHNOLOGY SELF ASSESSMENT REPORT (SAR)
POST-GRADUATE ENGINEERING PROGRAMS (TIER-I)
KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION
KRISHNANKOIL
TAMIL NADU

SARContents

Serial Code & Link to the Item	Item	Page No.
PART A	Institutional Information	6-11
PART B	Criteria Summary	
	Program Level Criteria	
1	Program Curriculum and Teaching –Learning processes	12-46
2	Program Outcomes	47-62
3	Students’ Performance	63-89
4	Faculty Contributions	90-168
5	Laboratories and Research Facilities	169-181
6	Continuous Improvement	182-216

PART-B: Criteria Summary
Name of the program : Biotechnology

Criteria No.	Criteria	Mark/Weightage
Program Level Criteria		
1.	Program Curriculum and Teaching –Learning processes	125
2.	Program Outcomes	75
3.	Students’ Performance	75
4.	Faculty Contributions	75
5.	Laboratories and Research Facilities	75
6.	Continuous Improvement	75
	Total	600

NBA-BT-Self Evaluation report

Criteria/Sub-criteria No.	Particulars	Max. Score	Available score
1	Criterion 1: Program Curriculum and Teaching –Learning processes	125	125
1.1	Program Curriculum	35	35
1.1.1	State the process for designing the program curriculum	10	10
1.1.2	Structure of the Curriculum	5	5
1.2	Teaching-Learning Processes	5	5
1.2.1	Quality of end semester examination, internal semester question papers, assignments and evaluation	20	20
1.2.2	Quality of student projects	30	30
1.2.3	Initiatives related to industry interaction including industry	10	10
1.2.4	Participation of Industry professionals in curriculum development, as	10	10
1.2.5	Quality of laboratory work given	20	20
2	Criterion 2: Program Outcomes (75)	75	75
2.1	Establish the connect between the courses and POs	15	15
2.2	Attainment of Program Outcomes	60	
2.2.1	Describe the assessment tools and processes used to gather the data upon	20	20
2.2.2	POs attainment levels with observations	40	40
3	Criterion 3: Students' Performance	75	75
3.1	Enrolment Ratio through GATE	20	8.33
3.2	Success Rate in the stipulated period of the program	20	20
3.3	Placement, Higher Studies and Entrepreneurship	20	20
3.4	Professional Activities	15	
3.4.1	Student's participation in Professional societies/chapters and organizing	5	5
3.4.2	Student's publications	10	10
4	Criterion 4: Faculty Contributions	75	
4.1	Student-Faculty Ratio (SFR)	10	10
4.2	Faculty competencies in the area of Program specialization	30	
4.2.1	Faculty name and specialization for the program under consideration	10	10
4.2.2	Faculty Research Publication	10	10
4.2.3	Faculty Development work	10	10
4.3	Faculty as participants in Faculty development/training activities/STTPs	5	5
4.4	Research and Development	30	
4.4.1	Sponsored Research	15	15
4.4.2	Consultancy (from Industry)	15	15

5	Laboratories and Research Facilities	75	
5.1	Adequate and well equipped laboratories in area of Program specialization	30	30
5.2	Research facilities / center of excellence	30	30
5.3	Access to laboratory facilities, training in the use of equipment	15	15
6	Continuous Improvement	75	
6.1	Actions taken based on the results of evaluation of each of the POs	25	25
6.2	Improvement in Quality of Projects	10	10
6.3	Improvement in Placement, Higher Studies and Entrepreneurship	10	10
6.4	Improvement in the quality of students admitted to the program	10	10
6.5	Improvement in quality of paper publication	10	10
6.6	Improvement in laboratories	10	10
	Total	500	488.33

Kalasalingam University (Kalasalingam Academy of Research and Education)

SELF ASSESSMENT REPORT(TIER - I)

Part A : Institutional Information

1 Name and Address of the Institution

Kalasalingam University (Kalasalingam Academy of Research and Education),
Kalasalingam University Anand Nagar, Krishnankoil- 626 126 Srivilliputtur(via) Virudhunagar (Dist.) Tamil Nadu

2 Name and Address of Affiliating University

Kalasalingam University

3 Year of establishment of the Institution:

1984

4 Type of the Institution:

<input type="radio"/> Institute of National Infortance	<input type="radio"/> Autonomous
<input type="radio"/> University	<input type="radio"/> Any other(please specify)
<input checked="" type="radio"/> Deemed University	

5 Ownership Status:

<input type="radio"/> Central Government	<input type="checkbox"/> Trust
<input type="radio"/> State Government	<input type="checkbox"/> Society
<input type="radio"/> Government Aided	<input type="checkbox"/> Section 25 Company
<input checked="" type="radio"/> Self financing	<input type="checkbox"/> Any Other(Please Specify)

6 Details of all the programs being offered by the Institution under consideration:

Name of Program	Program Applied level	Start of year	Year of AICTE approval	Initial Intake	Intake Increase	Current Intake	Accreditation status	From	To	Program for consideration	Program for Duration
B.Tech. Computer Science and Engineering	UG	2007	2007	300	Yes	240	Granted accreditation for 3 years for the period (specify period)	2022	2025	No	4
B.Tech. Computer Science and Engineering - Artificial Intelligence and Machine Learning	UG	2020	2020	60	No	60	Not eligible for accreditation	--	--	No	4
B.Tech. Computer Science and Engineering - Data Science	UG	2020	2020	60	No	120	Not eligible for accreditation	--	--	No	4
B.Tech. Computer Science and Engineering - Cyber Security	UG	2020	2020	60	No	180	Not eligible for accreditation	--	--	No	4
B.Tech. Computer Science and Engineering - Internet of Things and Cyber Security Including Block Cha	UG	2020	2020	60	No	60	Not eligible for accreditation	--	--	No	4
M.Tech. Computer Science and Engineering	PG	2007	2007	18	Yes	12	Not eligible for accreditation	--	--	No	2
B.Tech. Agricultural Engineering	UG	2017	2017	60	No	60	Not accredited (specify visit dates, year)	--	--	No	4
B.Tech. Aeronautical Engineering	UG	2017	2017	30	No	30	Not accredited (specify visit dates, year)	--	--	No	4
B.Tech. Automobile Engineering	UG	2011	2011	60	Yes	30	Not accredited (specify visit dates, year)	--	--	No	4
Sanctioned Intake for Last Five Years for the B.Tech. Automobile Engineering											
Academic Year				Sanctioned Intake							
2021-22				30							
2020-21				30							
2019-20				30							
2018-19				30							
2017-18				30							
2016-17				60							
B.Tech. Biomedical Engineering	UG	2015	2015	90	Yes	60	Not accredited (specify visit dates, year)	--	--	No	4

Name of Program	Program Applied level	Start of year	Year of AICTE approval	Initial Intake	Intake Increase	Current Intake	Accreditation status	From	To	Program for consideration	Program for Duration
Sanctioned Intake for Last Five Years for the B.Tech. Biomedical Engineering											
Academic Year				Sanctioned Intake							
2021-22				60							
2020-21				60							
2019-20				90							
2018-19				90							
2017-18				90							
2016-17				90							
B.Tech. Chemical Engineering	UG	2014	2014	60	Yes	30	Not accredited (specify visit dates, year)	--	--	No	4
Sanctioned Intake for Last Five Years for the B.Tech. Chemical Engineering											
Academic Year				Sanctioned Intake							
2021-22				30							
2020-21				30							
2019-20				30							
2018-19				30							
2017-18				30							
2016-17				60							
B.Tech. Food Technology	UG	2015	2015	90	No	90	Applying first time	--	--	Yes	4
B.Tech. Mechanical Engineering	UG	2007	2007	180	Yes	120	Granted accreditation for 6 years for the period (specify period)	2017	2023	No	4
Sanctioned Intake for Last Five Years for the B.Tech. Mechanical Engineering											
Academic Year				Sanctioned Intake							
2021-22				120							
2020-21				180							
2019-20				180							
2018-19				180							
2017-18				180							
2016-17				240							
M.Tech. Biotechnology	PG	2007	2007	12	No	12	Applying first time	--	--	Yes	2

Name of Program	Program Applied level	Start of year	Year of AICTE approval	Initial Intake	Intake Increase	Current Intake	Accreditation status	From	To	Program for consideration	Program for Duration
M.Tech. Industrial Safety & Engineering	PG	2011	2011	12	No	12	Applying first time	--	--	Yes	2
M.Tech. Manufacturing Engineering	PG	2014	2014	12	No	12	Not accredited (specify visit dates, year)	--	--	No	2
M.Tech. Renewable Energy Technologies	PG	2015	2015	12	No	12	Not accredited (specify visit dates, year)	--	--	No	2
M.Tech. Structural Engineering	PG	2015	2015	12	No	12	Applying first time	--	--	Yes	2
M.Tech. VLSI Design	PG	2007	2007	12	No	12	Eligible but not applied	--	--	No	2
M.Tech. Automotive Systems Engineering	PG	2009	2009	12	No	12	Not accredited (specify visit dates, year)	--	--	No	2
MCA. Computer Applications	PG	2007	2007	30	No	30	Not accredited (specify visit dates, year)	--	--	No	2
MBA. Business Administration	PG	2007	2007	120	No	120	Not accredited (specify visit dates, year)	--	--	No	2
MBA. Insurance and Risk Management	PG	2007	2007	18	No	18	Not accredited (specify visit dates, year)	--	--	No	2
B.Tech. Civil Engineering	UG	2007	2007	60	Yes	60	Granted accreditation for 3 years for the period (specify period)	2020	2023	No	4
Sanctioned Intake for Last Five Years for the B.Tech. Civil Engineering											
Academic Year				Sanctioned Intake							
2021-22				60							
2020-21				60							
2019-20				60							
2018-19				60							
2017-18				60							
2016-17				90							
B.Tech. Biotechnology	UG	2007	2007	120	No	120	Granted accreditation for 3 years for the period (specify period)	2022	2025	No	4
B.Tech. Electronics and Communication Engineering	UG	2007	2007	300	Yes	240	Granted accreditation for 6 years for the period (specify period)	2022	2028	No	4

Name of Program	Program Applied level	Start of year	Year of AICTE approval	Initial Intake	Intake Increase	Current Intake	Accreditation status	From	To	Program for consideration	Program for Duration
Sanctioned Intake for Last Five Years for the B.Tech. Electronics and Communication Engineering											
Academic Year				Sanctioned Intake							
2021-22				240							
2020-21				240							
2019-20				240							
2018-19				240							
2017-18				240							
2016-17				240							
B.Tech. Electrical and Electronics Engineering	UG	2007	2007	60	No	30	Granted accreditation for 3 years for the period (specify period)	2020	2023	No	4
B.Tech. Information Technology	UG	2007	2007	300	Yes	60	Applying first time	--	--	Yes	4

7 Programs to be considered for Accreditation vide this application:

S No	Level	Discipline	Program	Current Year Sanctioned Intake	Current Year Admission (in Nos.)
1	Post Graduate	Engineering & Technology	Bio technology	12	8
2	Post Graduate	Engineering & Technology	Industrial Safety Engg.	12	12
3	Post Graduate	Engineering & Technology	Structural Engineering	12	6

8 Vision of the Institution:

To be a University of Excellence of International Repute in Education and Research.

9 Mission of the Institution:

1. To provide a scholarly teaching-learning ambience which results in creating graduates equipped with skills and acumen to solve real-life problems.
 2. To promote research and create knowledge for human welfare, rural and societal development.
 3. To nurture entrepreneurial ambition, industrial and societal connect by creating an environment through which innovators and leaders emerge.
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10 Contact Information of the Head of the Institution and NBA coordinator, if designated:

Head of the Institution	
Name	Dr. V. Vasudevan
Designation	Registrar
Mobile No.	9487551111
Email ID	registrar@klu.ac.in

☐ **NBA Coordinator, If Designated**

CRITERION 1	PROGRAM CURRICULUM AND TEACHING –LEARNING PROCESSES	125
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1.1 Program Curriculum (35)

1.1.1 State the Process of designing the Program Curriculum

The curriculum design process involves both consultative and deliberative processes involving various committees as per the statutory bodies norms and as well the institute rules, which includes Academic Council (AC), Board of Studies (BoS) and Program Advisory Board (PAB). The curriculum design, development and update process framework is depicted in fig. 1.1.

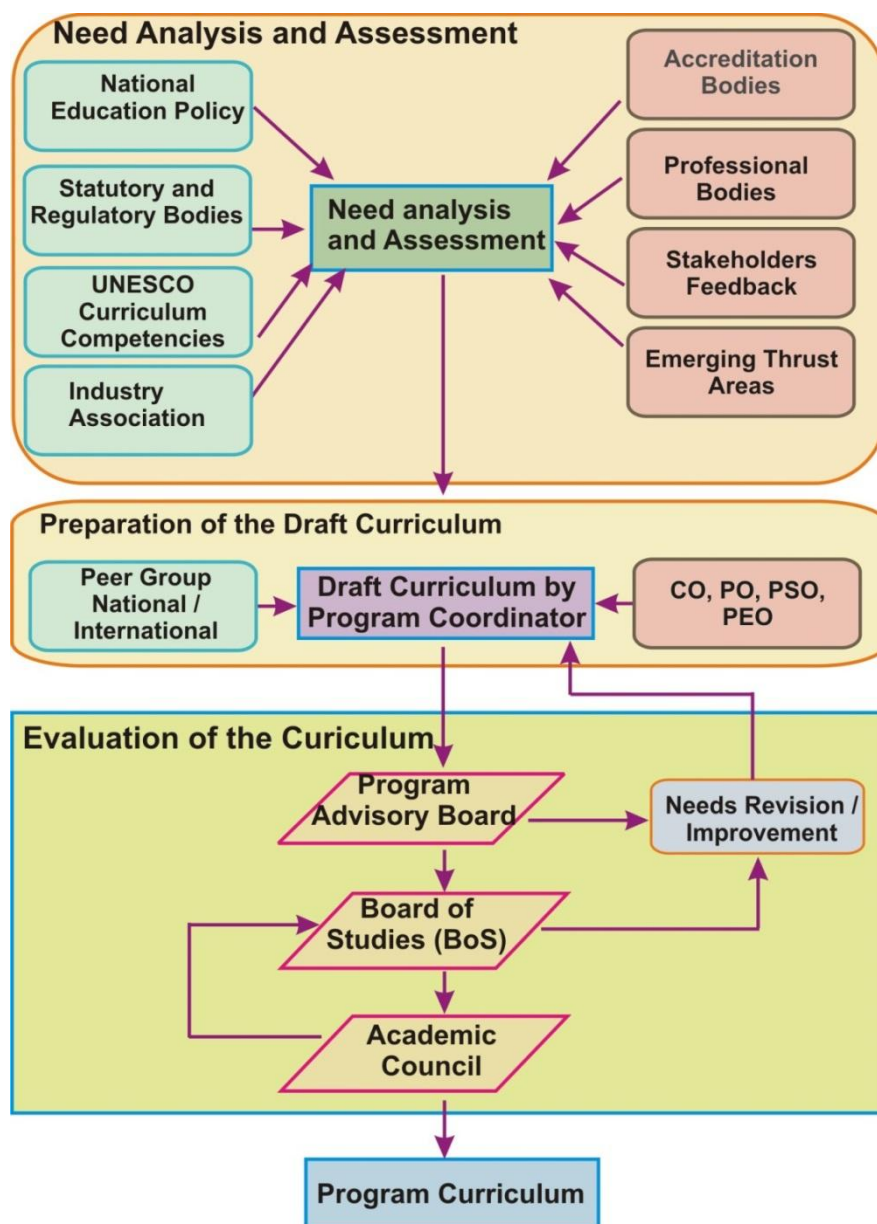


Fig. 1.1 Process of Designing the Program Curriculum

Curriculum design process at KARE can broadly be categorized in three stages:

(i) **Need Analysis and Assessment:** Needs assessment is the basic element of curriculum design, development, and revision. The needs assessment shall be carried out to identify the key competencies, desirable characteristics, and desirable learning experiences in curriculum development process. Need Analysis includes but not limited to, the following:

- Policy Revision at the National Level National Education Policy
- Statutory and Regulatory Bodies
- UNESCO Curriculum competencies
- Accreditation Bodies
- Professional Bodies
- Stakeholders Feedback
- Industry Associations
- Emerging Thrust Areas

The illustration of the student centric curriculum is depicted in fig. 1.2.

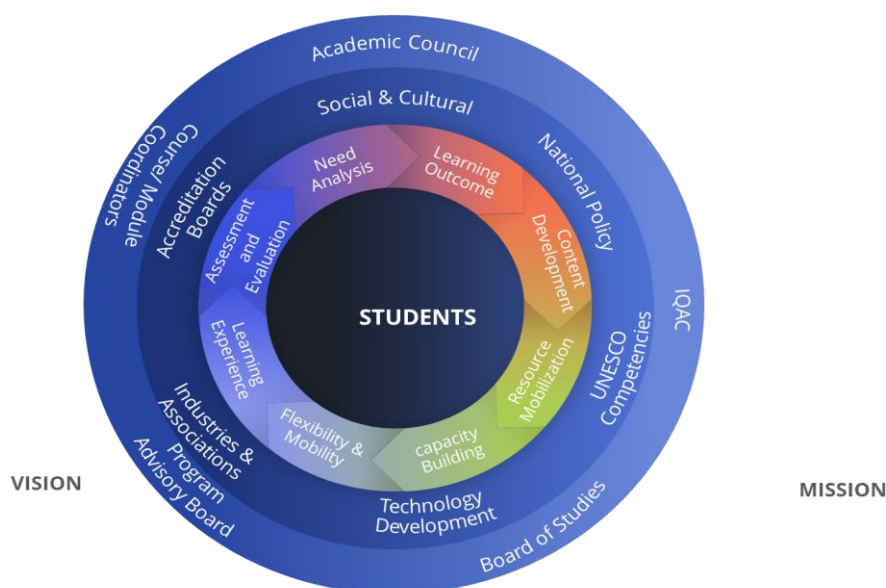


Fig. 1.2 Illustration for design and development of student-centered curriculum

(ii) **Draft Curriculum:** The Program Coordinator consolidates the need analysis report with the team of Course/Module Coordinators and proposes a draft curriculum. The draft curriculum is prepared with the references of peers from National and International Universities, as well as with the compliance of Course Outcomes (COs), Program Outcomes (POs), Program Specific Outcomes (PSOs), Program Educational Objectives

(PEOs).

- (iii) **Review of the Draft Curriculum:** The draft curriculum will be reviewed by the Program Advisory Board (PAB). PAB will consider revision/improvement for the curriculum, if required. The BoS duly constituted as per norms, consisting of members including experts from Academia and Industry, will review the curriculum. The BoS considers revision/improvement for the curriculum, if required. The Academic Council will consider the recommendations of the BoS and provide suggestions/approval for the program curriculum.

1.1.2 Structure of the Curriculum(5)

The curriculum structure consists of various course categories to cover the depth and breadth required for the Program, and for the attainment of program outcomes of the M.Tech. Biotechnology program. Two curricular systems are followed: regulations 2014 and regulations 2018. M.Tech. Biotechnology is offered on a Semester Pattern and each academic year consists of two semesters. The odd semester starts from July and ends in November and the even semester starts in December and ends in April. Each semester consists of 90 working days devoted to teaching-learning process and the students are required to maintain 80% attendance for each course so that they are eligible to write their examinations.

Regulations 2018

The structure of M.Tech. Biotechnology curriculum as per regulation 2018 is provided in Table 1.1.2a. A student has to earn a total of 73 credits to obtain the M. Tech., degree. The 73 credits are distributed in the following categories as below:

Course Code	Course Title	Total Number of contact hours				Credits
		Lecture (L)	Tutorial (T)	Practical # (P)	Total Hours/ week	
Program Core						
Core Courses						
BIT18R5001	Bioprocess and Bioseparation Technology	3	0	0	3	3
BIT18R5002	Advanced Bioinformatics	3	0	0	3	3
BIT18R5003	Immunotechnology	3	0	0	3	3
BIT18R5004	Genomics and Proteomics	3	0	0	3	3
BIT18R5005	Bioprocess Modeling and Simulation	3	0	0	3	3

Laboratory Courses						
BIT18R5081	Advanced Immunology Laboratory	0	0	6	6	2
BIT18R5082	Bioinformatics and Drug Design Laboratory	0	0	6	6	2
BIT18R5083	Recombinant DNA Technology Laboratory	0	0	6	6	2
BIT18R5084	Bioprocess Engineering Laboratory	0	0	6	6	2
Supportive Courses						
MAT18R5002	Statistics and Computational Techniques	3	0	0	3	3
BIT18R5006	Research Methodology	1	0	0	1	1
Program Specific Electives						
BIT18RXXXX	Elective I	3	0	0	3	3
BIT18RXXXX	Elective II	3	0	0	3	3
BIT18RXXXX	Elective III	3	0	0	3	3
BIT18RXXXX	Elective IV	3	0	0	3	3
BIT18RXXXX	Elective V	3	0	0	3	3
Open Electives						
XXX18RXXXX	Open Elective	3	0	0	3	3
Project Work						
BIT18R6097	Mini Project	0	0	6	6	2
BIT18R6098	Project Phase I	0	0	18	18	10
BIT18R6099	Project Phase II	0	0	30	30	16
Audit Course						
AUD18RXXXX	Audit Course I	1	0	0	1	-
AUD18RXXXX	Audit Course II	1	0	0	1	-
Total		39	0	78	118	73

Table: 1.1.2a

List of Program Specific Electives

S. No	Course Code	Course Name
1.	BIT18R5007	Developmental Biology
2.	BIT18R5008	Enzyme Technology
3.	BIT18R5009	Bioremediation
4.	BIT18R5010	Industrial Wastewater Treatment and Management
5.	BIT18R5011	Microbial Technology
6.	BIT18R5012	Bioprocess Plant and Equipment Design
7.	BIT18R5013	Biofuels
8.	BIT18R5014	Monitoring and Control of Bioprocess

9.	BIT18R5015	Bioethics, IPR and Biosafety
10.	BIT18R5016	Tumor Biology
11.	BIT18R5017	Infectious Diseases
12.	BIT18R5018	Clinical Physiology
13.	BIT18R6001	Biomaterials
14.	BIT18R6002	Drug Design and Targeting
15.	BIT18R6003	Metabolic Regulation and Metabolomics
16.	BIT18R6004	Plant Molecular Biology
17.	BIT18R6005	Clinical Trials
18.	BIT18R6006	Stem Cell Technology
19.	BIT18R6007	Neuroscience and Cognitive Diseases
20.	BIT18R6008	Tissue Engineering
21.	BIT18R6009	Bio-Entrepreneurship
22.	BIT18R6010	System Biology
23.	BIT18R6011	Molecular Pathology
24.	BIT18R6012	Cell Signaling
25.	BIT18R6013	Recombinant DNA technology
26.	BIT18R6014	Biopolymer Technology
27.	BIT18R6015	Algal Biotechnology

Regulations 2014

The structure of M.Tech. Biotechnology curriculum as per regulation 2014 is provided in Table 1.1.2b. A student has to earn a total of 65 credits to obtain the M. Tech., degree. The 65 credits are distributed in the following categories as below:

Course Code	Course Title	Total Number of contact hours				Credits
		Lecture (L)	Tutorial (T)	Practical# (P)	Total Hours/ week	
Program Core						
Core Courses						
MAT5001	Biomathematics	3	0	0	3	3
BIT5001	Immunotechnology	3	0	0	3	3
BIT5002	Downstream Processing	3	0	0	3	3
BIT5003	Bioprocess Plant and EquipmentDesign	3	0	0	3	3
BIT5017	Cellular and Molecular Biology	3	0	0	3	3
BIT5005	Genomics and Proteomics	3	0	0	3	3
BIT5018	Stem Cell Technology	3	0	0	3	3
BIT5007	Bioprocess Modeling andSimulation	3	0	0	3	3
BIT5008	Bioinformatics and Drug Design	3	0	0	3	3

BIT5019	Marine Biotechnology	3	0	0	3	3
Laboratory Courses						
BIT5081	Genetic Engineering Laboratory	0	0	6	6	2
BIT5082	Bioprocess Engineering Laboratory	0	0	6	6	2
Electives						
BITXXXX	Elective I	3	0	0	3	3
BITXXXX	Elective II	3	0	0	3	3
BITXXXX	Elective III	3	0	0	3	3
BITXXXX	Elective IV	3	0	0	3	3
BITXXXX	Elective V	3	0	0	3	3
Project Work						
BIT6098	Project Phase I	0	0	18	18	6
BIT6099	Project Phase II	0	0	30	30	10
Total		45	0	60	105	65

Table: 1.1.2b

List of Electives

S. No	Course Code	Course Name
1.	BIT5010	Enzyme Kinetics and Technology
2.	BIT5011	Bioremediation
3.	BIT5012	Metabolism and Bioenergetics
4.	BIT5013	Statistical Techniques and Computer Programming
5.	BIT5014	Drug Design and Targeting
6.	BIT5015	Clinical Physiology
7.	BIT5016	Biological Enquiry: History & Philosophy
8.	BIT5020	Bioethics and Intellectual Property Rights
9.	BIT6002	Industrial Microbiology
10.	BIT6003	Biomolecular Spectroscopy
11.	BIT6004	Industrial Wastewater Treatment and Management
12.	BIT6005	Bioelectricity
13.	BIT6006	Modeling and Analysis of Bioprocesses
14.	BIT6007	Membranes: Structure and Dynamics
15.	BIT6008	Plant Biotechnology
16.	BIT6009	Nanobiotechnology
17.	BIT6010	Molecular Diagnostics and Therapeutics
18.	BIT6011	Natural Products and Medicinal Chemistry

1.1.3 State the components of the curriculum(10)

Regulations 2018

The total 73 credits are distributed in the following six different categories which are described below.

- I. Program Core courses
- II. Program Elective courses
- III. Open Elective courses
- IV. Supportive courses
- V. Project
- VI. Audit course

I. Program Core

Program core includes theory and laboratory courses covering a total of 23 credits. Bioprocess and Bioseparation Technology, Advanced Bioinformatics, Immunotechnology, Genomics and Proteomics, Bioprocess Modeling and Simulation, Advanced Immunology Laboratory, Bioinformatics and Drug Design Laboratory, Recombinant DNA Technology Laboratory and Bioprocess Engineering Laboratory are the courses included in the 'core courses' category.

II. Program Elective

Programelectives are allied courses that add strength to the core courses. A total of 15 credits are covered by Programelective courses.

III. Open Elective courses

Open elective courses are offered with an intention of inculcating the interdisciplinary ideas and knowledge in students. A student can choose open elective courses from a department other than what he/she studies. 3 credits are provided to the open elective courses.

IV. Supportive courses

Supportive courses ensure the attainment of generic engineering competencies. Two courses, Statistics and Computational Techniques and Research Methodology are offered as supportive courses with total credits of 4.

V. Project

Students will undergo a mini-project work during the second semester of the program for which 2 credits are allotted. The major project work is divided into Project Phase I and II and offered in the third and fourth respectively with a total of 26 credits.

VI. Audit course

Two courses, English for Research Paper Writing and Pedagogy Skills are offered as audit courses. The audit courses don't carry any credit; however, students should pass the end semester examination.

The percentage of content, total contact hours and total number of credits for each component of M.Tech. Biotechnology Curriculum as per 2018 regulations is tabulated in Table 1.1.3a. Credit distribution in M. Tech., Biotechnology Curriculum as per 2018 regulation is depicted in the Figure 1.1.3.

Regulations 2018

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total number of credits
Program Core	31.51	585	23
Program Electives	20.55	225	15
Open Electives	4.11	45	3
Mini Project	2.74	90	2
Major Project	35.62	720	26
Any other (Specify)			
Supportive Courses	5.48	60	4
Audit Course	-	30	-
Total number of Credits			73

Table: 1.1.3a - Curricular Components

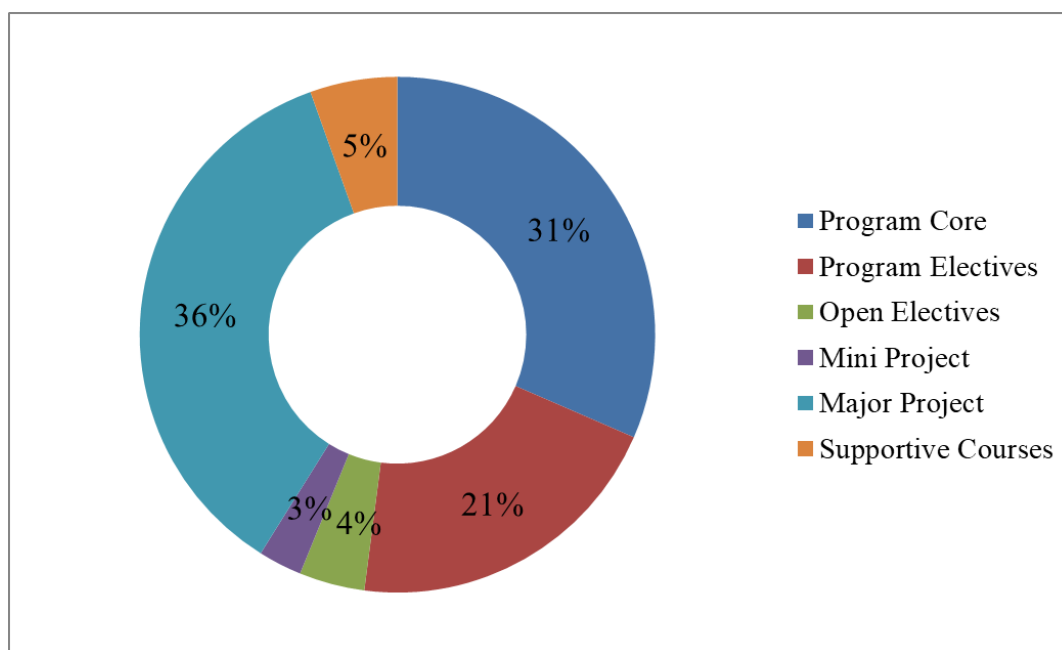


Figure 1.1.3 - Curricular Components

The percentage of content, total contact hours and total number of credits for each component of M.Tech. Biotechnology Curriculum as per 2014 regulations is tabulated in Table.1.1.3b.

Regulations 2014

Course Component	Curriculum Content (% of total number of credits of the program)	Total number of contact hours	Total number of credits
Program Core	52.30	630	34
Program Electives	23.08	225	15
Open Electives	-	-	-
Mini Project	-	-	-
Major Project	24.62	720	16
Any other (Specify)	-	-	-
Total number of Credits			65

Table: 1.1.3b

1.1.4. Overall quality and level of program curriculum(10)

The M.Tech. Biotechnology program offered at Kalasalingam Academy of Research and Education, India is on par with similar other programs offered by State, National and International University as shown in Table 1.1.4. Of the 73 credits to be earned by each student during his/her Master's Program, a major portion (35.6%) is dedicated towards the major project which helps the student harness his/her research and employability skills meeting the outcomes (PO1 and PO2). M.Tech. Biotechnology program at KARE stands out by providing Mini projects and Open electives in contrast to state and national level Universities, where the student has the leverage to select his/her career deciding courses and project tasks. This well-structured curriculum makes the program unique and hones the student's skills to attain the outcomes and the mission of the Institute.

Course Component	Curriculum Content (% of total number of credits of the program)				
	KARE (2018R)	Anna University, Chennai	IIT, Kharagpur	NIT, Warangal	University of San Francisco
Program Core	31.5	35.5	32	30.6	70
Program Electives	20.5	20	22	28	25
Open Electives	4.1				
Mini Projects	2.7				
Internships/Seminar			4.5	2.6	
Major Project	35.6	24.5	40.5	36	
Any other (Specify) Supportive Courses	5.4	20		2.6	5

Total Number of Credits	73	75	87	75	35
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Table 1.1.4 Comparison of the Curriculum content at KARE with similar programs offered by other State, National and International Institutes

1.2. Teaching-Learning Processes (90)

1.2.1. Quality of end semester examination, internal semester question papers, assignments and evaluation (20)

The performance of the students is assessed using internal (sessional) and end-semester examinations, assignments and seminar. Bloom's Taxonomy is followed while preparing the questions and the quality of the questions are ensured by the module and program coordinators. In case of end-semester examinations the questions are set by external subject experts. Make-up examination is an opportunity given for the students who fail to attend sessional or end-semester examinations with valid medical/personal and or emergency reasons.

Sessional examinations: Continuous assessment of the students is conducted through sessional examinations which are conducted twice a semester. The sessional examinations are conducted to determine the understanding of the students on a particular course and help the teacher in planning for future course of action. The Figure 1.2.1a depicts the process of question paper generation for the sessional and end semester examinations.

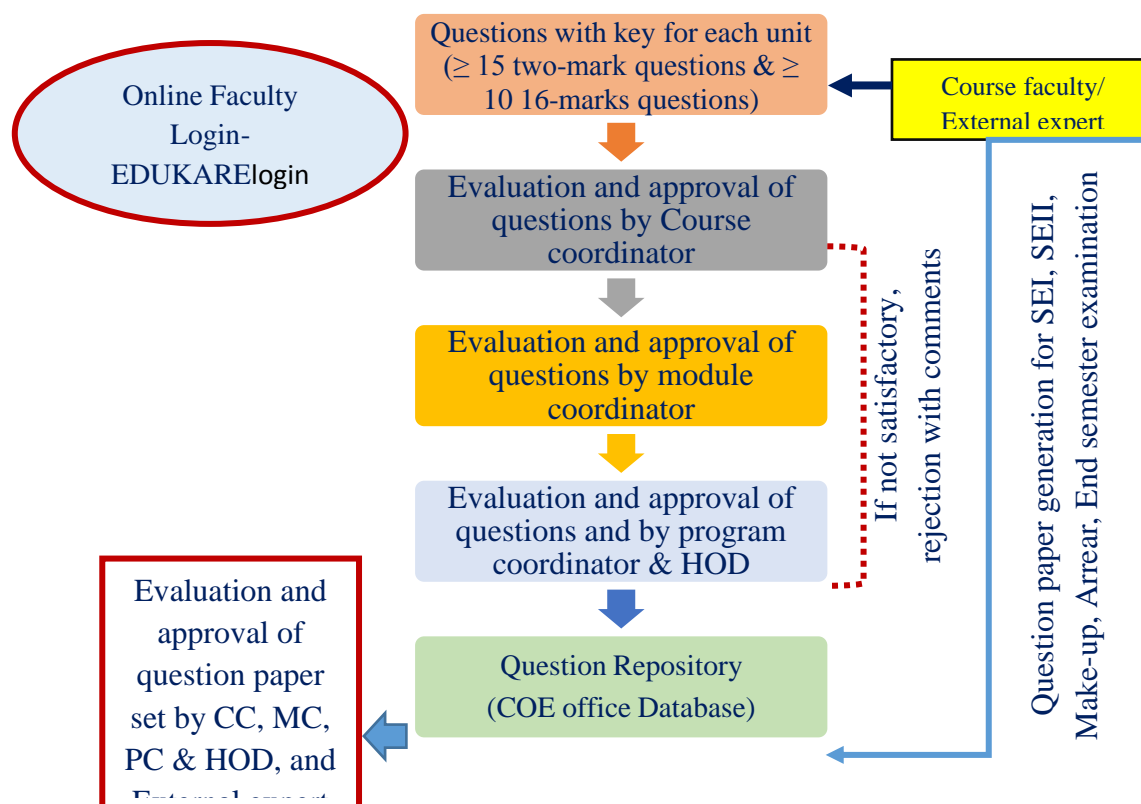


Figure.1.2.1a Process of question paper generation for the Sessional and End-semester examinations

End semester examination

End Semester examination is a metric for assessing whether all the POs are attained or not. This is a descriptive examination more focused on the knowledge gained by the student and help in determining the attainment of course outcomes and in turn program outcomes.

Sessional examinations and End-semester question papers

The question papers for all the sessional examinations (I & II), make-up examinations, and end semester examinations are computer generated from a question repository.

The questions are prepared by the course faculty and that is designed in such a way to cover all the course outcome. The questions are prepared based on Bloom's taxonomy and covers various levels of complexity (particularly in developing higher-order thinking which could lead to CO and PO attainment) and these questions are deposited along with the answer key in a repository maintained by the office of the Controller of Examinations. During the examinations, the questions are generated using an examination software from the repository and distributed to the students.

Before depositing, the questions are reviewed by the Module and Program coordinators to ensure that they are in compliance with the bloom's taxonomy. The question papers are also audited by the External Auditor.

Screenshot of question paper auditing and the details of question repository are presented in Figures 1.2.1b and Figure 1.2.1c. respectively. The screen shot of question paper generation process is depicted in Figure 1.2.1d.

Timestamp	Degree	Branch	Year	Semester	Sessional Exam	Subject Code	Name of faculty who prepared the question paper	Date	Auditing Details
24/01/2017 16:33:28	M.TECH	Biotech	I	II	I	BIT5008-Bioinformatics and Drug Design	Dr. Raksha	2/1/2017	Some of the questions (Q. No. 1 and 6) are given with two Blooms Taxonomy patterns, which can be avoided. More number of questions with higher level of Blooms Taxonomy can be asked.

Figure1.2.1b: Proof of Question Paper Auditing

Question Bank Details

Course

Select Course

Topic

Select Topic

Pattern

Select Pattern

Remember
Understand
Apply
Analyze
Evaluate
Create

Level of question

Select Level

Rich Text Editor:

- Bold (B)
- Italic (I)
- Text Color (ABC)
- Background Color (A B C D E F G H I J K L M N O P Q R S T U V W X Y Z)
- Link (Insert Link)
- Image (Insert Image)
- Table (Insert Table)
- Code (<>)

Answer Key

File Edit View Insert Format Tools Table

Paragraph Bold Italic Text Color Background Color Link Image Table Code

← → ↺ ⏏ edu.kalasalingam.ac.in/questionbank

EDU-KARE

← Back + New Record

Copy CSV Print Column visibility ▾ Search:

ID ↕	Action	Course Code ↕	CO No ↕	Unit No ↕	Topic ↕	Level of question ↕	Marks ↕	Pattern ↕	Status
ID		Course	CC	Uni	Topic	Select... ▾	Mark	Select... ▾	Select...
86311	...	BIT18R5001	2	2	SUBSTRATE INHIBITION	Tough	2	Analyze	Approved
86455	...	BIT18R5001	1	1	UNIT OPERATIONS	Easy	2	Understand	Approved
86463	...	BIT18R5001	1	1	UPSTREAM AND DOWNSTREAM PROCESSING	Medium	2	Understand	Approved

Activate Windows
Go to Settings to activate Windows.

Figure 1.2.1c Screenshot of questions bank in EDU-KARE

Screenshots of EDUKARE: provision for the generation of question papers

Course code: BIT18R5001/Bioprocess and Bioseparation Technology

The top screenshot displays the 'Course Coordinator Question Pattern report' for course BIT18R5001. The table lists exam sessions and their corresponding question patterns.

ID	Course Code	Course Name	Exam Name	Set	Qn Details	Status	Action
2361	BIT18R5001	Bioprocess and Bioseparation Technology	Sessional-I				Generate
2361	BIT18R5001	Bioprocess and Bioseparation Technology	Sessional-II				Generate
2361	BIT18R5001	Bioprocess and Bioseparation Technology	Sessional-III				Generate
2361	BIT18R5001	Bioprocess and Bioseparation Technology	End-Sem				Generate
2361	BIT18R5001	Bioprocess and Bioseparation Technology	Makeup				Generate

The bottom screenshot displays the 'Question report' for course BIT18R5001. The table lists questions and their corresponding reports.

ID	Course Code	Course Name	Action
2361	BIT18R5001	Bioprocess and Bioseparation Technology	Report Qn+Key Report MCQ Report
2566	BIT18R6098	Project Phase- I	Report Qn+Key Report MCQ Report

Figure1.2.1d. Provision for the generation of question papers

Sessional examination questions papers

- Sessional examinations are conducted by the Office of Controller of Examinations as per the academic calendar.

- The SE I & II are conducted for a maximum of 50 marks with 90 minutes duration. The question paper pattern is given in the Table 1.2.1.1.

Table 1.2.1.1: Question paper pattern

S. No.	Examination	Duration (Minutes)	PART A (2 marks)	PART B (16 or 8 marks)	Total Marks
1	Sessional I & II	90	$5 \times 2 = 10$	$16 \times 2 + 1 \times 8 = 40$ (or) $8 \times 5 = 40$	50
2	Make up	180	$10 \times 2 = 20$	$16 \times 5 = 80$	100
3	End semester	180	$10 \times 2 = 20$	$16 \times 5 = 80$	100

Assessment and Evaluation

- Assessment tools (Sessional examinations, End semester examinations, and Assignments) are used to assess and evaluate the impact of the delivery of course/course content contribution towards the attainment of course outcomes/program outcomes.
- Each question and assignment are mapped with COs at various Bloom's taxonomy levels. The marks scored by each student in each direct assessment are considered for the calculation of CO-PO attainments.

Assignments

Each student is given a problem or any other written assignment on a specific topic that covers the course outcomes and the assessment will be done based on their performance using a set of rubrics. The students need to do a detailed reading and analysis for the completion of the assignment. The assignments are also used to assess the knowledge gained by the students in a particular course and their problem-solving ability. The PG students are also encouraged to submit the assignments through the Google classroom assignment submission platform. The screen shot of sample assignments is given in Figure 1.2.1e.

The topics of assignments are provided in the course plan and the rubrics for the assessment of assignments are also provided well in advance. The rubrics for evaluation of the assignments is given in the following Table.

Rubrics for evaluation of assignment

Performance attribute	Level 1 Exemplary (5)	Level 2 Proficient (4)	Level 3 Intermediary (3)	Level 4 Inadequate (2)
	Far exceeds expectations	Exceed expectations	Meets expectations	Needs improvement
Originality/ Conceptualization	Develops new Concept and fresh insight that challenges the given task	Imaginative concept by referring others' works	Unimaginative concept by referring others' works	Derivative
Content knowledge	Content specifies mixture of concepts, original thought and support for the topic	Content indicates ideas with sufficient and firm evidence on a few ideas	Shows some thinking and reasoning but most ideas are underdeveloped and unoriginal	Most ideas are imitative and unoriginal.
ICT Tool usage	Demonstrates comprehension of the information and communication approach	Accurately expresses concepts relating to the information and communication approach	Illustrates simple information and communication approach	Shows minimal information and communication approach
Task completion	Submission on date	Submission with 1 day delay	Submission with 2 days delay	Submission with 3 days delay

Mapping of Assignments with COs

MAPPING OF COs TO ASSIGNMENTS:

CO	Assignment I	Assignment II	Assignment III	Assignment IV	Assignment V
C01	*				
C02		*			
C03			*		
C04				*	
C05					*

Advanced Bioinformatics (BIT18R5002)

Assignment 4

Submitted by:
S. Praseetha (9920102011)
M.tech Biotechnology
Ist year

AIM

To retrieve the GPCR protein, visualize the 3D structure in Rasmol and find the number of alpha helices in the protein.

PROCEDURE

1. Open the PDB database and download the GPCR protein in pdb format.
2. The PDB ID is 4OR2.
3. Open the Rasmol software.
4. Open the protein and visualize in the Rasmol.

RESULT

The GPCR protein is retrieved and visualized in Rasmol. The number of alpha helices was found to be 22.

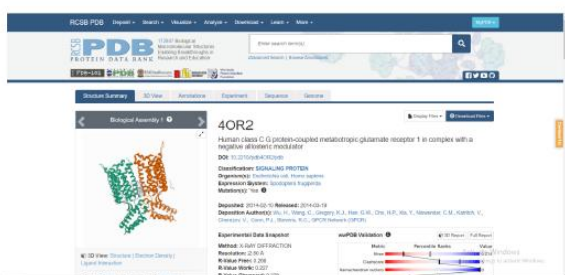


Fig 1. The webpage of PDB



Fig2. 3D structure of GPCR protein.

Figure 1.2.1e. Screenshot of Sample Assignments

1.2.2. Quality of student projects (30)

Project work is an essential component of the of the post-graduate program, M.Tech. (Biotechnology), offered by KARE. The M.Tech.R2018 regulations consists of one mini project and a major project done in two phases. The mini project (BIT18R6097) is to be undertaken during the second semester. Similarly, major project Phase I (BIT18R6098) and Phase II (BIT18R6099) need to be completed during the 3rd and 4th semesters respectively. Few students complete the Phase II of the major project in an industry or an academic or research institutions. For each project a project guide is assigned based on the preference of the student and acceptance by the guide. Project coordinator, appointed by the Head of the department, is responsible for planning, scheduling and execution of all the activities related to the student project work. The process of allocation of project guides is given in Figure 1.2.2a. The project is continuously assessed by three reviews that are conducted periodically. The total marks awarded for the internal assessment is 50 marks. Table 1.2.2.1 depicts the weightage of project assessment.

Final presentation and viva voce is done in the presence of an external expert. Marks are awarded based on the presentation of the report, oral presentation by the students and the performance of the students during viva-voce.

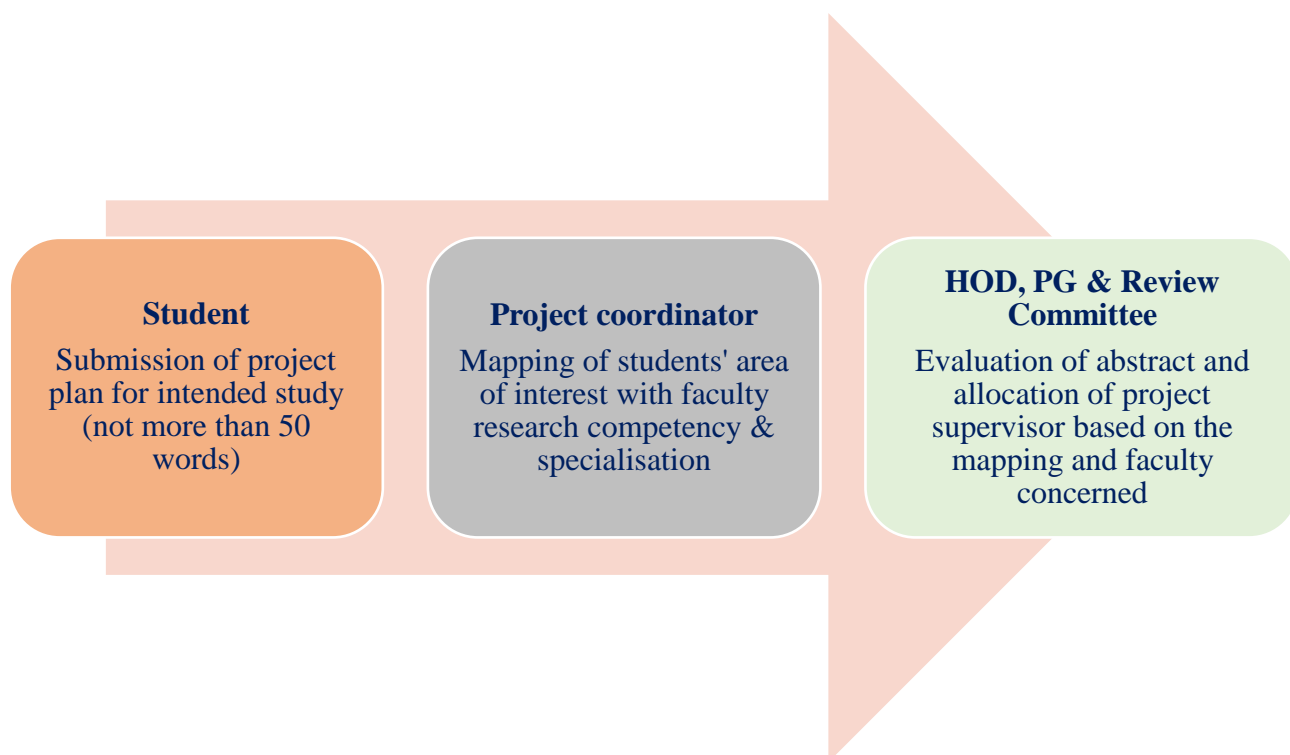


Figure 1.2.2a. Process of allocation of project supervisor for mini projects and major projects

classroom.google.com/u/0/c/NjQxMTk4MzQyNjha/a/OTAzMzYyOTgzNTda/submissions/by-status/and-sort-last-name/all

Table 1.2.2.1 Weightage of each assessment for grading

S. No.	Assessment	Evaluation by	Weightage	Marks
1	Sessional I	Internal subject expert	17.5%	17.5
2	Sessional II	Internal subject expert	17.5%	17.5
3	Assignment	Course teacher	15%	15
4	End semester	External subject expert	50%	50
Total				100

Assessment of PG student projects is done for 100 marks considering the following criteria:

(i) Problem identification (ii) Objectives (iii) Designing of Suggested solution- Methodology and development of theoretical and experimental methods used in the execution of the project (iii) quality of the project work-the state-of-the-art recent research trends (iv) Communication skill and content delivery, and (v) References documentation understanding and recommendations from the academic project.

M.Tech. Project Report

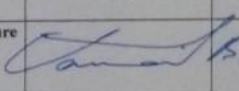

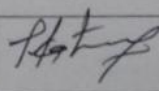
An academic project report must include an abstract, introduction, literature review, methodology, results, discussion, and conclusions and recommendations for future work. The process of writing and presenting an academic project is guided by guidelines proposed by the Office of Academic Affairs and duly signed by the supervisor and the Head of the Department.

Also, the quality of M.Tech.project report is ensured by checking for plagiarism using software like ithenticate or urkund. Similarity check report is to be attached as a part of every M.Tech., project report.

Mapping of department quality of the project standards with the standard provided by the accreditation process

Department metrics	Problem identification (CO1) (20 marks)	Suggested solution (CO 2) (20 marks)	Quality of Work (CO 3) (20 marks)	Communication skill/Content Delivery (CO 4) (20 marks)	References documentation understanding (CO 5) (20 marks)
Project quality standards	<ul style="list-style-type: none"> Very clear and concise objectives Cites substantial current and good quality literature 	<ul style="list-style-type: none"> Very clear methodology, articulated using technical terms indicating all steps and tools 	<ul style="list-style-type: none"> Clarity in design/setting up of experiment. Benchmarks used / Assumptions made 	<ul style="list-style-type: none"> Very clear methodology, articulated using technical terms indicating all steps and tools 	<ul style="list-style-type: none"> Overall presentation of the report

Proof of Project Monitoring/Review system

<u>FIRST REVIEW</u>						DATE: 05/03/2021
S.No	Register Number	Name of the Student	Reviewer 1	Reviewer 2	Reviewer 3	Average
			Dr. B. Vanavil	Dr. S. Ramkumar Pandian	Dr. T. Kathiresan	
1	9920102002	BAZEERA FERDHOUS P	78	75	89	81.6
2	9920102004	KALIRAJ C	76	70	88	79
3	9920102005	OVIYA S	85	81	89	86.4
4	9920102006	POOJA VAISNAVI M	58	54	80	64
5	9920102007	RAJA RAJESWARI R	77	71	85	80.4
6	9920102009	SHALINI M	83.5	82	89	85.5
7	9920102010	ANGELIN JENIT	85	78	89	85.7
8	9920102011	PRASEETHA S	86	81	90	87.6
9	9920102012	PREMKUMAR K	80	73	87	81
10	9920102013	DARSZHAN B	86	80	88	83.4
11	9920102015	RAMALAKSHMI G	60	60	86	73.8
12	9920102016	BHOOBALAN D	69	80	85	78
13	9920102017	DHANAPRADEEBA V	74	81	89	82.75
Reviewer Signature						

Review	Monitoring of Project components	Monitored by	Suggestions
Zeroth	Project domain, area, title, Project approach, requirements and feasibility are monitored	Internal Review committee nominated by HoD	If wrong with the project approach, unrealistic concepts, not feasible and no availability of requirements, students are directed to change the title and concepts.
First	Project objectives, literature survey, and methodology (Work plan) are monitored	Internal Review committee nominated by HoD	If the objectives are too many, students are asked to cut down the objectives. Suggestion to collect more literatures. Changes in the methodology
Second	Quality and progress of the proposed work, results and data interpretation are monitored	Internal Review committee nominated by HoD	If the progress is slow, students are advised to conclude with existing results
Viva-Voce	Brief presentation and Project outcomes are evaluated	External Expert nominated by CoE	Future prospects

Table 1.2.2.2 Process of Project Monitoring/Review system

Review Process

There shall be three assessments (each 100 marks) during the semester by a review committee. The student is instructed to make a presentation on the progress made before the committee. The Head of the Department constitutes the review committee consisting of a supervisor, project coordinator and another faculty member from the department to evaluate the progress of all the activities related to the student academic project work. The total marks obtained in the three assessments shall be consolidated to 50 marks. The process of project monitoring system and the project review system is given in Table 1.2.2.2 and Table 1.2.2.3 respectively.

S.No.	Project	Review-1 (Zeroth)	Review-2 (First)	Review-3 (Second)	End Semester Examination
1	BIT18R6097 Mini Project	Internal review committee	Internal review committee	Internal review committee	Internal review committee
2	BIT18R6098 ProjectPhase I	Internal review committee	Internal review committee	Internal review committee	External expert
3	BIT18R6099 Project Phase II	Internal review committee	Internal review committee	Internal review committee	External expert

Table 1.2.2.3Project Review Process

PROGRAM OUTCOMES (POs)

1. An ability to independently carry out research /investigation and development work to solve practical problems.
2. An ability to write and present a substantial technical report/document.
3. Students should be able to demonstrate a degree of mastery over various areas in biotechnology.
4. Capability to recognize problems, provide solutions related to industrial biotechnological processes that involve production of bioproducts.
5. Demonstrated ability to address issues related to environmental and health care biotechnology using modern computational and analytical tools.

