

# **SELF ASSESSMENT REPORT (SAR)**

**FOR ACCREDITATION OF  
UNDERGRADUATE ENGINEERING PROGRAMS  
(TIER-I)**

**Submitted to**



**NATIONAL BOARD OF ACCREDITATION  
New Delhi**



**COMPUTER SCIENCE AND ENGINEERING**

**KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION**

**Anandnagar, Krishnankoil - 626 126**

**August 2022**

## **SAR Contents**

<b>Criteria No.</b>	<b>Criteria</b>	<b>Mark/Weightage</b>
<b>Program Level Criteria</b>		
1.	Vision, Mission and Program Educational Objectives	50
2.	Program Curriculum and Teaching -Learning Processes	100
3.	Course Outcomes and Program Outcomes	175
4.	Students' Performance	100
5.	Faculty Information and Contributions	200
6.	Facilities and Technical Support	80
7.	Continuous Improvement	75
<b>Institute Level Criteria</b>		
8.	First Year Academics	50
9.	Student Support Systems	50
10.	Governance, Institutional Support and Financial Resources	120
	<b>Total</b>	<b>1000</b>

## PART B: Criteria Summary

Criteria No.	Criteria	Total Marks	Institute Marks
1	VISION, MISSION AND PROGRAM EDUCATIONAL OBJECTIVES	50	50.00
2	PROGRAM CURRICULUM AND TEACHING - LEARNING PROCESSES	100	100.00
3	COURSE OUTCOMES AND PROGRAM OUTCOMES	175	175.00
4	STUDENTS' PERFORMANCE	100	87.80
5	FACULTY INFORMATION AND CONTRIBUTIONS	200	196.32
6	FACILITIES AND TECHNICAL SUPPORT	80	80.00
7	CONTINUOUS IMPROVEMENT	75	75.00
8	FIRST YEAR ACADEMICS	50	46.86
9	STUDENT SUPPORT SYSTEMS	50	50.00
10	GOVERNANCE, INSTITUTIONAL SUPPORT AND FINANCIAL RESOURCES	120	120.00
	<b>Total</b>	<b>1000</b>	<b>981</b>

# 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 Other Academic Institutions of the Trust/Society/Company etc., if any

Name of Institutions	Year of Establishment	Programs of Study	Location

## 7 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)	2018	2021	Yes	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)	--	--	0	4
B.Tech. Automobile Engineering	UG	2011	2011	60	Yes	30	Not accredited (specify visit dates, year)	--	--	0	4
<b>Sanctioned Intake for Last Five Years for the B.Tech. Automobile Engineering</b>											
<b>Academic Year</b>				<b>Sanctioned Intake</b>							
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)	--	--	0	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
<b>Sanctioned Intake for Last Five Years for the B.Tech. Biomedical Engineering</b>											
<b>Academic Year</b>				<b>Sanctioned Intake</b>							
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)	--	--	0	4
<b>Sanctioned Intake for Last Five Years for the B.Tech. Chemical Engineering</b>											
<b>Academic Year</b>				<b>Sanctioned Intake</b>							
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	--	--	No	4
B.Tech. Mechanical Engineering	UG	2007	2007	180	Yes	120	Granted accreditation for 5 years for the period (specify period)	2017	2023	0	4
<b>Sanctioned Intake for Last Five Years for the B.Tech. Mechanical Engineering</b>											
<b>Academic Year</b>				<b>Sanctioned Intake</b>							
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	--	--	0	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
										0	2
M.Tech. Industrial Safety & Engineering	PG	2011	2011	12	No	12	Applying first time	--	--	0	2
M.Tech. Manufacturing Engineering	PG	2014	2014	12	No	12	Not accredited (specify visit dates, year)	--	--	0	2
M.Tech. Renewable Energy Technologies	PG	2015	2015	12	No	12	Not accredited (specify visit dates, year)	--	--	0	2
M.Tech. Civil Structural Engineering	PG	2015	2015	12	No	12	Applying first time	--	--	0	2
M.Tech. VLSI Design	PG	2007	2007	12	No	12	Eligible but not applied	--	--	0	2
M.Tech. Automotive Systems Engineering	PG	2009	2009	12	No	12	Not accredited (specify visit dates, year)	--	--	0	2
MCA. Computer Applications	PG	2007	2007	30	No	30	Not accredited (specify visit dates, year)	--	--	0	2
MBA. Business Administration	PG	2007	2007	120	No	120	Not accredited (specify visit dates, year)	--	--	0	2
MBA. Insurance and Risk Management	PG	2007	2007	18	No	18	Not accredited (specify visit dates, year)	--	--	0	2
B.Tech. Civil Engineering	UG	2007	2007	60	Yes	60	Granted accreditation for 3 years for the period (specify period)	2018	2021	No	4
<b>Sanctioned Intake for Last Five Years for the B.Tech. Civil Engineering</b>											
<b>Academic Year</b>				<b>Sanctioned Intake</b>							
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)	2018	2021	0	4
B.Tech. Electronics and Communication Engineering	UG	2007	2007	300	Yes	240	Granted accreditation for 3 years for the period (specify period)	2018	2021	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
<b>Sanctioned Intake for Last Five Years for the B.Tech. Electronics and Communication Engineering</b>											
<b>Academic Year</b>				<b>Sanctioned Intake</b>							
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	0	4
B.Tech. Information Technology	UG	2007	2007	300	Yes	60	Applying first time	--	--	0	4

**8 Programs to be considered for Accreditation vide this application:**

S No	Level	Discipline	Program
1	Under Graduate	Engineering & Technology	Biotechnology
2	Under Graduate	Engineering & Technology	Computer Science & Engg.
3	Under Graduate	Engineering & Technology	Electronics & Communication Engg.