List of Completed Mini Projects (2021-2023 Batch)

S. No	Reg. Number	Name of The Student	Project Title	Outcome of the Project	Relevance to POs
1	9921102001	Derina. J. Pearlin . D	Comparative studies between microalgae and macroalgae in waste water treatment	The role of microalgae and macroalgae in the wastewater treatment was analysed	PO1, PO2, PO4, PO5
2	9921102002	C.M. Karunya Sri	Homology modelling of putative ion transported proteins of <i>Streptococcus mutans</i> and molecular docking with phytochemicals of <i>Azadirachta indica</i> .	Poster presentation in International conference Pharma NEST'3.E. JSS College of Pharmacy Ooty.	PO1, PO2, PO5
3	9921102003	A. Parthiban	Bioactive compounds from <i>Withaniasomnifera</i> and <i>Cassia auriculata</i> -An <i>in silico</i> investigation against neurological disease.	The functional potential of bioactive compounds from <i>Withaniasomnifera</i> and <i>Cassia auriculata</i> in the treatment of	PO1, PO2, PO5

				Alzheimer's disease was elucidated	
4	9921102005	V.SivaBharathi	Extraction and characterization of <i>Asparagus racemosus</i> bioactive compounds	Poster presentation in International conference Pharma NEST'3.E. JSS College of Pharmacy Ooty.	PO1, PO2
5	9921102006	S. Shruthi	Amine functionalized eugenol loaded mesoporous silica nanoparticles in <i>in vitro</i> model of breast cancer	The effect of functionalized nanoparticles in the breast cancer cell lines was analysed	PO1, PO2, PO4
6	9921102008	Jins K Abraham	Extraction of bioactive compound from <i>Achyranthus aspera</i> and <i>Myxopyrum serratum</i> - <i>in silico</i> study of its antibacterial effects	The antibiotic potential of medicinal plants <i>Achyranthus aspera</i> and <i>Myxopyrum serratum</i> studied.	PO1, PO2, PO5

List of Completed Mini Projects (2020-2022 Batch)

S. No	Reg. Number	Name of The Student	Project Title	Outcome of the Project	Relevance to POs
1	9920102002	Bazeera Ferdhous P	<i>In silico</i> analysis of metal ion binding sites in alginate lyase.	Computational analysis of the metal binding site present in the industrial enzyme is explored.	PO1, PO2, PO4, PO5
2	9920102004	Kaliraj C	Co-delivery of piperine and linalool loaded hollow mesoporous silica nano particles induced cell death in <i>in silico</i> model of breast cancer.	Druggability of medicinal lead molecules was analysed using <i>in silico</i> techniques.	PO1, PO2, PO5
3	9920102005	Oviya S	Propagation of <i>Hybanthus enneaspermus</i> wild life environment.	Identified the optimal conditions for tissue culturing of medicinal plant.	PO1, PO2, PO5
4	9920102006	Pooja Vaisnavi M	<i>In silico</i> analysis of phytochemical and antibacterial activity of <i>Cardiospermum halicacabum</i> against wound pathogens.	Computational analysis of antibiotic activity and the available phytochemicals of <i>Cardiospermum halicacabum</i>	PO1, PO2, PO5
5	9920102007	Raja Rajeswari R	<i>In silico</i> analysis of Camptothecin an anti cancer drug against cancer signalling pathway.	Elucidated the role and mechanism involved in cancer suppression by natural compounds	PO1, PO2, PO5
6	9920102009	Shalini M	<i>In silico</i> comparative analysis of genome and proteome of severe acute respiratory syndrome Corona virus 2 (SARS Co 2) with bat virome.	Established the similarity of gene and proteins present in the bat virome and SARS CoV2.	PO1, PO2, PO5
7	9920102010	Angelin Jenit	Isolation of microalgae from cotton waste water disposal site	The microalgae from cotton waste water were isolated.	PO1, PO2, PO5
8	9920102011	Praseetha S	Computational prediction and <i>in silico</i> validation of breast cancer associated antigens	The antigens of HPV inducing breast cancer and their potential as vaccine candidate was analysed.	PO1, PO2, PO5
9	9920102012	Premkumar K	<i>In silico</i> characterization of cellulase by employing computational approach	The microbes producing cellulase enzyme was studied computationally.	PO1, PO2, PO5

10	9920102013	Darszhan B	In silico analysis and validation of L Asparaginase from enterobacter cloacae	The gene sequences involved in asparaginase production was found.	
11	9920102015	Ramalakshmi G	<i>In silico</i> evaluation of phytochemicals from <i>Tinosporacordifolia</i> against potential targets of irritable bowel syndrome	The role of phytochemicals in the treatment of irritable bowel syndrome was analysed.	PO1,PO2,PO5
12	9920102016	Bhoobalan D	A survey of the impact of heartfulness meditation on stress	The relation between heartfulness meditations with stress was recorded by descriptive surveying.	PO1, PO2.
13	9920102017	Dhanapradeeba V	Elucidating the role of oligonucleotides on inflammatory bowel disease (IBD)-An <i>in silico</i> approach	The function of nucleotides in the suppression of protein targets involved in IBD was studied.	PO1, PO2, PO5

List of Completed Mini Projects (2019-2021 Batch)

S. No	Reg. Number	Name of the Student	Project Title	Outcome of the Project	Relevance to POs
1	9919102001	Arun Robin Babu A	Batch degradation studies of cotton processing wastewater using <i>Chlorella vulgaris</i>	Published a book chapter: Algae or Bacteria – Future of biological wastewater treatment, Rahman – Handbook of Advanced Approaches V2	PO1, PO2, PO3, PO5
2	9919102002	Gowtham P S	Improvement of curdlan gum production using Elicitors	Developed a process for enhancement of curdlan gum using elicitors	PO1, PO2, PO4
3	9919102003	Poornimaa B	A survey of the impact of meditation and mental well-being	Innovations in Bio and Chemical Engineering for Sustainable(presentation),	PO1, PO2, PO5
4	9919102004	Sundarapandian V	Role of <i>Asparagus racemosus</i> on pentazone induced epilepsy in rodent model	International e-conference on Frontiers in Industrial Biotechnology	PO1, PO2, PO4
5	9919102005	Sureba S	Theranostic application of 4-Aminoantipyrine loaded mesoporous silica nanoparticles in <i>In vitro</i> models of breast cancer	The study provided an alternative for developing next generation drug delivery carriers for efficient tumor therapy.	PO1, PO2
6	9919102006	Vikram V	Studies on Mutagenesis of bacterium to find higher expression of enzyme protease identification and characterization.	Observations and findings were carried out on the mutated bacillus species which acted as a protease inhibitor.	PO1, PO2, PO4
7	9919102007	Divyabharathi R	Production and characterization of thermozymes from thermophilic bacteria	Innovations in Bio and Chemical Engineering for Sustainable(presentation)	PO1, PO2, PO4
8	9919102008	Jemmy Joy G	Designing Inhibitors of PVDQ to control the pathogenesis of Pseudomonas: A	Innovations in Bio and Chemical Engineering for Sustainable(presentation)	PO1,PO2,PO5

			Pharmacophore Modelling Approach		
9	9919102009	Clayton Fernando R	Identification of SARS-CoV-2 CTL Epitopes for Development of a Multivalent Subunit Vaccine for COVID-19	Published in Infection, Genetics and Evolution Journal (2021) and also presented this work in virtual international conference on Innovation in Interdisciplinary Research 2020 organized by KARE (23-24, June 2020)	PO1, PO2, PO5
10	9919102010	Kavitha A	Studies on riboflavin in earthworm and its effect in growth of rice seedling	Fungal pathogen can be maintained in vermiculture products to reduce disease index in rice plants caused by R. solani	PO1, PO2
11	9919102011	Aanandhalakshmi R	Biosynthesis and applications of Alginate oligosaccharides	Developed and optimized a process for synthesis of alginate oligosaccharides using alginate lyase of novel marine bacteria	PO1, PO2, PO4

List of Completed Phase I Projects (2021-2023 Batch)

S. No	Reg. Number	Name of The Student	Project Title	Outcome of the Project	Relevance to POs
1	9921102001	Derina.J.Pearlin .D	Removal of emerging pollutants from waste water using algal systems	The role of algae in wastewater treatment was studied.	PO1,PO2,PO5
2	9921102002	C.M.Karunya Sri	Effect of metabolites of <i>Azadirachtaindica</i> on glucosyltransferases of <i>Streptococcus mutans</i>	GTF enzyme was identified and the effects of bioactive compounds were studied	PO1,PO2,PO5
3	9921102003	A.Parthiban	Dioscorin and diosgenin from water yam (<i>Dioscoreaalata</i> L.) and their bioactive studies	The bioactive profile of water yam was elucidated.	PO1, PO2, PO5
4	9921102005	V.SivaBharathi	Bioprospecting of <i>Asparagus racemosus</i> crude extract on IBD <i>in vitro</i>	The impact of <i>Asparagus racemosus</i> in the cell line model of IBD.	PO1, PO2
5	9921102006	S.Shruthi	Amine functionalized eugenol loaded hollow mesoporous silica nanoparticles in <i>in silico</i> and <i>in vitro</i> model of breast cancer	The effect of functionalized nanoparticles in the breast cancer cell lines was analysed.	PO1, PO2, PO4
6	9921102008	Jins K Abraham	An integrated <i>in silico</i> approach for the comparative structural and functional exploration of β galactosidases of multiple species of Cellulomonas	The computational analysis study to establish the genes responsible for galactosidase in multiple species was observed	PO1, PO2, PO4

List of Completed Phase I Projects (2020-2022 Batch)

S. No	Reg. Number	Name of The Student	Project Title	Outcome of the Project	Relevance to POs
1	9920102002	BazeeraFerdhous P	Analysis of curdlan gum as a drug delivery and therapeutic agent through in vitro and in silico studies	Oral Presentation in 3rd International Conference on Communication and Intelligent Systems organized by NIT, Delhi, 18-19, December 2021.	PO1, PO2, PO5
2	9920102004	Kaliraj C	Codelivery of piperine and linalool loaded-hollow mesoporous silica nanoparticles induced cell death in in vitro and in silico model of breast cancer	ADMET properties of the ligands and physiochemical characteristics of the receptor proteins were analysed. ii. Calcinated Hollow Mesoporous Silica Nanoparticles were synthesized	PO1, PO2, PO5
3	9920102005	Oviya S	Pharmacoinformatics based Screening of Phytocompounds from Orthosiphonstamineus and Boerhaviadiffusa against Potential Targets of Chronic Kidney Disease (CKD)	Insilico analysis of Boerhaaviadiffusa and Orthosiphonstamineus plants have been done against CKD disease. The formulation of these herbs against CKD targets is suggested.	PO1, PO2, PO5
4	9920102006	PoojaVaisnavi M	Insilico analysis of phytochemical and antibacterial activity of cardiospermumhalicacabum against wound pathogens	Submitted to Ethanobotany	PO1, PO2
5	9920102007	Raja Rajeswari R	Glucose conjugated camptothecin loaded gluten nanoparticle for brain tumortargetting	Accepted in Bioimpacts journal	PO1, PO2, PO4
6	9920102009	Shalini M	Image based disease detection of cotton plant and formulation of disease resistant designer seed with BCA to combat cotton plant diseases.	Paper Submitted to Second International Conference on Artificial Intelligence-VIT, Vellore.	PO1, PO2, PO4
7	9920102010	AngelinJenit	Combined Biological and photocatalytic treatment of cotton processing wastewater	Accepted for Presentation at SuWAM 2022, IITM, titled "Integrated microalgal and bacterial consortium with photocatalytic treatment of surgical cotton effluent" March 2022	PO1, PO2, PO4
8	9920102011	Praseetha S	Designing of a novel epitope-based vaccine candidate for Human Papilloma Virus	Designed a DNA based vaccine for human papilloma	PO1,PO2,PO5

				virus and validated them using in-silico methods.	
9	9920102012	Premkumar K	<i>In silico</i> identification of phytoconstituents as potential inhibitors of Covid-19 main protease	This in silico study confirmed potential of phyto-constituents namely beta-sitosterol and beta-amyrin from <i>Nigella sativa</i> against covid-19 main protease (Mpro)	PO1, PO3, PO4
10	9920102013	Darszhan B	Insilico analysis and purification of L-Asparaginase from a marine isolate <i>Staphylococcus aureus</i>	The marine strain isolated and identified was screened for L-Asparaginase with purification process was intended. The high production of L-Asparaginase compared to the other commercially available strains makes this a useful prospect for the future. Also, Other Parameters such as half life are favourable for the isolated species. This makes this project an asset to explore more in the future.	PO1, PO2
11	9920102015	Ramalakshmi G	<i>in silico</i> analysis of endoglucanase in the genome of <i>Cellulomonas flavigena</i> ATCC 53703	Putative Endoglucanase enzyme has been analysed using <i>in silico</i> tools	PO1, PO2, PO4
12	9920102016	Bhoobalan D	A survey of the impact of meditation and mental well-being	Adriamycin dysregulate the hippo pathway by binding on the ck1d/e enzyme which leads to deregulation of heart regeneration and cardiac homeostasis.	PO1, PO2, PO3, PO5
13	9920102017	Dhanapradeeba V	Elucidating the role of oligonucleotides on inflammatory bowel's disease- An in silico approach	The binding affinity of oligonucleotide against the target has been analyzed. Oligonucleotide exhibited strong binding affinity towards the target	PO1, PO2, PO4

List of Completed Phase I Projects (2019-2021 Batch)

S.No	Reg Number	Name of the student	Project Title	Outcome of the project	Relevance to POs
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1	9919102001	Arun Robin Babu A	Mathematical modelling of biodegradation process in treatment of industrial effluent	Kinetic models were developed for bioreactors treating coke oven effluents containing phenol, cresol and cyanide pollutants using activated sludge microbes	PO1, PO2, PO4
2	9919102002	Gowtham P S	Docking and molecular interaction studies of covid-19 viral targets with sulphated polysaccharides	National Conference on Biological, Biochemical, Biomedical, Bioenergy and Environmental Biotechnology (NCBEBT-2021)	PO1, PO2, PO4
3	9919102003	Poornima B	Evaluation of the effect of adriamycin on sodium / potassium channels	Determination of the effect of Adriamycin / DOX on Na ⁺ / K ⁺ channel in silico and deriving a hypothetical model to elucidate the Adriamycin - induced cardiomyopathy from the perspective of impaired Na ⁺ / K ⁺ channels	PO1, PO2, PO5
4	9919102004	Sundarapandian V	Screening of bioactive compounds from <i>Semecarpus anacardium</i> : An in silico approach and molecular dynamics investigation against Alzheimer's	The binding affinity of the bioactive compounds derived from the <i>S. anacardium</i> has been identified. The conformation changes between the ligand and target has been studied.	PO1, PO2
5	9919102005	Sureba S	In silico and In vitro analysis of 4-Aminoantipyrine loaded mesoporous silica nanoparticles in breast cancer	HSP 60 may be better target for 4-Aminoantipyrine loaded Mesoporous silica nanoparticle which will be effective for breast cancer therapy.	PO1, PO2, PO4
6	9919102006	Vikram V	Designing inhibitors of Polyketide synthase (pks 13) to control the pathogenesis of <i>Mycobacterium tuberculosis</i> .	With the help of docking and Web tools like Binding database and Zinc pharmer, we were able to derive drug candidate which act as an inhibitor of the organism <i>Mycobacterium tuberculosis</i> thus preventing the cause of disease Tuberculosis.	PO1, PO2, PO4
7	9919102007	Divyabharathi R	Statistical experimental designs and artificial neural network model building in bioprocess engineering: Similarities	International e-conference on Frontiers in Industrial Biotechnology, Innovation in	PO1, PO2, PO4

			and Differences	Interdisciplinary Research (VICIHDR)	
8	9919102008	Jemmy Joy G	Sequence and structural relatedness of Acyl-Homoserine Lactone Acylase (PvdQ) of <i>Pseudomonas aeruginosa</i> with other organisms: an in silico study	This study shows that PvdQ, though investigated mainly in <i>P. aeruginosa</i> , is present in various other microorganisms as well. Since the active site and hydrolase domains are similar in other organisms, we might draw a conclusion that PvdQ in other organisms also possess similar functions as that of PvdQ in <i>P. aeruginosa</i>	PO1,PO2,PO5
9	9919102009	Clayton Fernando R	Comparative genomics of <i>Mycobacterium tuberculosis</i> field and vaccine strains for fishing out novel epitopes that can boost the immunogenicity of BCG vaccine	According to several studies, genes lost in BCG strains are major participants in virulence factors and modulation of host signals. In this study, we predicted the potential epitopes present in lost regions of BCG. Further validation of these CTL episodes facilitates for the development of ideal BCG vaccine.	PO1,PO2,PO5

10	9919102010	Kavitha A	Current biotechnological methods to restrict fungal pathogen Rhizoctoniasolani in rice	Transgenic rice plants expressing two different PR proteins and siRNAs that are specific target for fungal pathogen can be maintained in vermiculture products to reduce disease index in rice plants caused by R. solani	PO1, PO2, PO3
11	9919102011	Aanandhalakshmi R	In-silico analysis of different alginate lyase and its substrate specificity	National Conference on Biological, Biochemical, Biomedical, Bioenergy and Environmental Biotechnology	PO1, PO2, PO5

1.2.3 Initiatives related to industry interaction including industry internship/summer training (10)

The scientists from industries participate as members in our Board of Studies and Industry-Advisory Board and advice in strengthening our curriculum. Scientists from the industry and higher education institutions are also invited to deliver webinars in their field of interest that gives an opportunity for the students to learn what is happening in the outside world. Students have been part of several Industry Internships as given in the Table below:

S. No.	Register No	Student Name	Name of the Industry	Duration
1	9920102013	Darszhan B	Algal R NutraPharma Pvt Ltd, Tamilnadu	Nov 2021 – Dec 2021
2	9919102009	Clayton Fernando R	CSIR Summer Internship Training Programme	June 2020 – Aug 2020
3	9919102010	Kavitha A	CSIR Summer Internship Training Programme	July 2020 – Sep 2020
4	9919102011	Aanandhalakshmi R	CSIR Summer Internship Training Programme	July 2020 – Sep 2020

To promote industry interaction, the following initiatives are being undertaken by the department:

- Participation of experts from Industry in Curriculum development
- Invited lectures in collaboration with Industries
- Industrial Training
- Industrial Consultancy
- Industrial Visits by students

Proof of Student Industrial Training


CSIR-CIMAP
सी.एस.आई.आर. - केंद्रीय औषधीय एवं सगंध पौधा संस्थान
CSIR-Central Institute of Medicinal and Aromatic Plants
CSIR-Summer Research Training Program
(CSIR-SRTP-2020)

CERTIFICATE OF PARTICIPATION

This is to certify that the candidate has successfully completed the online Summer Research Training Program in Biology at CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow.

Name of the Candidate : R. Aanandhalakshmi

Parent Institution : Kalasalingam Academy of Research and Education,
Krishnankoil, Virudhunagar, Tamil Nadu - 626126

Category of Training : Summer Research Training Program-2020

Title of the Training Program : Information mining for thirty selected medicinal plants

Duration of the Training : 29.07.2020 – 24.09.2020

The institute wishes the candidate success in her future endeavors.


19.11.2020
Mentor


Head, HRD


Head of the Institute

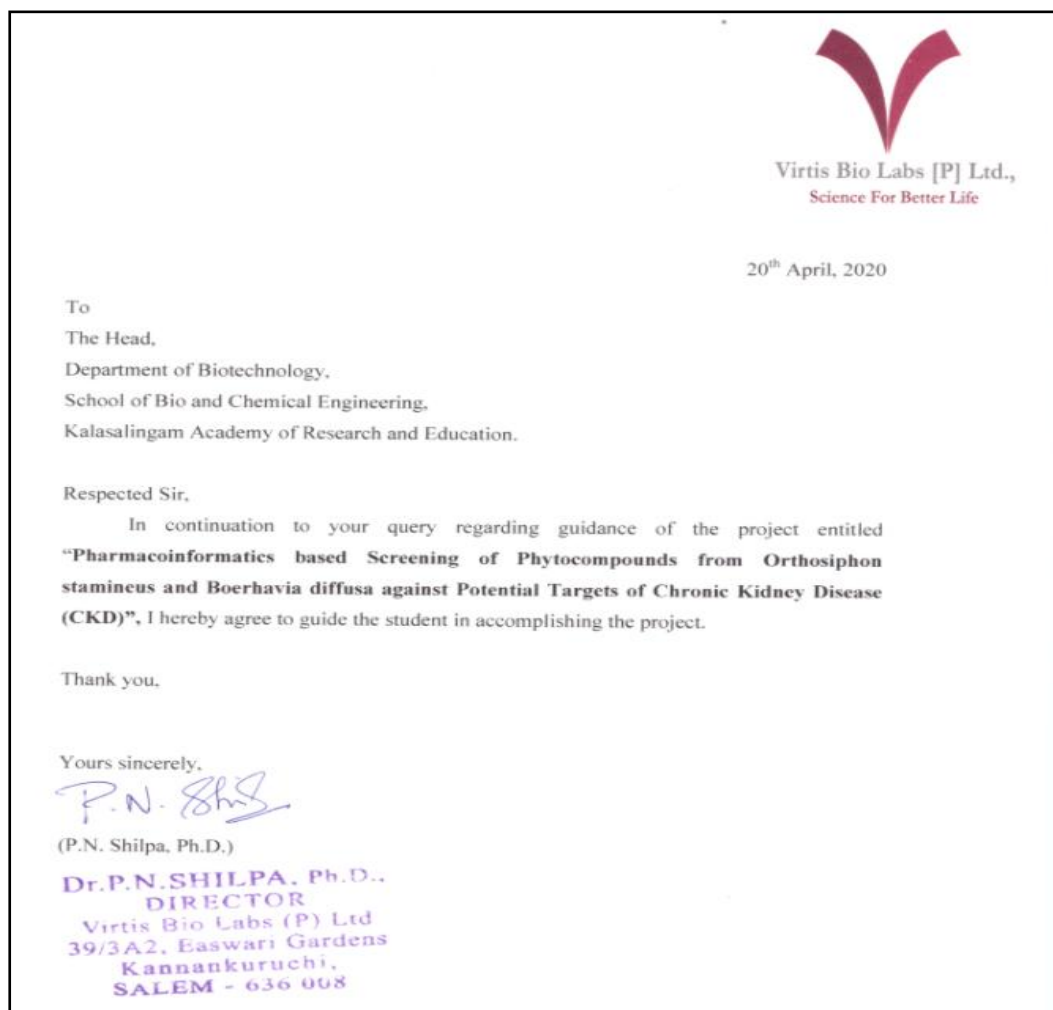
1.2.4. Participation of Industry professionals in curriculum development, as examiners, in major projects (10)

Industry experts, as members of Board of Studies, are involved in designing the curriculum. Besides, feedback is also obtained from resource persons from industries, alumni working in industry and that is placed in the next BoS meeting for discussion and critical analysis. Based on these recommendations few courses are introduced.

The PG program consists of major project in both the third and fourth semester. Students are

involved in their project work in various areas including biomedical, environmental, computational and industrial aspects of biotechnology. Each student has allotted one guide with their respective specialization. The evaluation of student project is through each review phase. The end semester project valuation is assessed through external expert from academic institution. Several Industrial personnel as acted as mentors for student project works.

Proof of Student Project Mentored by Industrial Personnel



1.2.5. Quality of laboratory work given (20)

The faculty members take utmost care in providing quality laboratory experiments so as to provide strong hands-on experience in the particular course. This is supported by the laboratory facilities that are established by the institution. Students also get an opportunity to work in research laboratories. Mini-projects were done by individual students as a part of the laboratory course for BIT18R5082 - Bioinformatics and Drug Design Laboratory. This enabled the students to solve practical problems with the application of the knowledge and skills gained from the set of completed experiments. Further, based on the project work done

as a part of this laboratory course, students have presented the work at various conferences and submitted manuscripts to the journal.



Industrial Personnel Delivering Lecture

List of Completed Projects (2020-2022 Batch)

Register Number	Name of the Student	Title of the Project
9920102002	BazeeraFerdhous P	Analysis of curdlan gum as drug delivery, therapeutic and immobilization agent
9920102004	Kaliraj C	Codelivery of piperine and linalool loaded hollow mesoporous silica nanoparticles induced cell death in vitro model of breast cancer
9920102005	Oviya S	Process optimization for extraction parameters and identification of bioactive compounds from <i>Boerhaviadiffusa</i> using RSM and ANFIS models
9920102006	PoojaVaisnavi M	<i>In vitro</i> analysis of phyto constituents from <i>Cannabis sativa</i> against pfDHFR
9920102007	Raja Rajeswari R	Glucose conjugated camptothecin loaded gluten nanoparticles for selectively targeting breast cancer
9920102009	Shalini M	Image based detection of cotton plant disease & formulation of disease resistant designer seed with bio control agent to combat cotton plant disease.
9920102010	AngelinJenit	Combined biological and photo catalytic treatment of cotton processing waste water
9920102011	Praseetha S	Construction of a multi-epitope plasmid DNA vaccine

		for HIV
9920102012	Premkumar K	Extraction of phytoconstituents from <i>Nigella sativa</i> and its <i>in silico</i> and <i>in vitro</i> identification
9920102013	Darszhan B	<i>In silico</i> mutagenesis of L-asparaginase from <i>Enterobacter cloacae</i> for efficient treatment of acute lymphoblastic leukemia
9920102015	Ramalakshmi G	<i>In silico</i> and functional analysis of endoglucanases in the genome of <i>Cellulomonas flavigena</i> ATCC 53703
9920102016	Bhoobalan D	Ilaneer Poovarasooranam effectively ameliorates adriamycin induced hepatotoxicity
9920102017	Dhanapradeeba V	Optimization and characterization of bioactive compounds from <i>Withania somnifera</i> by RSM

List of Completed Projects (2019-2021 Batch)

Register Number	Name of the Student	Title of the Project
9919102001	Arun Robin Babu A	<i>In Silico</i> Screening for Inhibitors of Lip132 from <i>Andrographis paniculata</i> and <i>Origanum vulgare</i> for treatment of leptospirosis
9919102002	Gowtham P S	Virtual screening of furazolidone analogues as inhibitors of siroheme synthase; A strategy to design Novel antimicrobials against <i>Salmonella gallinarum</i>
9919102003	Poornima B	CHK1 Kinase : The therapeutic target for hepatocellular carcinoma
9919102004	Sundara Pandian V	Nucleoside analogues as ATPase inhibitors; A strategy to treat tuberculosis
9919102005	Sureba S	Structure based drug design for dengue; screening for compounds from <i>Carica papaya</i>
9919102006	Vikram V	Virtual screening for inhibitors of squalene epoxidase as drug candidates to treat athletes' foot.
9919102007	Divyabharathi R	Urease : The therapeutic target for <i>Helicobacter pylori</i>
9919102008	Jemmy Joy G	Designing Drug Candidates for Dermatographism ; A Virtual Screening Approach
9919102009	Clayton Fernando R	Generation of 2D-QSAR and pharmacophore models for finding better anti-leishmanial therapeutics
9919102010	Kavitha A	An <i>in silico</i> approach to design an antifungal agent against <i>Rhizoctonia solani</i>
9919102011	Aanandhalakshmi R	Peptidomimetics as inhibitors of SPEB protease to control infections by <i>Streptococcus pyogenes</i>

Outcome of Project work given as a part of Laboratory Course

Register Number	Name	Title of the Project	Outcome
9919102009	Clayton Fernando R	Generation of 2D-QSAR and pharmacophore models for fishing better anti-leishmanial therapeutics	<ol style="list-style-type: none">1. Best Paper Award for the paper entitled “Generation of 2D-QSAR and pharmacophore models with MMV box compounds: A ligand-based drug designing approach for fishing anti-leishmanial therapeutics” at 17th IAAM Annual Conference on “Microbiology in New Millennium” organized by Indian Association of Applied Microbiologist and Kalasalingam Academy of Research and Education during 29-30 November, 2019.2. Presentation of the paper entitled “Generation of 2D-QSAR and pharmacophore models for fishing better anti-leishmanial therapeutics” at Virtual International Conference on “Innovations in Interdisciplinary Research 2020” organized by Kalasalingam Academy of Research and Education during 23-24 June, 2020.3. Manuscript entitled “Generation of 2D-QSAR and pharmacophore models for fishing better anti-leishmanial therapeutics” submitted to International Journal of Computational Biology and Drug Design, a Scopus indexed journal.

RUBRICS FOR CONTINUOUS ASSESSMENT

Category	MAX. MARKS ALLOTTED
Lab Preparation/Preparatory Work	25
Cleanliness, Replacement of Chemicals & Glassware	15
Experimental Skill	20
Reporting Observation & Submission of Result	20
Record Submission on Time	10
Viva Voce	10
Total	100

Assessment of the individual's ability to organize the experiment	25 marks
a. Arranging requirements	
b. Cleanliness of working area	
c. Replacing chemicals	
d. Proper washing of glassware	
e. Safety protocol follow up	
Experimental Skill	25 marks
Report, Result and Viva	50 marks
Completeness & Neatness & Submission of record	
Reporting & Observation of results on time	
Viva Questions	

CRITERION 2	PROGRAM OUTCOMES AND COURSE OUTCOMES	75
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2.1 Establish the connect between the courses and POs (15)

Table 2.1 PO correlation with courses

PO1	Courses	
An ability to independently carryout research/ investigation and development work to solve practical problems.	BIT18R5081 BIT18R5082 BIT18R5083 BIT18R5084 MAT18R5002 BIT18R5006 BIT18R6097 BIT18R6098 BIT18R6099 BIT18R5002	Advanced Immunology Laboratory Bioinformatics and Drug Design Laboratory Recombinant DNA Technology Laboratory Bioprocess Engineering Laboratory Statistics and Computational Techniques Research Methodology Mini Project Project Phase I Project Phase II Advanced Bioinformatics
PO2	Courses	
An ability to write and present a substantial technical report/document.	MAT18R5002 BIT18R5006 BIT18R6097 BIT18R6098 BIT18R6099 BIT18R5002	StatisticsandComputationalTechniques ResearchMethodology MiniProject ProjectPhaseI ProjectPhaseII AdvancedBioinformatics
PO3	Courses	
Students should be able to demonstrate a degree of mastery over various areas including medical, environmental, and industrial aspects of biotechnology.	BIT18R5001 BIT18R5003 BIT18R5004 BIT18R5005 BIT18R5007	Bioprocess and Bio separation Technology Immunotechnology Genomics and Proteomics Bioprocess Modeling and Simulation Developmental Biology
PO4	Courses	
Willacquireabilityto recognize problems, provide solutions relatedto industrialbiotechnological processes that involve production of bioproducts.	BIT18R5001 BIT18R5011 BIT18R5008 BIT18R5013 BIT18R5014 BIT18R6002 BIT18R6014 BIT18R6015	Bioprocess and Bio separation Technology Microbial Technology Enzyme Technology Biofuels Monitoring and Control of Bioprocess Drug Design and Targeting Biopolymer Technology Algal Biotechnology
PO5	Courses	
Willbe ableto addressissuesrelated to environmental and public health using modern computational and analytical tools.	BIT18R5010 BIT18R5009 BIT18R5012 BIT18R6004 BIT18R6008 BIT18R6013 BIT18R5001 BIT18R5004	Industrial Wastewater Treatment and Management Bioremediation Bioprocess Plant and Equipment Design Plant Molecular Biology Tissue Engineering Recombinant DNA technology Bioprocess and Bio separation Technology Genomics and Proteomics

2.2 Attainment of Program Outcomes (60)

2.2.1 Describe the assessment tools and processes used to gather the data upon which the evaluation of Program Outcome is based

The information on CO assessment is explained in detail under the following sections:

- A1. List of assessment tools used for CO attainment
- A2. Mark Allotment for CO assessment
- A3. Assessment Procedure for CO Attainment with sample calculations

A1. List of assessment tools used for CO attainment

Table 2.2 shows the different assessment tools used for the CO attainment process.

Table 2.2 Assessment Tools

<i>Assessment Tool</i>		<i>Description</i>
<i>Direct Assessment (Theory Courses)</i>	<i>Sessional Examinations</i>	The assessment tool is initiated during the sessional examination which is held twice in a semester. Every sessional examination will focus on the attainment of each course outcome during the semester. If the COs are found to be not attained in the sessional examination, then, corresponding actions for improvement of the particular COs will be taken to improve the attainment of CO in the subsequent end semester.
	<i>End Semester Examination</i>	End semester examination is a metric for assessing the attainment of COs for a particular course at the end of the semester. End Semester questions are framed to consider all COs for assessment.

		<p>An assignment is a qualitative performance assessment tool designed to assess the student's knowledge of engineering practices. An analytic rubric was developed to assess student's knowledge for the learning outcomes.</p> <p>Assignment can be given as Quiz, Seminar, Industry-expert-based evaluation, Research Article based evaluation, etc. The course coordinator will fix any of the above corresponding to the course outcomes.</p> <p>Quiz Quizzes will be conducted during regular class hours. Surprise quizzes are conducted in the respective classes and the evaluation is done based on their performances. After the quiz, the answers will be discussed in the respective class itself.</p> <p>Seminar It should be an individual student seminar. Seminar topics should be well planned as per the course outcomes of the concerned course and the presentation should contain all the technical components including literature review, any methodology, analysis methods, and specific conclusions</p> <p>Open Book Test Questions framed should not be directly from one or more published textbooks – either as solved or unsolved examples. The faculty must design the question himself as per the course outcome of the concerned course and preferably based on real-time case studies.</p> <p>Industry Expert Evaluation Industry persons can be invited to offer a real-time industry problem related to the course outcome of the concerned course and evaluate the students' performance. It can also include an interview by the industry persons</p> <p>Research Article Based Evaluation The topic will be given as an individual student exercise based on the course outcome of the concerned course. Research articles should be searched from standard journals such as Elsevier/Springer etc. The objectives should be clearly defined on what is the intended outcome of the research article's study.</p>
Direct (Laboratory Courses)	Internal	<p>The internal marks for laboratory courses are awarded based on rubrics framed by the course coordinator for the corresponding lab course consisting of experimentation, interpretation, and result analysis.</p>

	Mini Project	The mini-project provides an opportunity for students to demonstrate independence and originality, to plan and organize a Project over a given period, and to put into practice, the techniques that have been taught. Students must identify a problem related to the laboratory course and carry out a mini project on the problem defined. Two reviews are conducted during lab hours. Marks are awarded based on the rubrics defined by the course coordinator.
	External	The external examinations for laboratory courses are conducted at the end of the semester for 3 hours. It is evaluated based on rubrics framed by the course coordinator for the corresponding lab course.
Indirect Assessment	Course end Survey	At the end of every semester, every student is asked to give their opinion about the knowledge level of course outcomes of the corresponding course they have studied with assigned rubrics. The course end survey is assessed based on rubrics which will be designed by the course coordinator.

A2. Mark Allotment for CO assessment

Table 2.3 shows the marks allotment for each COs in the internal and external assessment.

Table 2.3. Marks allotment with respect to CO assessment

COs	INTERNAL ASSESSMENT				EXTERNAL ASSESSMENT
	SE-I	SE-II	Assignment	Total	END SEM
CO1	30		10	40	20
CO2	20		10	30	20
CO3		30	10	40	20
CO4		20	10	30	20
CO5			10	10	20
Total	50	50	50	150	100

Table 2.3 shows the indicative marks allotment for all the examinations conducted during the study.

A minimum of two Course Outcomes have been planned to cover ineach of the sessional examinations for 50 marks. For example, in Sessional Examination I the split-up for 50 marks is 30 marks from CO1 and 20 marks from CO2 approximately. For Sessional Examination II; 30 marks from CO3, 20 marks from CO4. In the End Semester Examination, the question paper covers all the COs. Assignment topics are also framed to cover the entire COs.

A3. Assessment Procedure for CO Attainment

The assessment procedure for CO attainment is based on both Direct and Indirect assessments. The Direct Assessment is completely based on the marks scored in the examinations and the indirect assessment is based on the survey taken for a particular course. The consideration of direct attainment was 80% and indirect attainment was 20%.

The overall CO attainment is obtained with a weighted average of Direct and Indirect assessment and the assessment methodologies are shown below:

Direct Assessment (Theory Courses)	Sessional Examination (SE-I, SE-II)
	Assignment
	End Semester Examination
Indirect Assessment	Course exit Survey

A.3.1 Course Outcome Attainment through Cumulative Internal Examination (CIE):

i. Sessional Examination

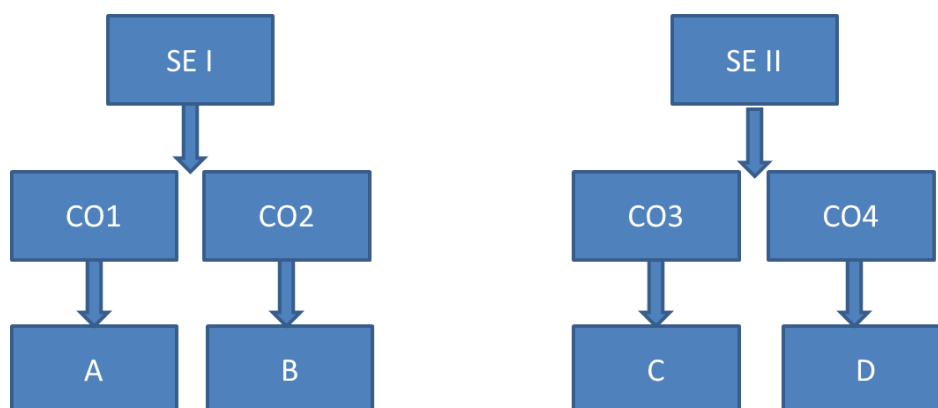


Fig 2.1. Contribution of COs in-sessional examination

Let us consider,

A - Contribution of CO1 in-sessional examination I

B - Contribution of CO2 in-sessional examination I

C - Contribution of CO3 in-sessional examination II

D – Contribution of CO4 in-sessional examination II

ii. Assignment

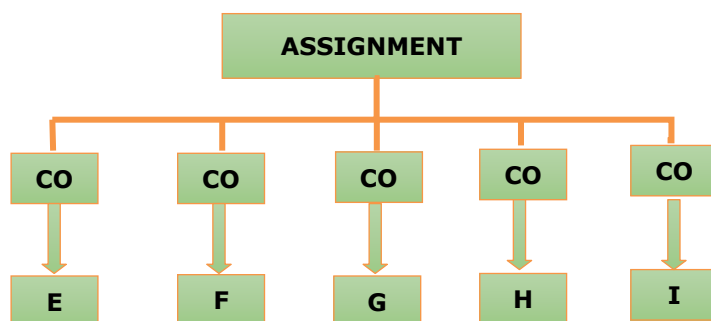


Fig 2.2. Contribution of COs in assignment

Let us consider,

E - Contribution of CO1 in Assignment.

F - Contribution of CO2 in Assignment.

G - Contribution of CO3 in Assignment.

H - Contribution of CO4 in Assignment.

I - Contribution of CO5 in Assignment

A.3.2. Course Outcome Attainment through Semester End Examination (SEE)

i. End Semester Examination

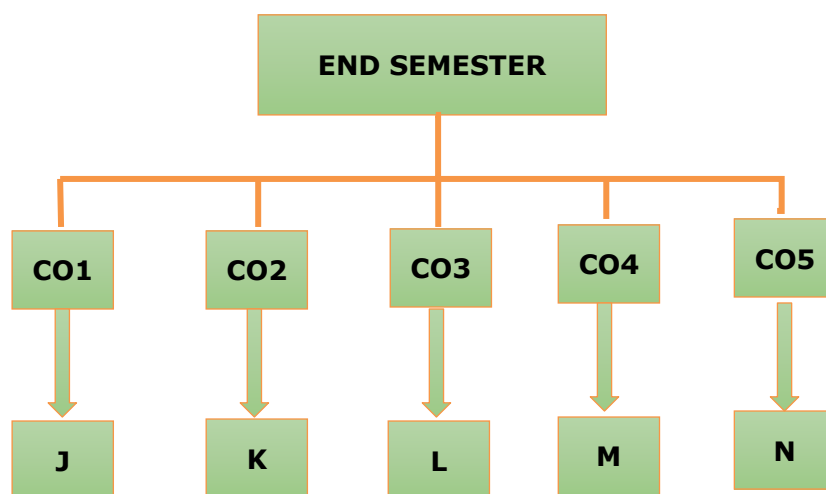


Fig 2.3. Assessment process of CO attainment for End semester

Let us consider,

J - Attainment of CO1 in the End semester exam

K - Attainment of CO2 in the End semester exam

L - Attainment of CO3 in the End semester exam

M - Attainment of CO4 in the End semester exam

N - Attainment of CO5 in the End semester exam

To calculate the direct attainment 50% of total internal attainment score and 50% of external attainment scores for each student was calculated.

Direct Assessment	Cumulative Internal Assessment	50% of attainment
	End Semester Examination	50% of attainment

A.3.3 Attainment level

Initially, attainment levels for overall CO attainment are calculated as in Fig 2.4.

<u>Attainment Level</u>
0 - Less than 60% of students attained the bench mark score
1 - 60% - 70% of students attained the bench mark score
2 - 70% - 80% of students attained the bench mark score
3 - 80% - 100% of students attained the bench mark score

Fig 2.4. Attainment level indicators

The attainment level is calculated by referring to the Fig 2.4, which is clearly stated that if the attainment value is less than 60% then the attainment level is 0, if the attainment value is less than 70% and greater than 60% then the attainment level is 1, if attainment value is less than 80% and greater than 70% then the attainment level is 2 and finally attainment value greater than 80% then the attainment level is 3.

In-Direct CO attainment

Course exit survey:




Course exit survey is conducted to analyze the CO attainment, at the end of every semester. The survey form includes questionnaires for the entire COs with a provision to mark whether the course has supported building the knowledge. Students will tick on the appropriate column in five-point scales. Considerations on surveys are made as the marks calculated based on normalized value.

Overall CO attainment

The overall CO attainment is calculated from direct and indirect assessments for individual courses. The weightage given for direct assessment is 80% and 20% for indirect attainment.

B. The quality /relevance of assessment processes & tools used

Table 2.4 Quality of assessment tools

<i>Assessment Tool</i>		<i>Description</i>
<i>Direct Assessment Tools</i>	<i>Sessional Examinations</i>	<ul style="list-style-type: none"> ☐ Two Sessional Examinations (SE) will be conducted for every course ☐ SE-I evaluates CO1 and CO2 ☐ SE-II evaluates CO3, and CO4 ☐ The question papers are strictly prepared based on Bloom's taxonomy. ☐ The quality of question papers is ensured as follows. <p style="text-align: center;">Course teacher- Prepares the QP according to Bloom's Taxonomy</p> <p style="text-align: center;"></p> <p style="text-align: center;">Course Coordinator- Verifies the QP</p> <p style="text-align: center;"></p> <p style="text-align: center;">Module Coordinator- Verifies the QP for understanding levels</p> <p style="text-align: center;"></p> <p style="text-align: center;">Program Coordinator- Approves</p> <ul style="list-style-type: none"> ☐ The IQAC office allocates internal experts to audit the question paper and answer scripts in the name of pre-audit and post-audit to ensure quality.
	<i>End Semester Examination</i>	<ul style="list-style-type: none"> ☐ Two sets of question papers for each course are prepared following Bloom's taxonomy by internal experts. ☐ Another set of question papers for each course is prepared following Bloom's taxonomy by external experts from reputed institutions like NIT and other renowned institutions. ☐ The End semester examination evaluates CO1, CO2, CO3, CO4 and CO5. ☐ Valuation is done by external experts ☐ The controller of examination allocates internal and external experts to audit the question paper before the examination to maintain the curriculum content and to avoid conflict on examinations. And also, to ensure the quality of valuation controller of examination, allocate external experts for post auditing the corrected papers.

Direct Assessment Tools	Assignment	Five assignments will be given for every course corresponding to the COs. Assignment 1(A1) will meet the CO1 and similarly the other assignments will meet the corresponding COs. The assignments are given based on the knowledge level of COs.
	Observation (Laboratory Sessions, Practical Examination)	<p>☐ The practical sessions are evaluated based on the rubrics assigned as follows with correlation levels</p> <ul style="list-style-type: none"> • Viva-voce • Observation • Programming knowledge • Usage of modern tools • Analysis • Result
	Project Works	<p>Mini Project</p> <p>☐ The mini-project provides an opportunity for students to demonstrate independence and originality, to plan and organize a project over a given period, and to put into practice, the techniques that have been taught.</p> <p>☐ Students must identify a problem and carry out a mini project on the problem defined. Two reviews are conducted. Marks are awarded based on the rubrics defined by the project coordinator.</p> <p>Main Project</p> <p>☐ Ten credits are allocated for project work</p> <p>☐ Project Review Committee constituted by the project coordinator and the continuous internal assessment evaluated by them based on the rubrics assigned by the project coordinator</p> <p>☐ External experts evaluate the projects based on the rubrics assigned by the project coordinator.</p>
Indirect Assessment Tools	Course end Survey	<p>☐ Survey has been taken for all the courses at the end of Semester</p> <p>☐ Collect a variety of information about course outcomes from the students after learning entire courses.</p> <p>☐ The questionnaires are framed by the course coordinator to ensure the knowledge levels of all the course outcomes of the corresponding course.</p> <p>☐ The survey is evaluated based on the correlation levels (strong, medium, and low) against all the course outcomes of the corresponding course.</p>

C. Record the attainment of Course Outcomes of all courses with respect to set attainment levels

A sample of attainment of COs of various courses are presented in Table 2.5.

Table 2.5 CO Attainment for Batch 2018 – 2020

Sem	CourseCode	CourseName	CO direct attainment	CO Indirect attainment	Overall CO attainment
I	BIT18R5001	Bioprocess and Bioseparation Technology	2.40	2.40	2.40
	BIT18R5002	Advanced Bioinformatics	2.70	2.80	2.72
	BIT18R5003	Immunotechnology	2.70	2.80	2.72
	BIT18R5013	Biofuels	2.70	2.60	2.68
	BIT18R5081	Advanced Immunology Laboratory	3.00	2.40	2.88
	BIT18R5082	Bioinformatics and Drug Design Laboratory	3.00	3.00	3.00
	MAT18R5002	Statistics and Computational Techniques	2.70	2.80	2.72
II	BIT18R5004	Genomics and Proteomics	2.70	2.80	2.72
	BIT18R5005	Bioprocess Modelling and Simulation	2.70	2.60	2.68
	BIT18R5006	Research Methodology	1.50	3.00	1.80
	BIT18R5011	Microbial Technology	2.70	2.80	2.72
	BIT18R5012	Bioprocess Plant and Equipment Design	2.40	2.20	2.36
	BIT18R5083	Recombinant DNA Technology Laboratory	3.00	3.00	3.00

	BIT18R5084	Bioprocess Engineering Laboratory	3.00	3.00	3.00
	BIT18R6006	Stem Cell Technology	3.00	3.00	3.00
	BIT18R6097	Mini Project	3.00	3.00	3.00
III	BIT18R6002	Drug Design and Targeting	2.40	2.20	2.36
	BIT18R6003	Metabolic Regulation and Metabolomics	2.10	3.00	2.28
	BIT18R6009	Bio-Entrepreneurship	2.10	3.00	2.28
	BIT18R6098	Project Phase- I	3.00	3.00	3.00
	MEC18R6052	Safety in Construction	2.10	3.00	2.28
IV	BIT18R6099	Project Phase II	3.00	3.00	3.00

2.2.2 POs attainment level with observations (20)

The Program attainment of a particular student is based on his academic curriculum, which includes:

- (i) Theory courses
- (ii) Practical / Laboratory courses
- (iii) Project courses

Table 2.6 describes the list of assessment tools used to calculate the POs directly. The assessment tools used to attain POs is mapped and tabulated as follows:

Table 2.6 Assessment tools for POs

<i>Direct Assessment</i>							
<i>Assessment Tools</i>	<i>Frequency (per course)</i>	<i>Responsible Person to conduct the Assessment</i>	<i>Program Outcomes (PO)</i>				
			<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Assignment</i>	Five in a semester	Course Teacher	X	X	X	X	X
<i>Sessional Examinations</i>	Two in a semester	COE	X	X	X	X	X
<i>End Semester</i>	Once in a semester	COE	X	X	X	X	X
<i>Project (Review)</i>	Thrice in a semester	Project Review Committee	X	X	X	X	X
<i>Laboratory Sessions</i>	Fifteen Sessions in a semester	Course Teacher	X	X	X	X	X
<i>Laboratory / Practical Examination (Model , End Semester)</i>	Once in a Semester	Course Coordinator	X	X	X	X	X
<i>Indirect Assessment</i>							
<i>Graduate Survey</i>	Yearly	Class Coordinator	X	X	X	X	X
<i>Alumni survey</i>	Yearly	Class Coordinator	X	X	X	X	X
<i>Employer survey</i>	Yearly	Class Coordinator	X	X	X	X	X
<i>Course exit survey</i>	Semester	Course Coordinator	X	X	X	X	X

Table 2.7 describes the list of assessment tools used to calculate the POs indirectly.

Table 2.7 List of Indirect Assessment Tool/ Processes used for PO attainment

<i>S. No</i>	<i>Assessment Tool</i>	<i>Method Description / Processes</i>
1.	<i>Alumni survey</i>	1. Survey made with a set of Questionnaires which was prepared based on POs. 2. These surveys have been taken with Passed out Students.
2.	<i>Graduate Survey</i>	1. Survey made with a set of Questionnaires which was prepared based on POs. 2. These surveys have been taken with the graduate of the academic year.
3.	<i>Employer Survey</i>	1. Survey made with a set of Questionnaires which was prepared based on POs. 2. These surveys have been taken with the employer of the passed-out students.

Direct Assessment

The POs are quantitatively measured by assigning weights for the correlation of CO and POs of a particular course. The weights assumed for the analysis are as: w1, w2, and w3 for strong, medium, and low correlation respectively.

Where:

w1 = 3/3 = 1 for strong correlation

w2 = 2/3 = 0.67 for medium correlation and

w3 = 1/3 = 0.33 for low correlation.

$$PO = \frac{\sum_{Wi=1}^3 Wi \times CO \text{ attainment}}{\sum_{Wi=1}^3 Wi \times No. of Subjects}$$

Similarly, a procedure has been followed to calculate for PO attainment whole batch result. The model calculation for PO attainment for the first program outcome PO1 is given in Table 2.8.

Table 2.8 Model calculation for PO1 attainment for 2018 – 2020 batch

<i>Sub Code</i>	<i>PO1 Correlation</i>	<i>CO Attained</i>	<i>Model Calculation [Wi X CO Attained]</i>	<i>Normalized Value</i>
BIT18R5001	3	2.4	$\Rightarrow 1 \times 2.4$	2.40
BIT18R5002	2	2.72	$\Rightarrow 0.67 \times 2.72$	1.82
BIT18R5003	3	2.72	$\Rightarrow 1 \times 2.72$	2.72
BIT18R5013	3	2.68	$\Rightarrow 1 \times 2.68$	2.68
BIT18R5081	3	2.88	$\Rightarrow 1 \times 2.88$	2.88
BIT18R5082	3	3	$\Rightarrow 1 \times 3$	3.00
MAT18R5002	3	2.72	$\Rightarrow 1 \times 2.72$	2.72
BIT18R5004	2	2.72	$\Rightarrow 0.67 \times 2.72$	1.82
BIT18R5005	2	2.68	$\Rightarrow 0.67 \times 2.68$	1.80
BIT18R5006	3	1.8	$\Rightarrow 1 \times 1.8$	1.80
BIT18R5011	3	2.72	$\Rightarrow 1 \times 2.72$	2.72
BIT18R5012	2	2.36	$\Rightarrow 0.67 \times 2.36$	1.58
BIT18R5083	3	3	$\Rightarrow 1 \times 3$	3.00
BIT18R5084	2	3	$\Rightarrow 0.67 \times 3$	2.01
BIT18R6006	2	3	$\Rightarrow 0.67 \times 3$	2.01
BIT18R6097	3	3	$\Rightarrow 1 \times 3$	3.00
BIT18R6002	2	2.36	$\Rightarrow 0.67 \times 2.36$	1.58
BIT18R6003	2	2.28	$\Rightarrow 0.67 \times 2.28$	1.53
BIT18R6009	0	2.28	$\Rightarrow 0 \times 2.28$	0
BIT18R6098	3	3	$\Rightarrow 1 \times 3$	3.00
MEC18R6052	0	2.28	$\Rightarrow 0.33 \times 2.28$	0
BIT18R6099	3	3	$\Rightarrow 1 \times 3$	3.00

Table 2.9 shows the Direct PO attainment contribution from individual courses for the Batch 2018-2020.

S.No .	Course Code	Course Name	PO1	PO2	PO3	PO4	PO5
1	BIT18R5001	Bioprocess and Bioseparation Technology	2.4	1.58	1.58	2.4	0.792
2	BIT18R5002	Advanced Bioinformatics	1.82	2.72	1.79		2.72
3	BIT18R5003	Immunotechnology	2.72	1.79	1.79	1.79	2.72
4	BIT18R5013	Biofuels	2.68		2.68	1.768	1.768
5	BIT18R5081	Advanced Immunology Laboratory	2.88		2.88	1.900	0.950
6	BIT18R5082	Bioinformatics and Drug Design Laboratory	3	0.99	1.98	3	3
7	MAT18R5002	Statistics and Computational Techniques	2.72		2.72	2.72	2.72
8	BIT18R5004	Genomics and Proteomics	1.82		2.72	0.897	2.72
9	BIT18R5005	Bioprocess Modelling and Simulation	1.8		0.88	2.68	2.68
10	BIT18R5006	Research Methodology	1.8	1.8	1.18	1.18	1.188
11	BIT18R5011	Microbial Technology	2.72		2.72	2.72	
12	BIT18R5012	Bioprocess Plant and Equipment Design	1.56		2.36	2.36	0.7788
13	BIT18R5083	Recombinant DNA Technology Laboratory	3		3	1.98	1.98
14	BIT18R5084	Bioprocess Engineering Laboratory	2.01		1.98	3	3
15	BIT18R6006	Stem Cell Technology	2.01	1.98	1.98	3	
16	BIT18R6097	Mini Project	3	3	3	3	3
17	BIT18R6002	Drug Design and Targeting	1.58		1.55	2.36	1.557
18	BIT18R6003	Metabolic Regulation and Metabolomics	1.53		1.50		
19	BIT18R6009	Bio-Entrepreneurship				1.50	
20	BIT18R6098	Project Phase- I	3	3	3	3	3
21	MEC18R6052	Safety in Construction					
22	BIT18R6099	Project Phase II	3	3	3	3	3

Tables 2.10 and 2.11 show the Direct and Indirect PO attainment for the Batch 2018-2020.

Table 2.10 shows the Direct PO attainment for the Batch 2018-2020.

<i>PO Attainment</i>	<i>PO1</i>	<i>PO2</i>	<i>PO3</i>	<i>PO4</i>	<i>PO5</i>
<i>Direct Attainment</i>	2.34	2.21	2.22	2.33	2.21

Table 2.11 shows the Indirect PO attainment for the Batch 2018-2020

<i>PO Attainment</i>	<i>PO1</i>	<i>PO2</i>	<i>PO3</i>	<i>PO4</i>	<i>PO5</i>
<i>Program Exit Survey</i>	3	3	3	3	3
<i>Employer Survey</i>	3	3	3	3	2
<i>Alumni Survey</i>	3	3	3	3	3
<i>Average</i>	3	3	3	3	2.75

PO Attainment level will be 80% of Direct Assessment + 20% of Indirect Assessment

For Example: PO1 attained 2.34 from direct assessment and 3 from indirect assessment. So final PO attainment is

$$[\text{PO1 Direct} \times 80\%] + [\text{PO1 Indirect} \times 20\%]$$

$$2.34 \times 0.8 + 3 \times 0.2$$

$$2.47 > \text{Target Value (1.7)}$$

Therefore, PO1 has been attained because the target fixed by the Program Advisory Committee for PO attainment was “1.7”.

Similarly, the POs are calculated and tabulated in table 2.12.

Table 2.12 shows the Overall PO Attainment for the Batch 2018-2020

<i>PO Attainment</i>	<i>PO1</i>	<i>PO2</i>	<i>PO3</i>	<i>PO4</i>	<i>PO5</i>
<i>Direct Attainment</i>	2.34	2.21	2.22	2.33	2.21
<i>Indirect Attainment</i>	3	3	3	3	3
<i>Overall Attainment</i>	2.47	2.37	2.38	2.46	2.37

CRITERION 3	STUDENTS' PERFORMANCE	75
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The sanctioned intake of the program is 12. The students are admitted through either GATE or through the PG entrance conducted by the university.

Item	CAY	CAY_{m1}	CAY_{m2} (LYG)	CAY_{m3} (LYG_{m1})	CAY_{m4} (LYG_{m2})
Sanctioned intake of the program (<i>N</i>)	12	12	12	12	12
Total number of students admitted through GATE (<i>N1</i>)	0	2	0	0	0
Total number of students admitted through PG Entrance and others (<i>N2</i>)	7	10	11	2	3
Total number of students admitted in the Program (<i>N1 + N2</i>)	7	12	11	2	3

Year of entry	<i>N1 + N2</i>	Number of students who have successfully graduated	
		I Year	II Year
CAY	7		
CAY _{m1}	12	12	
CAY _{m2} (LYG)	11	11	11
CAY _{m3} (LYG _{m1})	2	2	2
CAY _{m4} (LYG _{m2})	3	3	3

Table: 3.1.2 Number of students who have successfully graduated

3.1. Enrolment Ratio through GATE (20)

Item (Students enrolled at the First Year Level on average basis during the last three years starting from Current Academic Year)	Marks
<20% students enrolled through GATE	0

Table: 3.1.3 Enrolment Ratio through GATE

3.2. Success Rate in the stipulated period of the program (20)

All the admitted students in first year of same batch have completed the program in stipulated duration.

Item	Latest Year of Graduation, LYG (2019-20)	Latest Year of Graduation minus 1, LYGm1 (2018-19)	Latest Year of Graduation minus 2 LYGm2 (2017-18)
X Number of students admitted in first year of same batch	2	3	4
Y Number of students completing program in stipulated duration	2	3	4
Success Index [SI = Y / X]	1	1	1

Table: 3.2.1 Success Rate in the stipulated period of the program

Average SI [(SI1 + SI2 + SI3) / 3]: 1.00

Assessment [20 * Average SI]: 20.00

3.3. Placement, Higher Studies and Entrepreneurship (20)

Experts from industry and academia are invited to provide theoretical and practical advantage to students on the latest technologies in the industry. This helps students in their placement and higher studies. Efforts are taken by the Department of Biotechnology to ensure 100% placements for all the eligible students. The institution has a very active Training and Placement Section which is part of the Office of Corporate Relations. Department of Biotechnology emphasizes greater importance towards Competitive Examinations using which the students can enter into top institutions for their higher studies and research career.

Item	CAYm1	CAYm2	CAYm3
No. of students placed in companies or Government Sector (x)	9	7	2
No. of students pursuing Ph.D. / JRF/ SRF(y)	3	4	0
No. of students turned entrepreneur in engineering/technology (z)	0	0	0

$x + y + z =$	12	11	2
Placement Index : $(x + y + z)/N$	1	1	1
Average placement = $(P1 + P2 + P3)/3$	1		
Assessment Points = $20 \times$ average placement	20		

Table: 3.3.1 Placement, Higher Studies and Entrepreneurship

3.3.1a. Placement data:

Programs Name and Assessment Year: PG Biotechnology				
S. No.	Name of the student placed	Enrollment no.	Name of the Employer	Appointment letter reference no. with date
1	Radhalakshmi C	9918102001	AlgalR Nutra Pharms Pvt. Ltd. Thanjavur	ALR-23954/19.1.2020
2	Shobana A	9918102003	Visionary RCM	VISSHO25112019
3	Sundara Pandian V	9919102004	AlgalR Nutra Pharms Pvt. Ltd. Thanjavur	ALRSUN
4	Aanandhalakshmi R	9919102011	SPI Global, Chennai	SPI/OL/BKS/2020/2127
5	Divyabharathi R	9919102007	Lumina Datamatics, Chennai	LUMDIV09112020
6	Jemmy Joy G	9919102008	Lumina Datamatics, Chennai	LUMJEM09112020
7	Arun Robin Babu A	9919102001	Lumina Datamatics, Chennai	LUMARU09112020
8	Gowtham P S	9919102002	Lumina Datamatics, Chennai	LUMGOW09112020
9	Poornimaa B	9919102003	Lumina Datamatics, Chennai	LUMPOO09112020
10	Premkumar K	9920102012	Molecular Connections	MOLPRE
11	Ramalakshmi G	9920102015	Thryve	THRRAM09052022
12	Dhanapradeepa V	9920102017	Molecular Connections	MOLDHA
13	P. Bazeera Ferdhous	9920102002	Thryve	THRDAZ09052022
14	S. Praseetha	9920102011	SPI Technologies	SPI/OL/BKS/2022/3740
15	Oviya S	9920102005	Thryve	THROVI09052022
16	D. Bhoobalan	9920102016	Thryve	THRBHO09052022
17	F. Angelin Jenit	9920102010	Karpagam Academy of Higher Education	ANGKAR
18	M. Pooja Vaisnavi	9920102006	Thryve	THRPOO09052022

Table 3.3.1a Placement data

3.4 Professional Activities (15)

Student's participation in Professional societies/chapters and organizing Engineering events (5)

The post-graduate students are encouraged to participate in various professional events to enrich their knowledge, to network with senior scientists in the field and to present their research findings. The department also organizes various events with the help of professional societies such as Indian Association of Applied Microbiologists (IAAM). The local chapter of Indian Association of Applied Microbiologists is active in our institution. The following events are organized:

Table 3.4.1 Engineering Events organized by the Department

S. NO.	NAME OF THE PROGRAMME	DATE
1	National Conference on "Innovations in Biotechnology for Sustainable Life"	23.04.2022
2	One Day Workshop on "Lab Safety and Management"	20.04.2022
3	Industry Expert Guest Lecture on "What are the expectations of a hiring manager and how to prepare a candidate: Interactions on the industry perspective"	05.04.2022
4	One Day Workshop on "Nurturing and Transforming Research"	11.03.2022
5	2 nd National Conference on "Innovations in Bio and Chemical Engineering for Sustainable Life"	20.05.2021 - 21.05.2021
6	Virtual Workshop on "Biotechniques for Extraction of Metabolites from Plant and Microalgae Sources"	11.05.2020 - 12.05.2020
7	Online Workshop on "Bread, Butter and Biotechnology"	13.05.2020 - 14.05.2020
8	Virtual Workshop on "Protein and Genome Bioinformatics"	15.05.2020
9	Webinar on "What's New About Sars-Cov-2?"	03.06.2020
10	Webinar on "Vaccines: The Covid-19 Challenge"	04.06.2020
11	Webinar on "Is Ventilator a Double-Edged Sword?"	05.06.2020
12	Webinar on "Missing Links in The Enemy Territory."	06.06.2020
13	Webinar on "Does Complement Cascade a Culprit?"	10.06.2020
14	Webinar on "Viral Diagnosis: The Covid-19 Scenario"	11.06.2020

15	Virtual Conference on Innovations in Bio and Chemical Engineering for Sustainable Life	08-09.06.2020
16	Virtual Workshop on "Caterpillar to Butterfly 2.0 – Personality Development"	04.06.2020-06.06.2020
17	Virtual Workshop on "Protein Bioinformatics"	08.06.2020-10.06.2020
18	Virtual Workshop on "Plant Bioinformatics"	11.06.2020-12.06.2020
19	Virtual Workshop on "Waste –an Offer Letter"	11.06.2020
20	Virtual Workshop on "Understanding Proteins in the Post-Genomic Era"	13.06.2020-14.06.2020
21	Virtual Workshop on " From Student To Bio Entrepreneur"	14.06.2020
22	Virtual Workshop on " The Era Of Digital Bioprocessing: Exploitation of Matlab For Bioprocess Engineers"	17.06.2020-18.06.2020
23	Virtual Workshop on " Biofirm - Scaling Lab2market"	18.06.2020-20.06.2020
24	Virtual Workshop on " Basic Animal Handling Techniques"	19.06.2020
25	Virtual Conference on Innovation In Interdisciplinary Research 2020	23-24.06.2020
26	Workshop on “Metagenomics”	29.06.2020
27	Virtual Workshop on “Biologically Inspired Nanomaterials”	30.06.2020
28	International Virtual Workshop on “Experiment, Data, Report and Beyond-2020”	15.07.2020-16.07.2020
29	Virtual Workshop on “Python Programming”	08.07.2020-17.07.2020
30	Workshop on “Recent Trends in Functional Proteomics”	06-07.07.2020
31	Virtual Symposium on Origene 2k20	16.08.2020
32	Webinar on “Technology for Effective Presentation”	08-08-2020
33	Indo-Us Workshop on Thermophilic Bioprocessing	01-02.01.2019
34	Indo-Us Workshop on Extremophiles in Biotechnology	27-28.11. 2019
35	17 th IAAM Annual Conference on Microbiology in the New Millennium	29-30.11. 2019
36	Guest lecture on “Extremophiles and Deep Biosphere Microbes for Bioenergy Applications”	02.01.2018
37	Guest lecture on “Bioelectrochemical Interface Technologies for Energy Applications in Space”	02.01.2018

38	Guest lecture on “Defective Decidualization - a primer for preeclampsia”	04.01.2018
39	Guest lecture on “Agricultural challenges and opportunities”	06.01.2018
40	Guest lecture on “Societal Relevance of Ophthalmic Genetics”	06.01.18
41	Guest lecture on “Heavy metal removal by Algae derived activated carbon”	01.02.18
42	Guest lecture on “Biological Waste water treatment proces”	07.03.18
43	Entrepreneur Awareness Camp	15-03-2018
44	Techniques in Sustainable Urbanization	17-03-2018
45	One day Workshop on "Design of Experiments and Bioprocessoptimization"	22-03-2018
46	Biomasteros	18-08-2018
47	Guest lecture on “Functional Genomics of Plants"	20-09-2018
48	Workshop on “Basic Animal Cell Culture Techniques”	23-10-2018
49	Workshop on "Effective Report Writing And Presentation Skills"	26-10-2018

The list of events wherein our students participated is presented here in the following table:

Table 3.4.2 Students’ participation in engineering events

Reg. No.	Name	Batch	Event name	Organized by	Date
9921102006	Shruthi S	2021	PharmaNEST’3. E International Conference	JSS College of Pharmacy, Ooty	October 14 - 15, 2022
9921102005	Siva Bharathi V	2021	PharmaNEST’3. E International Conference	JSS College of Pharmacy, Ooty	October 14 - 15, 2022
9921102001	Derina J. Pearlin	2021	PharmaNEST’3. E International Conference	JSS College of Pharmacy, Ooty	October 14 - 15, 2022
9921102002	Karunya Sri C.M.	2021	PharmaNEST’3. E International Conference	JSS College of Pharmacy, Ooty	October 14 - 15, 2022
9920102009	Shalini M	2020	2 nd International Virtual Conference on Artificial Intelligence for Internet of Things	Vellore Institute of Technology, Vellore	April 7-8, 2022
9920102009	Shalini M	2020	National Conference on Innovations in Biotechnology for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	April 23, 2022
9920102002	Bazeera Ferdhous P	2020	3 rd International Conference on	National Institute of Technology, Delhi.	December 18-19, 2021

			Communication and Intelligent systems		
9920102002	Bazeera Ferdhous P	2020	2 nd Virtual International Conference on Naturopathy, Nanotechnology, Nutraceuticals and Immunotherapy in Cancer Research-2021	B.S. Abdur Rahman Crescent Institute of Science and Technology, Chennai	June 11-12, 2021
9920102011	Praseetha S	2020	Virtual Conference on Innovation in Bio and Chemical Engineering for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-9,2020
9920102006	Pooja Vaisnavi M	2020	International Conference on Sustainable Materials and Innovative Techniques (ICSMIT'22)	Kamaraj College of Engineering and Technology, Virudhunagar	March 18-19 2022
9920102006	Pooja Vaisnavi M	2020	National Conference on Innovations in Biotechnology for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	April 23,2022
9920102005	Oviya S	2020	National Conference on Innovations in Biotechnology for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	April 23,2022
9920102010	Angelin Jenit F	2020	First International Conference on Circular Economy for Sustainable Water Management	IIT Madras, Chennai	March 23-25, 2022
9920102004	Kaliraj C	2020	National Conference on Innovations in Biotechnology for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	April 23,2022
9920102016	Bhoobalan D	2020	National Conference on Innovations in Biotechnology for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	April 23,2022
9919102009	Clayton Fernando R	2019	Two Day Virtual Workshop on Plant Bioinformatics	Kalasalingam Academy of Research and Education,	June 11-12, 2020

				Krishnankoil	
9919102009	Clayton Fernando R	2019	Virtual Workshop on Biologically Inspired Nanomaterials	Kalasalingam Academy of Research and Education, Krishnankoil	June 30, 2020
9919102009	Clayton Fernando R	2019	Virtual Workshop on Basic Animal Handling Techniques	Kalasalingam Academy of Research and Education, Krishnankoil	June 19, 2020
9919102009	Clayton Fernando R	2019	SPARC Indo-US Immunology Workshop	IIT, Ropar and George Washington University, USA	June 12-13, 2020
9919102009	Clayton Fernando R	2019	Virtual Workshop on Protein Bioinformatics	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-10, 2020
9919102009	Clayton Fernando R	2019	Virtual Workshop on Computer Aided Drug Design	St. Peter' College of Engineering and Technology, Avadi	July 27-30, 2020
9919102009	Clayton Fernando R	2019	International Virtual Workshop on Experiment, Data, Report and Beyond - 2020	Kalasalingam Academy of Research and Education, Krishnankoil	July 15-16, 2020
9919102009	Clayton Fernando R	2019	International Webinar on Perspectives on Vaccine Development for Covid-19: Race Against Time	Vinayaka Mission's Kirupananda Variyar Engineering College, Salem	June 6, 2020
9919102009	Clayton Fernando R	2019	International Webinar on Transgenic Plant Production – Theoretical and Practical Approach	Vinayaka Mission's Kirupananda Variyar Engineering College, Salem	May 18, 2020
9919102009	Clayton Fernando R	2019	National Webinar on Molecular Markers: Tools for Identification in Biology	PP Savani University, Dhamdod	July 4, 2020
9919102009	Clayton Fernando R	2019	Virtual Workshop on Python Programming	Kalasalingam Academy of Research and Education, Krishnankoil	July 8-17, 2020
9919102009	Clayton Fernando R	2019	International Webinar on Identification of	Safi Institute of Advanced Study,	June 21, 2020

			Neutralising Epitopes of a Mediterranean Virus	Vazhayur	
9919102009	Clayton Fernando R	2019	Webinar on Technology for Effective Presentation	Kalasalingam Academy of Research and Education, Krishnankoil	August 8, 2020
9919102009	Clayton Fernando R	2019	Webinar Series 2020 on Peptide Microarray and Covid 19 Diagnosis	Government Arts College for Women, Krishnagiri	June 20, 2020
9919102009	Clayton Fernando R	2019	Web series on Covid-19	Kalasalingam Academy of Research and Education, Krishnankoil	June 4-6, June 10-11, 2020
9919102009	Clayton Fernando R	2019	Webinar Session on Alternate Approaches to Vaccines and Therapeutics: Organoid Models for SARS-CoV2 and Mucosal Pathogenesis	Rajalakshmi Engineering College, Thandalam	May 2, 2020
9919102009	Clayton Fernando R	2019	Webinar on Fundamentals of Mass Spectrometry	Sri Venkateswara College of Engineering, Sriperumpudur	June 29, 2020
9919102009	Clayton Fernando R	2019	Covid-19 Webinar on Immunology Aspects of Coronavirus: Epitope Prediction and <i>in silico</i> Vaccine Design	LLB-school and CPMB&B, Tamil Nadu Agricultural University, Coimbatore	June 21, 2020
9919102009	Clayton Fernando R	2019	International Webinar on Molecular Imaging in Infectious Diseases	Stella Maris College, Chennai	June 5, 2020
9919102009	Clayton Fernando R	2019	Webinar on How to Publish Research Article in Reputed Journals	Sathyabama Institute of Science and Technology, Chennai	June 5, 2020
9919102009	Clayton Fernando R	2019	Webinar titled Essentials in Drug Design	Athmic Biotech Solutions, Kaliyoor	June 21, 2020
9919102009	Clayton Fernando R	2019	Webinar on Biomolecules / Molecular Aspects of Cellular Dysfunction in Alzheimer's Disease	Multidisciplinary Digital Publishing Institute	July 1, 2020
9919102009	Clayton Fernando R	2019	National Webinar on Medicine Plants and	Government P.G. College, Nagnath-	June 8, 2020

			Community Health	Pokhari	
9919102009	Clayton Fernando R	2019	Webinar on Chemistry and Biology of Natural Products	CSIR-NEIST, Jorhat	July 24-25, 2020
9919102009	Clayton Fernando R	2019	Basic Author Workshop Research Article Writing and Reference Management Using Mendeley	Annamalai University, Chidambaram	June 22, 2020
9919102009	Clayton Fernando R	2019	Expert Webinar on Insightful Introduction to MATLAB	Sri Venkateswara College of Engineering, Sriperumpudur	July 11, 2020
9919102009	Clayton Fernando R	2019	Webinar on Technology Assisted Antibody-Mimetic Discovery: Prospect in Identifying SARS-COV2 hits	Adamas University, Kolkata	June 6, 2020
9919102009	Clayton Fernando R	2019	17 th IAAM Annual Conference on Microbiology in the New Millennium	Kalasalingam Academy of Research and Education, Krishnankoil	November 29-30, 2019
9919102009	Clayton Fernando R	2019	Kalasalingam Global Conference KGC-2019	Kalasalingam Academy of Research and Education, Krishnankoil	December 18-20, 2019
9919102009	Clayton Fernando R	2019	Exhibition on Science in Everyday Life	Aravind Medical Research Foundation, Madurai	September 28, 2019
9919102009	Clayton Fernando R	2019	Indo-US Workshop on Extremophiles in Biotechnology	Kalasalingam Academy of Research and Education, Krishnankoil	November 27-28, 2019
9919102010	Kavitha A	2019	Webseries on Covid-19	Kalasalingam Academy of Research and Education, Krishnankoil	June 4, June 5, June 6, June 10, June 11, 2020
9919102010	Kavitha A	2019	International Webinar on Transgenic Plant Production – Theoretical	Vinayaka Mission's Kirupananda Variyar Engineering	May 18, 2020

			&Practical Approach	College, Salem	
9919102010	Kavitha A	2019	SPARCIndo-US Immunology Workshop	IIT, Ropar and George Washington University,USA	June 12-13, 2020
9919102010	Kavitha A	2019	Webinar on How to Write a Research Paper	Erode Senguthar Engineering College, Erode	May 15, 2020
9919102010	Kavitha A	2019	Virtual Workshop on Python Programming	Kalasalingam Academy of Research and Education, Krishnankoil	July 8-17, 2020
9919102010	Kavitha A	2019	Workshop on Recent Trends in Functional Proteomics	Kalasalingam Academy of Research and Education, Krishnankoil	July 6-7, 2020
9919102010	Kavitha A	2019	Virtual Workshop on Protein Bioinformatics	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-10, 2020
9919102010	Kavitha A	2019	Webinar Role of Chromosome in Plant Taxonomy	Viva College, Virar	June 15, 2020
9919102010	Kavitha A	2019	Two Day Virtual Workshop on Plant Bioinformatics	Kalasalingam Academy of Research and Education, Krishnankoil	June 11-12, 2020
9919102010	Kavitha A	2019	Virtual Symposium on Origene 2K20	Kalasalingam Academy of Research and Education, Krishnankoil	August 16, 2020
9919102010	Kavitha A	2019	Online Webinar on Microbiome –Perceptions and Perspectives	Biotechnika, Bengaluru	June 27, 2020
9919102010	Kavitha A	2019	Workshop on Metagenomics	Kalasalingam Academy of Research and Education, Krishnankoil	June 29, 2020

9919102010	Kavitha A	2019	International Webinar on Identification of Neutralising Epitopes of a Mediterranean Virus	Safi Institute of Advanced Study, Vazhayur	June 21, 2020
9919102010	Kavitha A	2019	Webinar on Advanced Ovarian Cancer Prolonging Survival in the Present Decade	International Association of Oncology, Chennai	July 25, 2020
9919102010	Kavitha A	2019	17 th IAAM Annual Conference on Microbiology in the New Millennium	Kalasalingam Academy of Research and Education, Krishnankoil	November 29-30, 2019
9919102010	Kavitha A	2019	International Virtual Workshop on Experiment, Data, Report and Beyond - 2020	Kalasalingam Academy of Research and Education, Krishnankoil	July 15-16, 2020
9919102010	Kavitha A	2019	Hands on Training in Computational Drug Design Approach	Karpaga Vinayaga College of Engineering and Technology, Madhuranthgam	August 10-12, 2020
9919102010	Kavitha A	2019	Webinar on Computational Biology of Disease Trends, Challenges and Opportunities	Sri Venkateswara College of Engineering, Sriperumpudur	May 28, 2020
9919102010	Kavitha A	2019	Webinar on Cell-Free Bioprocessing: Opportunities and Challenges	Sri Venkateswara College of Engineering, Sriperumpudur	May 30, 2020
9919102010	Kavitha A	2019	Virtual Workshop on Basic Animal Handling Techniques	Kalasalingam Academy of Research and Education, Krishnankoil	June 19, 2020
9919102002	Gowtham P.S.	2019	Virtual Conference on Innovation in Interdisciplinary Research 2020	Kalasalingam Academy of Research and Education, Krishnankoil	June 23-24, 2020
9919102011	Aanandhalakshmi R	2019	17 th IAAM Annual	Kalasalingam	November

			Conference on Microbiology in the New Millennium	Academy of Research and Education, Krishnankoil	29-30, 2019
9919102011	Aanandhalakshmi R	2019	Two Day Virtual Workshop on Plant Bioinformatics	Kalasalingam Academy of Research and Education, Krishnankoil	June 11-12, 2020
9919102011	Aanandhalakshmi R	2019	Virtual Workshop on Protein Bioinformatics	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-10, 2020
9919102011	Aanandhalakshmi R	2019	Indo-US Workshop on Extremophiles in Biotechnology	Kalasalingam Academy of Research and Education, Krishnankoil	November 27-28, 2019
9919102011	Aanandhalakshmi R	2019	National Level Quiz on Recent Advancements in Spectroscopy	KPR Institute of Engineering and Technology, Arasur	June 29-30, 2020
9919102011	Aanandhalakshmi R	2019	National Level Quiz on Frontiers in Chemistry	KPR Institute of Engineering and Technology, Arasur	July 6-7, 2020
9919102011	Aanandhalakshmi R	2019	E-Quiz on Chemistry	Sri Vinayaga College of Arts and Science, Ulundurpet	July 6, 2020
9919102011	Aanandhalakshmi R	2019	Webinar on Chemistry and Biology of Natural Products	CSIR-NEIST, Jorhat	July 24-25, 2020
9919102011	Aanandhalakshmi R	2019	Webinar on Technology for Effective Presentation	Kalasalingam Academy of Research and Education, Krishnankoil	August 8, 2020
9919102011	Aanandhalakshmi R	2019	International Webinar on Role of Diagnostics in Drug Development and Review of Novel Diagnostics for Covid-19	Government Arts College, Kumbakonam	September 19, 2020
9919102011	Aanandhalakshmi R	2019	Webseries on Covid-19	Kalasalingam Academy of Research and Education,	June 5, June 6, 2020

				Krishnankoil	
9919102011	Aanandhalakshmi R	2019	Webinar on Microalgal Genes – the Novel Therapeutic Tool to Engineer Crop Plants	Sri Venkateswara College of Engineering, Sriperumpudur	June 9, 2020
9919102011	Aanandhalakshmi R	2019	Webinar on Perspectives on the Biological Effects of Radiation Exposure	Sri Venkateswara College of Engineering, Sriperumpudur	June 12, 2020
9919102011	Aanandhalakshmi R	2019	National Webinar on Molecular Markers: Tools for Identification in Biology	PP Savani University, Dhamdod	July 4, 2020
9919102011	Aanandhalakshmi R	2019	International Virtual Workshop on Experiment, Data, Report and Beyond - 2020	Kalasalingam Academy of Research and Education, Krishnankoil	July 15-16, 2020
9919102011	Aanandhalakshmi R	2019	Virtual Workshop on Python Programming	Kalasalingam Academy of Research and Education, Krishnankoil	July 8-17, 2020
9919102011	Aanandhalakshmi R	2019	Workshop on Recent Trends in Functional Proteomics	Kalasalingam Academy of Research and Education, Krishnankoil	July 6-7, 2020
9919102011	Aanandhalakshmi R	2019	Virtual Workshop on the Era of Digital Bioprocessing: Exploitation of MATLAB for Bioprocess Engineers	Kalasalingam Academy of Research and Education, Krishnankoil	June 17-1, 2020
9919102011	Aanandhalakshmi R	2019	30 th International Virtual Learning Series	Arulmigu Kalasalingam College of Pharmacy, Krishnankoil	July 4, 2020
9919102011	Aanandhalakshmi R	2019	Webinar Series 2020 on Peptide Microarray and Covid 19 Diagnosis	Government Arts College for Women, Krishnagiri	June 20, 2020
9919102008	Jemmy Joy G	2019	Virtual Workshop on Basic Animal Handling Techniques	Kalasalingam Academy of Research and Education,	June 19, 2020

				Krishnankoil	
9919102008	Jemmy Joy G	2019	Webseries on Covid-19	Kalasalingam Academy of Research and Education, Krishnankoil	June 10, June 11, 2020
9919102008	Jemmy Joy G	2019	3 Day International E-Workshop on Docking, QSAR and Molecular Dynamics	Ramaiah University of Applied Sciences, Bengaluru	July 29-31, 2020
9919102008	Jemmy Joy G	2019	International Virtual Workshop on Experiment, Data, Report and Beyond - 2020	Kalasalingam Academy of Research and Education, Krishnankoil	July 15-16, 2020
9919102008	Jemmy Joy G	2019	International E-Conference on Frontiers in Industrial Biotechnology	St. Joseph's College of Engineering, Chennai	July 27-29, 2020
9919102008	Jemmy Joy G	2019	Virtual Workshop on Biologically Inspired Nanomaterials	Kalasalingam Academy of Research and Education, Krishnankoil	June 30, 2020
9919102008	Jemmy Joy G	2019	Virtual Conference on Innovations in Bio and Chemical Engineering for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-9, 2020
9919102008	Jemmy Joy G	2019	Workshop on Recent Trends in Functional Proteomics	Kalasalingam Academy of Research and Education, Krishnankoil	July 6-7, 2020
9919102008	Jemmy Joy G	2019	Online National Level E-Quiz Competition on Life Science	Dr. C.V. Raman University, Bilaspur	July 30-31, 2020
9919102008	Jemmy Joy G	2019	National Webinar on Marine Research and Aqua culture	Sathyabama Institute of Science and Technology, Chennai	July 22-28, 2020
9919102004	Sundara Pandian V	2019	Virtual Workshop on Basic Animal Handling Techniques	Kalasalingam Academy of Research and Education, Krishnankoil	June 19, 2020

9919102004	Sundara Pandian V	2019	Virtual Workshop on Biologically Inspired Nanomaterials	Kalasalingam Academy of Research and Education, Krishnankoil	June 30, 2020
9919102004	Sundara Pandian V	2019	Workshop on Recent Trends in Functional Proteomics	Kalasalingam Academy of Research and Education, Krishnankoil	July 6-7, 2020
9919102004	Sundara Pandian V	2019	International Virtual Workshop on Experiment, Data, Report and Beyond - 2020	Kalasalingam Academy of Research and Education, Krishnankoil	July 15-16, 2020
9919102004	Sundara Pandian V	2019	3 Day International E-Workshop on Docking, QSAR and Molecular Dynamics	Ramaiah University of Applied Sciences, Bengaluru	July 29-31, 2020
9919102004	Sundara Pandian V	2019	Virtual Conference on Innovations in Bio and Chemical Engineering for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-9, 2020
9919102004	Sundara Pandian V	2019	International E-Conference on Frontiers in Industrial Biotechnology	St. Joseph's College of Engineering, Chennai	July 27-29, 2020
9919102004	Sundara Pandian V	2019	Web series on Covid-19	Kalasalingam Academy of Research and Education, Krishnankoil	June 4, June 5, June 6, June 10, June 11, 2020
9919102004	Sundara Pandian V	2019	30 th International Virtual Learning Series	Arulmigu Kalasalingam College of Pharmacy, Krishnankoil	July 4, 2020
9919102004	Sundara Pandian V	2019	International Webinar Lecture Series on "Biological Sciences"	Jamal Mohamed College, Tiruchirappalli	July 6-8, 2020
9919102004	Sundara Pandian V	2019	National Webinar on Marine Research and Aquaculture	Sathyabama Institute of Science and Technology, Chennai	July 22-28, 2020

9919102004	Sundara Pandian V	2019	Webinar on E-Publishing	Queen Mary's College, Chennai	August 1, 2020
9919102003	Poornimaa B	2019	International Webinar on Role of Diagnostics in Drug Development and Review of Novel Diagnostics for Covid-19	Government Arts College, Kumbakonam	September 19, 2020
9919102003	Poornimaa B	2019	Virtual Workshop on Basic Animal Handling Techniques	Kalasalingam Academy of Research and Education, Krishnankoil	June 19, 2020
9919102003	Poornimaa B	2019	International Webinar Lecture Series on "Biological Sciences"	Jamal Mohamed College, Tiruchirappalli	July 6-8, 2020
9919102003	Poornimaa B	2019	National Online Quiz on COVID-19	DIT University, Dehradun	May 25, 2020
9919102003	Poornimaa B	2019	COVID-19 Awareness Program Online Quiz	Periyar Maniammai Institute of Science and Technology	May 22, 2020
9919102003	Poornimaa B	2019	One Day Webinar on Covid-19 and Mental Health: Opportunities and Challenges	Narmadabai Bodkhe Adhyapak Mahavidyalaya	July 11, 2020
9919102003	Poornimaa B	2019	Webinar – Stepping into the Future of Environmental Studies	Seutus Waste Management Technologies Pvt. Ltd	June 21, 2020
9919102003	Poornimaa B	2019	International Virtual Workshop on Experiment, Data, Report and Beyond - 2020	Kalasalingam Academy of Research and Education, Krishnankoil	July 15-16, 2020
9919102003	Poornimaa B	2019	Webinar Series on "Fermentation Technology"	Guru Nanak College, Chennai	July 13-16, 2020
9919102003	Poornimaa B	2019	Webinar - Herb & Drug Interaction	VIVA College	July 6, 2020
9919102003	Poornimaa B	2019	International Conference on Physiological Diseases- 2020	Bharathidasan University, Nanyang Technological University, Bharathiar University, Kalsalingam	October 14-15, 2020

				Academy of Research and Education	
9919102003	Poornimaa B	2019	International e-Conference on Bioengineering for Health & Environment	Sathyabama Institute of Science and Technology, Chennai and MAHSA University, Malaysia	July 16-17, 2020
9919102003	Poornimaa B	2019	One Day Online Session on Learn to Live- Attitude and Skills to Face the Future	A.P.C. Mahalaxmi College for Women	July 8, 2020
9919102003	Poornimaa B	2019	Six Days National Webinar Lecture Series on “Biotechnology Concepts to Practice”	Sathyabama Institute of Science and Technology	July 6-11, 2020
9919102003	Poornimaa B	2019	AARI Bioscience World Wide Webinar Series Session-XIII	CHRIST, Bengaluru	July 10, 2020
9919102003	Poornimaa B	2019	Webinar on “Recent Trends in Medical Microbiology”	Idhaya College for Women, Kumbakonam	July 2, 2020
9919102003	Poornimaa B	2019	SPSR Talk on “Hair Fall Management, Diet and Homeopathy Treatment”	Society of Pharmaceutical Sciences and Research	July 5, 2020
9919102003	Poornimaa B	2019	Virtual Symposium on the Recent Trends in Aquaculture Industries	Sathyabama Institute of Science and Technology, Chennai	July 20-25, 2020
9919102003	Poornimaa B	2019	Webinar on “Understanding Biodiversity”	Marudupandiyar College, Thanjavur	July 6, 2020
9919102003	Poornimaa B	2019	Virtual Conference on Innovations in Bio and Chemical Engineering for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-9, 2020
9919102003	Poornimaa B	2019	Web series on Covid-19	Kalasalingam Academy of Research and Education, Krishnankoil	June 11, 2020
9919102003	Poornimaa B	2019	Webinar on Agriculture	Sathyabama	July 14, 2020

			Environment Electronics and Biosensor: An overview	Institute of Science and Technology, Chennai	
9919102003	Poornimaa B	2019	National Webinar on Research Methods in Social Sciences	Sri Bhuvanendra College, Udipi	August 3, 2020
9919102003	Poornimaa B	2019	National Webinar on “Career Opportunities in Biotechnology”	RajarshiShahuMaha vidyalya, Latur	June 28, 2020
9919102003	Poornimaa B	2019	Webinar on “Role of Taxonomy in Faunal Diversity and Conservation”	Government Arts College, Kumbakonam	October 10, 2020
9919102003	Poornimaa B	2019	International Webinar on Food Laws and the Requirements of Food Testing in India	AKS University, Satna	July 8, 2020
9919102003	Poornimaa B	2019	Online Webinar on Microbiologist in Everybody	Biocon Academy, Bengaluru	June 3, 2020
9919102003	Poornimaa B	2019	International Webinar on “COVID-19: Challenges and Opportunities for Sustainable Environmental Development”	AKS University, Satna	June 5-7, 2020
9919102003	Poornimaa B	2019	Webinar in the Series of Advances in Biotechnology for Health, Food and Nutrition to Encounter COVID-19	AKS University, Satna	May 22-23, 2020
9919102003	Poornimaa B	2019	Webinar on Introduction to Metal Oxide Nanostructures for Sensing Applications	Sathyabama Institute of Science and Technology, Chennai	June 15, 2020
9919102003	Poornimaa B	2019	One Day Online Webinar entitled as Porous Nanomaterials for Biomedical Applications	ISF College of Pharmacy, Moga	July 31, 2020
9919102003	Poornimaa B	2019	Virtual Workshop on “Waste – An offer Letter”	Kalasalingam Academy of Research and Education, Krishnankoil	June 11, 2020
9919102003	Poornimaa B	2019	Virtual Workshop on Biologically Inspired	Kalasalingam Academy of	June 30, 2020

			Nanomaterials	Research and Education, Krishnankoil	
9919102007	Divyabharathi R	2019	International E-Conference on Frontiers in Industrial Biotechnology	St. Joseph's College of Engineering, Chennai	July 27-29, 2020
9919102007	Divyabharathi R	2019	Virtual Conference on Innovations in Bio and Chemical Engineering for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-9, 2020
9919102007	Divyabharathi R	2019	Virtual International Conference on Innovation in Interdisciplinary Research 2020	Kalasalingam Academy of Research and Education, Krishnankoil	June 23-24, 2020
9919102007	Divyabharathi R	2019	Web series on Covid-19	Kalasalingam Academy of Research and Education, Krishnankoil	June 4, June 5, June 6, June 10, June 11, 2020
9919102007	Divyabharathi R	2019	30 th International Virtual Learning Series	Arulmigu Kalasalingam College of Pharmacy, Krishnankoil	July 4, 2020
9919102007	Divyabharathi R	2019	National Webinar on Marine Research and Aquaculture	Sathyabama Institute of Science and Technology, Chennai	July 22-28, 2020
9919102007	Divyabharathi R	2019	Webinar on Technology for Effective Presentation	Kalasalingam Academy of Research and Education, Krishnankoil	August 8, 2020
9919102007	Divyabharathi R	2019	Webinar on E-Publishing	Queen Mary's College, Chennai	August 1, 2020
9919102007	Divyabharathi R	2019	Workshop on Recent Trends in Functional Proteomics	Kalasalingam Academy of Research and Education, Krishnankoil	July 6-7, 2020
9919102007	Divyabharathi R	2019	International Virtual Workshop on Experiment,	Kalasalingam Academy of	July 15-16, 2020

			Data, Report and Beyond - 2020	Research and Education, Krishnankoil	
9919102007	Divyabharathi R	2019	3 Day International E-Workshop on Docking, QSAR and Molecular Dynamics	Ramaiah University of Applied Sciences, Bengaluru	July 29-31, 2020
9919102007	Divyabharathi R	2019	Virtual Workshop on the Era of Digital Bioprocessing: Exploitation of MATLAB for Bioprocess Engineers	Kalasalingam Academy of Research and Education, Krishnankoil	June 17-18, 2020
9919102007	Divyabharathi R	2019	Virtual Workshop on Basic Animal Handling Techniques	Kalasalingam Academy of Research and Education, Krishnankoil	June 19, 2020
9919102007	Divyabharathi R	2019	Virtual Workshop on Biologically Inspired Nanomaterials	Kalasalingam Academy of Research and Education, Krishnankoil	June 30, 2020
9918102001	Radhalakshmi C	2018	Virtual Workshop on Python Programming	Kalasalingam Academy of Research and Education, Krishnankoil	July 8-17, 2020
9918102001	Radhalakshmi C	2018	Virtual Conference on Innovations in Bio and Chemical Engineering for Sustainable Life	Kalasalingam Academy of Research and Education, Krishnankoil	June 8-9, 2020
9918102001	Radhalakshmi C	2018	Exhibition on Science in Everyday Life	Aravind Medical Reserach Foundation, Madurai	September 28, 2019
9918102001	Radhalakshmi C	2018	Indo-US Workshop on Thermophilic Bioprocessing	Kalasalingam Academy of Research and Education, Krishnankoil	January 1-2, 2019
9918102001	Radhalakshmi C	2018	17 th IAAM Annual Conference on Microbiology in the New Millennium	Kalasalingam Academy of Research and Education, Krishnankoil	November 29-30, 2019

9918102001	Radhalakshmi C	2018	Workshop on Recent Trends in Functional Proteomics	Kalasalingam Academy of Research and Education, Krishnankoil	July 6-7, 2020
9918102001	Radhalakshmi C	2018	Host-Pathogen Interaction: Present and Future Perspective	NIT Rourkela, Rourkela	September 2-25, 2020
9918102003	Shobana A	2018	Mighty Microbes	BDG Lifesciences Pvt. Ltd., New Delhi	October 11, 2020
9918102003	Shobana A	2018	Hands-on Workshop on Genomics and Proteomics	BDG Lifesciences Pvt. Ltd., New Delhi	October 19-23, 2020
9918102003	Shobana A	2018	Indo-UK Virtual Conference CIFTD-2020	Vellore Institute of Technology, Vellore	June 1-3, 2020
9918102003	Shobana A	2018	Virtual Workshop on the Era of Digital Bioprocessing: Exploitation of MATLAB for Bioprocess Engineers	Kalasalingam Academy of Research and Education, Krishnankoil	June 17-18, 2020
9918102003	Shobana A	2018	Virtual National Conference on Food Microbiology	IIFPT, Thanjavur	October 5-6, 2020

3.4.2. Student's publications (10)

Students are encouraged to present their discoveries at national and international conferences and to publish in national and international journals.

Table 3.4.3 Scopus/ SCI Indexed Publications

S. No.	Title of Publication	Indexed with/ Impact factor
1.	Bazeera Ferdhous, P., Aanandhalakshmi, R., Ramya, P. and Vanavil, B., 2022. Scrutiny of Metal Ion Binding Sites in Different Alginate Lyases through <i>In Silico</i> Analysis. <i>Applied Biochemistry and Biotechnology</i> , 194: 124-147.	2.926
2.	Mohan, M., P. Sivakumar, G.D. Dilip, J.C. Rosy, R. Coico, K. Sundar 2022. Computational analysis of proteome of Foot-and-mouth disease Virus for the prediction of immunogenic epitopes, <i>Vacunas</i> 23(3): 183-193.	Scopus
3.	Vanavil, B., Ezhilarasi, P., Aanandhalakshmi, R., Gowtham, P.S. and Sundar, K., 2022. Seaweed Bioprocessing for Production of Biofuels and Biochemicals. <i>Zero Waste Biorefinery</i> , pp.345-380.	Book Chapter
4.	Vijayalakshmi, M., Dhanapradeeba, V., Selvaraj, K., Sundar, K., Pandian, S.R.K., 2022. Targeting TLRs with the derivatives of <i>Mimosa pudica</i> : An <i>in silico</i> approach. <i>Biointerface Research in Applied Chemistry</i> , 13(3): 3.	SCI
5.	Kaliraj, C., Shane DI, Zochedh A, Bahadur SA and Kathiresan T. 2022. Docking simulation and ADMET-prediction based investigation on the phytochemical constituents of Noni (<i>Morinda citrifolia</i>) fruit as a potential anticancer drug. In <i>Silico Pharmacology</i> 10 (2), 1-14.	--
6.	Pandian, S. R. K., Kunjiappan, S., Pavadai, P., Sundarapandian, V., Vivek, C., Sundar, K., 2021. Delivery of Ursolic acid by PHB nanoparticles for cancer therapy: <i>in silico</i> and <i>in vitro</i> studies. <i>Drug Research</i> , 72(2): 72-81.	SCI
7.	Rencilin, C.F., Rosy, J.C., Mohan, M., Coico, R. and Sundar, K., 2021. Identification of SARS-CoV-2 CTL epitopes for development of a multivalent subunit vaccine for COVID-19. <i>Infection, Genetics and Evolution</i> , 89, 104712.	SCI/ 3.342
8.	Pandian, S.R.K., Rencilin, C.F., Sundar, K., 2021. Emerging nanomaterials for cancer immunotherapy. <i>Exploration in Medicine</i> , 2: 208-31.	Scopus
9.	Pandian, S.R.K., Kunjiappan, S., Ravishankar, V. and Sundarapandian, V., 2021. Synthesis of quercetin-functionalized silver nanoparticles by rapid one- pot approach. <i>BioTechnology</i> , 102(1): 75-84.	SCI

10.	Sharma, N.K. and Arivalagan, A.R. , 2021. Algae or bacteria—the future of biological wastewater treatment. In <i>Handbook of Advanced Approaches Towards Pollution Prevention and Control</i> (pp. 217-247). Elsevier.	Book Chapter
11.	Aanandhalakshmi, R. , Sundar, K., and Vanavil, B., 2021. Bioactive Oligosaccharides: Production, Characterization and Applications, In: <i>Biomolecular Engineering Solutions for Renewable Specialty Chemicals-Microorganisms, Products, and Processes</i> , Wiley. pp.165-199.	Book Chapter
12.	Vanavil, B., Selvaraj, K., Aanandhalakshmi, R. , Usha, S.K. and Arumugam, M., 2020. Bioactive and thermostable sulphated polysaccharide from <i>Sargassum swartzii</i> with drug delivery applications. <i>International Journal of Biological Macromolecules</i> , 153:190-200.	SCI/ 6.953
13.	Selvaraj, K., Panneerselvam, T., Murugesan, S., Balasubramanian, S., Sarathbabu, S., Sankarganesh, A., Parasuraman, P., Vellaichamy, S., Indhumathy, M., and Suraj, B. (2019). Design, graph theoretical analysis and bioinformatic studies of Proanthocyanidins encapsulated ethyl cellulose nanoparticles for effective anticancer activity. <i>Biomedical Physics & Engineering Express</i> , 5(2): 025004.	SCI
14.	Prakash, S., Rajeswari, K., Divya, P., Ferlin, M., Rajeshwari, C. T. , & Vanavil, B. (2018). Optimization and production of curdlan gum using <i>Bacillus cereus</i> pr3 isolated from rhizosphere of leguminous plant. <i>Preparative Biochemistry and Biotechnology</i> , 48(5): 408-418.	SCI/ 1.117
15.	Chowdhury, A., Panneerselvam, T., Suthendran, K., Bhattacharjee, C., Balasubramanian, S., Murugesan, S., Suraj, B. , and Selvaraj, K. (2018). Optimization of microwave-assisted extraction of bioactive compounds from <i>Marsilea quadrifolia</i> L. using RSM and ANFIS modeling. <i>Indian Journal of Natural Products and Resources</i> , 9(3): 204-221.	Non-Scopus
16.	Kabilan, S. J., Karunya Sri and Anto Theodicta Jefrina , 2021. A Review on Role of Marine Therapeutics against COVID-19. <i>Zeichen Journal</i> , 7(2): 43.	-

Table 3.4.4. Paper Presentations by Students in National and International Conferences

S. No	Details of Presentations	Type
1.	Shalini Mohan , D. Devaraj, L. Muthulakshmi Artificial Neural Network Approach for Image based disease detection of cotton plant, Second International Virtual Conference on Artificial Intelligence for Internet of Things, 07-08, April, 2022	International
2.	Shalini M , Lakshmanan Muthulakshmi, Devaraj D, Image based detection of cotton plant diseases and formulation of disease resistant designer seed with biocontrol agent to combat cotton plant disease, National Conference on Innovations in Biotechnology for Sustainable Life, 23 April, 2022	National

3.	Bazeera Ferdhous P , Gowtham P.S, Vanavil B, Curdlan sulfate as a novel inhibitor for SARS- CoV-2: A molecular docking study using computation tools, 3 rd International conference on communication and intelligent systems, 18-19 December, 2021	International
4.	Bazeera Ferdhous P , Ramya P, Aanandhalakshmi R and Vanavil B, Scrutiny of metal ion binding sites in alginate lyase through <i>in silico</i> analysis, 2nd virtual international conference on Naturopathy, Nanotechnology, Nutraceuticals and Immunotherapy in cancer research, 11-12 June, 2021	International
5.	S. Praseetha , M. Manikandan, J. Christina Rosy and K. Sundar, <i>In silico</i> validation of computationally predicted murine specific dengue CTL epitopes, Virtual Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, 8-9 June, 2020	National
6.	M.Pooja Vaisnavi , N. Hariram, <i>In vitro</i> Analysis of Phyto-Constituents from <i>Cannabis sativa</i> Against pfdHFR, National Conference on Innovations in Biotechnology for Sustainable Life, 23 April, 2022	National
7.	Kaliraj Chandran , Thandavarayan Kathiresan, Codelivery of piperine and linalool loaded hollow mesoporous silica nanoparticles induced cell death in breast cancer through <i>in silico</i> and <i>in vitro</i> approach, National Conference on Innovations in Biotechnology for Sustainable Life, 23 April, 2022.	National
8.	Bhoobalan D , Sankarganesh Arunachalam, Ilaneer poovarasu sooranam effectively ameliorates adriamycin-induced hepatotoxicity <i>in vivo</i> , National Conference on Innovations in Biotechnology for Sustainable Life, 23 April, 2022.	National
9.	Karunya Sri C.M , Shakti Chandra Vadhana Marimuthu, Krishnan Sundar. Homology modeling of putative iron-transporter protein of <i>Streptococcus mutans</i> molecular docking with phytochemicals of <i>Azadirachta indica</i> , PharmaNEST'3.E International conference at JSS college of Pharmacy, Ooty. October 14-15, 2022.	International
10.	Shruthi Shanmugasundaram , Suja Gayathri Suresh, Renuga Devi Balasubramaniam, Thimma Mohan Vishwanathan, Thandavarayan Kathiresan. Structure based virtual screening and molecular docking of Thymol and Eugenol as effective therapeutic molecules against Breast Cancer, PharmaNEST'3.E International conference at JSS college of Pharmacy, Ooty. October 14-15, 2022	International
11.	Siva Bharathi Velayutham , Vijayalakshmi Muniyandi, Selvaraj Kunjiappan, Krishnan Sundar, Sureshbabu Ram Kumar Pandian. Inhibitory effect of Bioactive Compounds from <i>Asparagus racemosus</i> against NF-kB: an <i>in-silico</i> approach, PharmaNEST'3.E International conference at JSS college of Pharmacy, Ooty. October 14-15, 2022	International
12.	Derina. J. Pearlin . Jyothi K. <i>In silico</i> study of the Bromelain-Phytochemical complex inhibition of Phospholipase A2 (PLA2) to reduce inflammation, PharmaNEST'3.E International conference at JSS college of Pharmacy, Ooty. October 14-15, 2022	International
13.	Kavitha A , Harsha Dev Mukherjee, Ganapathi Sridevi and K. Palanichelvam, Analysis of rice transcriptome data to identify plant defense pathways induced	National

	by the fungal pathogen <i>Rhizoctonia solani</i> upon infection, Second National Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, May 20-21, 2021	
14.	Aanandhalakshmi R , Ramya P and Vanavil B, Process optimization for alginate lyase production using <i>Enterobacter tabaci</i> RAU2C, Second National Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, May 20-21, 2021	National
15.	Gowtham P.S and Vanavil B, Sulphated Oligosaccharides as An Alternative Drug for Covid-19 – an <i>In Silico</i> Analysis, Second National Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, May 20-21, 2021	National
16.	Sundara Pandian V , Selvaraj K, and Ram Kumar Pandian S, screening of bioactive compounds from <i>Asparagus racemosus</i> and <i>Semecarpus anacardium</i> : an <i>in silico</i> investigation against neural disorders, Second National Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, May 20-21, 2021	National
17.	R Aanandhalakshmi , B Vanavil, <i>In silico</i> characterization of alginate lyase produced by different species, National Conference on Biological, Biochemical, Biomedical, Bioenergy, and Environmental Biotechnology, National Institute of Technology Warangal, January 29-30, 2021	National
18.	P.S Gowtham , B Vanavil, Docking and molecular interaction studies of Covid-19 viral targets with sulphated polysaccharides, National Conference on Biological, Biochemical, Biomedical, Bioenergy, and Environmental Biotechnology, National Institute of Technology Warangal, January 29-30, 2021	National
19.	P. Bazeera Ferdhous , Aanandhalakshmi R , P. Ramya and B. Vanavil, Scrutiny of metal ion binding sites in alginate lyase through <i>in silico</i> analysis, 2 nd Virtual Annual International Conference on Naturopathy, Nanotechnology, Nutraceuticals and Immunotherapy in Cancer Research, BSA Crescent Institute of Science and Technology, June 11-12, 2021	International
20.	Angelin Jenit F , Naresh Kumar Sharma Activated sludge microbial treatment of Crepe Cotton Processing Wastewater, National Conference on Innovations in Biotechnology for Sustainable Life, April 23, 2022	National
21.	Oviya Sivakumar , Selvaraj Kunjiapan, Suthendran, Kabilan Shanmugampillai Jeyarajaguru, Pharmacoinformatic Based screening of Phytocompounds from <i>Boerhavia diffusa</i> against potential targets of CKD and process optimization for extraction of Bioactive compounds using RSM and ANFIS models, National Conference on Innovations in Biotechnology for Sustainable Life, April 23, 2022	National
22.	P. Bazeera Ferdhous , P.S. Gowtham , B. Vanavil, Curdlan Sulfate as a Novel Inhibitor for SARS-CoV-2 (COVID – 19): A Molecular Docking Study using Computational Tools, 3 rd International Conference on Communication and Intelligent Systems, National Institute of Technology, Delhi, December 18-19, 2021	National
23.	Velmurugan Sundarapandian , Selvaraj Kunjiappan, Sureshbabu Ram Kumar Pandian, Role of <i>Asparagus racemosus</i> on pentazole-induced epilepsy	National

	in rodent model, Conference on Innovations in Bio & Chemical Engineering for Sustainable Life, June 8-9, 2020	
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CRITERION 4	Faculty Contributions	75
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The Department has adequate faculty members to cater to the needs of the student community in the PG program. The faculty members of the Department of Biotechnology possess either a doctoral degree or a Masters' degree. Of the 27 faculty members, 21 hold PhD degree and among the rest, 4 have enrolled for PhD degree in our department. Few of the faculty members have completed their PhD abroad and seven of them have post-doctoral experience in universities in USA, UK, Israel, Poland and Taiwan and possess several years of teaching experience. They are also involved actively in research in their respective areas of interest within the department, thereby enhancing and updating their knowledge and expertise.