**9 Total number of employees**



**A. Regular\* Employees (Faculty and Staff):**

Items	2021-22		2020-21		2019-20	
	MIN	MAX	MIN	MAX	MIN	MAX
Faculty in Engineering (Male)	228	232	292	309	254	265
Faculty in Engineering (Female)	89	92	96	100	80	87
Faculty in Maths, Science & Humanities teaching in engineering program (Male)	49	55	41	45	40	42
Faculty in Maths, Science & Humanities teaching in engineering program (Female)	29	30	14	17	20	21
Non-teaching staff (Male)	442	461	457	476	501	518
Non-teaching staff (Female)	167	174	172	179	209	223

**B. Contractual\* Employees (Faculty and Staff):**

Items	2021-22		2020-21		2019-20	
	MIN	MAX	MIN	MAX	MIN	MAX
Faculty in Engineering (Male)	0	0	0	0	0	0
Faculty in Engineering (Female)	0	0	0	0	0	0
Faculty in Maths, Science & Humanities teaching in engineering Programs (Male)	0	0	0	0	0	0
Faculty in Maths, Science & Humanities teaching in engineering Programs (Female)	0	0	0	0	0	0
Non-teaching staff (Male)	0	0	0	0	0	0
Non-teaching staff (Female)	0	0	0	0	0	0

**10 Total number of Engineering students:**

<b>Engineering and Technology- UG</b>	<input checked="" type="checkbox"/> Shift1	<input type="checkbox"/> Shift2
<b>Engineering and Technology- PG</b>	<input checked="" type="checkbox"/> Shift1	<input type="checkbox"/> Shift2
<b>Engineering and Technology- Polytechnic</b>	<input type="checkbox"/> Shift1	<input type="checkbox"/> Shift2
<b>MBA</b>	<input type="checkbox"/> Shift1	<input type="checkbox"/> Shift2
<b>MCA</b>	<input type="checkbox"/> Shift1	<input type="checkbox"/> Shift2

**Engineering and Technology- UG Shift-1**

Course Name	2021-22	2020-21	2019-20
Total no. of Boys	3529	2535	1690
Total no. of Girls	1226	2677	2531
<b>Total</b>	<b>4755</b>	<b>5212</b>	<b>4221</b>

**Engineering and Technology- PG Shift-1**

Course Name	2021-22	2020-21	2019-20
Total no. of Boys	57	124	27
Total no. of Girls	24	132	36
<b>Total</b>	<b>81</b>	<b>256</b>	<b>63</b>

**11 Vision of the Institution:**

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

**12 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.

**13 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**

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<b>CRITERIA 1</b>	
<b>VISION, MISSION AND PROGRAM EDUCATIONAL OBJECTIVES</b>	<b>50</b>

## **1 VISION, MISSION AND PROGRAM EDUCATIONAL OBJECTIVES (50)**

### **1.1 State the Vision and Mission of the Department and Institute (5)**

<b>Vision of the institute</b>	To be a University of Excellence of International Repute in Education and Research.
<b>Mission of the institute</b>	<ol style="list-style-type: none"> <li>1. To provide a scholarly teaching-learning ambience which results in creating graduates equipped with skills and acumen to solve real-life problems.</li> <li>2. To promote research and create knowledge for human welfare, rural and societal development.</li> <li>3. To nurture entrepreneurial ambition, industrial and societal connect by creating an environment through which innovators and leaders emerge.</li> </ol>
<b>Vision of the Department</b>	To be a Department of Excellence for Quality Education and Research in various fields of Computer Science and Engineering.
<b>Mission of the Department</b>	<ol style="list-style-type: none"> <li>1. Strive to build and maintain an academic atmosphere conducive to the highest levels of research and instruction by promoting high-quality teaching and scholarly activity.</li> <li>2. To equip students with knowledge and skills in both the fundamental and applied aspects of computer science, which are necessary to solve real-world engineering challenges to meet industry and societal needs.</li> <li>3. To prepare students to attain creative endeavors and entrepreneurship skills with proper ethical values and a desire to pursue life-long learning.</li> </ol>

**1.2 State the Program Educational Objectives (PEOs) (5)**

PEO No.	Program Educational Objectives Statements
<b>PEO1</b>	<b>TECHNICAL PROFICIENCY:</b> The graduates will demonstrate technical proficiency in Computer Science and Engineering during employment or higher studies
<b>PEO2</b>	<b>PROFESSIONAL GROWTH:</b> The graduates will imbibe problem solving skills through continuous learning and innovative mindset to provide sustainable solutions
<b>PEO3</b>	<b>MANAGEMENT SKILLS:</b> The graduates will operate in a diverse environment as a professional or an entrepreneur to solve societal problems with professional ethics