The Department has adequate faculty members to meet the needs of the PG program's student community. The faculty's technical expertise covers all core competencies in the interdisciplinary field of Biotechnology. The Detailed faculty qualifications and other details are in Table below.

CAY (2021–2022) = 27

		Qualification									Academic Research				
S. No.	Name of the faculty member	Degree (Highest Degree)	University	Year of attaining higher qualification	Association with the institution	Designation	Date on which designated as Professor/ Associate Professor	Date of Joining the Institution	Department	Specialization	Research Paper Publications	Ph.D. Guidance	Faculty Receiving Ph.D. during the Assessment Years	Currently Associated (Y/N) Date of Leaving (In case Currently Associated is (“No”))	Nature of Association (Regular/Contract)

1	Dr. K. Sundar	Ph.D.	Madurai Kamaraj University, Madurai.	1992	KARE	Professor	01.07.2008	27.06.2007	Biotechnology	Infectious and Inflammatory diseases	92	Yes	No	Y	Regular
2	Dr. T. Kathiresan	Ph.D.	Bharathiar University, Coimbatore.	1999	KARE	Professor	01.07.2011	01.07.2011	Biotechnology	Proteomics, Nanobiotechnology	35	Yes	No	Y	Regular
3	Dr. K. Palanichelvam	Ph.D.	Madurai Kamaraj University, Madurai.	1996	KARE	Professor	01.07.2016	01.07.2011	Biotechnology	Plant Molecular Biology	27	Yes	No	Y	Regular
4	Dr. V. Pandiyarajan	Ph.D.	Madurai Kamaraj University, Madurai.	2005	KARE	Professor	28.08.2019	28.08.2019	Biotechnology	Medicinal Plants	5	No	No	Y	Regular
5	Dr. A. Muthukumar	Ph.D.	Manonmaniam Sundaranar University, Tirunelveli.	2008	KARE	Professor	01.06.2017	22.07.2009	Biotechnology	Nano- and Animal Biotechnology	27	Yes	No	Y	Regular
6	Dr. B. Vanavil	Ph.D.	National Institute of Technology-Trichy.	2014	KARE	Associate Professor	15.06.2015	15.06.2015	Biotechnology	Bioprocess Technology	20	Yes	No	Y	Regular
7	Dr. S. Shantkriti	Ph.D.	Bharathidasan University, Trichy.	2018	KARE	Associate Professor	25.06.2018	25.06.2018	Biotechnology	Environmental Technology	29	No	No	Y	Regular
8	Dr. Nidhin Sreekumar	Ph.D.	National Institute of Technology, Calicut.	2018	KARE	Associate Professor	25.06.2018	25.06.2018	Biotechnology	Environmental Technology	23	No	No	Y	Regular
9	Dr. Naresh Kumar Sharma	Ph.D.	Indian Institute of Technology, Madras.	2014	KARE	Associate Professor	01.08.2014	01.08.2014	Biotechnology	Environmental Biotechnology	22	Yes	No	Y	Regular
10	Dr. K. K. Vasumathi	Ph.D.	National Institute of Technology, Trichy.	2014	KARE	Associate Professor	12.06.2017	12.06.2017	Biotechnology	Algal Biotechnology	14	No	No	Y	Regular
11	Dr. Sankarganesh Arunachalam	Ph.D.	Chonbuk National University, Jeonju, South Korea.	2012	KARE	Associate Professor	01.07.2016	19.05.2016	Biotechnology	Cardiovascular and Adverse Drug Reactions	41	Yes	No	Y	Regular
12	Dr. J. Kanimozhi	Ph.D.	National Institute of Technology Calicut	2018	KARE	Associate Professor	17.06.2019	17.06.2019	Biotechnology	Biochemical Engineering	14	No	No	Y	Regular
13	Dr. L. Muthulakshmi	Ph.D.	Kalasalingam Academy of Research and	2017	KARE	Associate Professor	01.06.2017	11.06.2007	Biotechnology	Biomaterials	21	No	No	Y	Regular

			Education.												
14	Dr. S. Ram Kumar Pandian	Ph.D.	Kalasalingam Academy of Research and Education.	2016	KARE	Associate Professor	01.06. 2017	01.07. 2015	Biotechnology	Innate Immunity and Inflammation	21	No	No	Y	Regular
15	Dr. S. Sheik Asraf	Ph.D.	Madurai Kamaraj University, Madurai.	2013	KARE	Associate Professor	01.06. 2017	14.07. 2014	Biotechnology	Genomics	20	No	No	Y	Regular
16	Dr. V. Deepak	Ph.D.	Kalasalingam Academy of Research and Education.	2016	KARE	Associate Professor	01.06. 2016	01.06. 2016	Biotechnology	Cell Biology	25	No	No	Y	Regular
17	Dr. K. Selvaraj	Ph.D.	Jadavpur university, Kolkata	2015	KARE	Assistant Professor	NA	13.10. 2014	Biotechnology	Drug Design & Drug Delivery	78	Yes	No	Y	Regular
18	Dr. K. Jyothi	Ph.D.	Bharathidasan University, Trichy.	2013	KARE	Assistant Professor	NA	01.06. 2017	Biotechnology	Biochemistry	13	No	No	Y	Regular
19	Mrs. J. Christina Rosy	M. Tech	Kalasalingam Academy of Research and Education.	2011	KARE	Assistant Professor	NA	01.07. 2011	Biotechnology	Bioinformatics & Microbiology	7	No	No	Y	Regular
20	Dr. R. Seenivasagan	Ph.D.	Periyar University	2015	KARE	Assistant Professor	NA	19.06. 2017	Biotechnology	Environmental Biotechnology	21	No	No	Y	Regular
21	Dr. D. Senthil Kumar	Ph.D.	VIT University	2016	KARE	Assistant Professor	NA	01.06. 2017	Biotechnology	Proteomics	7	No	No	Y	Regular
22	Ms. P. Ramya	M. Tech	Mepco Schlenk Engineering College, Sivakasi.	2013	KARE	Assistant Professor	NA	01.06. 2016	Biotechnology	Bioprocess Technology	2	No	No	Y	Regular
23	Ms. P. Priya	M. Tech	Kalasalingam Academy of Research and Education.	2013	KARE	Assistant Professor	NA	01.06. 2016	Biotechnology	Microbiology	3	No	No	Y	Regular
24	Mr. S. J. Kabilan	M. Tech	Kumaraguru College of Technology, Coimbatore.	2018	KARE	Assistant Professor	NA	25.06. 2018	Biotechnology	Drug Design and Bioactive Metabolites	3	No	No	Y	Regular
25	Dr. V. Kannan	Ph.D.	University of West of England, Bristol, UK	2017	KARE	Assistant Professor	NA	03.06. 2019	Biotechnology	Transgenic Technology	5	No	No	Y	Regular

26	Ms. S. Selva Vinothika	M. Tech	Kalasalingam Academy of Research and Education.	2018	KARE	Assistant Professor	NA	01.06.2021	Biotechnology	Proteomics, Cancer Biology	2	No	No	Y	Regular
27	Ms. R. Anandhalakshmi	M. Tech	Kalasalingam Academy of Research and Education.	2021	KARE	Assistant Professor	NA	01.07.2021	Biotechnology	Animal Biotechnology	2	No	No	Y	Regular

CAY m1 (2020–2021) = 27

S. No.	Name of the faculty member	Qualification			Association with the institution	Designation	Date on which designated as Professor/ Associate Professor	Date of Joining the Institution	Department	Specialization	Academic Research			Currently Associated (Y/N) Date of Leaving (In case Currently Associated is “No”)	Nature of Association (Regular/Contract)
		Degree (Highest Degree)	University	Year of attaining higher qualification							Research Paper Publications	Ph.D. Guidance	Faculty Receiving Ph.D. during the Assessment Years		
1	Dr. K. Sundar	Ph.D.	Madurai Kamaraj University, Madurai.	1992	KARE	Professor	01.07.2008	27.06.2007	Biotechnology	Infectious and Inflammatory diseases	92	Yes	No	Y	Regular
2	Dr. T. Kathiresan	Ph.D.	Bharathiar University, Coimbatore.	1999	KARE	Professor	01.07.2011	01.07.2011	Biotechnology	Proteomics, Nanobiotechnology	35	Yes	No	Y	Regular
3	Dr. K. Palanichelvam	Ph.D.	Madurai Kamaraj University, Madurai.	1996	KARE	Professor	01.07.2016	01.07.2011	Biotechnology	Plant Molecular Biology	27	Yes	No	Y	Regular
4	Dr. V. Pandiyarajan	Ph.D.	Madurai Kamaraj University, Madurai.	2005	KARE	Professor	28.08.2019	28.08.2019	Biotechnology	Medicinal Plants	5	No	No	Y	Regular
5	Dr. A.	Ph.D.	ManonmaniamSun	2008	KARE	Professor	01.06.	22.07.	Biotechnology	Nano- and	27	Yes	No	Y	Regular

	Muthukumaran		daranar University, Tirunelveli.				2017	2009		Animal Biotechnology					
6	Dr. B. Vanavil	Ph.D.	National Institute of Technology-Trichy.	2014	KARE	Associate Professor	15.06.2015	15.06.2015	Biotechnology	Bioprocess Technology	20	Yes	No	Y	Regular
7	Dr. S. Shantkriti	Ph.D.	Bharathidasan University, Trichy.	2018	KARE	Associate Professor	25.06.2018	25.06.2018	Biotechnology	Environmental Technology	29	No	No	Y	Regular
8	Dr.Nidhin Sreekumar	Ph.D.	National Institute of Technology, Calicut.	2018	KARE	Associate Professor	25.06.2018	25.06.2018	Biotechnology	Environmental Technology	23	No	No	Y	Regular
9	Dr. Naresh Kumar Sharma	Ph.D.	Indian Institute of Technology, Madras.	2014	KARE	Associate Professor	01.08.2014	01.08.2014	Biotechnology	Environmental Biotechnology	22	Yes	No	Y	Regular
10	Dr. K. K. Vasumathi	Ph.D.	National Institute of Technology, Trichy.	2014	KARE	Associate Professor	12.06.2017	12.06.2017	Biotechnology	Algal Biotechnology	14	No	No	Y	Regular
11	Dr.Sankarganesh Arunachalam	Ph.D.	Chonbuk National University, Jeonju, South Korea.	2012	KARE	Associate Professor	01.07.2016	19.05.2016	Biotechnology	Cardiovascular and Adverse Drug Reactions	41	Yes	No	Y	Regular
12	Dr. J. Kanimozhi	Ph.D.	National Institute of Technology Calicut	2018	KARE	Associate Professor	17.06.2019	17.06.2019	Biotechnology	Biochemical Engineering	14	No	No	Y	Regular
13	Dr. L. Muthulakshmi	Ph.D.	Kalasalingam Academy of Research and Education.	2017	KARE	Associate Professor	01.06.2017	11.06.2007	Biotechnology	Biomaterials	21	No	No	Y	Regular
14	Dr. S. Ram Kumar Pandian	Ph.D.	Kalasalingam Academy of Research and Education.	2016	KARE	Associate Professor	01.06.2017	01.07.2015	Biotechnology	Innate Immunity and Inflammation	21	No	No	Y	Regular
15	Dr. S. Sheik Asraf	Ph.D.	Madurai Kamaraj University, Madurai.	2013	KARE	Associate Professor	01.06.2017	14.07.2014	Biotechnology	Genomics	20	No	No	Y	Regular
16	Dr. V. Deepak	Ph.D.	Kalasalingam Academy of Research and Education.	2016	KARE	Associate Professor	01.06.2016	01.06.2016	Biotechnology	Cell Biology	25	No	No	Y	Regular
17	Dr. K. Selvaraj	Ph.D.	Jadavpur	2015	KARE	Assistant	NA	13.10.	Biotechnology	Drug Design	78	Yes	No	Y	Regular

			University, Kolkata.			Professor		2014		and Drug Delivery					
18	Dr. K. Jyothi	Ph.D.	Bharathidasan University, Trichy.	2013	KARE	Assistant Professor	NA	01.06. 2017	Biotechnology	Biochemistry	13	No	No	Y	Regular
19	Mrs. J. Christina Rosy	M. Tech	Kalasalingam Academy of Research and Education.	2011	KARE	Assistant Professor	NA	01.07. 2011	Biotechnology	Bioinformatics & Microbiology	7	No	No	Y	Regular
20	Dr. G. Nadana Raja Vadivu	Ph.D.	Kalasalingam Academy of Research and Education.	2021	KARE	Assistant Professor	NA	01.01. 2010	Biotechnology	Plant Biotechnology	7	No	Yes	N 30.06.2021	Regular
21	Dr. D. Sankar Ganesh	Ph.D.	Bharathidasan University, Trichy.	2015	KARE	Assistant Professor	NA	25.06. 2018	Biotechnology	Animal Biotechnology	32	No	No	N 30.06.2021	Regular
22	Dr. R. Seenivasagan	Ph.D.	Periyar University	2015	KARE	Assistant Professor	NA	19.06. 2017	Biotechnology	Environmental Biotechnology	21	No	No	Y	Regular
23	Dr. D. Senthil Kumar	Ph.D.	VIT University	2016	KARE	Assistant Professor	NA	01.06. 2017	Biotechnology	Proteomics	7	No	No	Y	Regular
24	Ms. P. Ramya	M. Tech	Mepco Schlenk Engineering College, Sivakasi.	2013	KARE	Assistant Professor	NA	01.06. 2016	Biotechnology	Bioprocess Technology	2	No	No	Y	Regular
25	Ms. P. Priya	M. Tech	Kalasalingam Academy of Research and Education.	2013	KARE	Assistant Professor	NA	01.06. 2016	Biotechnology	Microbiology	3	No	No	Y	Regular
26	Mr. S. J. Kabilan	M. Tech	Kumaraguru College of Technology, Coimbatore.	2018	KARE	Assistant Professor	NA	25.06. 2018	Biotechnology	Drug Design and Bioactive Metabolites	3	No	No	Y	Regular
27	Dr. V. Kannan	Ph.D.	University of West of England, Bristol, UK	2017	KARE	Assistant Professor	NA	03.06. 2019	Biotechnology	Transgenic Technology	5	No	No	Y	Regular

CAYm2 (2019–2020) = 27

S. No.	Name of the faculty member	Qualification			Association with the institution	Designation	Date on which designated Professor/ Associate Professor	Date of Joining the Institution	Department	Specialization	Academic Research			Currently Associated (Y/N) Date of Leaving (In case Currently Associated is ("No"))	Nature of Association (Regular/Contract)
		Degree (Highest Degree)	University	Year of attaining higher qualification							Research Paper Publications	Ph.D. Guidance	Faculty Receiving Ph.D. during the Assessment Years		
1	Dr.K.Sundar	Ph.D.	Madurai Kamaraj University, Madurai.	1992	KARE	Professor	01.07. 2008	27.06. 2007	Biotechnology	Infectious and Inflammatory diseases	92	Yes	No	Y	Regular
2	Dr. T. Kathiresan	Ph.D.	Bharathiar University, Coimbatore.	1999	KARE	Professor	01.07. 2011	01.07. 2011	Biotechnology	Proteomics, Nanobiotechnology	35	Yes	No	Y	Regular
3	Dr. K. Palanichelvam	Ph.D.	Madurai Kamaraj University, Madurai.	1996	KARE	Professor	01.07. 2016	01.07. 2011	Biotechnology	Plant Molecular Biology	27	Yes	No	Y	Regular
4	Dr.V.Pandiyarajan	Ph.D.	Madurai Kamaraj University, Madurai.	2005	KARE	Professor	28.08. 2019	28.08. 2019	Biotechnology	Medicinal Plants	5	No	No	Y	Regular
5	Dr. A. Muthukumaran	Ph.D.	Manonmaniam Sundaranar University, Tirunelveli.	2008	KARE	Professor	01.06. 2017	22.07. 2009	Biotechnology	Nano- and Animal Biotechnology	27	Yes	No	Y	Regular
6	Dr. B. Vanavil	Ph.D.	National Institute of Technology-Trichy.	2014	KARE	Associate Professor	15.06. 2015	15.06. 2015	Biotechnology	Bioprocess Technology	20	Yes	No	Y	Regular
7	Dr. S. Shantkriti	Ph.D.	Bharathidasan University, Trichy.	2018	KARE	Associate Professor	25.06. 2018	25.06. 2018	Biotechnology	Environmental Technology	29	No	No	Y	Regular
8	Dr.Nidhin Sreekumar	Ph.D.	National Institute of Technology, Calicut.	2018	KARE	Associate Professor	25.06. 2018	25.06. 2018	Biotechnology	Environmental Technology	23	No	No	Y	Regular

9	Dr. Naresh Kumar Sharma	Ph.D.	Indian Institute of Technology, Madras.	2014	KARE	Associate Professor	01.08. 2014	01.08. 2014	Biotechnology	Environmental Biotechnology	22	Yes	No	Y	Regular
10	Dr. K. K. Vasumathi	Ph.D.	National Institute of Technology, Trichy.	2014	KARE	Associate Professor	12.06. 2017	12.06. 2017	Biotechnology	Algal Biotechnology	14	No	No	Y	Regular
11	Dr.Sankarganesh Arunachalam	Ph.D.	Chonbuk National University, Jeonju, South Korea.	2012	KARE	Associate Professor	01.07. 2016	19.05. 2016	Biotechnology	Cardiovascular and Adverse Drug Reactions	41	Yes	No	Y	Regular
12	Dr. J. Kanimozhi	Ph.D.	National Institute of Technology Calicut	2018	KARE	Associate Professor	17.06. 2019	17.06. 2019	Biotechnology	Biochemical Engineering	14	No	No	Y	Regular
13	Dr. L. Muthulakshmi	Ph.D.	Kalasalingam Academy of Research and Education.	2017	KARE	Associate Professor	01.06. 2017	11.06. 2007	Biotechnology	Biomaterials	21	No	No	Y	Regular
14	Dr. S. Ram Kumar Pandian	Ph.D.	Kalasalingam Academy of Research and Education.	2016	KARE	Associate Professor	01.06. 2017	01.07. 2015	Biotechnology	Innate Immunity and Inflammation	21	No	No	Y	Regular
15	Dr. S. Sheik Asraf	Ph.D.	Madurai Kamaraj University, Madurai.	2013	KARE	Associate Professor	01.06. 2017	14.07. 2014	Biotechnology	Genomics	20	No	No	Y	Regular
16	Dr. V. Deepak	Ph.D.	Kalasalingam Academy of Research and Education.	2016	KARE	Associate Professor	01.06. 2016	01.06. 2016	Biotechnology	Cell Biology	25	No	No	Y	Regular
17	Dr. K. Selvaraj	Ph.D.	Jadavpur University, Kolkata.	2015	KARE	Assistant Professor	NA	13.10. 2014	Biotechnology	Drug Design and Drug Delivery	78	Yes	No	Y	Regular
18	Dr. K. Jyothi	Ph.D.	Bharathidasan University, Trichy.	2013	KARE	Assistant Professor	NA	01.06. 2017	Biotechnology	Biochemistry	13	No	No	Y	Regular
19	Mrs. J. Christina Rosy	M. Tech	Kalasalingam Academy of Research and Education.	2011	KARE	Assistant Professor	NA	01.07. 2011	Biotechnology	Bioinformatics & Microbiology	7	No	No	Y	Regular
20	Ms. G. Nadana Raja Vadivu	M. Tech	Anna University	2009	KARE	Assistant Professor	NA	01.01. 2010	Biotechnology	Plant Biotechnology	7	No	Yes	Y	Regular
21	Dr. D. Sankar	Ph.D.	Bharathidasan	2015	KARE	Assistant	NA	25.06.	Biotechnology	Animal	32	No	No	Y	Regular

	Ganesh		University, Trichy.			Professor		2018		Biotechnology					
22	Dr. R. Seenivasagan	Ph.D.	Periyar University	2015	KARE	Assistant Professor	NA	19.06. 2017	Biotechnology	Environmental Biotechnology	21	No	No	Y	Regular
23	Dr. D. Senthil Kumar	Ph.D.	VIT University	2016	KARE	Assistant Professor	NA	01.06. 2017	Biotechnology	Proteomics	7	No	No	Y	Regular
24	Ms. P. Ramya	M. Tech	Mepco Schlenk Engineering College, Sivakasi.	2013	KARE	Assistant Professor	NA	01.06. 2016	Biotechnology	Bioprocess Technology	2	No	No	Y	Regular
25	Ms. P. Priya	M. Tech	Kalasalingam Academy of Research and Education.	2013	KARE	Assistant Professor	NA	01.06. 2016	Biotechnology	Microbiology	3	No	No	Y	Regular
26	Mr. S. J. Kabilan	M. Tech	Kumaraguru College of Engineering, Coimbatore.	2018	KARE	Assistant Professor	NA	25.06. 2018	Biotechnology	Drug Design and Bioactive Metabolites	3	No	No	Y	Regular
27	Dr. V. Kannan	Ph.D.	University of West of England, Bristol, UK	2017	KARE	Assistant Professor	NA	03.06. 2019	Biotechnology	Transgenic Technology	5	No	No	Y	Regular

4.1. Student Faculty Ratio (SFR)

Year	CAY (2021-22)	CAYm1(2020 -21)	CAYm2 (2019- 20)
u1.1(No. of Students in UG 2nd Year)	120	120	120
u1.2 (No. of Students in UG 3rd Year)	120	120	120
u1.3 (No. of Students in UG 4th Year)	120	120	120
UG1(u1.1+u1.2+u1.3)	360	360	360
p1.1	12	12	12
p1.2	12	12	12
PG1(p1.1+ p1.2)	24	24	24
Total No. of Students in the Department (S)	384	384	384
No. of Faculty in the Department (F)	27	27	27
Student Faculty Ratio (SFR)=S/F	384/27=14.22	384/27=14.22	384/27=14.22
Average SFR = (SFR1+SFR2+SFR3)/3	(14.22+14.22+14.22)/3=14.22		

4.1.1. Provide the information about the regular and contractual faculty as per the format mentioned below:

	Total number of regular faculty in the department	Total number of contractual faculty in the department
CAY (2021-22)	27	NIL
CAYm1 (2020-21)	27	NIL
CAYm2 (2019-20)	27	NIL

List of Professors

CAY (2021-22)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
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1.	Dr. K. Sundar	Ph.D.	Professor	27.06.2007	15
2.	Dr. T. Kathiresan	Ph.D.	Professor	01.07.2011	11
3.	Dr. K. Palanichelvam	Ph.D.	Professor	01.07.2011	11
4.	Dr. V. Pandiyarajan	Ph.D.	Professor	28.08.2019	3
5.	Dr. A. Muthukumaran	Ph.D.	Professor	22.07.2009	13

List of Professors

CAYm1 (2020-21)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
1.	Dr. K. Sundar	Ph.D.	Professor	27.06.2007	15
2.	Dr. T. Kathiresan	Ph.D.	Professor	01.07.2011	11
3.	Dr. K. Palanichelvam	Ph.D.	Professor	01.07.2011	11
4.	Dr. V. Pandiyarajan	Ph.D.	Professor	28.08.2019	3
5.	Dr. A. Muthukumaran	Ph.D.	Professor	22.07.2009	13

List of Professors

CAYm2 (2019-20)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
1.	Dr. K. Sundar	Ph.D.	Professor	27.06.2007	15

2.	Dr. T. Kathiresan	Ph.D.	Professor	01.07.2011	11
3.	Dr. K. Palanichelvam	Ph.D.	Professor	01.07.2011	11
4.	Dr. V. Pandiyarajan	Ph.D.	Professor	28.08.2019	3
5.	Dr. A. Muthukumaran	Ph.D.	Professor	22.07.2009	13

List of Associate Professors

CAY (2021-22)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
1.	Dr. B. Vanavil	Ph.D.	Associate Professor	15.06.2015	7
2.	Dr. S. Shantkriti	Ph.D.	Associate Professor	25.06.2018	4
3.	Dr.Nidhin Sreekumar	Ph.D.	Associate Professor	25.06.2018	4
4.	Dr. Naresh Kumar Sharma	Ph.D.	Associate Professor	01.08.2014	8
5.	Dr. K. K. Vasumathi	Ph.D.	Associate Professor	12.06.2017	5
6.	Dr.Sankarganesh Arunachalam	Ph.D.	Associate Professor	19.05.2016	6
7.	Dr. J. Kanimozhi	Ph.D.	Associate Professor	17.06.2019	3

8.	Dr. L. Muthulakshmi	Ph.D.	Associate Professor	11.06.2007	15
9.	Dr. S. Ram Kumar Pandian	Ph.D.	Associate Professor	01.07.2015	7
10.	Dr. S. Sheik Asraf	Ph.D.	Associate Professor	14.07.2014	8
11.	Dr. V. Deepak	Ph.D.	Associate Professor	01.06.2016	6

List of Associate Professors

CAYm1 (2020-21)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
1.	Dr. B. Vanavil	Ph.D.	Associate Professor	15.06.2015	7
2.	Dr. S. Shantkriti	Ph.D.	Associate Professor	25.06.2018	4
3.	Dr.Nidhin Sreekumar	Ph.D.	Associate Professor	25.06.2018	4
4.	Dr. Naresh Kumar Sharma	Ph.D.	Associate Professor	01.08.2014	8
5.	Dr. K. K. Vasumathi	Ph.D.	Associate Professor	12.06.2017	5
6.	Dr.Sankarganesh Arunachalam	Ph.D.	Associate Professor	19.05.2016	6

7.	Dr. J. Kanimozhi	Ph.D.	Associate Professor	17.06.2019	3
8.	Dr. L. Muthulakshmi	Ph.D.	Associate Professor	11.06.2007	15
9.	Dr. S. Ram Kumar Pandian	Ph.D.	Associate Professor	01.07.2015	7
10.	Dr. S. Sheik Asraf	Ph.D.	Associate Professor	14.07.2014	8
11.	Dr. V. Deepak	Ph.D.	Associate Professor	01.06.2016	6

List of Associate Professors

CAYm2 (2019-20)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
1.	Dr. B. Vanavil	Ph.D.	Associate Professor	15.06.2015	7
2.	Dr. S. Shantkriti	Ph.D.	Associate Professor	25.06.2018	4
3.	Dr.Nidhin Sreekumar	Ph.D.	Associate Professor	25.06.2018	4
4.	Dr. Naresh Kumar Sharma	Ph.D.	Associate Professor	01.08.2014	8
5.	Dr. K. K. Vasumathi	Ph.D.	Associate Professor	12.06.2017	5

6.	Dr.Sankarganesh Arunachalam	Ph.D.	Associate Professor	19.05.2016	6
7.	Dr. J. Kanimozhi	Ph.D.	Associate Professor	17.06.2019	3
8.	Dr. L. Muthulakshmi	Ph.D.	Associate Professor	11.06.2007	15
9.	Dr. S. Ram Kumar Pandian	Ph.D.	Associate Professor	01.07.2015	7
10.	Dr. S. Sheik Asraf	Ph.D.	Associate Professor	14.07.2014	8
11.	Dr. V. Deepak	Ph.D.	Associate Professor	01.06.2016	6

List of Assistant Professors

CAY (2021-22)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
1.	Dr. K. Selvaraj	Ph.D.	AssistantProfessor	13.10.2014	8
2.	Dr. K. Jyothi	Ph.D.	Assistant Professor	01.06.2017	5
3.	Mrs. J. Christina Rosy	M. Tech	AssistantProfessor	01.07. 2011	11
4.	Dr. R. Seenivasagan	Ph.D.	Assistant Professor	19.06.2017	5

5.	Dr. D. Senthil Kumar	Ph.D.	Assistant Professor	01.06.2017	5
6.	Ms. P. Ramya	M. Tech	Assistant Professor	01.06. 2016	6
7.	Ms. P. Priya	M. Tech	Assistant Professor	01.06. 2016	6
8.	Mr. S. J. Kabilan	M. Tech	Assistant Professor	25.06. 2018	4
9.	Dr. V. Kannan	Ph.D.	Assistant Professor	03.06.2019	3
10.	S. Selva Vinothika	M. Tech	Assistant Professor	01.06. 2021	1
11.	S. Nirmala Devi	M. Tech	Assistant Professor	01.06. 2021	1

List of Assistant Professors

CAYm1 (2020-21)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
1.	Dr. K. Selvaraj	Ph.D.	AssistantProfessor	13.10.2014	8
2.	Dr. K. Jyothi	Ph.D.	Assistant Professor	01.06.2017	5
3.	Mrs. J. Christina Rosy	M. Tech	AssistantProfessor	01.07. 2011	11

4.	Dr. G. Nadana Raja Vadivu	Ph.D.	AssistantProfessor	01.01. 2010	12
5.	Dr. D. Sankar Ganesh	Ph.D.	Assistant Professor	25.06.2018	4
6.	Dr. R. Seenivasagan	Ph.D.	Assistant Professor	19.06.2017	5
7.	Dr. D. Senthil Kumar	Ph.D.	Assistant Professor	01.06.2017	5
8.	Ms. P. Ramya	M. Tech	Assistant Professor	01.06. 2016	6
9.	Ms. P. Priya	M. Tech	Assistant Professor	01.06. 2016	6
10.	Mr. S. J. Kabilan	M. Tech	Assistant Professor	25.06. 2018	4
11.	Dr. V. Kannan	Ph.D.	Assistant Professor	03.06.2019	3

List of Assistant Professors

CAYm2 (2019-20)

S. No.	Name of faculty member	Qualification	Designation	Date of Joining the institution	No of years of experience
1.	Dr. K. Selvaraj	Ph.D.	AssistantProfessor	13.10.2014	8
2.	Dr. K. Jyothi	Ph.D.	Assistant Professor	01.06.2017	5

3.	Mrs. J. Christina Rosy	M. Tech	AssistantProfessor	01.07. 2011	11
4.	Dr. G. Nadana Raja Vadivu	Ph.D.	AssistantProfessor	01.01. 2010	12
5.	Dr. D. Sankar Ganesh	Ph.D.	Assistant Professor	25.06.2018	4
6.	Dr. R. Seenivasagan	Ph.D.	Assistant Professor	19.06.2017	5
7.	Dr. D. Senthil Kumar	Ph.D.	Assistant Professor	01.06.2017	5
8.	Ms. P. Ramya	M. Tech	Assistant Professor	01.06. 2016	6
9.	Ms. P. Priya	M. Tech	Assistant Professor	01.06. 2016	6
10.	Mr. S. J. Kabilan	M. Tech	Assistant Professor	25.06. 2018	4
11.	Dr. V. Kannan	Ph.D.	Assistant Professor	03.06.2019	3

4.2. Faculty competencies in the area of Program specialization(30)

4.2.1. Faculty competency in the domain area (10)

The Department of Biotechnology being an inter-disciplinary department comprises of faculty members with expertise in Molecular Biology, Bioprocess Technology and Enzyme Engineering, Computational Biology, Inflammation and Autoimmunity and Environmental Technology. Faculty members impart their domain specific knowledge to students and help them in their academic pursuits as well as encourage them for participation in various events like workshops for acquiring new skills and conferences to present their project work.

Faculty members regularly publish their research work in renowned national/international journals and books, and received funding from various government agencies and through consultancy work.

The program specific criteria are correlated with the competency of faculty members through their specialization in terms of their degree, research work, publications, patents, FDP, workshops, conferences attended, and products developed.

Name of the faculty	Relevant Area of Specialization	Publications	Course development	H-Index
Dr. K. Sundar	Infection and Immunity	94	a. Microbiology b. Immunology c. Molecular Pathogenesis d. Vaccinology	21
Dr. T. Kathiresan	Proteomics, Nanobiotechnology	35	a. Proteomics b. Nanobiotechnology c. Cancer biology d. Recombinant Protein Production	11
Dr. V. Pandiyarajan	Medicinal Plants	5	a. Plant Biotechnology	1
Dr. K. Palanichelvam	Plant Molecular Biology	27	a. Plant Biotechnology b. RNAi Technology	12
Dr. A. Muthukumaran	Nano- and Animal Biotechnology	27	a. Nanobiotechnology b. Animal Biotechnology c. Healthcare Biotechnology	7
Dr. B. Vanavil	Bioprocess Technology	20	a. Bioprocess Principles b. Biochemical Engineering	8
Dr. S. Shantkriti	Environmental Technology	24	a. Environmental Microbiology b. Environmental biotechnology	8
Dr. Nidhin Sreekumar	Environmental Technology	23	a. Bioenergy b. Bioresource Technology	6
Dr. Naresh Kumar Sharma	Environmental Biotechnology	22	a. Biological WasteWater Treatment b. Downstream Processing c. Bioseparations: Principles and Applications	7

Dr. K. K. Vasumathi	Algal Biotechnology	14	a. Biological Waste Water Treatment b. Bioenergy c. Molecular Diagnostics and Therapeutics	4
Dr. Sankarganesh Arunachalam	Cardiovascular and Adverse Drug Reactions	41	a. Cell Biology and Genetics b. Molecular Biology c. Radiation biology	13
Dr. J. Kanimozhi	Biochemical Engineering	14	a. Bioprocess Principles b. Biochemical Engineering	4
Dr. L. Muthulakshmi	Biomaterials	21	a. Principles of Biochemistry b. Bioenergetics and Metabolism c. Enzyme Technology	8
Dr. S. Ram Kumar Pandian	Innate Immunity and Inflammation	21	a. Genetic Engineering b. Immunology c. Stem Cell Technology	10
Dr. S. Sheik Asraf	Genomics	20	a. Functional Genomics b. Bioinformatics c. Genomics and Proteomics	3
Dr. V. Deepak	Cell Biology	25	a. Cell Biology and Genetics b. Molecular Biology c. Cancer Biology	15
Dr. K. Selvaraj	Drug Design and Drug Delivery	78	a. Drug Design and Development b. Structural Biology c. Plant Bioinformatics	12
Dr. K. Jyothi	Biochemistry	13	a. Principles of Biochemistry b. Bioenergetics and Metabolism	2
Mrs. J. Christina Rosy	Bioinformatics & Microbiology	7	a. Bioinformatics b. Microbiology c. Systems Biology	1

Ms. G. Nadana Raja Vadivu	Plant Biotechnology	7	a. Plant Biotechnology b. Protein Science and Engineering c. Metabolic Engineering	4
Dr. D. Sankar Ganesh	Animal Biotechnology	32	a. Animal Biotechnology b. Cancer Biology	11
Dr. R. Seenivasagan	Environmental Biotechnology	21	a. Environmental Biotechnology b. Environmental Microbiology	6
Dr. D. Senthil Kumar	Proteomics	7	a. Functional Genomics b. Protein Science and Engineering	1
Ms. P. Ramya	Bioprocess Technology	2	a. Biochemical Engineering b. Industrial Biotechnology c. Bioprocess Instrumentation and Control	0
Ms. P. Priya	Microbiology	3	a. Exploring the microbial world b. Human diseases and prevention	0
Mr. S. J. Kabilan	Drug Design and Bioactive Metabolites	3	a. Drug Design and Development b. Systems Biology c. Clinical Trials and Management	0
Dr. V. Kannan	Transgenic Technology	5	a. Genetic Engineering b. RNAi Technology	1

4.2.2. Faculty Research Publication (10)

S. No.	Name of the faculty	Qualification	Designation	Specialization	H-Index	No of Research Publications			No. of Ph.D. completed under their guidance	No. of Ph.D. ongoing under their guidance
						SCI	Scopus	UGC CARE/ others		
1.	Dr. K. Sundar	Ph.D.	Professor	Infectious and Inflammatory diseases	21	90	04	0	8	6
2.	Dr. T. Kathiresan	Ph.D.	Professor	Proteomics, Nanobiotechnology	11	35	02	0	3	4
3.	Dr. V. Pandiyarajan	Ph.D.	Professor	Medicinal Plants	1	5		0	0	0
4.	Dr. K. Palanichelvam	Ph.D.	Professor	Plant Molecular Biology	12	25	2	0	1	1
5.	Dr. A. Muthukumaran	Ph.D.	Professor	Nano- and Animal Biotechnology	10	24	3	0	4	3
6.	Dr. B. Vanavil	Ph.D.	Associate Professor	Bioprocess Technology	8	11	4	7	0	2
7.	Dr. S. Shantkriti	Ph.D.	Associate Professor	Environmental Technology	8	6	4	17	0	0
8.	Dr. Nidhin Sreekumar	Ph.D.	Associate Professor	Environmental Technology	6	6	3	0	0	0
9.	Dr. Naresh Kumar Sharma	Ph.D.	Associate Professor	Environmental Biotechnology	7	20	2	10	0	3
10.	Dr. K. K. Vasumathi	Ph.D.	Associate Professor	Algal Biotechnology	4	10	4	0	0	1
11.	Dr. Sankarganesh Arunachalam	Ph.D.	Associate Professor	Cardiovascular and Adverse Drug Reactions	13	37	5	0	0	2
12.	Dr. J. Kanimozhi	Ph.D.	Associate	Biochemical	4	10	4	0	0	0

S. No.	Name of the faculty	Qualification	Designation	Specialization	H-Index	No of Research Publications			No. of Ph.D. completed under their guidance	No. of Ph.D. ongoing under their guidance
						SCI	Scopus	UGC CARE/ others		
			Professor	Engineering						
13.	Dr. L. Muthulakshmi	Ph.D.	Associate Professor	Biomaterials	8	19	2	0	0	0
14.	Dr. S. Ram Kumar Pandian	Ph.D.	Associate Professor	Innate Immunity and Inflammation	20	30	4	0	0	1
15.	Dr. S. Sheik Asraf	Ph.D.	Associate Professor	Genomics	3	1	6	13	0	0
16.	Dr. V. Deepak	Ph.D.	Associate Professor	Cell Biology	15	25	0	0	0	0
17.	Dr. K. Selvaraj	Ph.D.	Assistant Professor	Drug Design and Drug Delivery	14	70	8	0	1	3
18.	Dr. K. Jyothi	Ph.D.	Assistant Professor	Biochemistry	2	0	6	5	0	0
19.	Mrs. J. Christina Rosy	M. Tech	Assistant Professor	Bioinformatics & Microbiology	1	4	3	0	0	0
20.	Dr. G. Nadana Raja Vadivu	Ph.D.	Assistant Professor	Plant Biotechnology	4	4	3	0	0	0
21.	Dr. D. Sankar Ganesh	Ph.D.	Assistant Professor	Animal Biotechnology	11	28	4	0	0	0
22.	Dr. R. Seenivasagan	Ph.D.	Assistant Professor	Environmental Biotechnology	6	21	0	0	0	0
23.	Dr. D. Senthil Kumar	Ph.D.	Assistant Professor	Proteomics	1	7	0	0	0	0
24.	Ms. P. Ramya	M. Tech	Assistant Professor	Bioprocess Technology	0	0	2	0	0	0
25.	Ms. P. Priya	M. Tech	Assistant Professor	Microbiology	0	0	1	0	0	0

S. No.	Name of the faculty	Qualification	Designation	Specialization	H-Index	No of Research Publications			No. of Ph.D. completed under their guidance	No. of Ph.D. ongoing under their guidance
						SCI	Scopus	UGC CARE/ others		
26.	Mr. S. J. Kabilan	M. Tech	Assistant Professor	Drug Design and Bioactive Metabolites	0	3	2	0	0	0
27.	Dr. V. Kannan	Ph.D.	Assistant Professor	Transgenic Technology	1	2	3	0	0	0
28.	Ms. S. Selva Vinothika	M. Tech	Assistant Professor	Proteomics, Cancer Biology	0	0	0	0	0	0
29.	Ms. R. Anandhalakshmi	M. Tech	Assistant Professor	Animal Biotechnology	0	0	0	0	0	0

Publications

In their areas of expertise, faculty members have 139 publications in the past 3 years. Students are also encouraged to present their discoveries at national and international conferences and to publish in national and international journals. The following is the list of publications for the last three years:

Academic Year	CAY (2021–2022)	CAYm1 (2020–2021)	CAYm2 (2019–2020)
No of Publications	53	40	46

Faculty publication details along with DoIs and Publication Citation Details

S. No.	Name of the faculty member	Paper details	DoI	Citation
1	Dr. S. Shantkriti	Shantkriti Srinivasan*, Senthil Kumar Sadasivam (2021): Biodegradation of textile azo dyes by textile effluent non-adapted and adapted <i>Aeromonas hydrophila</i> . Environmental Research. 194: 110643.	10.1016/j.envres.2020.110643	21
2	Dr. S. Shantkriti	Kannan V., Anandan R., Sudalaimani D.K., Srinivasan S., Athiappan M (2021): Antibacterial and antioxidant activity of metabolites from bioconverted Docosahexaenoic Acid using gut bacteria. Research Square, 1-15.	10.21203/rs.3.rs-674393/v1	0
3	Dr. S. Shantkriti	Seshan Gunalan S., Somarathinam K., Bhattacharya J., Srinivasan S., Jaimohan S. M., Manoharan R., Ramachandran S., Kanagaraj S., Kothandan G. 2020. Understanding the dual mechanism of bioactive peptides targeting the enzymes involved in Renin Angiotensin System (RAS): an in-silico approach. Journal of Biomolecular Structure and Dynamics. 38 (17): 5044-5061.	10.1080/07391102.2019.1695668	3

4	Dr. S. Shantkriti	NeepaPandhi, Shantkriti Srinivasan (2020): Marine bacteria: a storehouse of novel compounds for biodegradation. In: Shah M (Eds.), Microbial bioremediation & biodegradation. Springer, Singapore, pp. 485-503. (ISBN: 978-981-15-1811-9)	10.1007/978-981-15-1812-6_19	1
5	Dr. S. Shantkriti	Shantkriti Srinivasan*, KanyagaParameswari M, Siranjeevi Nagaraj (2020): Latest innovations in bacterial degradation of textile azo dyes. In: Shah MP, Rodriguez-Couto S, Sengor SS (Eds.), Emerging technologies in environmental bioremediation. Elsevier, pp. 285-309. (ISBN: 978-0-12-819860-5) (Scopus)	10.1016/B978-0-12-819860-5.00012-2	6
6	Dr. S. Shantkriti	MuruganAthiappan, Shantkriti Srinivasan, RubavathiAnandan, Janani Rajaram (2020): Novel process of ellagic acid synthesis from waste generated from mango pulp processing industries. In: Shah MP, Rodriguez-Couto S, Sengor SS (Eds.), Emerging technologies in environmental bioremediation. Elsevier, pp. 443-454. (ISBN: 978-0-12-819860-5). (Scopus)	10.1016/B978-0-12-819860-5.00020-1	1
7	Dr. S. Shantkriti	Nidhin Sreekumar, AswathyUdayan, Shantkriti Srinivasan* (2020): Algal bioremediation of heavy metals. In: Shah MP (Ed), Removal of toxic pollutants through microbiological and tertiary treatment. Elsevier, pp. 279-307. (ISBN: 978-0-12-821014-7)	10.1016/B978-0-12-821014-7.00011-3	4
8	Dr. S. Shantkriti	KanagasabaiSomarathinam, Saravanan Velautham, Rajakumar Perumal, Saravanan Kandasamy, Shantkriti Srinivasan, E. Gayathri, GunganKothandan, S. Usharani (2019): Synthesis, X-ray crystal structure and DFT calculations of 2',4'-dihydro-10H-spiro[anthracene-9,3'-benzo[b][1,4]thiazin]-10-amine and 1,3,5 - triindolyl benzene. Chemical Data Collections. 21:100227. (Scopus)	10.1016/j.cdc.2019.100227	4
9	Dr. S. Shantkriti	Shantkriti Srinivasan*, Senthil Kumar Sadasivam, SeshanGunalan, Gnanendra Shanmugam, GunganKothandan (2019): Application of docking and active site analysis for enzyme linked bioremediation of textile dyes. Environmental Pollution. 248: 599-608. (SCI IF: 5.714)	10.1016/j.envpo.2019.02.080	44
10	Dr. S. Shantkriti	M. Kannan, D. Mubarakali, B. Thiyonila, M. Krishnan, B. Padmanaban, S. Shantkriti (2019): Insect gut as a bioresource for potential enzymes-	10.1016/j.bcab.2019.01.048	14

		an unexploited area for industrial Biotechnology. Biocatalysis and Agricultural Biotechnology. 18: 101010. (Scopus)		
11	Dr. S. Shantkriti	Hussain Al Ssadh†, Shantkriti Srinivasan†, Inamul Hasan Madar, Ashvini Desai, Alaa OmranAlmagrabi, Iftikhar Aslam Tayubi (2018): Apoptotic induction by Cassia fistula leaf extracts against human hepatocarcinoma cell lines. International Journal of Scientific Innovations. 5 (1): 84-93. (Google Scholar)	10.32594/IJSI_20180501	0
12	Dr. S. Shantkriti	Shantkriti Srinivasan*, Senthil Kumar Sadasivam (2018): Exploring bacterial systems for docking and aerobic-microaerophilic biodegradation of textile azo dye. Journal of Water Process Engineering. 22: 180-191. (SCIE IF: 3.173)	10.1016/j.jwpe.2018.02.004	54
13	Dr. S. Shantkriti	BerchmansThiyonila, Naveen Paulin Reneeta, Mani Kannan, Srinivasan Shantkriti, Muthukalingan Krishnan (2018): Dung beetle gut microbes: diversity, metabolic and immunity related roles in host system. International Journal of Scientific Innovations. 4(3): 77-83. (Google Scholar)	10.32594/IJSI_20180403	8
14	Dr. Naresh Kumar Sharma	Khalid Sayed, Lavania Baloo and Naresh Kumar Sharma. Bioremediation of total petroleum hydrocarbons (Tph) by bioaugmentation and biostimulation in water with floating oil spill containment booms as bioreactor basin. International Journal of Environmental Research and Public Health, 2021, 18(5), pp. 1–27, 2226	https://doi.org/10.3390/ijerph18052226	23
15	Dr. Naresh Kumar Sharma	Sharma, N.K., Arivalagan, A.R. Algae or bacteria-the future of biological wastewater treatment. Handbook of Advanced Approaches Towards Pollution Prevention and Control, 2021, 2, pp. 217–247	https://doi.org/10.1016/B978-0-12-822134-1.00008-7	3
16	Dr. Naresh Kumar Sharma	Babu, A.R., Sharma, N.K., Manickam, M. Carbon dissipation from surgical cotton production wastewater using macroalgae, microalgae, and activated sludge microbes. Environmental Science and Pollution Research, , 2021	https://doi.org/10.1007/s11356-021-17345-1	1
17	Dr. Naresh Kumar Sharma	Prakash, A.C., Sharma, N.K., Vanitha, S. Macro algae-based adsorption for treatment of cotton processing wastewater. IOP Conference	https://doi.org/10.1088/1757-899X/872/1/012	0

		Series: Materials Science and Engineering, 2020, 872(1), 012186	186	
18	Dr. Naresh Kumar Sharma	Karthika Arumugam, Swaminathan Meenkashisundaram, Naresh Kumar Sharma. Photocatalysis for Wastewater Treatment with Special Emphasis on Plastic Degradation. Handbook of Nanomaterials and Nanocomposites for Energy and Environmental Applications, pp 1-21	https://doi.org/10.1007/978-3-030-11155-7_41-1	2
19	Dr. Naresh Kumar Sharma	Sharma, N.K., Suganya, K. , Sivapragasam, C., Matheswaran, M. Genetic Programming Modeling for Pollutant Removal from Aerobic Bioreactor Treating Industrial Wastewater. IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing, INCOS 2019, 2019, 8951364	10.1109/INCOS45849.2019.8951364	0
20	Dr. Naresh Kumar Sharma	Arumugam, K., Roy, A., Sabreen, T. , Sharma, N.K., Swaminathan, M. Antibacterial and photocatalytic properties of the engineered nanoparticles against infectious pathogens. Materials Today: Proceedings, 2019, 15, pp. 669–676	https://doi.org/10.1016/j.matpr.2019.04.136	2
21	Dr. Naresh Kumar Sharma	Swaminathan, M., Sharma, N.K. Antimicrobial activity of the engineered nanoparticles used as coating agents. Handbook of Ecomaterials, 2019, 1, pp. 549–563	10.1007/978-3-319-68255-6_1	11
22	Dr. Naresh Kumar Sharma	Muttu Pandian P., Matheswaran M., Vanitha S., Sivapragasam C., Naresh K. Sharma. acroalgae and Activated Sludge Microbes in Treatment of Crepe Cotton Effluent. International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9, Issue-2S2, December 2019	10.35940/ijitee.B1168.1292S219	0
23	Dr. Naresh Kumar Sharma	K.Suganya, C.Sivapragasam, Naresh K Sharma, S.Vanitha. Current Trends on Oil Sludge Characterization, Toxicity and Treatment Systems. International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8, Issue-4S2, December 2019	10.35940/ijrte.D1004.1284S219	0

24	Dr. Naresh Kumar Sharma	Naresh K Sharma, C.Sivapragasam, S.Vanitha , K.Ganeshmoorthy, S.Dilipkumar S.Saivishnu, A.M.Muhil. Ingenious Method Towards Sustainable Decentralized Solid Waste Management. International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8, Issue-4S2, December 2019	10.35940/ijrte.D1143.1284S219	0
25	Dr. Naresh Kumar Sharma	Naresh Kumar Sharma, Balakrishnan A, Karthika A, Thirumalai K, Swaminathan M. Activity of Engineered Nano-Semiconductor Oxides against Gram Positive and Gram Negative Bacteria. International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8, Issue-4S2, December 2019	10.35940/ijrte.D1136.1284S219	0
26	Dr. Naresh Kumar Sharma	Karthika A, Karthike R, Swaminathan M, Naresh Kumar Sharma. Assessing the Degradation of Organics in Surgical Cotton Processing Wastewater by Mixed Microbial Culture and Photo-Catalysis. International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8 Issue-4S2, December 2019	10.35940/ijrte.D1152.1284S219	0
27	Dr. Naresh Kumar Sharma	Arunajanani, V., Naresh Kumar Sharma, N.K., Hariram, N., ... Chitradevi, K. , Sheik Asraf, S. Outcome based project for betterment of rural community. Journal of Engineering Education Transformations, 2021, 34(Special Issue), pp. 263–270	10.16920/jeet/2021/v34i0/157153	1
28	Dr. S. Sheik Asraf	Ganapathy Nadana Raja Vadivu, S Sheik Asraf and KaruppaiahPalanichelvam. Association of Alcaligenes faecalis strain in juvenile earthworms, from cocoons of Eudrilu eugeniae. International Journal of Innovative Technology and Exploring Engineering. 9 no.2S2. 688-692. 2019.	10.35940/ijitee.B1166.1292S219	1
29	Dr. S. Sheik Asraf	S Sheik Asraf, N Shobi, R Soundarya and M Udaya Kumar. Culture Dependent Examination of Commercially Available Bar Chocolates. International Journal of Recent Technology and Engineering. 8 no.4S2.745-748.2019.	10.35940/ijrte.D1135.1284S219	0

30	Dr. S. Sheik Asraf	S Sheik Asraf, V.Priyanga, P.S. Bhuvaneshwaran and M. Devanand. Bacterial culture dependent effect on mobile phone's surface. International Journal of Recent Technology and Engineering. 8 no.4S2. 999-1002. 2019.	10.35940/ijrte.D1144.1284S219	0
31	Dr. S. Sheik Asraf	S Sheik Asraf and K. Jyothi. Influence of Antibiotics on Gut Microbiota and Stroke – A Mini Review. International Journal for Research in Applied Science & Engineering Technology. Volume 8 Issue VI. 1358-1359 June 2020.	http://doi.org/10.22214/ijraset.2020.6219	0
32	Dr. S. Sheik Asraf	Jyothi Kanagaraj , S. Sheik Asraf. Usage of Plant Extractsin Treating Obesity - A Mini Review. International Journal for Research in Applied Science & EngineeringTechnology, 8(VI): 2167-2169. June 2020.	http://doi.org/10.22214/ijraset.2020.6354	0
33	Dr. S. Sheik Asraf	Arunajanani, V., Naresh Kumar Sharma, N. Hariram, G. Vishnuvarthanan, S. ReginoldJebitta, T. Arunprasath, K. Chitradevi and S. Sheik Asraf. Outcome basedproject for betterment of rural community. Journal of Engineering Education Transformations Volume 34 Special issue. 263-270. January 2021.	https://dx.doi.org/10.16920/jeet/2021/v34i0/157153	0
34	Dr. S. Sheik Asraf	S. Sheik Asraf. Strategies for Production of Ethanol and Value Added Products from Agriculture Wastes. International Journal for Research in Applied Science & Engineering Technology. Volume 9 Issue V. 669- 670. May 2021	https://doi.org/10.22214/ijraset.2021.33329	0
35	Dr. S. Sheik Asraf	S. Sheik Asraf, P. Pavithra, R. Muneeswari, AthiraRajan, S. Ramya, V. Jaya Surya. Bacterial Colonization in Computer Keyboards Posses Health Hazard. International Journal of Recent Technology and Engineering. Volume- 10 Issue-5, 1-3 January 2022.	https://doi.org/10.35940/ijrte.f8547.0110522	0
36	Dr. S. Sheik Asraf	S. Sheik Asraf, A. Sivakkanni, M. Sneha, S. Janani, P. Jashin and A. Martina Jemimal. In Silico Based Bioinformatics Project During the COVID-19 Lockdown Period: An Alternative to Wet Lab Study. Journal of Engineering Education Transformations Volume 35 Issue 3. 82-87. January 2022.	https://dx.doi.org/10.16920/jeet/2022/v35i3/22090	0
37	Dr. B. Vanavil	S. Monika, S.H. Ponlakshmi, K. Sundar and B. Vanavil, Biological Synthesis of Gallium	10.26674/ijesacbt/2017/49244	2

		Nanoparticles using Extracts of <i>Andrographis paniculata</i> , International Journal of Engineering Science, Advanced Computing and Bio-Technology, 8 (4), 208- 222, 2017.		
38	Dr. B.Vanavil	V. Anitha, K. Abinaya, S. Prakash, A. Seshagiri Rao and B. Vanavil, <i>Bacillus cereus</i> KLUVAA mediated biocement production using hard water and urea, Chemical and Biochemical Engineering Quarterly, 32 (2), 257-266, 2018.	https://doi.org/10.1016/j.ijbiomac.2020.02.332	15
39	Dr. B.Vanavil	Prakash. S, Rajeswari. K, Divya. P, Ferlin. M and Vanavil. B, Optimization and production of curdlan gum using <i>Bacillus cereus</i> PR3 isolated from rhizosphere of leguminous plant, Preparative Biochemistry & Biotechnology, 48 (5), 408-418, 2018.	https://doi.org/10.1080/10826068.2018.1451886	8
40	Dr. B.Vanavil	Yoka Barrathi N S and Vanavil B, Characterization of Nanohydroxyapatite isolated from Seer Fish Bones and Waste Scales and its Applications in Lead Removal, International Journal of Recent Technology and Engineering, 8 (4S2) 668-672, 2019.	10.35940/ijrte.D1142.1284S219	0
41	Dr. B.Vanavil	Ramya Petchimuthu, R Clayton Fernando, G Anand, PS Gowtham, K Dhivagar, B Vanavil, Assessment of Efficiency of Eco-Friendly Organic Mosquito Repellent Developed using Elephant Dung, International Journal of Recent Technology and Engineering, 8(4S2), 459-462, 2019.	10.35940/ijrte.D1153.1284S219	1
42	Dr. B.Vanavil	Ramya Petchimuthu, AngelinJenit Franklin, Maria Agnes RoganziaSahayaraj, Abisha Gopalan, Mari Selva Sundari Raju, Vanavil B., Formulation and Examination of Organic Oil and Shampoo from Fish Scales, International Journal of Innovative Technology and Exploring Engineering, 9 (2S2), 683-687, 2019.	10.35940/ijitee.B1165.1292S219	0
43	Dr. B.Vanavil	Vanavil, K. Selvaraj, R. Aanandhalakshmi, K. Usha Sri, M. Arumugam, Bioactive and thermostable sulphated polysaccharide from <i>Sargassum swartzii</i> with drug delivery applications, International Journal of Biological Macromolecules, 153, 190-200, 2020.	https://doi.org/10.1016/j.ijbiomac.2020.02.332	21
44	Dr. B.Vanavil	R. Aanandhalakshmi, K. Sundar and B. Vanavil, Bioactive Oligosaccharides: Production, Characterization and Applications, In:	https://doi.org/10.1002/9781119771951.ch6	0

		Biomolecular Engineering Solutions for Renewable Specialty Chemicals-Microorganisms, Products, and Processes, Wiley, 2021		
45	Dr. B.Vanavil	P. BazeeraFerdhous, R. Aanandhalakshmi, P.Ramya, B.Vanavil, Scrutiny of metal ion binding sites in alginate lyase through <i>in silico</i> analysis, Applied Biochemistry and Biotechnology, 194, 124-147, 2022.	10.1007/s12010-021-03746-y	1
46	Dr. B.Vanavil	V.R. Hema, P. Ezhilarasi, B. Vanavil, Development of Anti-bacterial Nano Filling Material for Dental Caries, Journal of Scientific Research, 66 (1), 2022	10.37398/JSR.2022.660112	0
47	Dr. B.Vanavil	P. BazeeraFerdhous, P.S. Gowtham, B. Vanavil, Curdlan Sulfate as a Novel Inhibitor for SARS-CoV-2 (COVID – 19): A Molecular Docking Study using Computational Tools (2021) in Rahul Srivastava & Aditya Kumar Singh Pundir (eds.), New Frontiers in Communication and Intelligent Systems, 507–516. Computing & Intelligent Systems, SCRS, India	https://doi.org/10.52458/978-81-95502-00-4-52	0
48	Dr. B.Vanavil	Vanavil B., Ezhilarasi P., Aanandhalakshmi R., Gowtham P.S., Sundar K. Seaweed Bioprocessing for Production of Biofuels and Biochemicals. In: Nandabalan Y.K., Garg V.K., Labhsetwar N.K., Singh A. (eds) Zero Waste Biorefinery. Energy, Environment, and Sustainability, Springer, Singapore, 345-380, 2022	https://doi.org/10.1007/978-981-16-8682-5_13	1
49	Dr. B.Vanavil	Monika Senthamarai Kannan, Ponlakshmi S. Hari Haran, Krishnan Sundar, Selvaraj Kunjiappan, Vanavil Balakrishnan, Fabrication of anti-bacterial cotton bandage using biologically synthesized nanoparticles for medical applications, Progress in Biomaterials (2022) 11:229–241	https://doi.org/10.1007/s40204-022-00190-x	0
50	Dr.L.Muthulakshmi	Lakshmanan Muthulakshmi, Kannan Suganya, MaruthamuthuMurugan, JamespandiAnnaraj, VeeramuthuDuraipandiyan, Dunia A Al Farraj, Mohamed S Elshikh, Annie Juliet, Mukesh Pasupuleti, Jesu Arockiaraj., Antibiofilm efficacy of novel biogenic silver nanoparticles from Terminalia catappa against food-borne Listeria monocytogenes ATCC 15313 and mechanisms investigation in-vivo and in-vitro., Journal of King Saud University – Science., 34: 5 2022., 102083.	https://doi.org/10.1016/j.jksus.2022.102083	2

51	Dr.L.Muthulakshmi	LakshmananMuthulakshmi.,SelvakaniPrabakaran, Vaikundamoorthy,Ramalingam A. VaradaRajulu, MarriappanRajan, Seeram Ramakrishna, Hongrong Luo., Sodium alginate nanofibers loaded Terminalia catappa scaffold regulates intrinsic apoptosis signaling in skin melanoma cancer., Process Biochemistry 118 (2022) 92–102	https://doi.org/10.1016/j.procbio.2022.04.004	3
52	Dr.L.Muthulakshmi	Lakshmanan Muthulakshmi, A. VaradaRajulu,SeeramRamakrishna,SabuThomas, Catalin I. Pruncu., Development of biocomposite films from natural protein sources for food packaging applications: Structural characterization and physicochemical properties., Journal of Applied Polymer Science.,(2021) 139, (8).,51665	https://doi.org/10.1002/app.51665	0
53	Dr.L.Muthulakshmi	Manikandan, E., Mayandi, K., Sivasubramanian, M., Rajini, N., Rajesh, S., Muthulakshmi, L., &Rashedi, A. (2021). A comprehensive review on the impact of nanofluid in solar photovoltaic/thermal system. Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, 236:9, 5078-5096	https://doi.org/10.1177/09544062211055651	0
54	Dr.L.Muthulakshmi	VaidhegiKugarajah., Atul Kumar Ojha, ShivenduRanjan.,Nandita Dasgupta, Mahesh Ganesapillai, Sangeetha Dharmalingam, Ahmad ElmollBhartendu Nath Mishra, Lakshmanan Muthulakshmi, Sekar Vijayakumar, Seyed Ali Hosseini, (2021). Future applications of electrospun nanofibers in pressure driven water treatment: A brief review and research update., Journal of Environmental Chemical Engineering 9 (2) 105107	https://doi.org/10.1016/j.jece.2021.105107	37
55	Dr.L.Muthulakshmi	Lakshmanan Muthulakshmi,T. Vijayakumar, P. Selvam, J. Annaraj, Shivendu Ranjan, Nandita Dasgupta, Strong and Nonspecific synergistic antibacterial/antibiofilm impact of nano-silver biosynthesized and decorated with active ingredients of Oscimumbasilicum L. 3 Biotech (2021) 11:153.	https://doi.org/10.1007/s13205-021-02687-x	3
56	Dr.L.Muthulakshmi	Lakshmanan Muthulakshmi.,U. Pavithra V. Sivaranjani, N. Balasubramanian Kunnathur Murugesan Sakthivel Catalin Iulian Pruncu. (2021) A novel Ag/carrageenan–gelatin hybrid hydrogel nanocomposite and its biological	https://doi.org/10.1007/s13205-021-02687-x	5

		applications: Preparation and characterization., Journal of the mechanical behaviour of biomedical materials., 115,104257		
57	Dr.L.Muthulakshmi	L. Muthulakshmi, B. Anand Kumar, Aruliah Rajasekar, J. Annaraj, Catalin I. Pruncu., (2021). The benefits of k-Carrageenan-gelatin hybrid composite coating on the medical grade stainless steel (SS304) used as anticorrosive barrier., Materials Chemistry and Physics 258 (2021) 123909	https://doi.org/10.1016/j.matchemphys.2020.123909	10
58	Dr.L.Muthulakshmi	L. Muthulakshmi, J. B. Mathangi, R. P. Suryasankar, V. C. Padmanaban, M. Helen Kalavathy, M. R. Sanjay, Suchart Siengchin., Extraction of Polymeric bioflocculant from Enterobacter sp. and Adsorptive Kinetic Studies on Industrial Dye Removal Applications., Journal of Polymers and the Environment., (2020) 29(4) 1040-1049	https://doi.org/10.1007/s10924-020-01871-z .	6
59	Dr.L.Muthulakshmi	Lakshmanan Muthulakshmi, J. Annaraj, Seeram Ramakrishna, Shivendu Ranjan, Nandita Dasgupta, Sanjay Mavinkere Rangappa, Suchart Siengchin. A sustainable solution for enhanced food packaging via a science-based composite blend of natural-sourced chitosan and microbial extracellular polymeric substances. J Food Process Preserv. 2021, 45(1)e15031	https://doi.org/10.1111/jfpp.15031	12
60	Dr.L.Muthulakshmi	Lakshmanan Muthulakshmi, Anumakonda Varada Rajalu, Gobi Saravanan Kaliaraj, Suchart Siengchin, Jyotishkumar Parameswaranpillai, Ramiah Saraswathi (2019) Preparation of cellulose/copper nanoparticles bionanocomposite films using a bioflocculant polymer as reducing agent for antibacterial and anticorrosion applications., Composites Part B 175 (2019) 107177	https://doi.org/10.1016/j.compositesb.2019.107177	39
61	Dr.L.Muthulakshmi	P Selvam, T Vijayakumar, Ashish Wadhvani & L Muthulakshmi (2019) Bioreduction of silver nanoparticles from aerial parts of Euphorbia hirta L.(EH-ET) and its potent anticancer activities against neuroblastoma cell lines., Indian Journal of Biochemistry & Biophysics., 56:132-136	http://nopr.niscair.res.in/.../46917	18
62	Dr.L.Muthulakshmi	Anukragah Sundar, Sankarganesh Arunachalam Sridhar Jayavel, L. Muthulakshmi (2019) Encapsulation of Amphotericin B into Quercetin based silver nanoparticles: Preparation,	https://doi.org/10.1007/978-3-030-25135-2_7 .	4

		Characterization and preliminary investigation of antiparasitic activity., Springer Nature Springer Proceedings in Materials. ICON 2019,(1-9).		
63	Dr.A.Muthukumaran	Uppala, R., &Muthukumaran, A. (2022). Management of biodegradable waste through the production of single-cell protein. In Cost Effective Technologies for Solid Waste and Wastewater Treatment (pp. 39-49). Elsevier.	https://doi.org/10.1016/B978-0-12-822933-0.00016-4	0
64	Dr.A.Muthukumaran	Jeyabharathi, S., Naveenkumar, S., Chandramohan, S., Venkateshan, N., Gawwad, M. R. A., Elshikh, M. S., ... &Muthukumaran, A. (2022). Biological synthesis of zinc oxide nanoparticles from the plant extract, Wattakakavolubilis showed anti-microbial and anti-hyperglycemic effects. Journal of King Saud University-Science, 34(3), 101881.	https://doi.org/10.1016/j.jksus.2022.101881	3
65	Dr.A.Muthukumaran	Panimalar, S., Logambal, S., Thambidurai, R., Inmozhi, C., Uthrakumar, R., Muthukumaran, A., ... &Kaviyarasu, K. (2022). Effect of Ag doped MnO2 nanostructures suitable for wastewater treatment and other environmental pollutant applications. Environmental Research, 205, 112560.	https://doi.org/10.1016/j.envres.2021.112560	24
66	Dr.A.Muthukumaran	Uppala, R., &Muthukumaran, A. (2021). OPTIMIZATION OF MEDIA COMPONENTS AND PROCESS PARAMETERS FOR MICROBIAL MEDIATED REMEDIATION OF AZO DYES: A REVIEW. Journal of microbiology, biotechnology and food sciences, 11(3), e3549-e3549.	https://doi.org/10.15414/jmbfs.3549	0
67	Dr.A.Muthukumaran	Mani, M., Okla, M. K., Selvaraj, S., Kumar, A. R., Kumaresan, S., Muthukumaran, A., ... &Elshikh, M. S. (2021). A novel biogenic Allium cepa leaf mediated silver nanoparticles for antimicrobial, antioxidant, and anticancer effects on MCF-7 cell line. Environmental Research, 198, 111199.	https://doi.org/10.1016/j.envres.2021.111199	27
68	Dr.A.Muthukumaran	Chandramohan, S., Naveenkumar, S., Kaviyarasu, K., Lavakumar, V., Sowmya, C., Santhanakumar, M., &Muthukumaran, A. (2021). Bio-distribution of selenium nanoparticles (SeNPs) to the Wistar rats and its breastfed offspring. Journal of Drug Delivery Science and Technology, 61, 102299.	https://doi.org/10.1016/j.jddst.2020.102299	4

69	Dr.A.Muthukumaran	Naveenkumar, S., Chandramohan, S., &Muthukumaran, A. (2021). A novel synthesis of zinc oxide nanoparticles using various carbohydrate sources and its antimicrobial effects. <i>Materials Today: Proceedings</i> , 36, 520-525.	https://doi.org/10.1016/j.matpr.2020.05.321	1
70	Dr.A.Muthukumaran	Jeyabharathi, S., Chandramohan, S., Naveenkumar, S., Sundar, K., &Muthukumaran, A. (2021). Synergistic effects of herbal zinc oxide nanoparticles (ZnONPs) and its anti-hyperglycemic and anti-bacterial effects. <i>Materials Today: Proceedings</i> , 36, 390-396.	https://doi.org/10.1016/j.matpr.2020.04.685	3
71	Dr.A.Muthukumaran	Jeyabharathi, S., Mahalakshmi, R., Chandramohan, S., Naveenkumar, S., Sundar, K., &Muthukumaran, A. (2020). Self-assembled hollow ZnO nano and micro donut shape by starch and its antimicrobial potentials. <i>Materials Letters</i> , 275, 128128.	https://doi.org/10.1016/j.matlet.2020.128128	5
72	Dr.A.Muthukumaran	Uppala, R., Sundar, K., &Muthukumaran, A. (2019). Decolorization of azo dyes using dried biomass of <i>Bacillus cereus</i> RC1 and <i>Kocuriakristinae</i> RC3. <i>J Pure Appl Microbio</i> , 13, 1969-76.	https://doi.org/10.22207/JPAM.13.4.08	2
73	Dr.A.Muthukumaran	Uppala, R., Sundar, K., &Muthukumaran, A. (2019). Response surface methodology mediated optimization of decolorization of azo dye amido black 10B by <i>Kocuriakristinae</i> RC3. <i>International Journal of Environmental Science and Technology</i> , 16(8), 4203-4214.	https://doi.org/10.1007/s13762-018-1888-3	7
74	Dr.A.Muthukumaran	Chandramohan, S., Sundar, K., &Muthukumaran, A. (2019). Reducing agents influence the shapes of selenium nanoparticles (SeNPs) and subsequently their antibacterial and antioxidant activity. <i>Materials Research Express</i> , 6(8), 0850i2.	https://doi.org/10.1088/2053-1591/ab29d6	11
75	Dr.A.Muthukumaran	Chandramohan, S., Sundar, K., &Muthukumaran, A. (2019). Hollow selenium nanoparticles from potato extract and investigation of its biological properties and developmental toxicity in zebrafish embryos. <i>IET nanobiotechnology</i> , 13(3), 275-281.	https://doi.org/10.1049/iet-nbt.2018.5228	10
76	Dr.A.Muthukumaran	Chandramohan, S., Saranya, D., Sundar, K., &Muthukumaran, A. (2019). A Bioengineered Zinc Oxide Nanoparticles for Anti-Oxidant Applications. <i>International Journal of Engineering and Advanced Technology</i> , 8, 1003 – 1005	DOI:10.35940/ijrte.D1145.1284S219	0

77	Dr.A.Muthukumaran	Chandramohan, S., Sundar, K., &Muthukumaran, A. (2019). Maternal Dietary Exposure of Zinc Oxide Nanoparticles (ZnONPs) and its Effect in Guppies (<i>Poecilia reticulata</i>). International Journal of Engineering and Advanced Technology, 8, 779-782	DOI:10.35940/ijeat.A1143.1291S419	0
78	Dr.A.Muthukumaran	Chandramohan, S., Sundar, K., &Muthukumaran, A. (2019). A Novel Biofortification of Selenium Nanoparticles (SeNPs) in Drinking Water and Examination of its Hepatotoxicity in Wister Rats. International Journal of Engineering and Advanced Technology, 8, 737- 740	DOI: 10.35940/ijrte.D1148.1284S219	0
79	Dr.A.Muthukumaran	Kalishwaralal, K., Jeyabharathi, S., Sundar, K., Selvamani, S., Prasanna, M., &Muthukumaran, A. (2018). A novel biocompatible chitosan–Selenium nanoparticles (SeNPs) film with electrical conductivity for cardiac tissue engineering application. Materials Science and Engineering: C, 92, 151-160.	https://doi.org/10.1016/j.msec.2018.06.036	56
80	Dr.A.Muthukumaran	Chandramohan, S., Sundar, K., &Muthukumaran, A. (2018). Monodispersed spherical shaped selenium nanoparticles (SeNPs) synthesized by <i>Bacillus subtilis</i> and its toxicity evaluation in zebrafish embryos. Materials Research Express, 5(2), 025020.	https://doi.org/10.1088/2053-1591/aaabeb	20
81	Dr.K.Jyothi	Jyothi Kanagaraj, Ghurupreya Ramesh (2022) Molecular docking of bio-active compounds from <i>Mimosa pudica</i> against NMDA receptor. International journal for modern trends in science and technology. 8(01)265-268.	https://doi.org/10.46501/IJMTST0801046	0
82	Dr.K.Jyothi	Jyothi Kanagaraj, Derina J Pearlin, Lalitha AR, Kowsalya M (2021) Phospholipase A2 (PLA2) sequences in <i>Rattus norvegicus</i> genome. International Journal for Research in Applied Science & Engineering Technology. 9(06)1388-1390.	https://doi.org/10.22214/ijraset.2020.6354	0
83	Dr.K.Jyothi	Jyothi Kanagaraj ,Ghurupreya Ramesh, Geetika Devi Kaliappa, Venkatesan Chandran, (2020) Comparative study of medicinal plants in skin care. . International Journal for Research in Applied Science & Engineering Technology. 8(12) 172-175.	https://doi.org/10.22214/ijraset.2020.30245	0

84	Dr.K.Jyothi	Jyothi Kanagaraj, S. Sheik Asraf (2020) Usage of plant extracts in treating obesity- A mini review. International Journal for Research in Applied Science & Engineering Technology. 8(6) 2167 – 2169.	https://doi.org/10.22214/ijraset.2020.6354	0
85	Dr.K.Jyothi	S. Sheik Asraf , Jyothi Kanagaraj, (2020) Influence of Antibiotics on Gut Microbiota and Stroke - A Mini Review. International Journal for Research in Applied Science & Engineering Technology. 8(6) 1358-1359.	http://doi.org/10.22214/ijraset.2020.6219	0
86	Dr.K.Jyothi	Jyothi Kanagaraj, Hariharan Prabakaran, Venkatesan Chandran (2019) Phytochemical and antioxidant potential of Indian flora. International Journal of Recent Technology and Engineering. 8(4S2) 1007-1010.	DOI:10.35940/ijrte.D1146.1284S219	0
87	Dr.K.Jyothi	Jyothi Kanagaraj, VasanthiNachiappan, Ghurupreya Ramesh (2019) Degradation of Phospholipids by N, N-Dimethylformamide induced liver toxicity in male wistar rats. International Journal of Recent Technology and Engineering. 9 (2S2) 665-669.	DOI: 10.35940/ijitee.B1162.1292S219	0
88	Dr. K. Selvaraj	Panneerselvam T, Selvaraj K, Jaikanth C, Saravanan G, Shrinivas JD, Parasuraman P, and Indhumathy M. Graph Theoretical Analysis, Insilico Modeling and Formulation of Pyrimidine Nanocomposites as p38 α MAP Kinases inhibitors: A Quantitative Proteomics Approach. Drug Research, 69(2):100-110, 2019	10.1055/a-0650-3979	7
89	Dr. K. Selvaraj	Selvaraj K, Panneerselvam T, Parasuraman P, Sureshbabu RP, Vigneshwaran R, Ponnusamy P, Murugananthan G, Senthil Rajan D, Murugesan S. Impact of physicochemical parameters on effective extraction of bioactive compounds from natural sources: An overview, Current Bioactive Compounds, 2021.	10.2174/1573407217666210525143836	0
90	Dr. K. Selvaraj	Srinivasan V, Selvaraj K, Parasuraman P. A brief review of carbon nanotube reinforced metal matrix composites for aerospace and defense applications, International Nano Letters, 1-25, 2021.	10.1007/s40089-021-00328-y	8
91	Dr. K. Selvaraj	Faheem, Banoth Kumar, Kondapalli Venkata Gowri Chandra Sekhar, Subhash Chander, Selvaraj K, Murugesan S. 1,2,3,4-Tetrahydroisoquinoline (THIQ) as privileged	10.1080/17460441.2021.1916464	0

		scaffolds for anticancer de novo drug design, Expert Opinion on Drug Discovery, 2021.		
92	Dr. K. Selvaraj	Faheem, Banoth Kumar, Kondapalli Venkata Gowri Chandra Sekhar, Subhash Chander, Selvaraj K, Murugesan S. Medicinal chemistry perspectives of 1,2,3,4-Tetrahydroisoquinoline analogs- biological activities and SAR studies, RSC Advances, 2021, 11, 12254-87.	10.1039/d1ra01480c	7
93	Dr. K. Selvaraj	Selvaraj K, Murugesan S, Banoth Kumar K, Parasuraman P, EwaBabkiewicz, Piotr Maszczyk, Eliza Glodkowska-Mrowka, Sankarganesh A, Sureshbabu RP, Vigneshwaran R, Suraj B, Sivakumar V, Lalitha A, and Panneerselvam T. Capsaicin-loaded solid lipid nanoparticles: Design, biodistribution, in silico modeling and in vitro cytotoxicity evaluation. Nanotechnology, 32 095101, 2021.	10.1088/1361-6528/abc57e	20
94	Dr. K. Selvaraj	Ponnusamy P, Parasuraman P, Sankarganesh A, Vigneshwaran R, Sureshbabu RP, Saravanan G, Balasubramanian S, Panneerselvam T, and Selvaraj K*. Removal of water and their soluble materials from fuels using Moringa oleifera loaded keratin-co-sodium acrylate hydrogel. Journal of Porous Materials, 2021.	10.1007/s10934-020-01015-7	5
95	Dr. K. Selvaraj	Uma Priya M, Selvaraj K, Tirupathi P, and Sankarganesh A. Adriamycin inhibits glycolysis through downregulation of key enzymes in Saccharomyces cerevisiae. 3 Biotech, 2020.	10.1007/s13205-020-02530-9	5
96	Dr. K. Selvaraj	Faheem F, Banoth Karan Kumar, Kondapalli Venkata Gowri Chandra Sekhar, Selvaraj K, JoazaizulfazliJamalis, Rafael Balaña-Fouce, Murugesan S. Recent update on the anti-infective potential of β -carboline analogs. Mini-Reviews in Medicinal Chemistry 2020.	10.2174/1389557520666201001130114	4
97	Dr. K. Selvaraj	Faheem F, Banoth Karan Kumar, Kondapalli Venkata Gowri Chandra Sekhar, Selvaraj K, JoazaizulfazliJamalis, Rafael Balaña-Fouce, Babu L. Tekwani, Murugesan S. Druggable targets of SARS-CoV-2 and treatment opportunities for COVID-19. Bioorganic Chemistry 2020.	10.1016/j.bioorg.2020.104269	53
98	Dr. K. Selvaraj	Saravanan G, TheivendrenPanneerselvam T, Selvaraj K, Parasuraman P, Alagarsamy V, Udayakumar P, Ramalingam S, Damodar NA, and Alagarsamy S. Graph theoretical analysis, Insilico	10.1002/ddr.21511	3

		modeling, Prediction of Toxicity, Metabolism and Synthesis of Novel 2-(methyl/phenyl)-3-(4-(5-substituted-1,3,4-oxadiazol-2-yl) phenyl) quinazolin-4(3H)-ones as NMDA Receptor Inhibitor. Drug Development Research, 80(3):368-385, 2019		
99	Dr. K. Selvaraj	Selvaraj K*, Panneerselvam T, Murugesan S, Balasubramanian S, Sarathbabu S, Sankarganesh A, Parasuraman P, Vellaichamy S, Indhumathy M, and Suraj B. Design, graph theoretical analysis and bioinformatic studies of Proanthocyanidins encapsulated ethyl cellulose nanoparticles for effective anticancer activity. Biomedical Physics & Engineering Express, 5, 025004, 2019.	10.1088/2057-1976/aaf2a4	5
100	Dr. K. Selvaraj	Panneerselvam T, Selvaraj K, Saravanan G, Veerachamy A, Parasuraman P. Design, Optimization, Synthesis and Anti-TB Screening of Benzimidazole Derivatives, Anti-infective agents, 2019.	10.2174/2211352517666190301144054	0
101	Dr. K. Selvaraj	Parasuraman P, Suresh R, Theivendren P, Selvaraj K, Pandurangan P, Vasudevan M, Govindaraj S, Veerachamy A, Damodar N A. Synthesis of piperidine-4-one derivative containing dipeptides: An AChE and β -Secretase inhibitor, Anti-infective agents, 2019.	10.2174/2211352517666190405155505	2
102	Dr. K. Selvaraj	Selvaraj K, Panneerselvam T, Suraj B, Bathrinath S, Ponnusamy P, Govindaraj S, Sankarganesh A, Murugesan S, Jawahar N, Balasubramanian S, Ashish W. Modeling a pH- sensitive Zein- co- acrylic acid hybrid hydrogels loaded 5- fluorouracil and rutin for enhanced anticancer efficacy by oral delivery. 3 biotech, 2019, 9:185.	10.1007/s13205-019-1720-x	20
103	Dr. K. Selvaraj	Suraj B, Panneerselvam T, Ponnusamy P, Suthendran K, Parasuraman P, Sankarganesh A, Murugesan S, Uma Priya M, Lokeshkumar R, and Selvaraj K*. Optimization of bioactive compounds extraction assisted by microwave parameters from Kappaphycusalvarezii using RSM and ANFIS modeling. Journal of Food Measurement and Characterization, 13: 2773–2789, 2019.	10.1007/s11694-019-00198-1	11
104	Dr. K. Selvaraj	Selvaraj K, Panneerselvam T, Saravanan G, Parasuraman P, Suraj B, Murugesan S, Sankarganesh A, EwaBabkiewicz, Aarthi J, Muthulakshmi L. Design, in silico modelling, and	10.2174/1871520619666190702145609	13

		functionality theory of novel folate receptor targeted Rutin encapsulated folic acid conjugated keratin nanoparticles for effective cancer treatment. <i>Anti-cancer Agents in Medicinal Chemistry</i> , 19(16):1966-1982, 2019.		
105	Dr. K. Selvaraj	Selvaraj K, Saravanan G, Pavadai P, Murugesan S, Sankarganesh A, Ponnusamy P, Uma Priya M, Babkiewicz E, Maszczyk P, Sivakumar V, and Panneerselvam T. Design, insilico modelling and functionality theory of folate receptor targeted Myricetin loaded bovine serum albumin nanoparticle formulation for cancer treatment. <i>Nanotechnology</i> 31:155102, 2020.	10.1088/1361-6528/ab5c56	23
106	Dr. K. Selvaraj	Selvaraj K, Parasuraman P, Sivakumar V, Sureshbabu RP, Vigneshwaran R, Gowshiki S, Ponnusamy P, Adhvitha P, Murugesan S, Panneerselvam T. Surface receptor-mediated targeted drug delivery systems for enhanced cancer treatment -A state of the art review. <i>Drug Development Research</i> 83(3), 309-340, 2021.	10.1002/ddr.21758	19
107	Dr. K. Selvaraj	Uma Priya M, Sriram B, Panneerselvam T, Sankarganesh D, MubarakAli D, Parasuraman P, Ponnusamy P, Adhvitha P, Sankarganesh A and Selvaraj K. Utilization of plant-derived Myricetin molecule coupled with ultrasound for the synthesis of gold nanoparticles against breast cancer. <i>Naunyn-Schmiedeberg's Archives of Pharmacology</i> 2020.	10.1007/s00210-020-01874-6	11
108	Dr. K. Selvaraj	Suraj B, Panneerselvam T, Govindaraj S, Sankarganesh A, Parasuraman P, Sureshbabu RP, Murugesan S, Uma Priya M, Ponnusamy P, Vigneshwaran R, and Selvaraj K. Formulation and characterization of folate receptor-targeted PEGylated liposome encapsulating bioactive compounds from <i>Kappaphycus alvarezii</i> for cancer therapy. <i>3 biotech</i> , 2020.	10.1007/s13205-020-2132-7	13
109	Dr. K. Selvaraj	Jithendra CH, Saravanan G, Alagarsamy V, Panneerselvam T, Selvaraj K and Parasuraman P. Synthesis, Characterization & Antimicrobial Activities of New Isoxazole Substituted Mannich and Schiff Bases of 5-Nitroisatin Analogs. <i>Asian Journal of Chemistry</i> , 32(4): 970-974, 2020	10.14233/ajchem.2020.22596	0
110	Dr. K. Selvaraj	Selvaraj K, Panneerselvam T, Saravanan G, Suthendran K, Pavadai P, Sankarganesh A, Murugesan S, Suraj B, Ponnusamy P, Damodar	10.1007/s13738-019-01812-1	5

		NA. Optimization and analysis of ultrasound-assisted extraction of bioactive polyphenols from <i>Garcinia indica</i> using RSM and ANFIS modeling and its anticancer activity. <i>Journal of the Iranian Chemical Society</i> , 17: 789–801, 2020.		
111	Dr. K. Selvaraj	Rajagopal G, Nivetha A, Sundar M, Panneerselvam T, Murugesan S, Parasuraman P, Sattanathan K, Ilango S, Selvaraj K. Mixed phytochemicals mediated synthesis of copper nanoparticles for anticancer and larvicidal applications, <i>Heliyon</i> , 7(6), E07360, 2021.	10.1016/j.heliyon.2021.e07360	12
112	Dr. K. Selvaraj	Arjun Kumar K, Panneerselvam T, Parasuraman P, Ram Kumar Pandian S, Sundar K, Murugesan S, Damodar Nayak A, Sattanathan K, Sankarganesh A, Selvaraj K*. Pharmacoinformatics-based investigation of bioactive compounds of Rasam (South Indian recipe) against human cancer. <i>Scientific Reports</i> , 11, 21488, 2021.	10.1038/s41598-021-01008-9	11
113	Dr. K. Selvaraj	Arjun Kumar K, Pavadai Parasuraman, Pandian Sivakumar, Murugesan Sankaranarayanan, Sankarganesh Arunachalam, Sureshbabu Ram Kumar Pandian, Vigneshwaran Ravishankar, Damodar Nayak Ammunje, Muthukumar Sampath, TheivendranPanneerselvam, Selvaraj K*. In silico and in vitro screening of antioxidant and anticancer potentials of bioactive secondary metabolites from an endophytic fungus (<i>Curvularia</i> sp.) from <i>Phyllanthus niruri</i> L. <i>Environmental Science and Pollution Research</i> , 2022	10.1007/s11356-022-19249-0	1
114	Mr. S. J. Kabilan	Kabilan, S. J. (2022). Effect of Virtual Activity and Game-Based Learning Techniques in Effective Teaching of 'Professional Ethics' Course. <i>Journal of Engineering Education Transformations</i> , 35(3).	10.16920/jeet/2022/v35i3/22092	0
115	Mr. S. J. Kabilan	Kabilan, S. J. (2021). Effect of Autonomous Assessment Method in Effective Teaching of 'Clinical Trials and Management' Course. <i>Journal of Engineering Education Transformations</i> , 34(Special Issue).	10.16920/jeet/2021/v34i0/157159	0
116	Mr. S. J. Kabilan	KabilanShanmugampillaiJeyarajaguru, Gowshiki Srinivasan, Selvaraj Kunjiappan, Krishnan Sundar. Ginger Compress Therapy – A Painless Solution for Kidney Failure Patients. <i>Biointerface</i>	https://doi.org/10.33263/BRIAC133.260	0

		Research in Applied Chemistry. 13(3), 260.		
117	Mr. S. J. Kabilan	Palanichamy, C., Pavadai, P., Panneerselvam, T., Arunachalam, S., Babkiewicz, E., Ram Kumar Pandian, S., ... & Kunjiappan, S. (2022). Aphrodisiac Performance of Bioactive Compounds from <i>Mimosa pudica</i> Linn.: In Silico Molecular Docking and Dynamics Simulation Approach. <i>Molecules</i> , 27(12), 3799.	https://doi.org/10.3390/molecules27123799	0
118	Mr. S. J. Kabilan	JeyarajaguruShanmugampillaiKabilan*, Kunjiappan Selvaraj, SundaresanHemapriya, Mahesh Subikshaa and Srinivasan Gowshiki, Therapeutic Efficacy of Polyherbal formulation Kabasurakudineer against common viral fevers – A perspective review, <i>Anti-Infective Agents</i> 2022; 20() : e270522205330 .	10.2174/2211352520666220527102858	0
119	Dr.K.Palanichelvam	Nadana Raja Vadivu Ganapathy, SenthamaraiKannanBalaji, KaruppaiahPalanichelvam Putative volatiles in coelomic fluid of earthworm regulate the growth of <i>Vigna radiata</i> <i>Biocatalysis and Agricultural Biotechnology</i> Volume 18, March 2019, 101070	https://doi.org/10.1016/j.bcab.2019.101070	6
120	Dr.K.Palanichelvam	Rajesh, C., Rajamanikkam, K., Vadivu, G.N.R. and Palanichelvam, K., 2019. Coelomic fluid of earthworm, <i>Eudriluseugeniae</i> , inhibits the growth of fungal hyphae, in vitro. <i>Int. J. Eng. Adv. Technol</i> , 9, pp.2249-8958. DOI:10.35940/ijeat.A1146.1291S419	DOI: 10.35940/ijeat.A1146.1291S419	6
121	Dr.K.Palanichelvam	Rajamanikkam, K., Rajesh, C., Prakash, R., Selvapalam, N. and Palanichelvam, K., 2019. Earthworm, an in Vivo System to Screen Proliferative and Antimitotic Compounds.	DOI: 10.35940/ijitee.B1164.1292S219	1
122	Dr.K.Palanichelvam	Nadana, G.R.V., Rajesh, C., Kavitha, A., Sivakumar, P., Sridevi, G. and Palanichelvam, K., 2020. Induction of growth and defense mechanism in rice plants towards fungal pathogen by eco-friendly coelomic fluid of earthworm. <i>Environmental Technology & Innovation</i> , 19, p.101011.	https://doi.org/10.1016/j.eti.2020.101011	9
123	Dr.K.Palanichelvam	Rajesh, C., Palanimuthu, V.R. and Palanichelvam, K., 2021. Fatty acids and its derivatives of <i>Acorus calamus</i> Linn. rhizome induce stem cell-mediated cell	https://doi.org/10.1016/j.bcab.2021.102153	0

		division in plants and animals. Biocatalysis and Agricultural Biotechnology, 36, p.102153.		
124	Dr.K.Palanichelv am	Vadivu, G.N.R., Asraf, S.S. and Palanichelv am, K., Association of Alcaligenes Faecalis Strain in Juvenile Earthworms, from Cocoons of EudrilusEugeniae.	DOI: 10.35940/ijitee. B1166.1292S21 9	1
125	Dr.K.Palanichelv am	Nadana, G.R.V., Selvaraj, K., Sivakumar, P. and Palanichelvam, K., 2020. Coelomic fluid of earthworms extruded by cold stress method has commercially significant compounds and trigger seed germination in Vigna radiata L. Environmental Technology & Innovation, 19, p.100814.	https://doi.org/10.1016/j.eti.2020.100814	7
126	Dr.K.Palanichelv am	ajamanikkam, K., RAJA, S.E., Balaji, S.K., Rajavadivu, G.N., Sivasubramaniam, S. and Palanichelvam, K., 2019. Earthworm, a novel in vivo system to validate antimitotic compounds. Turkish Journal of Zoology, 43(2), pp.153-163.	10.3906/zoo- 1806-36	6
127	Dr. T. Kathiresan	Harini, L., Srivastava, S., Gnanakumar, G. P., Karthikeyan, B., Ross, C., Krishnakumar, V., ... &Kathiresan, T. (2019). An ingenious non- spherical mesoporous silica nanoparticle cargo with curcumin induces mitochondria-mediated apoptosis in breast cancer (MCF-7) cells. Oncotarget, 10(11), 1193.	10.18632/oncotar get.26623	27
128	Dr. T. Kathiresan	Viswanathan, T. M., Arun, A., Senthilkumar, D., Sundar, K., &Kathiresan, T Mediated Apoptosis. Superoxide Dismutase-1 Induced Oxidative Stress in Murine Retinal Pigment Epithelial Cells. retina, 11, 12.	DOI: 10.35940/ijrte.D 1154.1284S219	0
129	Dr. T. Kathiresan	Kathiresan, Thandavarayan. (2019). Oil Extraction and Compound analysis of Microalgae Chlorella Vulgaris. International Journal of Recent Technology and Engineering. 8. 231-234. 10.35940/ijrte.D1070.1284S419.	DOI:10.35940/ij rte.D1070.1284 S419	0
130	Dr. T. Kathiresan	ThandavarayanKathiresan T. Mohan Viswanathan, RajanPradeepa, Ravi Lavanya, PalaniyappanAbinaya, Krishnan Sundar (2019). In Silico And Molecular Docking Prediction Studies Elucidate Anti-Breast Cancer Activity Of	DOI: 10.31838/jcdr.2 021.12.05.67	0

		Lycopene And Gallic Acid. Journal of Cardiovascular Disease Research, 12 (5), 503-509.		
131	Dr. T. Kathiresan	Harini, L., Bose, K., Viswanathan, T. M., Kumar, N. S., Sundar, K., & Kathiresan, T. (2021). Mesoporous Silica Nanoparticles Are Nanocarrier for Drug Loading and Induces Cell Death in Breast Cancer. In Environmental Biotechnology Volume 4 (pp. 225-245). Springer, Cham.	DOI: 10.1007/978-3-030-77795-1_8	2
132	Dr. T. Kathiresan	Thandavarayan Kathiresan Azar Zochedh A S, Asath Bahadur S (2019), Quantum chemical and Molecular docking studies of Naringin: A potent anti-cancer drug. Journal of Cardiovascular Disease Research, 12 (5), 1140-1148.	DOI: 10.31838/jcdr.2021.12.05.147	0
133	Dr. T. Kathiresan	Mohan Viswanathan, T., Krishnakumar, V., Senthilkumar, D., Chitradevi, K., Vijayabhaskar, R., Rajesh Kannan, V., ... & Kathiresan, T. (2022). Combinatorial Delivery of Gallium (III) Nitrate and Curcumin Complex-Loaded Hollow Mesoporous Silica Nanoparticles for Breast Cancer Treatment. Nanomaterials, 12(9), 1472.	https://doi.org/10.3390/nano12091472	2
134	Dr. T. Kathiresan	Viswanathan, T. M., Chitradevi, K., Zochedh, A., Vijayabhaskar, R., Sukumaran, S., Kunjiappan, S., ... & Kathiresan, T. (2022). Guanidine–Curcumin Complex-Loaded Amine-Functionalised Hollow Mesoporous Silica Nanoparticles for Breast Cancer Therapy. Cancers, 14(14), 3490.	https://doi.org/10.3390/nano12091472	0
135	Dr. T. Kathiresan	Zochedh, A., Priya, M., Shunmuganarayanan, A., Thandavarayan, K., & Sultan, A. B. (2022). Investigation on structural, spectroscopic, DFT, biological activity and molecular docking simulation of essential oil Gamma-Terpinene. Journal of Molecular Structure, 1268, 133651.	https://doi.org/10.3390/cancers14143490	0
136	Dr. Nadana Raja Vadivu Ganapathy	Nadana Raja Vadivu Ganapathy, Senthamarai Kannan Balaji, Karuppaiah Palanichelvam Putative volatiles in coelomic fluid of earthworm regulate the growth of Vigna radiata Biocatalysis and Agricultural Biotechnology Volume 18, March 2019, 101070	https://doi.org/10.1016/j.bcab.2019.101070	6
137	Dr. Nadana Raja Vadivu Ganapathy	Rajesh, C., Rajamanikkam, K., Vadivu, G.N.R. and Palanichelvam, K., 2019. Coelomic fluid of earthworm, Eudriluseugeniae, inhibits the growth of fungal hyphae, in vitro.	DOI:10.35940/ijeat.A1146.1291S419	6

		Int. J. Eng. Adv. Technol, 9, pp.2249-8958.		
138	Dr. Nadana Raja Vadivu Ganapathy	Nadana, G.R.V., Rajesh, C., Kavitha, A., Sivakumar, P., Sridevi, G. and Palanichelvam, K., 2020. Induction of growth and defense mechanism in rice plants towards fungal pathogen by eco-friendly coelomic fluid of earthworm. Environmental Technology & Innovation, 19, p.101011.	https://doi.org/10.1016/j.eti.2020.101011	9
139	Dr. Nadana Raja Vadivu Ganapathy	Vadivu, G.N.R., Asraf, S.S. and Palanichelvam, K., Association of Alcaligenes Faecalis Strain in Juvenile Earthworms, from Cocoons of EudrilusEugeniae.	DOI: 10.35940/ijitee.B1166.1292S219	1
140	Dr. Nadana Raja Vadivu Ganapathy	Nadana, G.R.V., Selvaraj, K., Sivakumar, P. and Palanichelvam, K., 2020. Coelomic fluid of earthworms extruded by cold stress method has commercially significant compounds and trigger seed germination in Vigna radiata L. Environmental Technology & Innovation, 19, p.100814.	https://doi.org/10.1016/j.eti.2020.100814	7
141	Dr. Nadana Raja Vadivu Ganapathy	Rajamanikkam, K., RAJA, S.E., Balaji, S.K., Rajavadivu, G.N., Sivasubramaniam, S. and Palanichelvam, K., 2019. Earthworm, a novel in vivo system to validate antimutagenic compounds. Turkish Journal of Zoology, 43(2), pp.153-163.	10.3906/zoo-1806-36	6
142	Dr.K.Vasumathi	Vasumathi, K. K., Fenila, F., Nithya, E. M., Ramakant, P., Premalatha M. 2019 Optimization Of Nutrients for The Growth Of Scenedesmus Sp. By Response Surface Methodology. International Journal of Recent Technology and Engineering, 8 (4S2), 664 - 667 .	DOI: 10.35940/ijrte.D1141.1284S219	0
143	Dr.K.Vasumathi	Ganapathy, N. R. V., Vasumathi Krishnan, Aruna Janani Veeraraghavan, Varatharajan and Gokul Devaraj. 2019 Biosynthesis of Zinc Oxide Nanoparticles From PlectranthusAmboinicus and Its Photocatalytic Effect on Wastewater. Treatment International Journal of Recent Technology and Engineering, 8(4S2), 660 – 663.	DOI: 10.35940/ijrte.D1140.1284S219	0

144	Dr.J.kanimozhi	Kanimozhi, J., Sivasubramanian V., Ganesh MoorthyI., R. Sivashanka. 2019 Influence of Dextranase of WeissellaCibaria Nitsch4 on Low Molecular Weight Dextran Yield: aStatistical Approach using Mixed Level Taguchi Design and Artificial Neural Network. International Journal of Innovative Technology and Exploring Engineering,9 (2S2), 657 – 664.	DOI: 10.35940/ijitee.B1161.1292S219	0
145	Mrs.J.Christina rosy	Joseph Christina, R., Ashok Bala, M., Krishnan, S. 2019. Virtual Screening of Natural Metabolites as Candidate Drugs for Rheumatoid Arthritis. International Journal of Recent Technology and Engineering, 8 (4S4), 226-230.	DOI: 10.35940/ijrte.D1069.1284S419	0
146	Dr.D.Sankar Ganesh	Sankarganesh, D., Ramachandran, R., Suriyakalaa, U., Ramesh Saravanakumar, V., Archunan, G., Akbarsha, M. A., and Achiraman, S. 2019. Assessment of urinary volatile compounds and proteins in the female goat Capra hircus: A pilot study to reveal potential indicators of oestrus. Reproduction in Domestic Animals, 54(3), 646-651.	https://doi.org/10.1111/rda.13407	0
147	Dr.D.Sankar Ganesh	Silambarasan, V., Deepalakshmi, G., Sankarganesh, D., Nithya, V. and Archunan, G., 2019. Identification of potential pheromone source in sows. Behavioural Processes, 168, 103940.	10.1016/j.beproc.2019.103940	0
148	Dr.D.Sankar Ganesh	Sankarganesh, D., Suriyakalaa, U., Ramachandran, R., Achiraman, S., Arunachalam, S. and Angayarkanni, J., 2019. Urinary volatile metabolomics as a viable alternative diagnostic tool for polycystic ovary syndrome: An exploratory hypothesis. Medical Hypotheses, 124, 121-124.	https://doi.org/10.1016/j.mehy.2019.02.009	0
149	Dr.D.Sankar Ganesh	Sankarganesh, D., Ramachandran, R., Vinothkumar, A., Rengarajan, R.L., Saravanakumar, V.R., Archunan, G. and Achiraman, S., 2019. Changes in urinary volatiles and proteins in male goats: A possible clue for females during mate selection. Biocatalysis and Agricultural Biotechnology, 17, 361-365.	https://doi.org/10.1016/j.bcab.2018.12.016	0
150	Dr.D.Sankar Ganesh	Elangovan, N.D., Dhanabalan, A.K., Gunasekaran, K., Kandimalla, R. and Sankarganesh, D., 2020. Screening of potential drug for Alzheimer's disease: a computational study with GSK-3 β inhibition through virtual	https://doi.org/10.1080/07391102.2020.1805362	0

		screening, docking, and molecular dynamics simulation. Journal of Biomolecular Structure and Dynamics, pp.1-15.		
151	Dr.D.Sankar Ganesh	Ramachandran, R., Vinothkumar, A., Sankarganesh, D., Suriyakalaa, U., Aathmanathan, V.S., Kamalakkannan, S., Nithya, V., Angayarkanni, J., Archunan, G., Akbarsha, M.A. and Achiraman, S., 2020. Detection of estrous biomarkers in the body exudates of Kangayam cattle (<i>Bos indicus</i>) from interplay of hormones and behavioral expressions. Domestic Animal Endocrinology, 72, p.106392.	https://doi.org/10.1016/j.domaniend.2019.106392	0
152	Dr.D.Sankar Ganesh	Pichiah, P.B., Sankarganesh, D., Arunachalam, S. and Achiraman, S., 2020. Adipose-Derived Molecules–Untouched Horizons in Alzheimer’s Disease Biology. Frontiers in Aging Neuroscience, 12, p.17.	DOI:10.3389/fnagi.2020.00017	0
153	Dr.D.Sankar Ganesh	Suriyakalaa, U., Ramachandran, R., Doulathunnisa, J.A., Aseervatham, S.B., Sankarganesh, D., Kamalakkannan, S., Kadalmani, B., Angayarkanni, J., Akbarsha, M.A. and Achiraman, S., 2021. Upregulation of Cyp19a1 and PPAR- γ in ovarian steroidogenic pathway by <i>Ficus religiosa</i> : A potential cure for polycystic ovary syndrome. Journal of Ethnopharmacology, 267, p.113540.	https://doi.org/10.1016/j.jep.2020.113540	0
154	Dr.D.Senthil Kumar	Viswanathan, T.M., Arun, A., Senthilkumar, D., Sundar, K., Kathiresan, T., 2019 Superoxide Dismutase-1 Induced Oxidative Stress Mediated Apoptosis in Murine Retinal Pigment Epithelial Cells. International Journal of Recent Technology and Engineering, 8 (4S2), 463-466.	DOI: 10.35940/ijrte.D1154.1284S219	0
155	Ms.P.Ramya	Priya P., Ramya P., Sarah Afreen B., Ramya K. M., Harshi S. G., Uma Maheshwari D. 2019 Production of Cost Effective, Biodegradable, Disposable Feminine Sanitary Napkins using Banana Fibres. International Journal of Engineering and Advanced Technology, 9 (1S4), 789 – 791.	DOI:10.35940/ijeat.A1145.1291S419	0
156	Ms.P.Ramya	Ramya, P., AngelinJenit, F., Maria Agnes Roganzia, S., Abisha, G., Mari Selva Sundari, R., Vanavil, B. 2019. Formulation and Examination of Organic Oil and Shampoo from Fish Scales. International Journal of Innovative Technology and Exploring Engineering, 9 (2S2), 683-687.	DOI: 10.35940/ijitee.B1165.1292S219	0

157	Dr. K. Sundar	Ajitha, M., K. Sundar, S. Arul Mugilan, S. Arumugam (2018) Development of METAL-ACTIVE SITE and ZINCCLUSTER tool to predict active site pockets, <i>PROTEINS: Structure, Function and Bioinformatics</i> , 86(3): 322-331.	10.1002/prot.25441	8
158	Dr. K. Sundar	Subramanian, E.R., D.K. Sudalaimani, J.R.S.S. Christyraj, K. Ramamoorthy, N.G. Daisy, J.D.S. Christyraj, K. Renganathan, S. Krishnan, S. Sivasubramaniam (2017) Studies on organogenesis during regeneration in the earthworm, <i>Eudriluseugeniae</i> , in support of symbiotic association with <i>Bacillus endophyticus</i> , <i>Turk J Biol</i> 41: 113-126.	10.3906/Biy-1604-44	14
159	Dr K. Sundar	Christina Rosy, J., E. Babkiewicz, P. Maszczyk, P. Mrówka, B.K. Kumar, S. Murugesan, S. Kunjiappan, K. Sundar (2022) L-Ornithine-N5-monooxygenase (PvdA) Substrate Analogue Inhibitors for <i>Pseudomonas aeruginosa</i> Infections Treatment: Drug Repurposing Computational Studies. <i>Biomolecules</i> , 12(7): 887.	10.3390/biom12070887	1
160	Dr. K. Sundar	Harini, L., Srivastava, S., Gnanakumar, G.P., Karthikeyan, B., Ross, C., Krishnakumar, V., Kannan, V.R., Sundar, K. and Kathiresan, T., 2019. An ingenious non-spherical mesoporous silica nanoparticle cargo with curcumin induces mitochondria-mediated apoptosis in breast cancer (MCF-7) cells. <i>Oncotarget</i> , 10(11), 1193.	10.18632/oncotarget.26623	30
161	Dr. K. Sundar	Viswanathan, T.M., Arun, A., Senthilkumar, D., Sundar, K., Kathiresan, T., 2019 Superoxide Dismutase-1 Induced Oxidative Stress Mediated Apoptosis in Murine Retinal Pigment Epithelial Cells. <i>International Journal of Recent Technology and Engineering</i> , 8 (4S2), 463-466.	10.35940/ijrte.D1154.1284S219	0
162	Dr. K. Sundar	Pandian, S.R.K., Arunachalam, S., Deepak, V., Kunjiappan, S. and Sundar, K., 2020. Targeting complement cascade: an alternative strategy for COVID-19. <i>3 Biotech</i> , 10(11), pp.1-10.	10.1007/s13205-020-02464-2	9
163	Dr. K. Sundar	Mohan, M., P. Shanmugaraja, R. Krishnan, K. Rajagopalan, K. Sundar (2020) In silico prediction of B-cell epitopes of dengue virus - a reverse vaccinology approach, <i>Journal of Applied Pharmaceutical Science</i> , 10(10): 77-85.	10.7324/JAPS.2020.10109	4
164	Dr. K. Sundar	Marimuthu, S.C.V., Ravinarayanan, H., Rosy, J.C. and Sundar, K., 2020. Mining the Proteome of	10.2174/1871526520666200622	0

		Streptococcus mutans for Putative Drug Targets. Infectious Disorders Drug Targets, 21(3), p. 429-438.	143316	
165	Dr. K. Sundar	Deepak, V., Sundar, W.A., Pandian, S.R.K., Sivasubramaniam, S.D., Hariharan, N. and Sundar, K., 2021. Exopolysaccharides from Lactobacillus acidophilus modulates the antioxidant status of 1, 2–dimethyl hydrazine-induced colon cancer rat model. 3 Biotech, 11(5), pp.1-9.	10.1007/s13205-021-02784-x	2
166	Dr. K. Sundar	Rencilin, C.F., Rosy, J.C., Mohan, M., Coico, R. and Sundar, K., 2021. Identification of SARS-CoV-2 CTL epitopes for development of a multivalent subunit vaccine for COVID-19. Infection, Genetics and Evolution, 89, p.104712.	10.1016/j.meegid.2021.104712	10
167	Dr. K. Sundar	Pandian, S.R.K., Rencilin, C.F., Sundar, K., 2021. Emerging nanomaterials for cancer immunotherapy. Exploration in Medicine, 2, p. 208-31.	10.37349/emed.2021.00043	0
168	Dr. K. Sundar	Mohan, M., R. Haribalaganesh, R. Coico, K. Sundar (2018) HLA-directed bioinformatics approach for genome-wide mapping of dengue CTL epitopes, Future Virology, 13: 331-342	10.2217/fvl-2017-0157.	3
169	Dr. S. Ram Kumar Pandian	Kunjiappan, S., Sankaranarayanan, M., Kumar, B.K., Pavadai, P., Babkiewicz, E., Maszczyk, P., Glodkowska-Mrowka, E., Arunachalam, S., Pandian, S.R.K., Ravishankar, V. and Baskararaj, S., 2020. Capsaicin-loaded solid lipid nanoparticles: Design, biodistribution, in silico modeling and in vitro cytotoxicity evaluation. Nanotechnology, 32(9), p.095101.	10.1088/1361-6528/abc57e	0
170	Dr. S. Ram Kumar Pandian	Pandian, S.R.K., Arunachalam, S., Deepak, V., Kunjiappan, S. and Sundar, K., 2020. Targeting complement cascade: an alternative strategy for COVID-19. 3 Biotech, 10(11), pp.1-10.	10.1007/s13205-020-02464-2	0
171	Dr. S. Ram Kumar Pandian	Baskararaj, S., Panneerselvam, T., Govindaraj, S., Arunachalam, S., Parasuraman, P., Pandian, S.R.K., Sankaranarayanan, M., Mohan, U.P., Palanisamy, P., Ravishankar, V. and Kunjiappan, S., 2020. Formulation and characterization of folate receptor-targeted PEGylated liposome encapsulating bioactive compounds from Kappaphycus alvarezii for cancer therapy. 3	10.1007/s13205-020-2132-7	0

		Biotech, 10(3), pp.1-18.		
172	Dr. S. Ram Kumar Pandian	Kunjiappan, S., Theivendren, P., Pavadai, P., Govindaraj, S., Sankaranarayanan, M., Somasundaram, B., Arunachalam, S., Ram Kumar Pandian, S. and Ammunje, D.N., 2020. Design and in silico modeling of Indoloquinoxaline incorporated keratin nanoparticles for modulation of glucose metabolism in 3T3- L1 adipocytes. Biotechnology Progress, 36(1), p.e2904.	10.1002/btpr.2904	0
173	Dr. S. Ram Kumar Pandian	Kunjiappan, S., Pavadai, P., Vellaichamy, S., Ram Kumar Pandian, S., Ravishankar, V., Palanisamy, P., Govindaraj, S., Srinivasan, G., Premanand, A., Sankaranarayanan, M. and Theivendren, P., 2021. Surface receptor- mediated targeted drug delivery systems for enhanced cancer treatment: A state- of- the- art review. Drug Development Research, 82(3), pp.309-340.	10.1002/ddr.21758	0
174	Dr. S. Ram Kumar Pandian	Deepak, V., Sundar, W.A., Pandian, S.R.K., Sivasubramaniam, S.D., Hariharan, N. and Sundar, K., 2021. Exopolysaccharides from Lactobacillus acidophilus modulates the antioxidant status of 1, 2–dimethyl hydrazine-induced colon cancer rat model. 3 Biotech, 11(5), pp.1-9.	10.1007/s13205-021-02784-x	0
175	Dr. S. Ram Kumar Pandian	Palanisamy, P., Pavadai, P., Arunachalam, S., Pandian, S.R.K., Ravishankar, V., Govindaraj, S., Somasundaram, B., Panneerselvam, T. and Kunjiappan, S., 2021. Removal of water and their soluble materials from fuels using Moringa oleifera loaded keratin-co-sodium acrylate hydrogel. Journal of Porous Materials, 28(2), pp.515-527.	10.1007/s10934-020-01015-7	0
176	Dr. S. Ram Kumar Pandian	Pandian, S.R.K., Pavadai, P., Vellaisamy, S., Ravishankar, V., Palanisamy, P., Sundar, L.M., Chandramohan, V., Sankaranarayanan, M., Panneerselvam, T. and Kunjiappan, S., 2021. Formulation and evaluation of rutin-loaded solid lipid nanoparticles for the treatment of brain tumor. Naunyn-Schmiedeberg's Archives of Pharmacology, 394(4), pp.735-749.	10.1007/s00210-020-02015-9	0
177	Dr. S. Ram Kumar Pandian	Pandian, S., Kunjiappan, S., Ravishankar, V. and Sundarapandian, V., 2021. Synthesis of quercetin-functionalized silver nanoparticles by rapid one-pot approach. BioTechnologia, 102(1), pp.75-84.	10.5114/bta.2021.103764	0

178	Dr. S. Ram Kumar Pandian	Pandian, S.R.K., Rencilin, C.F., Sundar, K., 2021. Emerging nanomaterials for cancer immunotherapy. <i>Exploration in Medicine</i> , 2, p. 208-31.	10.37349/emed.2021.00043	0
179	Dr. S. Ram Kumar Pandian	Pandian, S.R.K., Panneerselvam, T., Pavadai, P., Govindaraj, S., Ravishankar, V., Palanisamy, P., Sampath, M., Sankaranarayanan, M. and Kunjiappan, S., 2021. Nano based approach for the treatment of Neglected tropical diseases. <i>Frontiers in Nanotechnology</i> , 3, p.49.	10.3389/fnano.2021.665274	0
180	Ms.P.Priya	Priya P., Ramya P., Sarah Afreen B., Ramya K. M., Harshi S. G., Uma Maheshwari D. 2019 Production of Cost Effective, Biodegradable, Disposable Feminine Sanitary Napkins using Banana Fibres. <i>International Journal of Engineering and Advanced Technology</i> , 9 (1S4), 789 – 791.	10.35940/ijeat.A1145.1291S419	0
181	Ms.P.Priya	Priya Petchimuthu, Ramya Petchimuthu, Athmarishi Ayyappan, Vijaya Mariappan, RevathyPalanipandi, Baladevi Ramaiah. A Review on Lab Scale Cultivation of Calocybe Indica and Its Medicinal Value. <i>International Journal of Nutrition</i> . Volume No: 6 Issue No: 3	10.14302/issn.2379-7835.ijn-20-3406	0
182	Ms.P.Priya	Priya Petchimuthu, Ramya Petchimuthu, Aarthi Arul Raj, Varsha Krishna Kumar, Swetha Sivasankarapandian, Naganandhini Ganesh. Production of Cost-Effective Biodegradable Straw. <i>International Journal for Research in Applied Science & Engineering Technology (IJRASET)</i> ISSN: 2321-9653, Volume 9 Issue VII July 2021	https://doi.org/10.22214/ijraset.2021.37096	0
183	Ms.P.Priya	Priya P., Ramya P., Sarah Afreen B., Ramya K. M., Harshi S. G., Uma Maheshwari D. 2019 Production of Cost Effective, Biodegradable, Disposable Feminine Sanitary Napkins using Banana Fibres. <i>International Journal of Engineering and Advanced Technology</i> , 9 (1S4), 789 – 791.	DOI:10.35940/ijeat.A1145.1291S419	0
184	Dr. Sankarganesh Arunachalam	Akthar IST, Pichiah PBT, Arunachalam S, Raja S. Adriamycin inhibits embryonic development in zebrafish through downregulation of Kruppel- like factor4. <i>J Biochem Mol Toxicol</i> . 2019;33(1):e22235	https://doi.org/10.1002/jbt.22235	5

185	Dr. Sankarganesh Arunachalam	Kunjiappan S, Theivendren P, Sankaranarayanan M, Somasundaram B, Subbarayan S, Arunachalam S, et al. Design, graph theoretical analysis and bioinformatic studies of proanthocyanidins encapsulated ethyl cellulose nanoparticles for effective anticancer activity. Biomed Phys Eng Express. 2019;	https://iopscience.iop.org/article/10.1088/2057-1976/aaf2a4/meta	5
186	Dr. Sankarganesh Arunachalam	Renu K, Sruthy KB, Parthiban S, Sugunapriyadarshini S, George A, PB TP, et al. Elevated lipolysis in adipose tissue by doxorubicin via PPAR α activation associated with hepatic steatosis and insulin resistance. Eur J Pharmacol. 2019;843:162–76.	https://doi.org/10.1016/j.ejphar.2018.11.018	15
187	Dr. Sankarganesh Arunachalam	Sankarganesh D, Suriyakalaa U, Ramachandran R, Achiraman S, Arunachalam S, Angayarkanni J. Urinary volatile metabolomics as a viable alternative diagnostic tool for polycystic ovary syndrome: An exploratory hypothesis. Med Hypotheses. 2019;	https://doi.org/10.1016/j.mehy.2019.02.009	6
188	Dr. Sankarganesh Arunachalam	Kunjiappan S, Theivendran P, Baskararaj S, Sankaranarayanan B, Palanisamy P, Saravanan G, et al. Modeling a pH-sensitive Zein-co-acrylic acid hybrid hydrogels loaded 5-fluorouracil and rutin for enhanced anticancer efficacy by oral delivery. 3 Biotech. 2019;	https://doi.org/10.1007/s13205-019-1720-x	20
189	Dr. Sankarganesh Arunachalam	Kunjiappan S, Panneerselvam T, Govindaraj S, Parasuraman P, Baskararaj S, Sankaranarayanan M, et al. Design, In Silico Modelling, and Functionality Theory of Novel Folate Receptor Targeted Rutin Encapsulated Folic Acid Conjugated Keratin Nanoparticles for Effective Cancer Treatment. Anticancer Agents Med Chem. 2019;	https://iopscience.iop.org/article/10.1088/1361-6528/ab5c56/meta	23
190	Dr. Sankarganesh Arunachalam	Thabassum Akhtar Iqbal S, TirupathiPichiah PB, Raja S, Arunachalam S. Paeonol Reverses Adriamycin Induced Cardiac Pathological Remodeling through Notch1 Signaling Reactivation in H9c2 Cells and Adult Zebrafish Heart. Chem Res Toxicol. 2019;	https://pubs.acs.org/doi/abs/10.1021/acs.chemrestox.9b00093	9
191	Dr. Sankarganesh Arunachalam	Baskararaj S, Theivendren P, Palanisamy P, Kannan S, Pavadai P, Arunachalam S, et al. Optimization of bioactive compounds extraction assisted by microwave parameters from Kappaphycusalvarezii using RSM and ANFIS modeling. J Food Meas Charact. 2019;	https://doi.org/10.1007/s11694-019-00198-1	11

192	Dr. Sankarganesh Arunachalam	Kunjiappan S, Theivendren P, Pavadai P, Govindaraj S, Sankaranarayanan M, Somasundaram B, et al. Design and in silico modeling of Indoloquinoxaline incorporated keratin nanoparticles for modulation of glucose metabolism in 3T3-L1 adipocytes. <i>Biotechnol Prog.</i> 2020;	https://doi.org/10.1002/btpr.2904	5
193	Dr. Sankarganesh Arunachalam	Kunjiappan S, Govindaraj S, Parasuraman P, Sankaranarayanan M, Arunachalam S, Palanisamy P, et al. Design, in silico modelling and functionality theory of folate-receptor-targeted myricetin-loaded bovine serum albumin nanoparticle formulation for cancer treatment. <i>Nanotechnology.</i> 2020;	https://iopscience.iop.org/article/10.1088/1361-6528/ab5c56/meta	23
194	Dr. Sankarganesh Arunachalam	Pichiah PBT, Sankarganesh D, Arunachalam S, Achiraman S. Adipose-Derived Molecules–Untouched Horizons in Alzheimer’s Disease Biology. <i>Frontiers in Aging Neuroscience.</i> 2020.	https://doi.org/10.3389/fnagi.2020.00017	4
195	Dr. Sankarganesh Arunachalam	Baskararaj S, Panneerselvam T, Govindaraj S, Arunachalam S, Parasuraman P, Pandian SRK, et al. Formulation and characterization of folate receptor-targeted PEGylated liposome encapsulating bioactive compounds from <i>Kappaphycus alvarezii</i> for cancer therapy. <i>3 Biotech.</i> 2020;	https://doi.org/10.1007/s13205-020-2132-7	14
196	Dr. Sankarganesh Arunachalam	Kunjiappan S, Panneerselvam T, Govindaraj S, Kannan S, Parasuraman P, Arunachalam S, et al. Optimization and analysis of ultrasound-assisted extraction of bioactive polyphenols from <i>Garcinia indica</i> using RSM and ANFIS modeling and its anticancer activity. <i>J Iran Chem Soc.</i> 2020;	https://doi.org/10.1007/s13738-019-01812-1	5
197	Dr. Sankarganesh Arunachalam	Selvaraj K, Murugesan S, Banoth Kumar K, Parasuraman P, EwaBabkiewicz, Piotr Maszczyk, Eliza Glodkowska-Mrowka, Sankarganesh A, Sureshbabu RP, Vigneshwaran R, Suraj B, Sivakumar V, Lalitha A, and Panneerselvam T. Capsaicin-loaded solid lipid nanoparticles: Design, biodistribution, in silico modeling and in vitro cytotoxicity evaluation. <i>Nanotechnology</i> , 32 095101, 2021.	10.1088/1361-6528/abc57e	21
198	Dr. Sankarganesh Arunachalam	Ponnusamy P, Parasuraman P, Sankarganesh A, Vigneshwaran R, Sureshbabu RP, Saravanan G, Balasubramanian S, Panneerselvam T, and Selvaraj K*. Removal of water and their soluble materials from fuels using <i>Moringa oleifera</i>	10.1007/s10934-020-01015-7	3

		loaded keratin-co-sodium acrylate hydrogel. Journal of Porous Materials, 2021.		
199	Dr. Sankarganesh Arunachalam	Uma Priya M, Selvaraj K, Tirupathi P, and Sankarganesh A. Adriamycin inhibits glycolysis through downregulation of key enzymes in <i>Saccharomyces cerevisiae</i> . 3 Biotech, 2020.	10.1007/s13205-020-02530-9	5
200	Dr. Sankarganesh Arunachalam	Selvaraj K*, Panneerselvam T, Murugesan S, Balasubramanian S, Sarathbabu S, Sankarganesh A, Parasuraman P, Vellaichamy S, Indhumathy M, and Suraj B. Design, graph theoretical analysis and bioinformatic studies of Proanthocyanidins encapsulated ethyl cellulose nanoparticles for effective anticancer activity. Biomedical Physics & Engineering Express, 5, 025004, 2019.	10.1088/2057-1976/aaf2a4	5
201	Dr. Sankarganesh Arunachalam	Selvaraj K, Panneerselvam T, Suraj B, Bathrinath S, Ponnusamy P, Govindaraj S, Sankarganesh A, Murugesan S, Jawahar N, Balasubramanian S, Ashish W. Modeling a pH- sensitive Zein- co- acrylic acid hybrid hydrogels loaded 5- fluorouracil and rutin for enhanced anticancer efficacy by oral delivery. 3 biotech, 2019, 9:185.	10.1007/s13205-019-1720-x	20
202	Dr. Sankarganesh Arunachalam	Suraj B, Panneerselvam T, Ponnusamy P, Suthendran K, Parasuraman P, Sankarganesh A, Murugesan S, Uma Priya M, Lokeshkumar R, and Selvaraj K*. Optimization of bioactive compounds extraction assisted by microwave parameters from <i>Kappaphycus alvarezii</i> using RSM and ANFIS modeling. Journal of Food Measurement and Characterization, 13: 2773–2789, 2019.	10.1007/s11694-019-00198-1	11
203	Dr. Sankarganesh Arunachalam	Selvaraj K, Panneerselvam T, Saravanan G, Parasuraman P, Suraj B, Murugesan S, Sankarganesh A, EwaBabkiewicz, Aarthi J, Muthulakshmi L. Design, in silico modelling, and functionality theory of novel folate receptor targeted Rutin encapsulated folic acid conjugated keratin nanoparticles for effective cancer treatment. Anti-cancer Agents in Medicinal Chemistry, 19(16):1966-1982, 2019.	10.2174/1871520619666190702145609	13
204	Dr. Sankarganesh Arunachalam	Selvaraj K, Saravanan G, Pavadai P, Murugesan S, Sankarganesh A, Ponnusamy P, Uma Priya M, Babkiewicz E, Maszczyk P, Sivakumar V, and Panneerselvam T. Design, insilico modelling and functionality theory of folate receptor targeted Myricetin loaded bovine serum albumin	10.1088/1361-6528/ab5c56	23

		nanoparticle formulation for cancer treatment. Nanotechnology 31:155102, 2020.		
205	Dr. Sankarganesh Arunachalam	Uma Priya M, Sriram B, Panneerselvam T, Sankarganesh D, MubarakAli D, Parasuraman P, Ponnusamy P, Adhvitha P, Sankarganesh A and Selvaraj K. Utilization of plant-derived Myricetin molecule coupled with ultrasound for the synthesis of gold nanoparticles against breast cancer. Naunyn-Schmiedeberg's Archives of Pharmacology 2020.	10.1007/s00210-020-01874-6	11
206	Dr. Sankarganesh Arunachalam	Suraj B, Panneerselvam T, Govindaraj S, Sankarganesh A, Parasuraman P, Sureshbabu RP, Murugesan S, Uma Priya M, Ponnusamy P, Vigneshwaran R, and Selvaraj K. Formulation and characterization of folate receptor-targeted PEGylated liposome encapsulating bioactive compounds from Kappaphycusalvarezii for cancer therapy. 3 biotech, 2020.	10.1007/s13205-020-2132-7	13
207	Dr. Sankarganesh Arunachalam	Selvaraj K, Panneerselvam T, Saravanan G, Suthendran K, Pavadai P, Sankarganesh A, Murugesan S, Suraj B, Ponnusamy P, Damodar NA. Optimization and analysis of ultrasound-assisted extraction of bioactive polyphenols from Garcinia indica using RSM and ANFIS modeling and its anticancer activity. Journal of the Iranian Chemical Society, 17: 789–801, 2020.	10.1007/s13738-019-01812-1	5
208	Dr. Sankarganesh Arunachalam	Arjun Kumar K, Panneerselvam T, Parasuraman P, Ram Kumar Pandian S, Sundar K, Murugesan S, Damodar Nayak A, Sattanathan K, Sankarganesh A, Selvaraj K*. Pharmacoinformatics-based investigation of bioactive compounds of Rasam (South Indian recipe) against human cancer. Scientific Reports, 11, 21488, 2021.	10.1038/s41598-021-01008-9	11
209	Dr. Sankarganesh Arunachalam	Arjun Kumar K, Pavadai Parasuraman, Pandian Sivakumar, Murugesan Sankaranarayanan, Sankarganesh Arunachalam, Sureshbabu Ram Kumar Pandian, Vigneshwaran Ravishankar, Damodar Nayak Ammunje, Muthukumar Sampath, TheivendranPanneerselvam, Selvaraj K*. In silico and in vitro screening of antioxidant and anticancer potentials of bioactive secondary metabolites from an endophytic fungus (Curvularia sp.) from Phyllanthus niruri L. Environmental Science and Pollution Research,	10.1007/s11356-022-19249-0	1

		2022		
210	Dr. Sankarganesh Arunachalam	Uma Priya Mohan, Selvaraj Kunjiappan, TirupathiPichiah P.B, EwaBabkiewicz, Piotr Maszczyk, Sankarganesh Arunachalam. "Exploring the role of Melatonin in Meditation on Cardiovascular Health" Biointerface Research in Applied Chemistry (2022).	10.33263/BRIA C131.064	0
211	Dr. Sankarganesh Arunachalam	Uma Priya Mohan, Selvaraj Kunjiappan, and Sankarganesh Arunachalam. "Doxorubicin Disrupts the Calcium Homeostasis through its Antagonistic Activity on PINK1–An In-silico Approach." Biointerface Research in Applied Chemistry (2022).	10.33263/BRIA C131.082	0
212	Dr. Sankarganesh Arunachalam	Uma Priya Mohan, Selvaraj Kunjiappan, and Sankarganesh Arunachalam. "Disruption of Glycolysis, TCA Cycle, Respiratory Chain, Calcium and Iron Homeostasis in Doxorubicin Induced Cardiomyopathy-An In-silicoApproach." Biointerface Research in Applied Chemistry 12 (2021): 8527-8542,	10.33263/BRIA C126.85278542	1
213	Dr. Sankarganesh Arunachalam	Uma Priya Mohan, TirupathiPichiah PB, SyedaThabassum Akhtar Iqbal, and Sankarganesh Arunachalam. "Mechanisms of Doxorubicin-Mediated Reproductive Toxicity–A Review." Reproductive Toxicology (2021). 102: 80-89	10.1016/j.reprot ox.2021.04.003	0
214	Dr. Sankarganesh Arunachalam	Uma Priya Mohan, Selvaraj Kunjiappan, TirupathiPichiah P.B., Sankarganesh Arunachalam. "A Hypothesis Concerning the role of PPAR family on Cardiac Energetics in Adriamycin Induced Cardiomyopathy". – Journal of Applied Toxicology. (2022)	10.1002/jat.4374	0

Ph.D.Guidance

The faculty members guide other scholars and faculty members in their PhD work by imparting their technical knowledge and research expertise. The supervisors and the number of research scholars working under them are listed below:

S. No.	Name of the Supervisor	Designation	No. of Ph.D. Scholars completed till August 2022	No. of Scholars under guidance
1.	Dr. K. Sundar	Professor	Dr. Vinothapoosan Dr. Livingston Dr. S. Ram Kumar Pandian Dr. V. Deepak Dr. R. Haribalaganesh Dr. R. Kasimani Dr. M. Ajitha Dr. M. Manikandan	Mrs. J. Christina Rosy Ms. P. Priya Ms. Shakti Chandra Vadhana Mr. T. Essakimuthu Mr. S. J. Kabilan Mr. M. Cibe Chakravarthy
2.	Dr. H. Nellaiah	Professor	Dr. William Arpudha Sundar	
3.	Dr. T. Kathiresan	Professor & Head	Dr. B. Karthikeyan Dr. L. Harini Dr. L. Muthulakshmi	Mr. T. M. Viswanathan Ms. K. Chitradevi Mr. A.S. Azar Zochedh Ms. S. Sureba Mr. K. Kaliraj
4.	Dr. K. Palanichelvam	Professor	Dr. Nadana Raja Vadivu	Mr. C. Rajesh
5.	Dr. A. Muthukumaran	Associate Professor	Dr. K. Kalishwaralal Dr. S. Chandramohan Dr. Rajeshwari Uppala Dr. S. Jeyabharathi	Mr. S. Naveenkumar Mrs. Lekshmi R Babu
6.	Dr. Naresh Kumar Sharma	Associate Professor		Mrs. Rajanandini Meher Ms. S. Karthiga
7.	Dr. B. Vanavil	Associate Professor		Mrs. P. Ramya Mrs. P. Ezhilarasi
8.	Dr. Sankarganesh Arunachalam	Associate Professor	Ms. Uma Priya	Ms. R. Sumathi
9.	Dr. S. Ram Kumar Pandian	Associate Professor		Ms. M. Vijayalakshmi
10.	Dr. K. Selvaraj	Assistant Professor		Mr. K. Arjunkumar Mr. Chandirasekar Mr. Senthil Kumar Ms. Rajrajeshwari

4.2.3. Faculty Development work(10)

Faculty as participants in Faculty development/training activities/STTPs

S. No.	Year	Faculty Name	Details of FDP	Date(s)
1	2021-2022	Dr. S. Shantkriti	Five days online FDP on “Emerging Trends and Challenges in Higher Education and Research” organized by IQAC of Prince Shri Venkateshwara Arts and Science College, Gowrivakkam, Chennai.	18-22 April, 2022
2	2021-2022	Dr. S. Shantkriti	5-day online FDP on the theme “Inculcating Universal Human Values in Technical Education” organized by All India Council for Technical Education (AICTE)	2-6 August, 2021
3	2021-2022	Dr. S. Shantkriti	Faculty Enrichment Program on “Cutting Edge Science in Cellular and Molecular Biomedicine” organized by AIMMSCR, Amity University, Noida, UP	27-31 July, 2021
4	2020-2021	Dr. S. Shantkriti	AICTE sponsored Online QIP-Short Term Course on “Bioenergy: A hope for Future for Global Energy Security” organized by Department of Chemistry and Mechanical Engineering, IIT (BHU) Varanasi	1-6 March, 2021
5	2020-2021	Dr. S. Shantkriti	Five-day Faculty Development Program on “Engineering Education Research” organized by Centre for Learning Technologies, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu	19-23 January, 2021
6	2020-2021	Dr. S. Shantkriti	Five-day International Online Faculty Development Program on “Current Perspectives in Proteogenomics” organized by Department of Biotechnology, Vignan’s Foundation for Science, Technology & Research, Guntur, Andhra Pradesh	20-24 July, 2020
7	2020-2021	Dr. S. Shantkriti	Five-day Online Faculty Development Program on “Evolution from Offline to Online Teaching” organized by IQAC and FDP committee Satish Pradhan Dnyasadhana College, Thane in association with Department of Information Technology, Univ. of Mumbai and Microsoft	30 May-3 June, 2020
8	2019-2020	Dr. S. Shantkriti	One Week National Level Online Faculty Development Programme and hands on training in “R Language”, organized by PG & Research Dept. of Mathematics,	13-20 May, 2020

			Auxilium College (Autonomous), Vellore, Tamil Nadu, in collaboration with Spoken-Tutorial Project, IIT Bombay	
9	2020-2021	Dr. S. Shantkriti	Two Weeks Faculty Development Programme on “Managing Online Classes and Co-Creating MOOCS” organized by Teaching Learning Centre, Ramanujan College, University of Delhi and sponsored by MHRD, PMMM National Mission On Teachers and Teaching	20th April-6th May, 2020
10	2019-2020	Dr. S. Shantkriti	Faculty Development Program on “Funding Hacks for Research Grants” by Dept. of Biotechnology, SBCE, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu	1-5th July, 2019
11	2021-2022	Dr. B.Vanavil	Five days virtual short-term training programme (STTP) on “Advanced Characterization Techniques for Chemical Scaffolds (ACTCS-2021)”, organized by Department of Chemistry, Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, Gujarat	21-25, September 2021
12	2021-2022	Dr. B.Vanavil	Online Faculty Development Program on Application of Artificial Intelligence and Machine Learning in Bioinformatics, NIT-Warangal	15-25, March 2022
13	2020-2021	Dr. B.Vanavil	One week online FDP on Recent Trends in Computer Simulations for Applications in Biotechnology: Teaching and Learning strategies, Department of Biotechnology in association with Teaching-Learning Centre National Institute of Technology- Warangal	17-21, August 2020
14	2019-2020	Dr. B.Vanavil	FDP entitled "Gearing up for Research & Research Writing" by Dept. of Biotechnology, SBCE, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu	20-26 May, 2020
15	2019-2020	Dr. B.Vanavil	Faculty Training on "Project Proposal Writing" organized by Office of Faculty Affairs & Centre for Learning Technology, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu	May 25- 26, 2020
16	2019-2020	Dr. B.Vanavil	Indo-Australia Workshop On Nanomaterials For Applications In Agriculture, Energy And Environment, National Institute of Technology Tiruchirappalli	23, January 2020
17	2021-	Dr. S. Sheik Asraf	Faculty Development Program On Problem Solving	26 July- 6

	2022		Using Computer Programming, KARE	August/2021
18	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program On Prospects On Biochemical Engineering: Basics And Beyond, KARE	01-07/June/2020
19	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program On Digital Tools For Learning, KARE	15-20/June/2020
20	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program On Gearing Up For Research And Research Writing, KARE	20-26/May/2020
21	2019-2020	Dr. S. Sheik Asraf	Faculty Training On Project Proposal Writing, KARE	25-26/May/2020
22	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program On Prospects In Plant And Algal Biotechnology, KARE	06-12/Dec/2019
23	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program on “Funding Hacks for Research Grants” by Dept. of Biotechnology, SBCE, KARE	1-5/July/2019
24	2021-2022	Dr. L. Muthulakshmi	Faculty Development Programme on "Tools and Techniques in Characterization of Compounds", CSIR-CIKRI,Karaikudi	17-21 January 2022
25	2021-2022	Dr. L. Muthulakshmi	International Workshop on "Microalgal Technology", St.Maries College, Tuticorin	16-18 February 2022
26	2021-2022	Dr. L. Muthulakshmi	Faculty development Programme on "Printed and Flexible Electronics", VIT,Chennai.	27-29 June 2022
27	2020-2021	Dr. L. Muthulakshmi	ATAL Sponsored one week faculty development Programme on, Novel Biomaterial for future Application”, Ramaiah Institute of Technology-Bangalore.	12-17 July 2021
28	2020-2021	Dr. L. Muthulakshmi	one week faculty development Programme on, “Innovation,Incubation,and Entrenuership”,SPMVV College, Tirupathi.	5-9 July 2021
29	2020-2021	Dr. L. Muthulakshmi	one week faculty development Programme on “Applications of Computers in Biology”, Golgotia University,Noida.	6-10 June2021
30	2019-2020	Dr. L. Muthulakshmi	MHRD-IQAC Sponsered faculty development Programme on “Recent trends in Biomedical Engineering and Research Perspectives”, Dr.N.G.P Institute of Technology, Coimbatore	26-30 April 2020
31	2019-	Dr Naresh Kumar	Faculty Development Program On "Prospects On	01-

	2020	Sharma	Biochemical Engineering: Basics And Beyond", KARE	07/June/2020
32	2020-2021	Mr. S. J. Kabilan	Faculty Development Program on “Problem Solving Using Computer Programming”, KARE	26 July- 6 August/2021
33	2019-2020	Mr. S. J. Kabilan	Faculty Development Program On “Gearing Up For Research And Research Writing”, KARE	20-26/May/2020
34	2019-2020	Mr. S. J. Kabilan	Faculty Development Program On “Prospects In Plant And Algal Biotechnology”, KARE	06-12/Dec/2019
35	2019-2020	Mr. S. J. Kabilan	Faculty Development Program on “Funding Hacks for Research Grants” by Dept. of Biotechnology, SBCE, KARE	1-5/July/2019
36	2020-2021	Dr.K.Jyothi	Sustainable Development and Research opportunities in Food and Chemical Engineering. Hindusthan College of Engineering and Technology.	5-11 October 2020
37	2019-2020	Dr.K.Jyothi	7 Days FDP on Academic Leadership, Teaching and learning methods, Research plan, Patents.SNMV College of Arts and Science. Coimbatore	8-15 June 2020
38	2019-2020	Dr. K.Jyothi	Two Days FTP on Project Proposal Writing, CLT , KARE	25-26 May 2020
39	2019-2020	Dr. K.Jyothi	One week FDP on Digital Tools for Learning, CLT, KARE	15-20 June 2020
40	2019-2020	Ms. P. Priya	Faculty Development Program On Gearing Up For Research And Research Writing, KARE	20-26/May/2020
41	2019-2020	Ms. P. Priya	Faculty Development Program On “Prospects In Plant And Algal Biotechnology”, KARE	06-12/Dec/2019
42	2019-2020	Ms. P. Priya	Faculty Development Program on “Funding Hacks for Research Grants” by Dept. of Biotechnology, SBCE, KARE	1-5/July/2019
43	2021-2022	Ms. P. Priya	ATAL Sponsored one week faculty development Programme on, Recent trends in Food processing and Preservation technologies	01/02/2022 - 05/02/2022
44	2021-2022	Ms. P. Priya	ATAL Sponsored one week faculty development program on, Role of Microbes in planning for alternate fuel strategies	12/07/2021-16/07/2021
45	2021-2022	Ms. P. Priya	ATAL Sponsored one week faculty development Programme on, Strategies and Outcome to enhance sustainable green environment	19/07/2021-23/07/2021

Faculty as participants**Outside Campus**

S. No	Year	Faculty Name	Details of Contribution	Date(s)
1	2021-2022	Dr. S. Shantkriti	Elected fellow of Young Academy of India (YAI)	20 Sept, 2021
2	2021-2022	Dr Naresh Kumar Sharma	Nineth International Conference on Transformations in Engineering Education	7 -9 Jan 2022
3	2021-2022	Dr. S.SheikAsraf	International Conference on Transformations in Engineering Education (Virtual)	7 -9 January 2022
4	2020-2021	Dr. S.SheikAsraf	Eighth International Conference on Transformations in Engineering Education	8 - 10, January 2021
5	2021-2022	S J Kabilan	Ninth International Conference on Transformations in Engineering Education	7 -9 January 2022
6	2020-2021	S J Kabilan	Eighth International Conference on Transformations in Engineering Education	8 - 10, January 2021

Faculty as participants (Outside Campus)**Faculty Awards and Recognition**

S. No	Faculty Name	Details of Awards	Date(s)
1	Dr. S. Shantkriti	InRes Young Scientist Award 2021 by Institute for Researchers (InRes), India	25 Oct, 2021
2	Dr. S. Shantkriti	Indo Asian – Best Researcher Award 2021 in Environmental Biotechnology by IMRF Institute of	5 Oct, 2021

		Higher Education & Research, India	
3	Dr. S. Shantkriti	Dr. Sarvepalli Radhakrishnan Best Teacher Award 2021 in Environmental Microbiology by Centre for Professional Advancement, India	5 Sept, 2021
4	Dr. S. Shantkriti	SFRF Summer Faculty Research Fellow Programme by Indian Institute of Technology, Delhi	14 May -28 Jun, 2019
5	Dr. B.Vanavil	Topic Coordinator, Microbial Factories: Strategies and Applications, Frontiers in Microbiology	March 30, 2022
6	Dr. B.Vanavil	Mentor for Funded Project by Tamilnadu State Council for Science and Technology under Student Project Scheme	2021-2022
7	Dr. B.Vanavil	Mentorship under the CSIR-Summer Research Training Programme, Council of Scientific and Industrial Research, North East Institute of Science and Technology, Jorhat, Assam.	June-August, 2020
8	Dr. S. Sheik Asraf	Mentor for Indo Universal Collaboration for Engineering Education (IUCEE) National Education Policy mini course on "Leadership and Sustainability"	19 January-13 April, 2022
9	Dr.L.Muthulakshmi	Mentor for Indo Universal Collaboration for Engineering Education (IUCEE)"Project Oriented Problem Based Learning"	Aug- Dec-2021
10	Dr. Naresh Kumar Sharma	Mentor for Indo Universal Collaboration for Engineering Education (IUCEE)"Clean and Green Campus"	8 Jan 2022
11	Mr. S J Kabilan	Best Paper Award: Eighth International Conference on Transformations in Engineering Education	8 - 10, Jan, 2021
12	Mr. S J Kabilan	Mentor for Indo Universal Collaboration for Engineering Education (IUCEE) - NEP Minicourse "Entrepreneurial thinking"	Jan - June, 2022

Faculty as participants (Outside Campus)

Faculty Contribution as External Expert, Invited Speaker, Resource Person, etc.

S. No	Year	Faculty Name	Details of Contribution	Date(s)
1	2021-2022	Dr. S. Shantkriti	Faculty Coordinator for the "MANAV Scientific Reading and Comprehension Self-Assessment Module (for students)" by Project MANAV– The Human Atlas Initiative	Sept-Oct 2021
2	2021-2022	Dr. S. Shantkriti	Keynote speaker at 5th International Conference on Environment and Disasters (ICED 2021) by Zhengzhou Excellent Young Scholars Science and Technology Co., Ltd., China	22-23 Jul, 2021
3	2020-2021	Dr. S. Shantkriti	Board of Studies member for B. Sc. & M. Sc. Microbiology, Thiagarajar College, Madurai	23 Jul, 2020
4	2019-2020	Dr. B.Vanavil	External Examiner for conducting End Semester practical Examinations for Bioprocess Laboratory- 15BT551 and 15MB352-Advanced Molecular Biology and Genetic Engineering Laboratory	17 October, 2019
5	2020-2021	Dr. S. Sheik Asraf	Resource Person from KARE for " Study In India Virtual Expo"	11-15 June, 2021
6	2021-2022	Dr.L.Muthulakshmi	Resource Person State level Virtual Workshop on “Nanotechnology: Recent trends and future perspectives”	22.03.2022
7	2020-2021	Dr.L.Muthulakshmi	Resource Person Association Inaguration,delivered lectured “ Scope and Applications of Nanobiotechnology,	06.06.2021
8	2020-2021	Dr Naresh Kumar Sharma	Invited Speaker Virtual Faculty Development Programme on " Research Trends in Water Resources and Environmental Engineering	August 6, 2020

9	2021-2022	Mr S J Kabilan	Resource person for 3 Days Workshop on ""Basic Bioinformatics Tools and Techniques"" organized by Department of Chemistry / Biochemistry, RAMAIAH College of Arts, Science & Commerce In collaboration with Karnataka Science and Technology Academy (KSTA)	30 th , 31 st , May and 1 st June 2022
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Faculty as participants (Inside Campus)

Faculty Contribution as Organizer, Invited Speaker, Resource Person, etc.

S. No	Year	Faculty Name	Details of Contribution	Date(s)
1	2021-2022	Dr. S. Shantkriti	Session Chair on theme: Innovations in microbiology for sustainable life at 2 nd National conference on "Innovations in bio & chemical engineering for sustainable life" by Dept. of Biotechnology, KARE	20 May, 2021
2	2021-2022	Dr. B.Vanavil	Session chair for National Conference on "Innovations in Biotechnology for Sustainable Life" organized by Department of Biotechnology, KARE	23 April, 2022
3	2021-2022	Dr. B.Vanavil	Guest Lecture on "Bioreactors in Animal Cell Culture" organized by Department of Biomedical Engineering, KARE	18 Dec, 2021
4	2020-2021	Dr. B.Vanavil	Session Chair on the theme "Innovations in Bioprocess Technology for Sustainable Life" in Second National Conference on 'innovations In Bio And Chemical Engineering For Sustainable Life" , SBCE, KARE	20 May, 2021
5	2020-2021	Dr. B.Vanavil	Organized Webinar on "Technology for Effective Presentation"	8 August, 2020
6	2020-2021	Dr. B.Vanavil	Session Chair on the theme "Innovations in Bioprocess Technology for Sustainable Life" in Second National Conference on 'innovations In Bio	8 June, 2020

			And Chemical Engineering For Sustainable Life”, SBCE, KARE	
7	2020-2021	Dr. B.Vanavil	Coordinator for FDP on Biochemical Engineering: Basics and Beyond, KARE	1 June 2020- 07 June 2020
8	2019-2020	Dr. B.Vanavil	Organized "Workshop on “Bread, Butter and Biotechnology”, KARE	May 13-14, 2020
9	2019-2020	Dr. B.Vanavil	Organized "Indo - US Workshop on “Extremophiles in Biotechnology”, KARE	November 27-28, 2019
10	2019-2020	Dr. S. Sheik Asraf	Organized Workshop on Protein and Genome Informatics	May 15, 2020
11	2020-2021	Dr. S. Sheik Asraf	Organized Workshop on Metagenomics	June 29, 2020
12	2020-2021	Dr. S. Sheik Asraf	Organized Bionexus 2020	August 10, 2020
13	2020-2021	Dr. S. Sheik Asraf	Organized Webinar on Evergreen Hero – Gandhi Ji	October 02, 2020
14	2020-2021	Dr. S. Sheik Asraf	Organized National Youth Day 2021	January 12, 2021
15	2021-2022	Dr. S. Sheik Asraf	Organized Community Service Project EXPO	November 26, 2021
16	2020-2021	Dr Naresh Kumar Sharma	Invited Speaker Virtual Faculty Development Programme on " Research Trends in Water Resources and Environmental Engineering	August 6, 2020
17	2019-2020	Mr S J Kabilan	Organizing Secretary for Two - Day Virtual Conference on "Innovations in Bio & chemical Engineering for sustainable life"	June 8 & 9, 2020
18	2020-2021	Mr S J Kabilan	Organized Virtual Workshop On "Recent Trends In Functional Proteomics"	JULY 6 & 7, 2020

19	2020-2021	Mr S J Kabilan	Invited speaker for FDP on “Digital tools for learning organized by CLT, KARE	15-20, June 2020
20	2021-2022	Dr. K.Jyothi	Organized One Day Workshop on Lab Safety and Management	20 April 2022
21	2019-2020	Dr. K.Jyothi	Organized Two Days Virtual Workshop on Biotechniques for Extraction of Metabolites from Plant and Algal Sources	11-12 May 2020
22	2020-2021	Ms. P. Priya	Organized Bionexus 2020	August 10, 2020
23	2020-2021	Ms. P. Priya	Organized Webinar on Evergreen Hero – Gandhi Ji	October 02, 2020
24	2021-2022	Ms. P. Priya	Organized Personality Development workshop Caterpillar to Butterfly 2.0	June 4- June 6 2020
25	2021-2022	Ms. P. Priya	Organized workshop "Biofirm Scaling Lab2Market"	June 18-June 20 2020
26	2021-2022	Ms. P. Priya	Organized National Youth Day 2021	January 12, 2021
27	2020-2021	Ms. P. Priya	Organized Virtual technical symposium ORIGENE 2K20	15/08/2020

Faculty as participants (Inside Campus)

Faculty Participation in various events

S. No	Year	Faculty Name	Details of Contribution	Date(s)
1	2020-2021	Dr. S. Shantkriti	First prize for Poetry (English) event at International Women's Day celebration	6 Mar, 2021
2	2020-2021	Dr. S. Shantkriti	First prize for Singing (Hindi/English) event at International Women's Day celebration	7 Mar, 2021

3	2020-2021	Dr. S. Shantkriti	Second prize for Art from Waste event at International Women's Day celebration	8 Mar, 2021
4	2021-2022	Dr Naresh Kumar Sharma	Participated in Five-day Faculty Development Programme titled "Expanding Horizon of Downstream Processing"	4 July 2022 - 8 July 2022

4.3. Faculty as participants in Faculty development / training activities /STTPs

The Biotechnology department's faculty members are expected to participate in a variety of Professional Development programmes and other training activities organized by Professional Societies, other Institutions, and Research Centers.

S. No.	Year	Faculty Name	Details of FDP	Date(s)
1	2021-2022	Dr. S. Shantkriti	Five days online FDP on "Emerging Trends and Challenges in Higher Education and Research" organized by IQAC of Prince Shri Venkateshwara Arts and Science College, Gowrivakkam, Chennai.	18-22nd April, 2022
2	2021-2022	Dr. S. Shantkriti	5-day online FDP on the theme "Inculcating Universal Human Values in Technical Education" organized by All India Council for Technical Education (AICTE)	2-6th August, 2021
3	2021-2022	Dr. S. Shantkriti	Faculty Enrichment Program on "Cutting Edge Science in Cellular and Molecular Biomedicine" organized by AIMMSCR, Amity University, Noida, UP	27-31st July, 2021
4	2020-2021	Dr. S. Shantkriti	AICTE sponsored Online QIP-Short Term Course on "Bioenergy: A hope for Future for Global Energy Security" organized by Department of Chemistry and Mechanical Engineering, IIT (BHU) Varanasi	1-6th March, 2021

5	2020-2021	Dr. S. Shantkriti	Five-day Faculty Development Program on “Engineering Education Research” organized by Centre for Learning Technologies, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu	19-23rd January, 2021
6	2020-2021	Dr. S. Shantkriti	Five-day International Online Faculty Development Program on “Current Perspectives in Proteogenomics” organized by Department of Biotechnology, Vignan’s Foundation for Science, Technology & Research, Guntur, Andhra Pradesh	20-24th July, 2020
7	2020-2021	Dr. S. Shantkriti	One Week National Level Online Faculty Development Programme and hands on training in “R Language”, organized by PG & Research Dept. of Mathematics, Auxilium College (Autonomous), Vellore, Tamil Nadu, in collaboration with Spoken-Tutorial Project, IIT Bombay	13-20th May, 2020
8	2020-2021	Dr. S. Shantkriti	Two Weeks Faculty Development Programme on “Managing Online Classes and Co-Creating MOOCS” organized by Teaching Learning Centre, Ramanujan College, University of Delhi and sponsored by MHRD, PMMM National Mission On Teachers and Teaching	20th April-6th May, 2020
9	2019-2020	Dr. S. Shantkriti	Faculty Development Program on “Funding Hacks for Research Grants” by Dept. of Biotechnology, SBCE, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu	1-5th July, 2019

10	2021-2022	Dr.B.Vanavil	Five days virtual short-term training programme (STTP) on “Advanced Characterization Techniques for Chemical Scaffolds (ACTCS-2021)”, organized by Department of Chemistry, Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, Gujarat	21-25, September 2021
11	2021-2022	Dr.B.Vanavil	Online Faculty Development Program on Application of Artificial Intelligence and Machine Learning in Bioinformatics, NIT-Warangal	15-25, March 2022
12	2020-2021	Dr.B.Vanavil	One week online FDP on Recent Trends in Computer Simulations for Applications in Biotechnology: Teaching and Learning strategies, Department of Biotechnology in association with Teaching-Learning Centre National Institute of Technology- Warangal	17-21, August 2020
13	2019-2020	Dr.B.Vanavil	FDP entitled "Gearing up for Research & Research Writing" by Dept. of Biotechnology, SBCE, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu	20-26 May, 2020
14	2019-2020	Dr.B.Vanavil	Faculty Training on "Project Proposal Writing" organized by Office of Faculty Affairs & Centre for Learning Technology, Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu	May 25- 26, 2020
15	2019-2020	Dr.B.Vanavil	Indo-Australia Workshop On Nanomaterials For Applications In Agriculture, Energy And Environment, National Institute of Technology Tiruchirappalli	23, January 2020

17	2021-2022	Dr. S. Sheik Asraf	FDP on Expanding Horizon of Downstream Processing, Kalasalingam Academy of Research and Education.	4 -8 /JULY /2022
18	2020-2021	Dr. S. Sheik Asraf	Faculty Development Program on Problem Solving Using Computer Programming, Kalasalingam Academy of Research and Education.	26 JULY- 6 AUGUST/2021
19	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program on Prospects on Biochemical Engineering: Basics and Beyond, Kalasalingam Academy of Research and Education.	01-07/JUNE/2020
20	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program on Digital Tools for Learning, Kalasalingam Academy of Research and Education.	15-20/JUNE/2020
21	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program on Gearing Up for Research and Research Writing, Kalasalingam Academy of Research and Education.	20-26/MAY/2020
22	2019-2020	Dr. S. Sheik Asraf	Faculty Training on Project Proposal Writing, Kalasalingam Academy of Research and Education.	25-26/MAY/2020
23	2019-2020	Dr. S. Sheik Asraf	Faculty Development Program on Prospects in Plant and Algal Biotechnology, Kalasalingam Academy of Research and Education.	06-12/DECEMBER/2019
24	2019-2020	Dr. S. Sheik Asraf	Funding Hacks for Research Grants, Kalasalingam Academy of Research and Education.	1-5/JULY/2019
25	2021-2022	Dr.L.Muthulakshmi	FDP on "Expanding Horizon of Downstream Processing" Kalasalingam Academy of Research and Education.	4 -8 /JULY /2022
26	2021-2022	Dr. L. Muthulakshmi	Faculty Development Programme on "Tools and Techniques in Characterization of Compounds" CSIR-CIKRI, Karaikudi	17-21 January 2022
27	2021-2022	Dr. L. Muthulakshmi	International Workshop on "Microalgal Technology", St.Mary's College, Tuticorin	16-18 February 2022
28	2021-2022	Dr. L. Muthulakshmi	Faculty development Programme on "Printed and Flexible Electronics", VIT, Chennai.	27-29 June 2022
29	2020-2021	Dr. L. Muthulakshmi	ATAL Sponsored one week faculty development Programme on, Novel Biomaterial for future Application", Ramaiah Institute of Technology-Bangalore.	12-17 July 2021

30	2020-2021	Dr. L. Muthulakshmi	One week faculty development Programme on, “Innovation, Incubation, and Entrepreneurship”, SPMVV College, Tirupathi.	5-9 July 2021
31	2020-2021	Dr. L. Muthulakshmi	One week faculty development Programme on “Applications of Computers in Biology”, Golgostia University, Noida.	6-10 June 2021
32	2019-2020	Dr. L. Muthulakshmi	MHRD-IQAC Sponsored faculty development Programme on “Recent trends in Biomedical Engineering and Research Perspectives” Dr.N.G.P Institute of Technology, Coimbatore	26-30 April 2020
33	2019-2020	Dr Naresh Kumar Sharma	Faculty Development Program on “Prospects on Biochemical Engineering: Basics and Beyond”, Kalasalingam Academy of Research and Education.	01-07/JUNE/2020
34	2021-2022	Dr Naresh Kumar Sharma	FDP on "Expanding Horizon of Downstream Processing" Kalasalingam Academy Of Research and Education.	4 -8 /JULY /2022
35	2021-2022	Mr. S. J. Kabilan	FDP on “Expanding Horizon of Downstream Processing”.	4 -8 /JULY /2022
36	2020-2021	Mr. S. J. Kabilan	Faculty Development Program on Problem Solving Using Computer Programming, Kalasalingam Academy of Research and Education.	26 JULY- 6 AUGUST/2021
37	2019-2020	Mr. S. J. Kabilan	Faculty Development Program on Gearing Up for Research And Research Writing, Kalasalingam Academy of Research And Education.	20-26/MAY/2020
38	2019-2020	Mr. S. J. Kabilan	Faculty Development Program on Prospects in “Plant and Algal Biotechnology”, Kalasalingam Academy of Research And Education (Deemed To Be University)	06-12/DECEMBER/2019
39	2019-2020	Mr. S. J. Kabilan	Funding Hacks for Research Grants, Kalasalingam Academy of Research and Education (Deemed To Be University)	1-5/JULY/2019
40	2021-2022	Dr.K.Jyothi	One week FDP on Research Prospects and Progress in Biological Science. SRM Institute of Science and Technology	4-10 July 2022
41	2020-2021	Dr.K.Jyothi	Sustainable Development and Research opportunities in Food and Chemical Engineering. Hindustan College of Engineering and Technology.	5-11 October 2020

42	2019-2020	Dr.K.Jyothi	7 Days FDP on Academic Leadership, Teaching and learning methods, Research plan, Patents.SNMV College of Arts and Science. Coimbatore	8-15 June 2020
43	2019-2020	Dr.K.Jyothi	Two Days FTP on Project Proposal Writing, CLT, KARE	25-26 May 2020
44	2019-2020	Dr.K.Jyothi	One week FDP on Digital Tools for Learning, CLT, KARE	15-20 June 2020
45	2021-2022	Ms.P.Priya	FDPon "Expanding Horizon of Downstream Processing" Kalasalingam Academy Of Research And Education	4 -8 /JULY /2022
46	2019-2020	Ms.P.Priya	Faculty Development Program on Gearing Up For Research And Research Writing, Kalasalingam Academy Of Research And Education (Deemed To Be University)	20-26/MAY/2020
47	2019-2020	Ms.P.Priya	Faculty Development Program on Prospects In Plant And Algal Biotechnology, Kalasalingam Academyof Research And Education (Deemed To Be University)	06-12/DECEMBER/2019
48	2019-2020	Ms.P.Priya	Funding Hacks for Research Grants, Kalasalingam Academy of Research And Education (Deemed To Be University)	1-5/JULY/2019

4.4. Research and Development (30)

4.4.1. Sponsored Research (15)

Department of Biotechnology has established many research laboratories to work on various research projects that are funded by major funding agencies including SERB, ICMR, DST-TARE and DBT. The facilities established has helped our faculty in performing quality research and this has resulted in numerous publications in indexed journals. List of various projects is presented here:

S. No.	Principal Investigator	Title of Project	Funding agency	Amount (Rs.) (Lakhs)	Period	
					From	To
1.	Dr. T. Kathiresan	Mechanistic investigation on EMT targeted nanotherapeutics for drug-	DBT	58.74	March, 2022	February, 2025

		resistant triple-negative breast cancer cells				
2.	Dr. A. Muthukumaran	Evaluation of biocompatible Collagen-Chitosan–Selenium Nanoparticles (SeNPs) scaffold for cardiac tissue engineering applications in wistar rats	ICMR	17.00	April, 2020	March, 2023
3.	Dr. K. Sundar	Developing an extract of <i>Sida cordifolia</i> as a therapy for epilepsy	DBT	24.32	October, 2020	September, 2022
4.	Dr. B. Vanavil	Unraveling the role of carbon sources on biological activity of curdlan produced by novel marine bacteria	DST–WOS	26.40	June, 2019	Present
5.	Dr. Naresh Kumar Sharma	Self-sustaining photo bio-catalytic reactors with concomitant biofuel harvesting from crepe cotton wastewater	DST–SERB	15.00	November, 2018	Present
6.	Dr. K. Sundar	Use of recombinant bacteriophage as a novel delivery vehicle for viral CTL epitopes	DST–SERB	45.00	June, 2018	Present
7.	Dr. Sankarganesh Arunachalam	Elucidating the role of PPAR alpha in the development of doxorubicin- induced cardiomyopathy	DST–SERB	13.00	June, 2018	Present
8.	Dr. A. Muthukumaran	A smart alginate–pectin–selenium nanoparticle scaffold and its applications in cardiac	DST–SERB	19.00	June, 2018	Present

		tissue engineering				
9.	Dr. Sankarganesh Arunachalam	Unravelling the physiological mechanism of meditation mediated (PRANAHUTI) benefits on cardiovascular risk	DST–Sathyam	40.00	June, 2018	Present
Total (Rs. in Lakhs)				258.46		

List of Research projects Completed in the department along with the outcome

S. No.	Name of the faculty	Qualification	Designation	Name of the Project Title	Name of the Funding Agency	Outcome of the Projects* (Publications, Products, Ph.D. Produced)
30.	Dr. K. Sundar	Ph.D.	Professor	Genome-wide mapping of murine specific Dengue T-cell epitopes: computational prediction, identification and use as candidate vaccines	DST–SERB	SCI Publications
31.	Dr. T. Kathiresan	Ph.D.	Professor	Molecular functional characterization of mitochondrial BK channel in mouse cochlear hair cell	DST–SERB	SCI Publications
32.	Dr. Sankarganesh Arunachalam	Ph.D.	Associate Professor	Elucidation of mechanism of Adriamycin mediated male reproductive toxicity and recovery by restoration of epididymal adipose tissue	DST–SERB	SCI Publications

List of Ongoing projects and its progress report

S. No.	Name of the faculty	Qualification	Designation	Name of the Project Title	Name of the Funding Agency
1.	Dr. K. Sundar	Ph.D.	Professor	Developing an extract of <i>Sida cordifolia</i> as a therapy for epilepsy	DBT
2.	Dr. K. Sundar	Ph.D.	Professor	Use of recombinant bacteriophage as a novel delivery vehicle for viral CTL epitopes	DST-SERB
3.	Dr. T. Kathiresan	Ph.D.	Professor	Mechanistic investigation on EMT targeted nanotherapeutics for drug-resistant triple-negative breast cancer cells	DBT
4.	Dr. A. Muthukumaran	Ph.D.	Professor	Evaluation of biocompatible Collagen-Chitosan-Selenium Nanoparticles (SeNPs) scaffold for cardiac tissue engineering applications in wistar rats	ICMR
5.	Dr. A. Muthukumaran	Ph.D.	Professor	A smart alginate-pectin-selenium nanoparticle scaffold and its applications in cardiac tissue engineering	DST-SERB
6.	Dr. B. Vanavil	Ph.D.	Associate Professor	Unraveling the role of carbon sources on biological activity of curdlan produced by novel marine bacteria	DST- WOS
7.	Dr. Naresh Kumar Sharma	Ph.D.	Associate Professor	Self-sustaining photo bio-catalytic reactors with concomitant biofuel harvesting from crepe cotton wastewater	DST-SERB
8.	Dr. Sankarganesh Arunachalam	Ph.D.	Associate Professor	Elucidating the role of PPAR alpha in the development of doxorubicin-induced cardiomyopathy	DST-SERB
9.	Dr. Sankarganesh Arunachalam	Ph.D.	Associate Professor	Unravelling the physiological mechanism of meditation mediated (PRANAHUTI) benefits on cardiovascular risk	DST-Sathyam

4.4.2. Consultancy (From Industry) (15)

S. No.	Duration	Number
1	2018-2019	3
2	2019-2020	1/2
3	2018-2020	3
4	2021-2022	5/6
5	2020-2021	1

S. No.	Faculty Name	Title of the project	Funding Agency	Amount (in L)	Duration
1	Dr. Naresh Kumar Sharma	Conducting a descriptive study, assessment of pollution and for ecological restoration of Vadakarari and Ilandaikulam tanks at Tirumangalam and Tirunelveli	PWD Madurai	0.2	2021-2022 (1 Year)
2	Dr. L. Muthulakshmi	Efficient Water Treatment Solution	S A Anandan Spinning Mills Pvt. Ltd.	4.75	2021-2022 (1 Year)
7	Dr. Naresh Kumar Sharma	Conducting a descriptive study, assessment of pollution and for ecological restoration of Vadakarari and Ilandaikulam tanks at Tirumangalam and Tirunelveli	PWD Madurai	0.2	2020-2021 (1 Year)
7	Dr. K. Palanichelvam	Propagation of endangered medicinal plant	Aravindh Herbals Labs (P) Ltd	1.00	2019-2020 (1 year)
8	Dr. Naresh Kumar Sharma	Conducting a descriptive study, assessment of pollution and for ecological restoration of Vadakarari and Ilandaikulam tanks at Tirumangalam and Tirunelveli	PWD Madurai & PWD Tirunelveli	0.1	2019-2020 (1 year)

9	Dr. B. Vanavil	Establishment of organic roof garden	Kala Constructions, Chennai	2.25	2018-2020 (2 years)
10	Dr. A. Muthukumaran	Induced breeding and larval rearing techniques in ornamental fishes	Covelong Fisheries and Farms, Kovalam	2.50	2018-2020 (2 years)
11	Dr. T. Kathiresan	Drug screening and identification of inhibitor molecules for breast cancer	Madurai City hospital, Madurai	3.25	2018-2020 (2 years)
12	Ms. P. Priya and Ms. P. Ramya	Establishment of mushroom cultivation facility	Sri Ramesh Prasad Farms, Virudhunagar	0.6	2018-2019 (1 year)
13	Dr. K. Selvaraj	Analytical services for pharmaceutical industries	Modern Surgicals, Rajapalayam	2.00	2018-2019 (1 year)
1.	Dr. K. Palanichelvam	To improve an agricultural product that enhances plant growth and immunity	Seabios –I, Inc, Chennai	0.4	2017-2018
Total (Rs. in Lakhs)				29.25	

CRITERION 5	LABORATORIES AND RESEARCH FACILITIES	75
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5.1. Adequate and well-equipped laboratories in area of Program specialization (30)

- The department laboratories are equipped with high quality instruments and are regularly calibrated and maintained.
- Each of the laboratory is assigned with a faculty member as lab-in-charge and a technician.
- The technicians are qualified with a UG or a PG degree and are given hands-on training prior to assigning the laboratories and are encouraged to learn new techniques.
- During the practical session instructions are given by the course faculty and students are assisted by the technicians.
- The students are encouraged to do additional experiments after working hours. During the extra-hour permission is given to the students and are accompanied by either a faculty technician. This system is very much useful for the final year students who undergo capstone project.
- Central instruments facility has all the equipment with air-conditioning facility. It is maintained in such a way that the students can avail all the facilities under one roof.

The equipment in the laboratories are presented here:

S. No.	Name of the Laboratory	Specialized Equipment Name	Equipment Details	Utilization details from the perspective of PO attainment
1	GC Lab	Gas Chromatography	Shimadzu Corp.	PO1, PO4 BIT18R5001, BIT18R5005
2	Central Instruments Facility	Bench-Top Fermenter	Bioengineering	PO1, PO4 BIT18R5001, BIT18R5005
3	Central Instruments Facility	Cryostat (Chiller)	Bioengineering	PO1, PO4 BIT18R5001, BIT18R5005, BIT18R5084
	Central Instruments Facility	Sonicator	Sonics Vibra cell	PO1, PO4 BIT18R5003, BIT18R5083

4	Central Instruments Facility	Biologic LP Chromatography	Bio-Rad	PO1, PO5 BIT18R5001, BIT18R5005
5	Central Instruments Facility	Variable Peristaltic Pump	Bioengineering	PO1, PO4, PO5 BIT18R5001, BIT18R5005
6	Central Instruments Facility	UV -Visible Spectrophotometer	Shimadzu	PO1, PO4, PO5 BIT18R5008, BIT18R5012
7	Central Instruments Facility	ESCO Vertical Laminar Flow cabinet	ESCO	PO1, PO4, PO5 BIT18R6013, BIT18R5003
8	Central Instruments Facility	UV Transilluminator	Biotech R&D Laboratories	PO1, PO5 BIT18R5001, BIT18R5005
9	Central Instruments Facility	Gel Documentation System	Bio-Rad	PO1, PO5 BIT18R5003, BIT18R5004
10	Central Instruments Facility	Cooling Centrifuge	Remi	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R5012
11	Central Instruments Facility	Cooling Microcentrifuge	Remi	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R5083, BIT18R5084
12	Central Instruments Facility	Visible spectrophotometer	Labman Vertex Enterprises	PO1, PO4, PO5 BIT18R5001, BIT18R5005
13	Central Instruments Facility	Incubator cum Shaker	Selec-RC 5100	PO1, PO4, PO5 BIT18R5001, BIT18R5005
14	Central Instruments Facility	Micro centrifuge	Heraeus	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R5083, BIT18R5084
15	Central Instruments Facility	High Speed Refrigerated Centrifuge	Eppendorff	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R5083, BIT18R5084
16	Central Instruments Facility	Orbital Shaker	Remi CIS24	PO1, PO4, PO5 BIT18R5001, BIT18R5008

17	Central Instruments Facility	Double Distillation Unit	HS-2	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R5008
18	Central Instruments Facility	Circulation Water Bath	Borosil	PO1, PO4, PO5 BIT18R5001, BIT18R5005
19	Central Instruments Facility	Hot Air Oven	Tecnico	PO1, PO4, PO5 BIT18R5001, BIT18R5005
20	Central Instruments Facility	Orbital Shaking Incubator	Labtech LTOSI	PO1, PO4, PO5 BIT18R5001, BIT18R5005
21	Central Instruments Facility	Mini Rotary Shaker	Remi	PO1, PO4, PO5 BIT18R5001, BIT18R5005
22	Central Instruments Facility	Digital Colony counter	Preeth Scientific	PO1, PO4, PO5 BIT18R5001, BIT18R5005
23	Central Instruments Facility	Water Bath Shaker	SECOR Scientific	PO1, PO4, PO5 BIT18R5001, BIT18R5005
24	Microbiology Lab	Microscope Monocular (15 Nos)	Labomed	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R50083
25	Microbiology Lab	Binocular Microscope (5 Nos)	Labomed	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R50083
26	Autoclave Room	Autoclave – Horizontal High-Pressure Sterilizer	Nat Steel	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R50083
27	Autoclave Room	Water Still	Nat Steel	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R50083

Table 5.1.1: Equipment Available in the Teaching Laboratories

5.2. Research facilities / center of excellence (30)

- There are six research laboratories in the department of biotechnology. Faculty members experienced in various research domains are in-charge of each of these laboratories.

- Each of these laboratories are funded by the government through various research grants, at least in part.
- Post-graduate students are attached to faculty in the first year itself and do their mini projects under the supervision of respective faculty.
- Students do their final year projects also under the same guide in the same laboratory.
- Students have free access to instruments in each of the research laboratories.
- In addition to their host laboratories students are permitted to avail the facility in other laboratories as well.
- Senior research scholars in the research laboratories help the post-graduate students in using the instruments.

S. No.	Name of the Facility	Specialized Equipment Name	Equipment details	Utilization details from the perspective of PO attainment
1	Molecular Immunology Research Lab	Sanyo - Ultra Low temperature freezer	Sanyo	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R50083
2.	Molecular Immunology Research Lab	Microfiltration / Ultrafiltration Unit	Millipore	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R50083
3	Molecular Immunology Research Lab	Micro Plate Reader	Bio-Rad	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
4	Molecular Immunology Research Lab	Inverted Phase Contrast Microscope	Carl Zeiss	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
5	Molecular Immunology Research Lab	Analytical Balance	Shimadzu	PO1, PO5 BIT18R50083, BIT18R50084
6	Molecular Immunology Research Lab	Refrigerated Centrifuge	Thermoscientific	PO1, PO4, PO5 BIT18R50081, BIT18R50083, BIT18R50084
7	Molecular Immunology Research Lab	UV-VIS Spectrophotometer	Thermoscientific	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R50083

				BIT18R50081,
8	Molecular Immunology Research Lab	Freeze Drier	Esquire Biotech	PO1, PO4, PO5 BIT18R5001, BIT18R5005, BIT18R50083 BIT18R50081,
9	Molecular Immunology Research Lab	Liquid nitrogen tank	Model 1X-35	PO1, PO5 PO1, PO4, PO5 BIT18R50081, BIT18R50083, BIT18R50084
10	Molecular Immunology Research Lab	Class-II Biohazard Safety Cabinet	Class-II, ESCO, Type A2	PO1, PO5 PO1, PO4, PO5 BIT18R50083 BIT18R50081, BIT18R50084
11	Molecular Immunology Research Lab	Galaxy B CO ₂ Incubator	Galaxy B+	PO1, PO5 BIT18R50083, BIT18R50084
12	Molecular Immunology Research Lab	Easy Pipetting Aid	Eppendorff	PO1, PO4, PO5 BIT18R50083, BIT18R50084
13	Molecular Immunology Research Lab	MilliQ water purification system	Millipore	PO1, PO4, PO5 BIT18R50083, BIT18R50084
14	Molecular Immunology Research Lab	Plat form Rocker II (GR2)	Remi	PO1, PO4, PO5 BIT18R273, BIT18R50081, BIT18R50083, BIT18R50084
15	Molecular Immunology Research Lab	Nucleofector Device II	Amaza	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
16	Molecular Immunology Research Lab	Multi-well Fluorescence & Luminescence reader	BioTek	PO1, PO5 BIT18R273, BIT18R50081, BIT18R50083, BIT18R50084
17	Molecular Immunology Research Lab	Micro Centrifuge	Biofuge	PO1, PO4, PO5 BIT18R50081, BIT18R50083, BIT18R50084
18	Molecular Immunology Research Lab	Chemi-doc imager	Alpha Innotech	PO1, PO5 BIT18R273, BIT18R50081,

				BIT18R50083, BIT18R50084
19	Molecular Immunology Research Lab	Fluorescence microscope	Axioscope, Carl Zeiss	PO1, PO4, PO5 BIT18R273, BIT18R50081, BIT18R50083, BIT18R50084
20	Molecular Immunology Research Lab	Binocular microscope	Labomed	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
21	Molecular Immunology Research Lab	Thermocycler	Bio-Rad	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
22	Proteomics Laboratory	Dissection Microscope	Carl Zeiss stereo zoom microscope	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
23	Proteomics Laboratory	Isoelectric Focusing Unit	GE Healthcare	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
24	Proteomics Laboratory	SDS-PAGE Apparatus	GE Healthcare	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
25	Proteomics Laboratory	Submarine for DNA Gel Electrophoresis	GE Healthcare	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
26	Proteomics Laboratory	Power pack SE-600	GE Healthcare	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
27	Proteomics Laboratory	Semi-dry Western blot apparatus	GE Healthcare	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
28	Proteomics Laboratory	Wet Western blot apparatus	GE Healthcare	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
29	Proteomics Laboratory	Refrigerated Centrifuge	Thermoscientific	PO1, PO5 BIT18R50081, BIT18R50083,

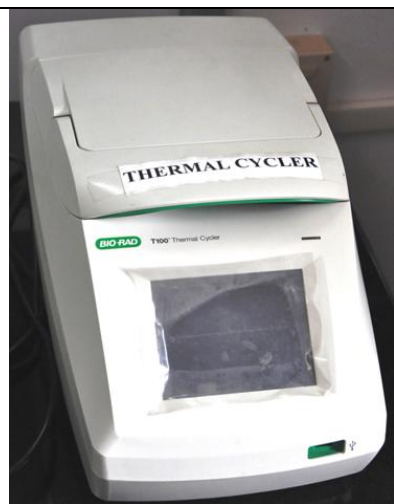
				BIT18R50084
30	Proteomics Laboratory	Ultra-Low Freezer	PHC Corporation	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
31	Proteomics Laboratory	BSL-B2 Biosafety Cabinet	Biobase	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
32	Proteomics Laboratory	Speed Vac	Biobase	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
33	Plant Molecular Biology Lab	Poly House	SS Agencies Coimbatore	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
34	Plant Molecular Biology Lab	Laminar Air Flow Unit	Clean Air	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
35	Plant Molecular Biology Lab	pH Meter	Systronics	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
36	Plant Molecular Biology Lab	Weighing Balance	Wensar	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
37	Plant Molecular Biology Lab	Magnetic Stirrer	Glasco	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
38	Plant Molecular Biology Lab	Gel apparatus and Power Pack	Orange	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
39	Plant Molecular Biology Lab	Vortex Mixer	Remi	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
40	Plant Molecular Biology Lab	Gel Rocker	Tarson	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
41	Plant Molecular	Vacuum pump	Tarson	PO1, PO5

	Biology Lab			BIT18R50081, BIT18R50083, BIT18R50084
42	Center for Cardiovascular and Adverse Drug Reactions	pH Meter	MK IV	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
43	Center for Cardiovascular and Adverse Drug Reactions	Magnetic Stirrer	REMI 1MLH	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
44	Center for Cardiovascular and Adverse Drug Reactions	Electronic Balance	Wensar PGB200	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
45	Center for Cardiovascular and Adverse Drug Reactions	Gel Electrophoresis Unit	Hi-Media	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
46	Center for Cardiovascular and Adverse Drug Reactions	Mini Centrifuge	REMI	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
47	Center for Cardiovascular and Adverse Drug Reactions	Vortex Mixture	REMI	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
48	Center for Cardiovascular and Adverse Drug Reactions	Western Blot	Bio-Rad	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
49	Center for Cardiovascular and Adverse Drug Reactions	Deep Freezer (-80°C)	REMI	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
50	Center for Cardiovascular and Adverse Drug Reactions	Cooling Incubator	REMI	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
51	Center for Cardiovascular and Adverse Drug Reactions	ELISA Reader	EIA QUANT	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
52	Center for Cardiovascular and Adverse Drug	High Speed Cooling Centrifuge	REMI C24 Plus	PO1, PO5 BIT18R50081, BIT18R50083,

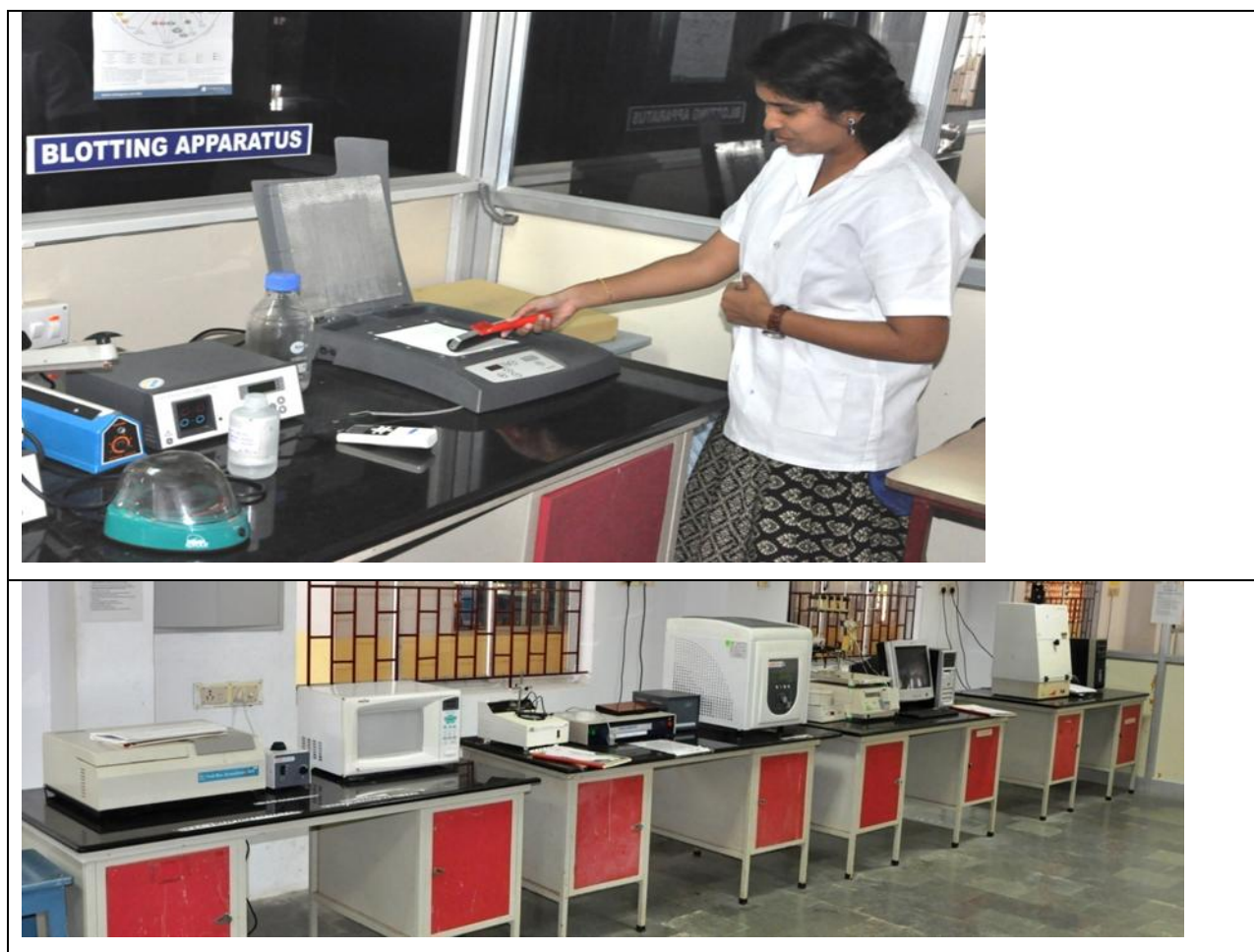
	Reactions			BIT18R50084
53	Center for Cardiovascular and Adverse Drug Reactions	Gradient PCR	Hi-Media	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
54	Center for Cardiovascular and Adverse Drug Reactions	Laminar Air Flow	Clean Air	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
55	Center for Cardiovascular and Adverse Drug Reactions	Inverted Microscope with Fluorescent Attachment	Labomed	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
56	Center for Cardiovascular and Adverse Drug Reactions	UV-Trans illuminator	Yercaud Biotech	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
57	Center for Cardiovascular and Adverse Drug Reactions	Refrigerators	LG	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
58	Center for Cardiovascular and Adverse Drug Reactions	CO ₂ Incubator	BEING/BPN-50CH	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084
59	Center for Cardiovascular and Adverse Drug Reactions	Biosafety cabinet	Clean Air	PO1, PO5 BIT18R50081, BIT18R50083, BIT18R50084

Table 5.2.1: Equipment Available in the Research Laboratories

Sample Photographs of Equipment available in the department







5.3. Access to laboratory facilities, training in the use of equipment (15)

- Students are given free access to all the teaching laboratories provided they have to enter the log book for each of the instruments.
- In addition to the working hours, students are encouraged to work-extra hours in the laboratories.
- Standard operating procedure is available for each instrument/equipment and is maintained near the instrument/equipment.
- During the extra-hour students are accompanied by lab-in-charges/course teachers/technicians. A separate log book is maintained for recording the extra-hour working.
- In research laboratories, students have free access to all the equipment and they are assisted by the senior research scholars, post-doctoral fellows of the host laboratory.

- In addition to the host laboratory, students are also given access to other research laboratories (non-host) for doing certain specialized experiments.
- The students are encouraged to undertake interdisciplinary projects by collaborating with other institutions/departments through their guides.
- Our students utilize the facilities of other institutions/departments which are not available in the department. In turn, the collaborating institutions are given access to our facilities.
- The facilities are accessible to other department students through proper channel. A request is made officially and approved by the Head of the department.
- National and international collaborations have yielded a number of research publications.

CRITERION 6	Continuous Improvement	75
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6.1 Actions taken based on the results of evaluation of each of the POs(25)

The Department of Biotechnology takes various measures to ensure the quality of education that is being provided to the PG students that is measured by PO attainment. For improving the PO attainment necessary remedial measures are considered and implemented by curriculum intervention, use of new pedagogy tools, miniprojects and encouraging students to attend and present their results in Conferences or publish in reputed journals.

Table:1 : Overall PO Attainment for the Batch 2018-2020

<i>PO Attainment</i>	<i>PO1</i>	<i>PO2</i>	<i>PO3</i>	<i>PO4</i>	<i>PO5</i>
<i>Direct Attainment</i>	2.34	2.21	2.22	2.33	2.21
<i>Indirect Attainment</i>	3	3	3	3	2.75
<i>Overall Attainment</i>	2.47	2.37	2.38	2.46	2.32

Table:2 PO Attainment

POs	Target Level	Attainment Level	Observations
PO1: An ability to independently carryout the research / investigation and development work to solve the practical problems.			
PO1	2.3	2.47	<p>The attainment level reached the expected level.</p> <ul style="list-style-type: none"> Students need to complete a minor project and a major project during their degree program. They are encouraged to carry out the work independently with the supervision of a faculty mentor.
Action: <ul style="list-style-type: none"> The department takes necessary steps to improve the PO attainment. The teaching learning process was continuously monitored and used new pedagogy tools (such as white board, videos, e-content, animation) for explaining their concept thoroughly. 			

<ul style="list-style-type: none"> • BIT18R5001: Bioprocess and Bio separation Technology students used online software for process optimization and using bio separation techniques, extract valuable plant metabolites using research laboratory equipments. 			
PO2: An ability to write & present a substantial technical report / document			
PO2	2.3	2.37	The PO level was attained at the expected level.
Action: <ul style="list-style-type: none"> • Students learn the fundamental concepts of research paper writing through the curriculum (BIT18R5002 / Research Methodology) • To improve their writing skills assignments are given in various courses for which marks are allotted. • Audit courses like English for paper writing helps in improving their writing skills. • The students also learned to document results and prepare reports when they complete mini project and major project. • They also need to present their results in conferences which helps them in improving their presentation skills. 			
PO3: Students should be able to demonstrate degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate level.			
PO3	2.3	2.38	The attainment level has reached the expected level.
Action: <ul style="list-style-type: none"> • The students are provided opportunity to improve their skills during the laboratory courses and workshops conducted on various topics also help them in honing their skills. • Students knowledge and technical skills are improvised by providing opportunities to handle equipment. • As the faculty members have funded research projects the students also get an opportunity to work in funded research project in the department. 			
PO4: Capability to recognize problems and provide solutions related to industrial biotechnological process that involve production of sustainable bioproducts.			
PO4	2.3	2.46	The PO attainment level was reached.

Action: <ul style="list-style-type: none"> The students encouraged to recognize the problems related to biotechnological process and involve the product production from plant, algal and microbial sources. 			
PO5: Demonstrated ability to address issues related to environmental & healthcare biotechnology using modern computational and analytical tools.			
PO5	2.3	2.32	<ul style="list-style-type: none"> The target was attained.
Action: <ul style="list-style-type: none"> The students were trained in using online tools for design and development of drugs that could contribute to the improvement in healthcare. Besided regular laboratory classes, students are encouraged to attend workshops related to the use and applications of online tools for their project work. 			

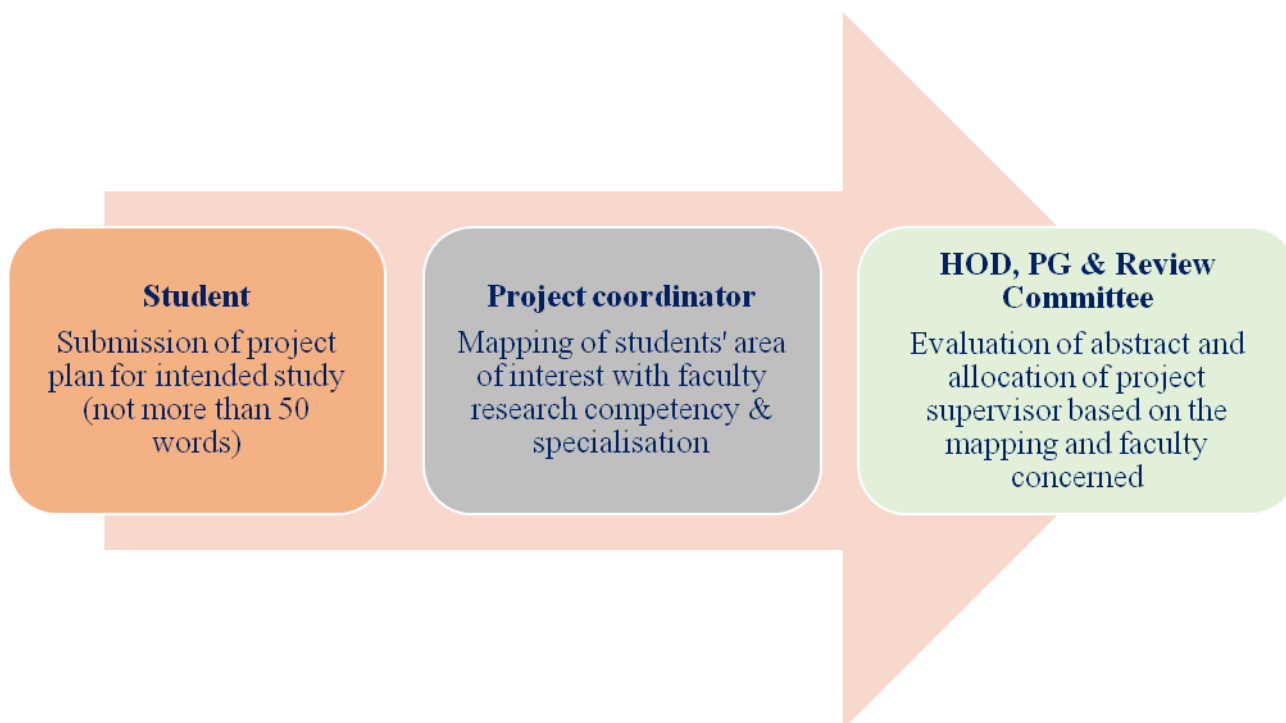
6.2 Improvement in Quality of Projects(10)

Project work is an essential component of the Post-Graduate program. The Project work of M.Tech. (Biotechnology) R2018 regulation consists of one mini project and a major project done in two phases. The mini project (BIT18R6097) is to be undertaken during the second semester. Similarly, major project Phase I (BIT18R6098) and Phase II (BIT18R6099) need to be completed during the 3rd and 4th semesters respectively. A few students complete the Phase II of the major project in an industry or in an academic or research institutions. For each project a project guide is assigned based on the preference of the student and the acceptance by the guide. Project coordinator, appointed by the Head of the department, is responsible for planning, scheduling and execution of all the activities related to the student project work. The project is continuously assessed by three reviews that are conducted periodically. The maximum marks awarded during internal assessment is 50. Final presentation and viva voce is done in the presence of an external expert. Marks are awarded based on the presentation of the report, oral presentation by the students and the performance of the students during viva-voce. To improve the quality of the projects and to bring in uniformity in evaluation, a pre-defined rubrics is used for evaluation.

Assessment of PG projects is done for 100 marks considering the following criteria:

- (i) Problem identification - relevance to industry or research
- (ii) Suggested solution - methodology and development of theoretical and experimental methods used in the execution of the project
- (iii) Quality of the project work
- (iv) Communication skill and content delivery and
- (v) Documentation of results and References

The process of allocations of project supervisor for mini projects and major projects are presented in the following figure.



Quality of project report

An academic project report must include an abstract, introduction, literature review, methodology, results, discussion, and conclusions and recommendations for future work. The process of writing and presenting an academic project is based on the guidelines proposed by the Office of Academic Affairs and duly signed by the Supervisor and the Head of the Department. Quality of M.Tech. project report is also ensured by checking for plagiarism using software like iThenticate or Urkund. Similarity check report is to be attached as part of every M.Tech. project report.

Table 3: Mapping of department quality of the project standards with the standard provided by the accreditation process

Department	Problem identification (CO1) (20 marks)	Suggested solution (CO 2) (20 marks)	Quality of Work (CO 3) (20 marks)	Communication skill/Content Delivery (CO 4) (20 marks)	References documentation understanding (CO 5) (20 marks)
Project quality	<ul style="list-style-type: none"> Very clear and concise objectives Cites substantial current and good quality literature 	<ul style="list-style-type: none"> Very clear methodology, articulated using technical terms indicating all steps and tools 	<ul style="list-style-type: none"> Clarity in design/setting up of experiment. Benchmarks used / Assumptions made 	<ul style="list-style-type: none"> Very clear methodology, articulated using technical terms indicating all steps and tools 	<ul style="list-style-type: none"> Overall presentation of the report

Table:4 Process of Project Monitoring /Review system

Review	Monitoring of Project components	Monitored by	Suggestions
Zeroth	Project domain, area, title, Project approach, requirements and feasibility are monitored	Internal Review committee nominated by HoD	If wrong with the project approach, unrealistic concepts, not feasible and no availability of requirements, students are directed to change the title and concepts.
First	Project objectives, literature survey, and methodology (Work plan) are monitored	Internal Review committee nominated by HoD	If the objectives are too many, students are asked to cut down the objectives. Suggestion to collect more literatures. Changes in the methodology
Second	Quality and progress of the proposed work, results and data interpretation are monitored	Internal Review committee nominated by HoD	If the progress is slow, students are advised to conclude with existing results

Viva-Voce	Brief presentation and Project outcomes are evaluated	External Expert nominated by CoE	Future prospects
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Review Process

There shall be three assessments (each 100 marks) during the semester by a review committee. The student is instructed to make a presentation on the progress made before the committee. The Head of the Department constitutes the review committee consisting of the supervisor, project coordinator and another faculty member from the department to evaluate the progress of all the activities related to the student academic project work. The total marks obtained in the three assessments shall be consolidated to 50 marks.

Table 5: Project Review Process

S.No.	Project	Review-1 (Zeroth)	Review-2 (First)	Review-3 (Second)	End Semester Examination
1	BIT18R6097 Mini Project	Internal review committee	Internal review committee	Internal review committee	Internal review committee
2	BIT18R6098 Project Phase I	Internal review committee	Internal review committee	Internal review committee	External expert
3	BIT18R6099 Project Phase II	Internal review committee	Internal review committee	Internal review committee	External expert

Table:6 List of Completed Mini Projects (2021-2023 Batch)

S. No	Reg. Number	Name of The Student	Project Title	Outcome of the Project	Relevance to POs
1	9921102001	Derina.J.Pearlin .D	Comparative studies between microalgae and macroalgae in waste water treatment	The role of microalgae and macroalgae in the wastewater treatment was analysed	PO1,PO2,PO4,PO5
2	9921102002	C.M.Karunya Sri	Homology modelling of putative ion transported proteins of Streptococcus mutants and molecular docking	Poster presentation in International conference Pharma NEST'3.E. JSS College of Pharmacy	PO1,PO2,PO5

			with phytochemicals of <i>Azadirachta indica</i> .	Ooty.	
3	9921102003	A.Parthiban	Bioactive compounds from <i>Withania somnifera</i> and <i>Cassia auriculata</i> - An <i>in silico</i> investigation against neurological disease.	The functional potential of bioactive compounds from <i>Withania somnifera</i> and <i>Cassia auriculata</i> in the treatment of Alzheimer disease was elucidated	PO1, PO2, PO5
4	9921102005	V.Siva Bharathi	Extraction and characterization of <i>Asparagus racemosus</i> bioactive compounds	Poster presentation in International conference Pharma NEST'3.E. JSS College of Pharmacy Ooty.	PO1, PO2
5	9921102006	S.Shruthi	Amine functionalized eugenol loaded mesoporous silica nanoparticles in <i>in vitro</i> model of breast cancer	The effect of functionalized nanoparticles in the breast cancer cell lines was analysed	PO1, PO2, PO4
6	9921102008	Jins K Abraham	Extraction of bioactive compound from <i>Achyranthus aspera</i> and <i>Myxopyrum serratum</i> - <i>in silico</i> study of its antibacterial effects	The antibiotic potential of medicinal plants <i>Achyranthus aspera</i> and <i>Myxopyrum serratum</i> is studied.	PO1,PO2,PO5

Table:7 List of Completed Mini Projects (2020-2022 Batch)

S. No	Reg. Number	Name of The Student	Project Title	Outcome of the Project	Relevance to POs
1	9920102002	Bazeera Ferdhous P	<i>In silico</i> analysis of metal ion binding sites in alginate lyase.	Computational analysis of the metal binding site present in the industrial enzyme is explored.	PO1,PO2,PO3, PO4, PO5
2	9920102004	Kaliraj C	Co-delivery of piperine and linalool loaded hollow mesoporous silica nano particles induced cell death in <i>in silico</i> model of breast cancer.	Druggability of medicinal lead molecules was analysed using <i>in silico</i> techniques.	PO1,PO2,PO3, PO5
3	9920102005	Oviya S	Propagation of <i>Hybanthus enneaspermum</i> in wild life environment.	Identified the optimal conditions for tissue culturing of medicinal plant.	PO1,PO2,PO3, PO5
4	9920102006	Pooja Vaisnavi M	<i>In silico</i> analysis of phytochemical and antibacterial activity of <i>Cardiospermum halicacabum</i> against wound pathogens.	Computational analysis of antibiotic activity and the available phytocompounds of <i>Cardiospermum halicacabum</i>	PO1,PO2, PO5

5	9920102007	Raja Rajeswari R	In silico analysis of Camptothecin an anti cancer drug against cancer signalling pathway.	Elucidated the role and mechanism involved in cancer suppression by natural compounds	PO1,PO2,PO3, PO5
6	9920102009	Shalini M	<i>In silico</i> comparative analysis of genome and proteome of severe acute respiratory syndrome Corona virus 2 (SARS Co 2) with bat virome.	Established the similarity of gene and proteins present in the bat virome and SARS CoV2.	PO1,PO2,PO3, PO5
7	9920102010	Angelin Jenit	Isolation of microalgae from cotton waste water disposal site	The microalgae from cotton waste water were isolated.	PO1,PO2,PO3
8	9920102011	Praseetha S	Computational prediction and <i>in silico</i> validation of breast cancer associated antigens	The antigens of HPV inducing breast cancer and their potential as vaccine candidate was analysed.	PO1,PO2, PO5
9	9920102012	Premkumar K	<i>In silico</i> characterization of cellulase by employing computational approach	The microbes producing cellulase enzyme was studied computationally.	PO1,PO2, PO5
10	9920102013	Darszhan B	In silico analysis and validation of L Asparaginase from enterobacter cloacae	The gene sequences involved in asparaginase production was found.	
11	9920102015	Ramalakshmi G	<i>In silico</i> evaluation of phytochemicals from <i>Tinospora cordifolia</i> against potential targets of irritable bowel syndrome	The role of phytochemicals in the treatment of irritable bowel syndrome was analysed.	PO1,PO2,PO3, PO5
12	9920102016	Bhoobalan D	A survey of the impact of heartfulness meditation on stress	The relation between heartfulness meditations with stress was recorded by descriptive surveying.	PO1, PO2.
13	9920102017	Dhanapradeeba V	Elucidating the role of oligonucleotides on inflammatory bowel disease (IBD)-An <i>in silico</i> approach	The function of nucleotides in the suppression of protein targets involved in IBD was studied.	PO1,PO2, PO5

Table: 8 List of Completed Mini Projects (2019-2021 Batch)

S. No	Reg. Number	Name of the Student	Project Title	Outcome of the Project	Relevance to POs
1	9919102001	Arun Robin Babu A	Batch degradation studies of cotton processing wastewater using <i>Chlorella vulgaris</i>	Published a book chapter: Algae or Bacteria – Future of biological wastewater treatment, Rahman – Handbook of Advanced Approaches	PO1,PO2,PO3, PO5

				V2	
2	9919102002	Gowtham P S	Improvement of curdlan gum production using Elicitors	Developed a process for enhancement of curdlan gum using elicitors	PO1,PO2,PO4
3	9919102003	Poornimaa B	A survey of the impact of meditation and mental well-being	Innovations in Bio and Chemical Engineering for Sustainable(presentation),	PO1,PO2,PO5
4	9919102004	Sundarapandian V	Role of Asparagus racemosus on pentazole induced epilepsy in rodent model	International e-conference on Frontiers in Industrial Biotechnology	PO1,PO2,PO4
5	9919102005	Sureba S	Theranostic application of 4-Aminoantipyrine loaded mesoporous silica nanoparticles in <i>In vitro</i> models of breast cancer	The study provided an alternative for developing next generation drug delivery carriers for efficient tumor therapy.	PO1, PO2
6	9919102006	Vikram V	Studies on Mutagenesis of bacterium to find higher expression of enzyme protease identification and characterization.	Observations and findings were carried out on the mutated bacillus species which acted as a protease inhibitor.	PO1,PO2,PO4
7	9919102007	Divyabharathi R	Production and characterization of thermozymes from thermophilic bacteria	Innovations in Bio and Chemical Engineering for Sustainable(presentation)	PO1,PO2,PO4
8	9919102008	Jemmy Joy G	Designing Inhibitors of PVDQ to control the pathogenesis of Pseudomonas: A Pharmacophore Modelling Approach	Innovations in Bio and Chemical Engineering for Sustainable(presentation)	PO1,PO2,PO5
9	9919102009	Clayton Fernando R	Identification of SARS-CoV-2 CTL Epitopes for Development of a Multivalent Subunit Vaccine for COVID-19	Published in Infection, Genetics and Evolution Journal (2021) and also presented this work in virtual international conference on Innovation in Interdisciplinary Research 2020 organized by KARE (23-24, June 2020)	PO1, PO2, PO5
10	9919102010	Kavitha A	Studies on riboflavin in earthworm and its effect in growth of rice seedling	Fungal pathogen can be maintained in vermiculture products to reduce disease index in rice plants caused by <i>R. solani</i>	PO1, PO2
11	9919102011	Aanandhalakshmi R	Biosynthesis and applications of Alginate oligosaccharides	Developed and optimized a process for synthesis of alginate oligosaccharides using alginate lyase of novel	PO1, PO2, PO4

				marine bacteria	
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Table:9 List of Completed Phase I Projects (2021-2023 Batch)

S. No	Reg. Number	Name of The Student	Project Title	Outcome of the Project	Relevance to POs
1	9921102001	Derina.J.Pearlin .D	Removal of emerging pollutants from waste water using algal systems	The role of algae in wastewater treatment was studied.	PO1,PO2,PO5
2	9921102002	C.M.Karunya Sri	Effect of metabolites of <i>Azadirachta indica</i> on glucosyl transferases of <i>Streptococcus mutans</i>	GTF enzyme was identified and the effects of bioactive compounds were studied	PO1,PO2,PO5
3	9921102003	A.Parthiban	Dioscorin and diosgenin from water yam (<i>Dioscorea alata</i> L.) and their bioactive studies	The bioactive profile of water yam was elucidated.	PO1, PO2, PO5
4	9921102005	V.Siva Bharathi	Bioprospecting of <i>Asparagus racemosus</i> crude extract on IBD <i>in vitro</i>	The impact of <i>Asparagus racemosus</i> in the cell line model of IBD.	PO1, PO2
5	9921102006	S.Shruthi	Amine functionalized eugenol loaded hollow mesoporous silica nanoparticles in <i>in silico</i> and <i>in vitro</i> model of breast cancer	The effect of functionalized nanoparticles in the breast cancer cell lines was analysed.	PO1, PO2, PO4
6	9921102008	Jins K Abraham	An integrated <i>in silico</i> approach for the comparative structural and functional exploration of β galactosidases of multiple species of <i>Cellulomonas</i>	The computational analysis study to establish the genes responsible for galactosidase in multiple species was observed	PO1,PO2,PO4

Table:10 List of Completed Phase I Projects (2020-2022 Batch)

S. No	Reg. Number	Name of The Student	Project Title	Outcome of the Project	Relevance to POs
1	9920102002	Bazeera Ferdhous P	Analysis of curdlan gum as a drug delivery and therapeutic agent through in vitro and in silico studies	Oral Presentation in 3rd International Conference on Communication and Intelligent Systems organized by National Institute of Technology Delhi, 18-19, December 2021.	PO1,PO2,PO5

2	9920102004	Kaliraj C	Codelivery of piperine and linalool loaded-hollow mesoporous silica nanoparticles induced cell death in in vitro and in silico model of breast cancer	ADMET properties of the ligands and physiochemical characteristics of the receptor proteins were analysed. ii. Calcinated Hollow Mesoporous Silica Nanoparticles were synthesized	PO1,PO2,PO5
3	9920102005	Oviya S	Pharmacoinformatics based Screening of Phytocompounds from Orthosiphon stamineus and Boerhavia diffusa against Potential Targets of Chronic Kidney Disease (CKD)	Insilico analysis of Boerhaavia diffusa and Orthosiphon stamineus plants have been done against CKD disease. The formulation of these herbs against CKD targets is suggested.	PO1, PO2, PO5
4	9920102006	Pooja Vaisnavi M	Insilico analysis of phytochemical and antibacterial activity of cardiospermumhalicacabum against wound pathogens	GC-MS analysis of phytoconstituents from Cardiospermum helicacabum L and molecular docking interactionsof bioactive HbA1C, MMP-8, MMP-9 taken from DFUtarget protein against wound pathogens Submitted the documents to Ethanobotany Feb, 21, 2022	PO1, PO2
5	9920102007	Raja Rajeswari R	Glucose conjugated camtothecin loaded gluten nanoparticle for brain tumor targetting	Revision submitted in Bioimpacts journal	PO1, PO2, PO4
6	9920102009	Shalini M	Image based disease detection of cotton plant and formulation of disease resistant designer seed with BCA to comabt cotton plant diseases.	Paper Submitted to Second International Conference on Artificial Intelligence- Vellore Institute of Technology-Vellore.	PO1,PO2,PO4
7	9920102010	Angelin Jenit	Combined Biological and photocatalytic treatment of cotton processing wastewater	Accepted for Presentation at SuWAM 2022, IITM, titled "Integrated microalgal and bacterial consortium with photocatalytic	PO1,PO2,PO4

				treatment of surgical cotton effluent" March 2022	
8	9920102011	Praseetha S	Designing of a novel epitope-based vaccine candidate for Human Papilloma Virus	Designed a DNA based vaccine for human papilloma virus and validated them using in-silico methods.	PO1,PO2,PO5
9	9920102012	Premkumar K	<i>In silico</i> identification of phytoconstituents as potential inhibitors of Covid-19 main protease	This in silico study confirmed potential of phyto-constituents namely beta-sitosterol and beta-amyrin from <i>Nigella sativa</i> against covid-19 main protease (Mpro)	PO1, PO3, PO4
10	9920102013	Darszhan B	Insilico analysis and purification of L-Asparaginase from a marine isolate <i>Staphylococcus aureus</i>	The marine strain isolated and identified was screened for L-Asparaginase with purification process was intended. The high production of L-Asparaginase compared to the other commercially available strains makes this a useful prospect for the future. Also, Other Parameters such as half life are favourable for the isolated species. This makes this project an asset to explore more in the future.	PO1, PO2
11	9920102015	Ramalakshmi G	<i>in silico</i> analysis of endoglucanase in the genome of <i>Cellulomonas flavigena</i> ATCC 53703	Putative Endoglucanase enzyme has been analysed using <i>in silico</i> tools	PO1, PO2, PO4
12	9920102016	Bhoobalan D	A survey of the impact of meditation and mental well-being	Adriamycin dysregulate the hippo pathway by binding on the ck1d/e enzyme which leads to deregulation of heart regeneration and cardiac homeostasis.	PO1,PO2,PO3, PO5

13	9920102017	Dhanapradeeba V	Elucidating the role of oligonucleotides on inflammatory bowel's disease- An in silico approach	The binding affinity of oligonucleotide against the target has been analyzed. Oligonucleotide exhibited strong binding affinity towards the target	PO1,PO2,PO4
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Table:11 List of Completed Phase I Projects (2019-2021 Batch)

S.No	Reg Number	Name of the student	Project Title	Outcome of the project	Relevance to POs
1	9919102001	Arun Robin Babu A	Mathematical modelling of biodegradation process in treatment of industrial effluent	Kinetic models were developed for bioreactors treating coke oven effluents containing phenol, cresol and cyanide pollutants using activated sludge microbes	PO1,PO2,PO4
2	9919102002	Gowtham P S	Docking and molecular interaction studies of covid-19 viral targets with sulphated polysaccharides	National Conference on Biological, Biochemical, Biomedical, Bioenergy and Environmental Biotechnology (NCBEBT-2021)	PO1,PO2,PO4
3	9919102003	Poornimaa B	Evaluation of the effect of adriamycin on sodium / potassium channels	Determination of the effect of Adriamycin / DOX on Na ⁺ / K ⁺ channel in silico and deriving a hypothetical model to elucidate the Adriamycin - induced cardiomyopathy from the perspective of impaired Na ⁺ / K ⁺ channels	PO1,PO2,PO5
4	9919102004	Sundarapandian V	Screening of bioactive compounds from <i>Semecarpus anacardium</i> : An in silico approach and molecular dynamics investigation against Alzheimer's	The binding affinity of the bioactive compounds derived from the <i>S. anacardium</i> has been identified. The conformation changes between the ligand and target has been studied.	PO1, PO2
5	9919102005	Sureba S	In silico and In vitro analysis of 4-Aminoantipyrine loaded mesoporous silica nanoparticles in breast cancer	HSP 60 may be better target for 4-Aminoantipyrine loaded Mesoporous silica nanoparticle which will be	PO1, PO2, PO4

				effective for breast cancer therapy.	
6	9919102006	Vikram V	Designing inhibitors of Polyketide synthase (pks 13) to control the pathogenesis of Mycobacterium tuberculosis.	With the help of docking and Web tools like Binding database and Zinc pharmer, we were able derive drug candidate which act as an inhibitor of the organism Mycobacterium tuberculosis thus preventing the cause of disease Tuberculosis.	PO1,PO2,PO4
7	9919102007	Divyabharathi R	Statistical experimental designs and artificial neural network model building in bioprocess engineering: Similarities and Differences	International e-conference on Frontiers in Industrial Biotechnology, Innovation in Interdisciplinary Research (VICIIDR)	PO1,PO2,PO4
8	9919102008	Jemmy Joy G	Sequence and structural relatedness of Acyl-Homoserine Lactone Acylase (PvdQ) of Pseudomonas aeruginosa with other organisms: an in silico study	This study shows that PvdQ, though investigated mainly in P. aeruginosa, is present in various other microorganisms as well. Since the active site and hydrolase domains are similar in other organisms, we might draw a conclusion that PvdQ in other organisms also possess similar functions as that of PvdQ in P. aeruginosa	PO1,PO2,PO5
9	9919102009	Clayton Fernando R	Comparative genomics of Mycobacterium tuberculosis field and vaccine strains for fishing out novel epitopes that can boost the immunogenicity of BCG vaccine	According to several studies, genes lost in BCG strains are major participants in virulence factors and modulation of host signals. In this study, we predicted the potential epitopes present in lost regions of BCG. Further validation of these CTL episodes facilitates for the development of ideal BCG vaccine.	PO1,PO2,PO5
10	9919102010	Kavitha A	Current biotechnological methods to restrict fungal	Transgenic rice plants expressing two different	PO1, PO2, PO3

			pathogen Rhizoctonia solani in rice	PR proteins and siRNAs that are specific target for fungal pathogen can be maintained in vermiculture products to reduce disease index in rice plants caused by R. solani	
11	9919102011	Aanandhalakshmi R	In-silico analysis of different alginate lyase and its substrate specificity	National Conference on Biological, Biochemical, Biomedical, Bioenergy and Environmental Biotechnology	PO1, PO2, PO5

Table:12 List of Completed Projects (2020-2022 Batch)

Register Number	Name of the Student	Title of the Project
9920102002	Bazeera Ferdhous P	Analysis of curdlan gum as drug delivery, therapeutic and immobilization agent
9920102004	Kaliraj C	Codelivery of piperine and linalool loaded hollow mesoporous silica nanoparticles induced cell death in vitro model of breast cancer
9920102005	Oviya S	Process optimization for extraction parameters and identification of bioactive compounds from <i>Boerhavia diffusa</i> using RSM and ANFIS models
9920102006	Pooja Vaisnavi M	<i>In vitro</i> analysis of phyto constituents from <i>Cannabis sativa</i> against pfdHFR
9920102007	Raja Rajeswari R	Glucose conjugated camptothecin loaded gluten nanoparticles for selectively targeting breast cancer
9920102009	Shalini M	Image based detection of cotton plant disease & formulationn of disease resistant designer seed with bio control agent to combat cotton plant disease.
9920102010	Angelin Jenit	Combined biological and photo catalytic treatment of cotton processing waste water
9920102011	Praseetha S	Construction of a multi-epitope plasmid DNA vaccine for HIV
9920102012	Premkumar K	Extraction of phytoconstituents from <i>Nigella sativa</i> and its <i>in silico</i> and <i>in vitro</i> identification
9920102013	Darszhan B	<i>In silico</i> mutagenesis of L-asparaginase from <i>Enterbacter cloacae</i> for efficient treatment of acute lymphoblastic leukemia
9920102015	Ramalakshmi G	<i>In silico</i> and fuctional analysis of endoglucanases in the genome of <i>Cellulomonas flavigena</i> ATCC 53703
9920102016	Bhoobalan D	Ilaneer Poovarasu sooranam effectively ameliorates

		adriamycin induced hepatotoxicity
9920102017	Dhanapradeeba V	Optimization and characterization of bioactive compounds from <i>Withania somnifera</i> by RSM

Table: 13 List of Completed Projects (2019-2021 Batch)

Register Number	Name of the Student	Title of the Project
9919102001	Arun Robin Babu A	<i>In Silico</i> Screening for Inhibitors of Lip132 from <i>Andrographis paniculata</i> and <i>Origanum vulgare</i> for treatment of leptospirosis
9919102002	Gowtham P S	Virtual screening of furazolidone analogues as inhibitors of siroheme synthase; A strategy to design Novel antimicrobials against <i>Salmonella gallinarum</i>
9919102003	Poornimaa B	CHK1 Kinase : The therapeutic target for hepatocellular carcinoma
9919102004	SundaraPandian V	Nucleoside analogues as ATPase inhibitors; A strategy to treat tuberculosis
9919102005	Sureba S	Structure based drug design for dengue; screening for compounds from <i>Caricapapaya</i>
9919102006	Vikram V	Virtual screening for inhibitors of squalene epoxidase as drug candidates to treat athletes' foot.
9919102007	Divyabharathi R	Urease : The therapeutic target for <i>Helicobacter pylori</i>
9919102008	Jemmy Joy G	Designing Drug Candidates for Dermatographism ; A Virtual Screening Approach
9919102009	Clayton Fernando R	Generation of 2D-QSAR and pharmacophore models for fishing better anti-leishmanial therapeutics
9919102010	Kavitha A	An <i>in silico</i> approach to design an antifungal agent against <i>Rhizoctoniasolani</i>
9919102011	Aanandhalakshmi R	Peptidomimetics as inhibitors of SPEB protease to control infections by <i>Streptococcus pyogenes</i>

6.3. Improvement in Placement, Higher Studies and Entrepreneurship(10)

Our students are placed in various reputed companies and research institutes. Following Table mentioned the students placements.

Table: 14 Placements in companies				
S. No.	Name of the student placed	Enrollment No.	Name of the Employer	Appointment letter reference no. with date
1	Nirmala Devi S	9916102002	Omics	OMINIR14052018
2	Rajeshwari C T	9916102003	AlgalRNutraPharms Pvt. Ltd. Thanjavur	ALR-23675/21.03.2018

3	Anukragah Sundar	9916102001	Omics	OMIANU14052018
4	Selva Vinothiga A	9916102004	AlgalRNutraPharms Pvt. Ltd. Thanjavur	ALR-23676/21.03.2018
5	Jaspin Celia J	9917102003	AlgalR Nutra Pharms Pvt. Ltd. Thanjavur	ALR-23889/15.2.2019
6	Jenitta Selva Manisha S	9917102001	Indian Healthcare	INDJENI10.03.2019
7	Suraj B	9917102002	Omics	OMISUR06052019
8	Radhalakshmi C	9918102001	AlgalR Nutra Pharms Pvt. Ltd. Thanjavur	ALR-23954/19.1.2020
9	Shobana A	9918102003	Visionary RCM	VISSHO25112019

6.4. Improvement in the quality of students admitted to program

The institution has taken some active initiatives to improve the quality of the students admitted to all the UG and PG programs offered by the institution including M.Tech. (Biotechnology). The institution offers Merit scholarships to students who excel in their studies. GATE qualified candidates get a fellowship of Rs.12500/- per month from AICTE. These initiatives improved the quality of the students admitted to the program.

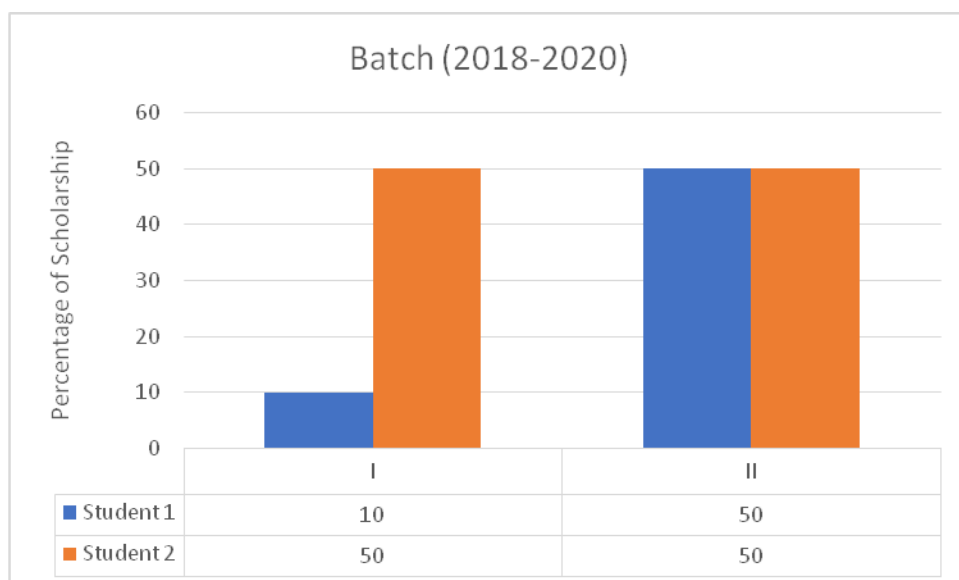
Most graduates with first-class and distinction are admitted in the M.Tech. program. Students are eligible for KARE-MERIT scholarships based on their CGPA/ percentage of marks in the UG program. Depending on their grades in the first year, the students are eligible for scholarship in the 2nd year as well.

Table:15: Scholarship details

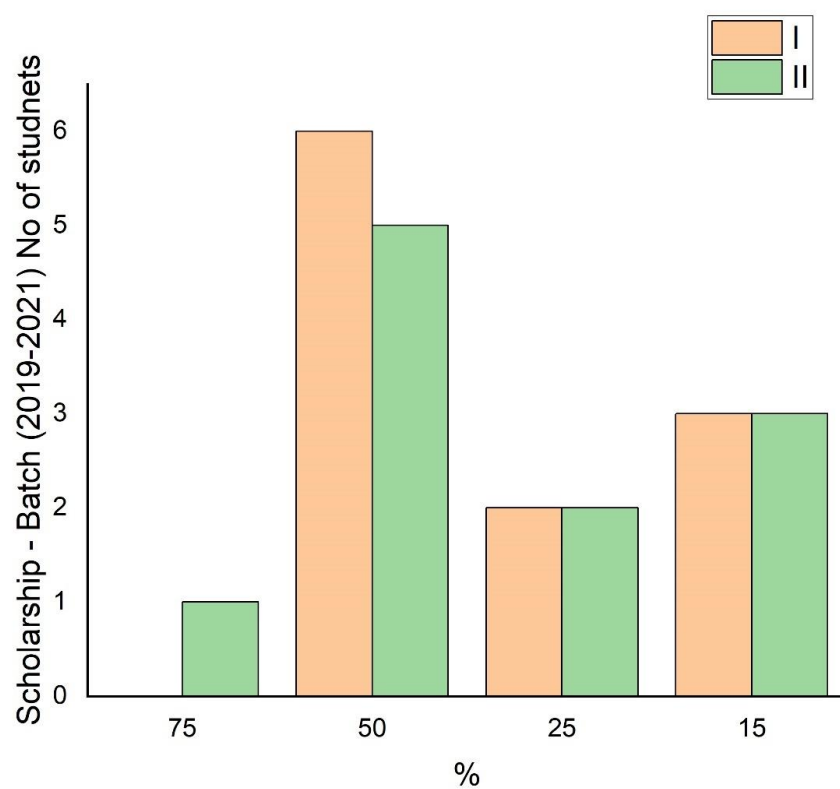
CGPA or % in UG Degree	Percentage of Scholarship eligible for 2 years
CGPA / % Above 8 or >80%	50%
7 - 7.9 or 70 - 79%	25%
6 - 6.9 or 60 - 69%	10%

KARE Scholarship details

Batch - 2018 - 2020



Batch 2019 – 2021



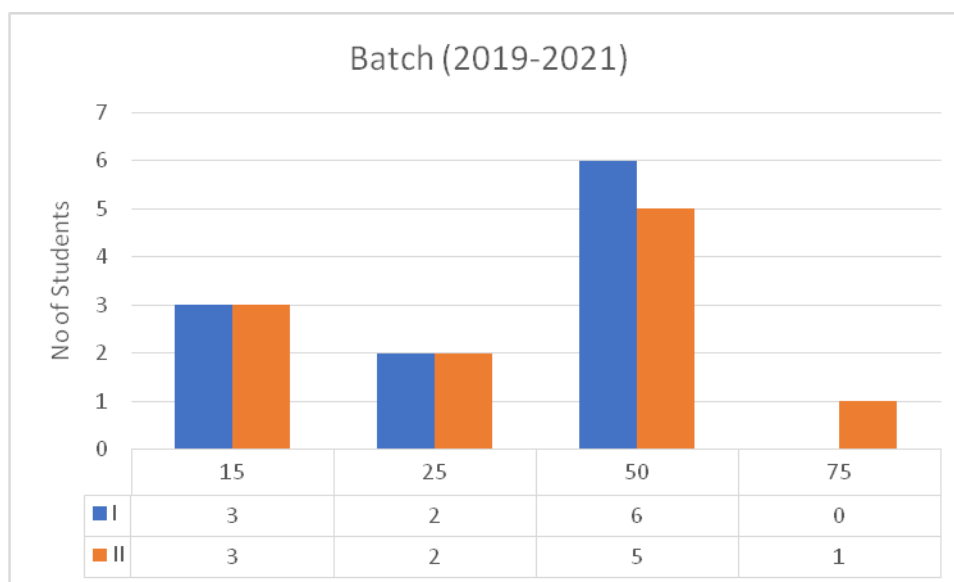
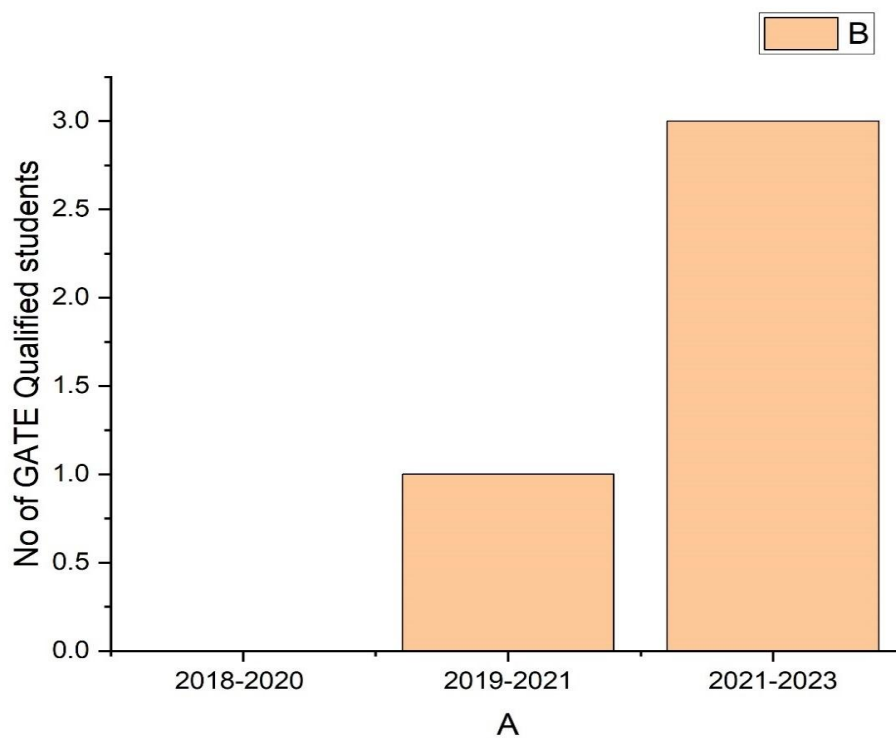


Table:16 Government of India Scholarship

S.No	Register No	Name of the Candidate	Funding Agency	Amount Received
1	9919102009	Clayton Fernando R	Merit-Cum-means scholarship for Professional and Technical Courses CS offered for Minorities, Ministry of Electronics and Information Technology, Government of India. (Register No:TN201920001621491)	Rs. 30,000/-
2	9919102010	A Kavitha	GATE 2021	KARE scholarship
3	9920102005	S Oviya	GATE 2020	Rs.12,500/- per month
4	9920102009	M Shalini	GATE 2020	Rs.12,500/- per month
5	9920102011	S Praseetha	GATE 2021	KARE Fellowship
6	9920102009	M Shalini	DBT Fellowship	Rs.32,800/- per month

- Due to the continuous improvements in the Academics and Research facilities, GATE qualified students have also joined in the academic year 2020-2022.



6.5 Improvement in quality of paper publication(10)

To impart more practical skills, a mini project was also included in the curriculum from 2018-19 onwards. This provided an opportunity for the students to improve upon the practical skills that they have learned during their laboratory courses. The students also get a chance to identify the research areas during the mini project itself and continue to work on the same or related projects during their Phase I and Phase II of major project.

These projects have provided an opportunity for the students to complete quality research projects. The students are encouraged to present their results in various conferences and they also contribute to research articles as co-authors. The presentation / publication of their research is one of the mandatory requirements for the completion of their degrees.

Publications

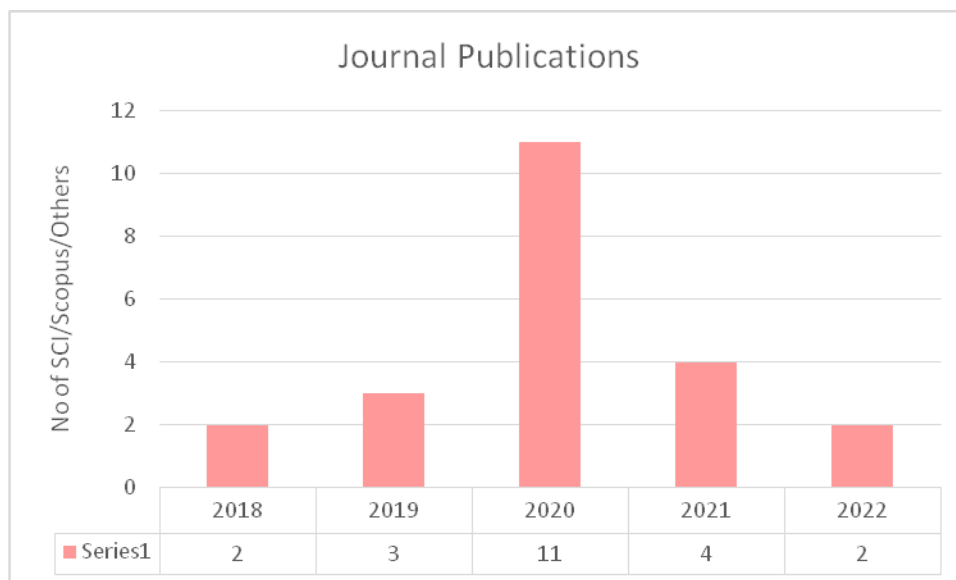


Table 17: Publication Details

2018	<ol style="list-style-type: none"> 1. Prakash, S., Rajeswari, K., Divya, P., Ferlin, M., Rajeshwari, C. T., and Vanavil, B. (2018) Optimization and production of curdlan gum using <i>Bacillus cereus</i> PR3 isolated from rhizosphere of leguminous plant. Preparative Biochemistry & Biotechnology. 48 (5), 408-418. 2. Chowdhury, Anindita, TheivendrenPanneerselvam, Suthendran Kannan, ChiranjibBhattachjee, Balasubramanian Somasundaram, Murugesan Sankaranarayanan, Suraj Baskararaj, and Selvaraj Kunjiappan. (2018) Optimization of microwave-assisted extraction of bioactive polyphenolic compounds from <i>Marsilea quadrifolia</i> L. using RSM and ANFIS modelling. Indian Journal of Natural Products and Resources (IJNPR). 9(3): 204-221.
2019	<ol style="list-style-type: none"> 1. Ramya Petchimuthu, Clayton Fernando R, Anand G, Gowtham P. S, Dhivagar K, Vanavil B. (2019) Assessment of Efficiency of Eco-Friendly Organic Mosquito Repellent Developed using Elephant Dung. International Journal of Recent Technology and Engineering. 8 (4S2), 459-462. 2. Petchimuthu, R., Clayton Fernando, R., Anand, G., Gowtham, P.S., Dhivagar, K. and Vanavil, B., (2019) Assessment of Efficiency of Eco-Friendly Organic Mosquito Repellent Developed using Elephant Dung. International Journal of Recent Technology and Engineering. 8 (4S2), 459-462.

	<p>3. Selvaraj, K., A. Sankarganesh, P. Sajan Francis, and B. Suraj. (2019) Utilization of ATR-FTIR Spectroscopy-Multivariate Chemometric Analysis in the Examine of Food Quality Edible Sesame Oils. <i>International Journal of Recent Technology and Engineering</i>. 8 no.4S2, 749-754</p>
2020	<ol style="list-style-type: none"> 1. Nadana, G.R.V., Rajesh, C., Kavitha, A., Sivakumar, P., Sridevi, G. and Palanichelvam, K. (2020). Induction of growth and defense mechanism in rice plants towards fungal pathogen by eco-friendly coelomic fluid of earthworm. <i>Environmental Technology & Innovation</i>. 19, 101011. 2. Kunjiappan, Selvaraj, TheivendrenPanneerselvam, Saravanan Govindaraj, Suthendran Kannan, Pavadai Parasuraman, Sankarganesh Arunachalam, Murugesan Sankaranarayanan, Suraj Baskararaj, PonnusamyPalanisamy, and Damodar Nayak Ammunje (2020). Optimization and analysis of ultrasound-assisted extraction of bioactive polyphenols from <i>Garcinia indica</i> using RSM and ANFIS modeling and its anticancer activity. <i>Journal of the Iranian Chemical Society</i>. 17(4): 789-801. 3. Vanavil, B., Selvaraj, K., Aanandhalakshmi, R., Sri, K.U. and Arumugam, M. (2020). Bioactive and thermostable sulphated polysaccharide from <i>Sargassum swartzii</i> with drug delivery applications. <i>International Journal of Biological Macromolecules</i>. 153: 190-200. 4. Kunjiappan, S., Sankaranarayanan, M., Kumar, B.K., Pavadai, P., Babkiewicz, E., Maszczyk, P., Glodkowska-Mrowka, E., Arunachalam, S., Pandian, S.R.K., Ravishankar, V. and Baskararaj, S. (2020) Capsaicin-loaded solid lipid nanoparticles: design, biodistribution, in silico modeling and <i>in vitro</i> cytotoxicity evaluation. <i>Nanotechnology</i> 32(9): 095101. 5. Pandian, S. R. K., Kunjiappan, S., Ravishankar, V., Sundarapandian, V. (2020) Synthesis of quercetin functionalized silver nanoparticles by rapid one-pot approach. <i>Biotechnologia</i>, 102(1): 75-84. 6. Baskararaj, Suraj, TheivendrenPanneerselvam, Saravanan Govindaraj, Sankarganesh Arunachalam, Pavadai Parasuraman, Sureshbabu Ram Kumar Pandian, Murugesan Sankaranarayanan et al. (2020) Formulation and characterization of folate receptor-targeted PEGylated liposome encapsulating bioactive compounds from <i>Kappaphycusalvarezii</i> for cancer therapy. <i>3 Biotech</i>. 10(3): 1-18. 7. Kunjiappan, Selvaraj, TheivendrenPanneerselvam, Saravanan Govindaraj, Pavadai Parasuraman, Suraj Baskararaj, Murugesan Sankaranarayanan, Sankarganesh Arunachalam, EwaBabkiewicz, Aarthi Jeyakumar, and Muthulakshmi Lakshmanan. (2019) Design, <i>in silico</i> modelling, and functionality theory of novel folate receptor targeted rutin encapsulated folic acid conjugated keratin nanoparticles for effective cancer treatment. <i>Anti-Cancer Agents in Medicinal Chemistry</i> 19(16): 1966-1982. 8. Selvaraj, K., Panneerselvam, T., Murugesan, S., Balasubramanian, S., Sarathbabu, S., Sankarganesh, A., Parasuraman, P., Vellaichamy, S.,

	<p>Indhumathy, M., and Suraj, B. (2019). Design, graph theoretical analysis and bioinformatic studies of Proanthocyanidins encapsulated ethyl cellulose nanoparticles for effective anticancer activity. <i>Biomedical Physics & Engineering Express</i>, 5(2): 025004.</p> <p>9. Kunjiappan, Selvaraj, PanneerselvamTheivendran, Suraj Baskararaj, BathrinathSankaranarayanan, PonnusamyPalanisamy, Govindaraj Saravanan, Sankarganesh Arunachalam et al. (2019) Modeling a pH-sensitive Zein-co-acrylic acid hybrid hydrogels loaded 5-fluorouracil and rutin for enhanced anticancer efficacy by oral delivery. <i>3 Biotech</i>. 9(5): 185.</p> <p>10. Baskararaj, Suraj, PanneerselvamTheivendren, PonnusamyPalanisamy, Suthendran Kannan, Parasuraman Pavadai, Sankarganesh Arunachalam, Murugesan Sankaranarayanan, Uma Priya Mohan, Lokeshkumar Ramasamy, and Selvaraj Kunjiappan. (2019) Optimization of bioactive compounds extraction assisted by microwave parameters from <i>Kappaphycusalvarezii</i> using RSM and ANFIS modeling. <i>Journal of Food Measurement and Characterization</i>. 13(4): 2773-2789.</p> <p>11. Prakash P, Aishwarya B, Poornimaa B, Shaik Asma Taj, Narendrakumar G, Antony V Samrot, Abirami S, & Jane Cypriyana P J. (2020). Purification, Characterization, Optimization and Evaluation of Bioactivity Potential of Exopolysaccharides of <i>Curvularialunata</i>. <i>International Journal of Research in Pharmaceutical Sciences</i>, 11(4), 7476-7485.</p>
2021	<p>1. Pandian, S. R. K., Kunjiappan, S., Pavadai, P., Sundarapandian, V., Vivek, C., Sundar, K., 2021. Delivery of Ursolic acid by PHB nanoparticles for cancer therapy: <i>in silico</i> and <i>in vitro</i> studies. <i>Drug Research</i>, 72(2), p.72-81.</p> <p>2. Rencilin, C. F., Rosy, J. C., Mohan, M., Coico, R., & Sundar, K 2021. Identification of SARS-CoV-2 CTL epitopes for development of a multivalent subunit vaccine for COVID-19. <i>Infection, Genetics and Evolution</i>, 104712.</p> <p>3. Pandian, S.R.K., Rencilin, C.F., Sundar, K., 2021. Emerging nanomaterials for cancer immunotherapy. <i>Exploration in Medicine</i>, 2:. 208-31.</p> <p>4. Pandian, S.R.K., Kunjiappan, S., Ravishankar, V. and Sundarapandian, V., 2021. Synthesis of quercetin-functionalized silver nanoparticles by rapid one-pot approach. <i>BioTechnologia</i>, 102(1): 75-84.</p>
2022	<p>1. Bazeera Ferdhous, P., Aanandhalakshmi, R., Ramya, P. and Vanavil, B., 2022. Scrutiny of Metal Ion Binding Sites in Different Alginate Lyases through In Silico Analysis. <i>Applied biochemistry and biotechnology</i>, 194: 124-147.</p> <p>2. Vijayalakshmi, M., Dhanapradeeba, V., Selvaraj, K., Sundar, K., Pandian, S.R.K*, 2022. Targeting TLRs with the derivatives of Mimosa pudica: An <i>in silico</i> approach. <i>Biointerface Research in Applied Chemistry</i>, (Accepted).</p>

	3. Lakshmanan Muthulakshmi, Josephine Selle Jeyanathan, Shalini Mohan , Suryasankar RP, Devaraj D and Nellaiah Hariharan., Technologies and Therapies for Disease Diagnosis and Treatment., EAI Endorsed Transactions on Innovations in Communication and Computing., Springer.
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Book Chapter

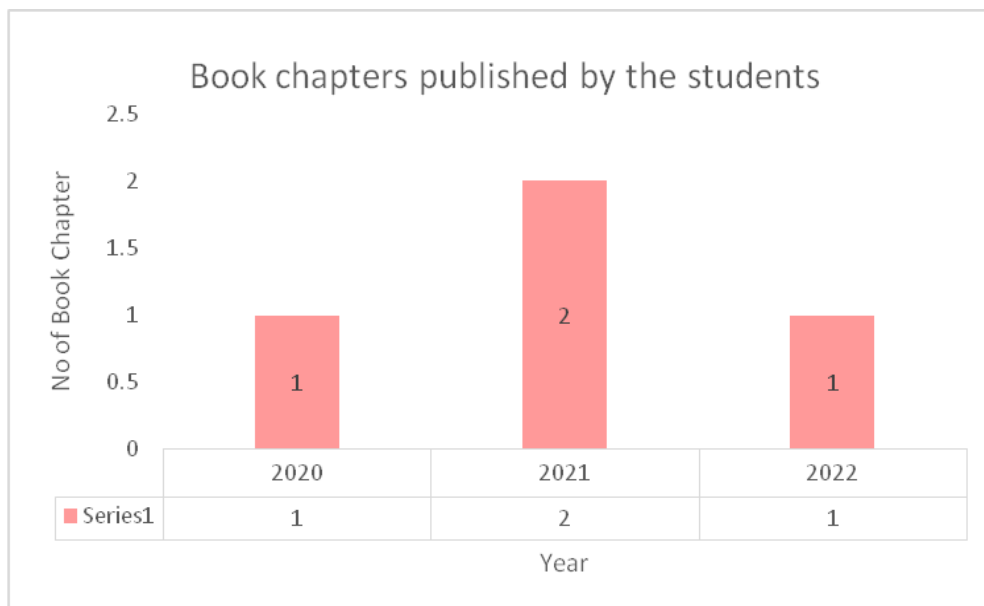


Table 18: Publication in Book chapters:

2019	1. Anukragah Sundar , Sankarganesh Arunachalam Sridhar Jayavel,L.Muthulakshmi.,(2019) Encapsulation of Amphotericin B into Quercetin based silver nanoparticles: Preparation, Characterization and preliminary investigation of antiparasitic activity., Springer Nature Springer Proceedings in Materials. ICON 2019, (1-9).
2020	2. Robin Babu, A. , and Sharma, N.K. (2020) Algae or Bacteria - Future of biological wastewater treatment, In: Handbook of Advanced Approaches Towards Pollution Prevention and Control 1 st Edition. (Accepted) ISBN: 9780128221341.
2021	1. Aanandhalakshmi, R. , Sundar, K., and Vanavil, B., 2021. Bioactive Oligosaccharides: Production, Characterization and Applications, In: Biomolecular Engineering Solutions for Renewable Specialty Chemicals-Microorganisms, Products, and Processes, Wiley. (In Press) 2. Sharma, N.K. and Arivalagan, A.R. , 2021. Algae or bacteria - the future of biological wastewater treatment. In Handbook of

	Advanced Approaches Towards Pollution Prevention and Control (pp. 217-247). Elsevier.
2022	1. Vanavil, B., Ezhilarasi, P., Aanandhalakshmi, R., Gowtham, P.S. and Sundar, K., 2022. Seaweed Bioprocessing for Production of Biofuels and Biochemicals. Zero Waste Biorefinery, pp.345-380.
2022	<p>2. Lakshmanan Muthulakshmi, ShaliniMohan., Musa Algutymi., The genus Bacillus: fungicidal activity against plant pathogens., CRC Press and Taylor & Francis., 2022 (In Press)</p> <p>3. LakshmananMuthulakshmi., Shalini Mohan.,Shanktkriti Srinivasan., Synthesis of trace elements loaded nano-fertilizers and their benefits in agriculture. CRC Press and Taylor & Francis., 2022 (Book Chapter accepted).</p> <p>4. Shalini Mohan, Mukesh Pasupulti, Ajit Behera, Lakshmanan Muthulakshmi, Nellaiah Hariharan.,“The World of Microbes and its Industrial and Medical Significance” Antiviral and Antimicrobial Smart coating, Elsevier., 2022 (In Press).</p> <p>5. Lakshmanan Muthulakshmi, Shalini Mohan, Nellaiah Hariharan, Sodium Alginate: Grafted Alginate as Suitable corrosion Inhibitors- Grafted Biopolymers as Corrosion Inhibitors: Safety, Sustainability, and Efficiency Wiley., 2022 (In press).</p> <p>6. Lakshmanan Muthulakshmi,Shalini Mohan, Rajam.R, “Recent advances in the development of PHB (Poly Beta Hydroxybutyrate) based packaging materials”- “Biopolymer-Based Films and Coatings: Trends and Challenges” CRC Press and Taylor & Francis., 2022 (In press).</p> <p>7. Lakshmanan Muthulakshmi, Velmurugan Sundarapandian, D. Nagapriyadarshini, Jamespandi Annaraj, M. T. Mathew, H. Nellaiah., “Larvicidal and Antimicrobial Activities of Green-Synthesized Ag Nanoparticles.” “Antimicrobial and Antiviral Materials”. (2022).,23-46, CRC press, 9781003143093.</p>

Conference Presentations

Students participate and present their work in national and international conferences along with their guides.

Table:19 International Conference Presentation

2018	<ol style="list-style-type: none"> 1. Rajeshwari, C.T., and Vanavil, B. Studies on Potential Applications of Curdlan Biopolymer Produced using <i>Bacillus cereus</i> PR3, <i>International Conference on Energy and Environment: Global Challenges – ICEE-2018</i>. National Institute of Technology, Calicut. 9 - 10 March 2018.
2020	<ol style="list-style-type: none"> 1. Gowtham, P.S., Anand, G., Dhivagar, K., and Vanavil, B. Comparison of Anti-Oxidant Activity of Curdlan Gum Produced with Different Carbon Sources using <i>B. cereus</i> PR3, Virtual International Conference on “Innovations in Interdisciplinary Research” (VICIIDR-2020). Kalasalingam Academy of Research and Education. 23-24, June 2020. 2. Divyabharathi, R.,Jeyaram, K. Cellulosic ethanol production from sugarcane bagasse by <i>Candida tropicalis</i> NITCSK13. Virtual International conference on “Innovations in Interdisciplinary Research” (VICIIDR-2020). Kalasalingam Academy of Research and Education. 23-24, June 2020. 3. Clayton Fernando, R., Christina Rosy, J., Mohan, M., Coico, R., Sundar, K. Identification of SARS-CoV-2 CTL epitopes for development of a multivalent subunit vaccine for COVID-19. Virtual International conference on Innovation in the interdisciplinary research 2020. Kalasalingam Academy of Research and Education. June 23-24, 2020 4. Sundarapandian, V.,Kunjiappan, S., Pandian, S. R. K. Elucidating the role of Shatavari crude extract on epilepsy <i>in vivo</i>. International e-conference on “Frontiers in Industrial Biotechnology”. Department of Biotechnology, St. Joseph’s College of Engineering, Chennai. July 27-29, 2020 5. Divyabharathi, R., Velmurugan, S., Jeyaram, K. Statistical investigation of cellulosic ethanol production from sugarcane bagasse by <i>Candida tropicalis</i> NITCSK13 using Artificial Neural Network (ANN). International e-conference on “Frontiers in Industrial Biotechnology”. Department of Biotechnology, St. Joseph’s College of Engineering, Chennai. July 27-29, 2020. 6. Prakash P, Aishwarya B, Poornimaa B, Shaik Asma Taj, Narendrakumar G, Antony V Samrot, Abirami S, & Jane Cypriyana P J. Purification, Characterization, Optimization and Evaluation of Bioactivity Potential of Exopolysaccharides of <i>Curvularialunata</i>.

	International e-Conference on bioengineering for health and Environment (ICBHE-2020). MAHSA University, Malaysia ,Sathyabama Institute of science and technology, Chennai. July 16 & 17, 2020.
2021	<ol style="list-style-type: none"> 1. P. BazeeraFerdhous, Aanandhalakshmi R, P. Ramya and B. Vanavil, Scrutiny of metal ion binding sites in alginate lyase through in silico analysis, 2nd Virtual Annual International Conference on Naturopathy, Nanotechnology, Nutraceuticals and Immunotherapy in Cancer Research, BSA Crescent Institute of Science and Technology, June 11-12, 2021
2022	<ol style="list-style-type: none"> 1. Shalini Mohan, Devaraj D, Lakshmanan Muthulakshmi Artificial Neural Network Approach for Image based disease detection of cotton plant, Second International Virtual Conference on Artificial Intelligence for Internet of Things, April 07-08, 2022. 2. M. Pooja Vaisnavi, G. Rama Lakshmi, N.Sankaragomathi , K.N. Rajnish, S. Sheik Asraf, Metagenome and culture based study of commercial cookies, International Conference on Sustainable Materials and Innovative Techniques (ICSMIT'22),March 18 & 19. 3. Karunya Sri C.M, Shakti Chandra Vadhana Marimuthu, Krishnan Sundar. Homology modeling of putative iron-transporter protein of <i>Streptococcus mutans</i> molecular docking with phytochemicals of <i>Azadirachta indica</i>, PharmaNEST'3.E International conference at JSS college of Pharmacy, Ooty. October 14-15, 2022. 4. Shruthi Shanmugasundaram, Suja Gayathri Suresh, Renuga Devi Balasubramaniam, Thimma Mohan Vishwanathan, Thandavarayan Kathiresan. Structure based virtual screening and molecular docking of Thymol and Eugenol as effective therapeutic molecules against Breast Cancer, PharmaNEST'3.E International conference at JSS college of Pharmacy, Ooty. October 14-15, 2022. 5. Siva Bharathi Velayutham, Vijayalakshmi Muniyandi, Selvaraj Kunjiappan, Krishnan Sundar, Sureshbabu Ram Kumar Pandian. Inhibitory effect of Bioactive Compounds from <i>Asparagus racemosus</i> against NF-kB: an <i>in-silico</i> approach, PharmaNEST'3.E International conference at JSS college of Pharmacy, Ooty. October 14-15, 2022. 6. Derina. J. Pearlin. Jyothi K. Insilico study of the Bromelain-Phytochemical complex inhibition of Phospholipase A2 (PLA2) to reduce inflammation, PharmaNEST'3.E International conference at JSS college of Pharmacy, Ooty. October 14-15, 2022.

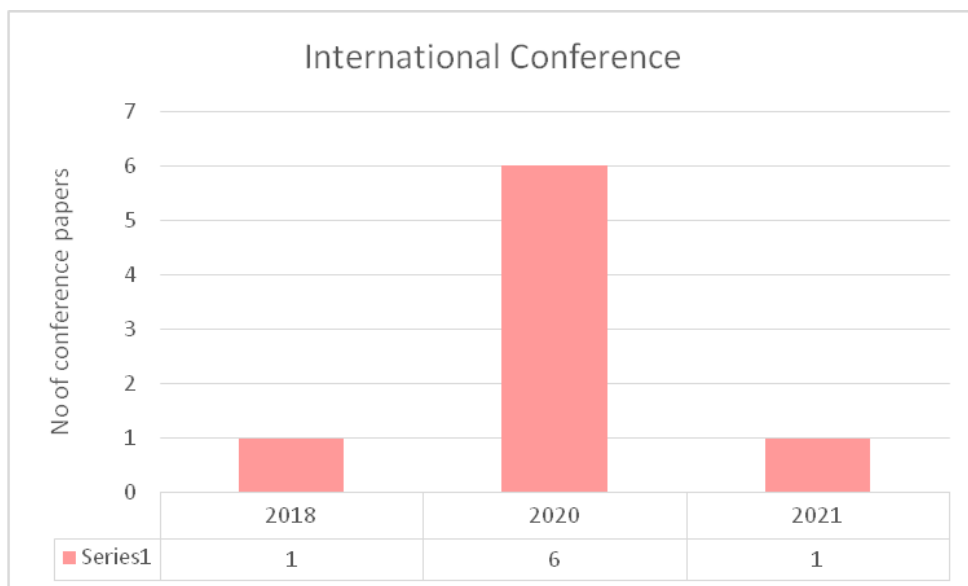
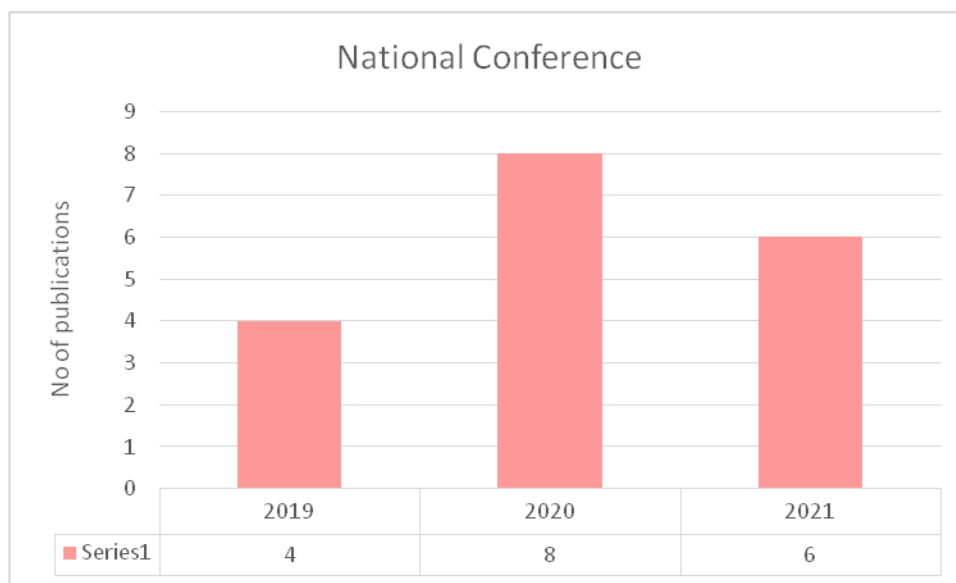


Table:20 National Conference Presentation

Year	Details
2019	<ol style="list-style-type: none"> Aanandhalakshmi, R., Usha Sri, K., Guru Dharini, I., Arumugam, M., Vanavil, B. Thermostable Therapeutic Sulphated Polysaccharide from Red Seaweed <i>Amphiroa anceps</i>, 17th National Conference of Indian Association of Applied Microbiologists (IAAM)- Microbiology in the New Millennium. Kalasalingam Academy of Research and Education. 29-30 November, 2019. Rencilin, C.F., Christina Rosy, J., Sundar, K. Generation of 2D-QSAR and pharmacophore models with MMV box compounds: A ligand-based drug designing approach for fishing anti-leishmanial therapeutics. Microbiology in New Millennium, 17th National Conference of Indian Association of Applied Microbiologists (IAAM) - Microbiology in the New Millennium. Kalasalingam Academy of Research and Education. 29-30 November, 2019. Baskararaj, Suraj, and Selvaraj Kunjiappan. Biogenic synthesis of <i>Garcinia indica</i> mediated gold nanoparticles for enhanced anticancer activity on human hepatoma cell lines. Personalised Medicine & Nutrition – An Insight, organized by Anna University, Coimbatore. February 15, 2019. RadhalakshmiChidambarakrishnan, Venkataraman Deepak. Iron Stable Fibrinolytic Protease Screening for the Treatment of Myocardial Infarction, 17th IAAM Annual Conference on Microbiology in the New Millennium. Kalasalingam Academy of Research and Education, Krishnankoil, November 29-30, 2019.

2020	<ol style="list-style-type: none"> 1. Velmurugan Sundarapandian, Selvaraj Kunjiappan, Sureshabu Ram Kumar Pandian, Role of <i>Asparagus racemosus</i> on pentazole-induced epilepsy in rodent model, Conference on Innovations in Bio & Chemical Engineering for Sustainable Life, June 8-9, 2020 2. Sundarapandian, V.,Kunjiappan, S., Pandian, S. R. K. Role of <i>Asparagus racemosus</i> on pentazole induced-epilepsy in rodent model. Virtual conference on “Innovations in Bio and Chemical Engineering for Sustainable Life”. School of Bio and Chemical Engineering, Kalasalingam Academy of Research and Education. June 8-9, 2020. 3. Divyabharathi, R.,Jeyaram, K. Isolation and characterization of thermophilic bacteria from charcoal pit. Virtual conference on “Innovations in Bio and Chemical Engineering for Sustainable Life”. School of Bio and Chemical Engineering (SBCE), Kalasalingam Academy of Research and Education. June 8-9, 2020. 4. Poornimaa.B, Sankarganesh Arunachalam, Uma Priya. A survey of the impact of meditation and mental well-being. Virtual conference on “Innovations in Bio and Chemical Engineering for Sustainable Life”. School of Bio and Chemical Engineering, Kalasalingam Academy of Research and Education. June 8-9, 2020. 5. Jemmy Joy George, Christina Rosy Joseph, and Krishnan Sundar. Designing inhibitors of PvdQ to control the pathogenesis of <i>Pseudomonas aeruginosa</i>: A pharmacophore-modelling approach. Virtual conference on “Innovations in Bio and Chemical Engineering for Sustainable Life”. The School of Bio and Chemical Engineering (SBCE), Kalasalingam Academy of Research and Education. June 8-9, 2020. 6. ShobanaAlagan, Amutha Santhanam. Synthesis of Peptin from Fruit and Vegetable Waste. Indo-UK Virtual Conference on Current Innovations and The Future of Therapeutic Developments, organized by Vellore Institute of Technology, Vellore, India and Swansea University, United Kingdom. June 1-3, 2020. 7. RadhalakshmiChidambarakrishnan, Amutha Santhanam. Development of Nano-emulsion with Curcumin for Wound Healing Applications. Virtual conference on “Innovations in Bio and Chemical Engineering for Sustainable Life”. The School of Bio and Chemical Engineering (SBCE), Kalasalingam Academy of Research and Education. June 8-9, 2020. 8. Aanandhalakshmi R, Ramya P and Vanavil B, Process optimization for alginate lyase production using <i>Enterobacter tabaci</i> RAU2C, Second National Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, May 20-21, 2021
2021	<ol style="list-style-type: none"> 1. P. BazeeraFerdhous, P.S.Gowtham, B.Vanavil, Curdlan Sulfate as a Novel Inhibitor for SARS-CoV-2 (COVID – 19): A Molecular Docking

	<p>Study using Computational Tools, 3rd International Conference on Communication and Intelligent Systems, National Institute of Technology, Delhi, December 18-19, 2021</p> <ol style="list-style-type: none"> 2. Kavitha A, Harsha Dev Mukherjee, Ganapathi Sridevi and K. Palanichelvam, Analysis of rice transcriptome data to identify plant defense pathways induced by the fungal pathogen <i>Rhizoctonia solani</i> upon infection, Second National Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, May 20-21, 2021 3. Sundara Pandian V, Selvaraj K, and Ram Kumar Pandian S, screening of bioactive compounds from <i>asparagus racemosus</i> and <i>semecarpus anacardium</i>: an in silico investigation against neural disorders, Second National Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, May 20-21, 2021 4. R Aanandhalakshmi, B Vanavil, In silico characterization of alginate lyase produced by different species, National Conference on Biological, Biochemical, Biomedical, Bioenergy, and Environmental Biotechnology, National Institute of Technology Warangal, January 29-30, 2021 5. Gowtham P.S and Vanavil B, Sulphated Oligosaccharides as An Alternative Drug for Covid-19 – an In Silico Analysis, Second National Conference on Innovations in Bio and Chemical Engineering for Sustainable Life, May 20-21, 2021 6. P.S Gowtham, B Vanavil, Docking and molecular interaction studies of Covid-19 viral targets with sulphated polysaccharides, National Conference on Biological, Biochemical, Biomedical, Bioenergy, and Environmental Biotechnology, National Institute of Technology Warangal, January 29-30, 2021
2022	<ol style="list-style-type: none"> 1. Shalini M, Lakshmanan Muthulakshmi, Devaraj D, Image based detection of cotton plant diseases and formulation of disease resistant designer seed with biocontrol agent to combat cotton plant disease, National Conference on Innovations in Biotechnology for Sustainable Life, April 23, 2022. 2. M.Pooja Vaisnavi, Dr.N. Hariram, <i>In vitro</i> Analysis of Phyto-Constituents from <i>Cannabis sativa</i> Against p_fDHFR, National Conference on Innovations in Biotechnology for Sustainable Life, April 23, 2022 3. Kaliraj Chandran, Thandavarayan Kathiresan, Codelivery of piperine and linalool loaded hollow mesoporous silica nanoparticles induced cell death in breast cancer through <i>in silico</i> and <i>in vitro</i> approach, National Conference on Innovations in Biotechnology for Sustainable Life (April 23, 2022). 4. Bhoobalan D, Sankarganesh Arunachalam, Ilaneer poovarasu sooranam effectively ameliorates adriamycin-induced hepatotoxicity in vivo, National Conference on Innovations in Biotechnology for Sustainable Life (April 23, 2022).



6.6 Improvement in laboratories (10)

To cater to the need of PG students and to offer a quality laboratory experience, the department is provided with adequate budget for acquiring new equipment, maintenance of equipment and for consumables. Steps have been taken to replace the older equipment. Students also get an opportunity to use the equipment present in research laboratories as well. In addition to the equipment that is available in the department, the International Research Center houses a Central State-of-the-art Equipment Facility that includes Scanning Electron Microscope, EDAX, FTIR and Atomic Absorption Spectrophotometer.

Table 21: Available Equipment Details

Sl. No	Name of the Equipment	Make	Date of Purchase	PO Attainment
1.	UV-VIS Spectrophotometer	Thermoscientific Evolution 201	16.08.2018	PO1, PO4, PO5
2.	ELISA reader	Bio-Rad	06.02.2019	PO1, PO4, PO5
3.	Thermocycler for Real-time PCR analysis	Roche	30.03.2017	PO1, PO4, PO5
4.	Fourmicroscopes	MicrovisN-10D	21.08.2017	PO1, PO2, PO3, PO4, PO5

5.	Microscope with Imaging facility	Microvis N-10D / Imaging (Model 1: N-117M)	21.08.2017	PO4, PO5
6.	Bench-top refrigerated centrifuge	Remi	10.10.2017	PO1,PO2, PO3, PO4, PO5
7.	Bench top-refrigerated centrifuge	ThermoScientific	16.08.2018	PO1,PO2, PO3, PO4, PO5
8.	Incubator with shakers	Labtech LTOSI	23.01.2018	PO1,PO2, PO3, PO4, PO5
9.	Visible spectrophotometers	Labman Vertex Enterprises	13.04.2018	PO1,PO2, PO3, PO4, PO5
10.	Hot air ovens	Technico Hos-3	08.02.2018	PO1,PO2, PO3, PO4, PO5
11.	Autoclaves	Technico Model 3563	28.02.2018	PO1,PO2, PO3, PO4, PO5
12.	Water baths	Technico Model No 3561	29.07.2019	PO1,PO2, PO3, PO4, PO5
13.	Soxhlet apparatus	Borosil	22.02.2018	PO1, PO4, PO5
14.	BOD Incubator	Remi CI-6S	14.02.2019	PO4, PO5
15.	Laminar Air Flow	PU Coating Vertical Model	25.10.2017	PO1,PO2, PO3, PO4, PO5
16.	Weighing Balance	Shimadzu ELB300 cap	14.02.2018	PO1,PO2, PO3, PO4, PO5
17.	Water Distillation Unit	Borosil	23.02.2022	PO1,PO2, PO3, PO4, PO5
18.	Microtome	Model No 820 (Spenser type)	16.02.2021	PO4, PO5
19.	Weighing Balance	Wensar PGP200	16.02.2021	PO1,PO2, PO3, PO4, PO5
20.	Serological Water bath	Technico	16.02.2021	PO1,PO2, PO3, PO4, PO5

21.	Magnetic stirrer with hot plate	Remi (2 No's)	16.02.2021	PO1,PO2, PO3, PO4, PO5
22.	Ceramic Coated Hot Plate	Tarson	16.02.2021	PO1,PO2, PO3, PO4, PO5
23.	Inverted Fluorescence Microscope	LabomedTCM400	20.05.2019	PO4, PO5
24.	-70°C Deep Freezer	REMI/ULT 185	27.02.2019	PO4, PO5
25.	Thermal Cycler	Hi Media WEE Series	14.02.2019	PO4, PO5
26.	HPLC (dual pumb)	Shimadzu	15.03.2011	PO4, PO5

In addition to the equipment that is available in the department, the International Research Center in our campus houses the following equipment:

Table:22 Equipment available in International Research center.

Sl.No	Name of the Equipment	Make	Date of Purchase	PO Attainment
1.	Scanning Electron Microscope and EDAX	Carl Zeiss EVO18	25.04.2014	PO4, PO5
2.	X- ray diffractometer	Bruker D8 Advance ECO	05.05.2014	PO4, PO5
3.	Fourier Transform Infrared Spectrophotometer	Shimadzu IR Tracer 100	25.04.2014	PO4, PO5
4.	Atomic Absorption Spectrophotometer	Shimadzu AA 700	26.04.2014	PO4, PO5
5.	Flash Chromatography	Agla CHEETAH TM-MT100	16.1.2017	PO4, PO5
6.	Energy Dispersive X-ray Spectrometer	AMETEK-EDAX PV6500/00V	27.12.2017	PO4, PO5
7.	UV Visible Spectrophotometer	Shimadzu UV1800	23.03.2018	PO4, PO5

Adequate and well-equipped laboratories in the area of Program specialization (30)

- The department laboratories are equipped with high quality equipment and are regularly calibrated and maintained. The equipment are calibrated during the every semester break.
- Laboratory maintenance is scheduled every week during the weekends (especially on Saturdays).

- Each of the laboratories are cleaned and fumigated during every semester break. In case of frequent contamination, unscheduled fumigation is performed using standard procedures.
- Each of the laboratory is assigned with a faculty member as lab-in-charge and a technician.
- The technicians are given hands-on training prior to assigning the laboratories and are encouraged to learn new techniques.
- During the practical session instructions are given by the course faculty and students are assisted by the technicians.
- The students are encouraged to do additional experiments after working hours. During the extra-hour permission is given to the students and are accompanied by faculty/technician. This system is very much useful for the final year students who undergo capstone project.
- Central instruments facility has all the equipment with air-conditioning facility. It is maintained in such a way that the students can avail all the facilities under one roof.
- The number of available instruments/equipment are periodically reviewed against the requirements and accordingly new additional instrument/equipment are purchased to match the number of students. For example, centrifuges, microscopes and incubators are added to the facility frequently.

Table :23 Equipment available in department

Sr. No.	Name of the Laboratory	Specialized Equipment Name	Equipment Details	Date of Purchase	Utilization details from the perspective of PO attainment
1	Central Instruments Facility	Cooling Centrifuge	Remi C24 Plus	10.10.2017	PO1, PO4, PO5
2	Central Instruments Facility	Cooling Microcentrifuge	Remi	09.11.2017	PO1, PO4, PO5
3	Central Instruments Facility	Visible spectrophotometer	Labman Vertex Enterprises	24.02.2018	PO1, PO4, PO5
4	Central Instruments Facility	Orbital Shaking Incubator	Labtech LTOSI	23.01.2018	PO1, PO4, PO5

5	Central Instruments Facility	Heating Mantles	Rivotex/HM/596	26.02.2018	PO1, PO4, PO5
6	Central Instruments Facility	Heating Mantles (250 ml)	Rivotex	23.01.2018	PO1, PO4, PO5
7	Central Instruments Facility	Heating Mantles (1000 ml)	Rivotex	23.01.2018	PO1, PO4, PO5
8	Central Instruments Facility	Mini Rotary Shaker	Remi	23.10.2017	PO1, PO4, PO5

Research facilities / center of excellence

- There are six research laboratories in the department of biotechnology. Faculty members experienced in various research domains are in-charge of each of these laboratories.
- Each of these laboratories are funded by the government through various research grants, at least in part.
- Post-graduate students are attached to faculty in the first year itself and do their mini projects under the supervision of respective faculty.
- Students do their final year projects also under the same guide in the same laboratory.
- Students have free access to instruments in each of the research laboratories.
- In addition to their host laboratories students are permitted to avail the facility in non-host laboratories.
- Senior research scholars in the research laboratories help the post-graduate students in using the instruments.

Table: 24 Facilities in funded research laboratory

Sr.No.	Name of the Facility	Specialized Equipment Name	Equipment details	Date of Purchase	Utilization details from the perspective of PO Attainment
1.	Molecular Immunology Research Lab	Fluorescence microscope	Axioscope, Carl Zeiss,	23.10.2012	PO1, PO4, PO5
2.	Molecular Immunology Research Lab	Binocular microscope	Carl-Zeiss	10.05.2015	PO1, PO5

3.	Molecular Immunology Research Lab	Thermal cycler	Bio-Rad	10.03.2014	PO1, PO5
4.	Molecular Immunology Research Lab	Inverted Microscope	Carl-Zeiss		
5.	Plant Molecular Biology Lab	Poly House	SS Agencies	20.04.2018	PO1, PO5
6.	Plant Molecular Biology Lab	pH Meter	Systronics	04.12.2017	PO1, PO4, PO5
7.	Plant Molecular Biology Lab	Weighing Balance	Wensar	04.12.2017	PO1, PO4, PO5
8.	Plant Molecular Biology Lab	Magnetic Stirrer	Glasco	04.12.2017	PO1, PO4, PO5
9.	Plant Molecular Biology Lab	Gel apparatus and Power Pack	Orange	04.12.2017	PO1, PO5
10.	Plant Molecular Biology Lab	Vortex Mixer	Remi	04.12.2017	PO1, PO4, PO5
11.	Plant Molecular Biology Lab	Gel Rocker	Tarson	04.12.2017	PO1, PO4, PO5
12.	Plant Molecular Biology Lab	Vacuum pump	Tarson	04.12.2017	PO1, PO4, PO5
13.	Center for Cardiovascular and Adverse Drug Reactions	Real-Time PCR	Light Cycler Nano	06.05.2014	PO1, PO5
14.	Center for Cardiovascular and Adverse Drug Reactions	pH Meter	MK IV	08.02.2017	PO1, PO4, PO5
15.	Center for Cardiovascular and Adverse Drug Reactions	Magnetic Stirrer	REMI 1MLH	23.01.2017	PO1, PO4, PO5
16.	Center for Cardiovascular and Adverse Drug Reactions	Electronic Balance	Wensar PGB200	08.02.2018	PO1, PO4, PO5
17.	Center for Cardiovascular and Adverse Drug Reactions	Gel Electrophoresis Unit	Hi-Media	08.02.2018	PO1, PO5
18.	Center for Cardiovascular and Adverse Drug Reactions	Mini Centrifuge	REMI	08.02.2018	PO1, PO4, PO5
19.	Center for Cardiovascular and Adverse Drug Reactions	Vortex Mixture	REMI	23.01.2017	PO1, PO4, PO5
20.	Center for Cardiovascular and Adverse Drug Reactions	Western Blot	Bio-Rad	10.10.2018	PO1, PO5
21.	Center for Cardiovascular and	Deep Freezer	REMI	27.06.2019	PO1, PO4, PO5

	Adverse Drug Reactions				
22.	Center for Cardiovascular and Adverse Drug Reactions	Cooling Incubator	REMI	06.02.2019	PO1, PO4, PO5
23.	Center for Cardiovascular and Adverse Drug Reactions	ELISA Reader	EIA QUANT	06.02.2019	PO1, PO5
24.	Center for Cardiovascular and Adverse Drug Reactions	High Speed Cooling Centrifuge	REMI C24 Plus	06.02.2019	PO1, PO4, PO5
25.	Center for Cardiovascular and Adverse Drug Reactions	Gradient PCR	Hi-Media	06.02.2019	PO1, PO5
26.	Center for Cardiovascular and Adverse Drug Reactions	Laminar Air Flow	Clean Air	06.02.2019	PO1, PO4, PO5
27.	Center for Cardiovascular and Adverse Drug Reactions	Inverted Microscope with Fluorescent Attachment	Labomed	20.05.2019	PO1, PO4, PO5
28.	Center for Cardiovascular and Adverse Drug Reactions	UV-Trans illuminator	Yercaud Biotech	19.07.2019	PO1, PO5
29.	Center for Cardiovascular and Adverse Drug Reactions	CO ₂ Incubator	BEING/BPN-50CH	20.11.2019	PO1, PO5
30.	Center for Cardiovascular and Adverse Drug Reactions	Biosafety cabinet	Clean Air	09.12.2019	PO1, PO4, PO5