**1.3 Indicate where the Vision, Mission and PEOs are published and disseminated among stakeholders (15)****Indicate where the Vision, Mission and PEOs are published and disseminated among stakeholders**

The Vision, Mission and PEOs of the B. Tech., Computer Science and Engineering program of the Department of Science and Engineering are published in various venues inside the campus of Kalasalingam Academy of Research and Education in the Department of Computer Science and Engineering such as

1. HoD's cabin
2. Faculty cabins
3. Laboratories
4. Classrooms
5. Meeting rooms

The Vision, Mission and PEOs of the B. Tech., Computer Science and Engineering program of the Department of Science and Engineering are also disseminated through

1. Course Information sheet
2. Laboratory Manuals
3. Department Magazine

4. University Website
5. Event Brochures
6. Board of Studies meeting

The Internal Stakeholders are

1. Faculty Members
2. Student Representatives and
3. Representatives from the Management

The External Stakeholders are

1. Industry Experts
2. BoS experts
3. Alumni
4. Recruiters
5. Parents

Dissemination of Vision, Mission and PEOs among the stakeholders is carried out as given in the Table.1.3.1. as shown below.

**Table. 1.3.1. Dissemination of Vision, Mission and PEOs among the stakeholders**

Name of the stakeholder	Category of the stakeholder	Means of Dissemination
Faculty member	Internal	<ul style="list-style-type: none"> <li>• HoD's cabin</li> <li>• Faculty cabins</li> <li>• Classrooms</li> <li>• Laboratories</li> <li>• Course Information sheet</li> <li>• Laboratory manuals</li> <li>• University Website</li> <li>• Department Magazine</li> <li>• Event Brochures</li> <li>• Board of Studies meeting</li> </ul>
Student Representative	Internal	<ul style="list-style-type: none"> <li>• HoD's cabin</li> <li>• Faculty cabins</li> <li>• Classrooms</li> <li>• Laboratories</li> <li>• Course Information sheet</li> </ul>

		<ul style="list-style-type: none"> <li>• Laboratory manuals</li> <li>• University Website</li> <li>• Department Magazine</li> </ul>
Management Representative	Internal	<ul style="list-style-type: none"> <li>• University Website</li> <li>• HoD's cabin</li> <li>• Faculty cabins</li> <li>• Classrooms</li> <li>• Laboratories</li> </ul>
Industry experts	External	<ul style="list-style-type: none"> <li>• University Website</li> <li>• Board of Studies meeting</li> </ul>
BoS experts	External	<ul style="list-style-type: none"> <li>• University Website</li> <li>• Board of Studies meeting</li> </ul>
Alumni	External	<ul style="list-style-type: none"> <li>• University Website</li> </ul>
Recruiters	External	<ul style="list-style-type: none"> <li>• University Website</li> </ul>
Parents	External	<ul style="list-style-type: none"> <li>• University Website</li> <li>• Parent-Teacher meeting</li> </ul>

The significance of stakeholders in various processes is depicted in Table. 1.3.2.

**Table 1.3.2 Significance of the stakeholders**

Name of the stakeholder	Category of the stakeholder	Significance of the stakeholder
Faculty member	Internal	<ul style="list-style-type: none"> <li>• Involves in curriculum development and establishing and assessing the attainment of POs, PEOs, PSOs and COs, PSOs</li> <li>• Is accountable for the program's quality delivery and continuous improvement</li> </ul>

Students & Representatives	Internal	<ul style="list-style-type: none"> <li>• Exist as the primary stakeholder</li> <li>• Their knowledge acquisition demonstrates the program's success</li> <li>• Their placement record and moving for higher studies also demonstrates the program's success</li> <li>• Their feedback aids in the improvement of the program</li> </ul>
Management Representative	Internal	<ul style="list-style-type: none"> <li>• Involves in setting goals and objectives to achieve the mission and vision</li> </ul>
Industry experts and recruiters	External	<ul style="list-style-type: none"> <li>• They act as the subject matter experts while designing BTech CSE curriculum</li> <li>• They offer training programs to students and provide students with placements.</li> <li>• Their feedback bridges the gap between industry expectations and institutional curriculum</li> </ul>
BoS experts	External	<ul style="list-style-type: none"> <li>• Plays the key role on all aspects of education, teaching, learning, and research, including curricula and examinations.</li> </ul>
Alumni	External	<ul style="list-style-type: none"> <li>• Aids in the development and expansion of the university's brand through word-of-mouth marketing</li> <li>• Provides students with mentoring, internships, and career opportunities</li> </ul>
Parents	External	<ul style="list-style-type: none"> <li>• Primary authority in allowing their wards to participate in the program</li> <li>• Have desires of good and quality education for their wards</li> <li>• Aspire for a decent job for their wards</li> </ul>

The Vision, Mission and PEOs of the B.Tech., Computer Science and Engineering program of the Department of Science and Engineering are also disseminated through



1. Course Information Sheet
2. Laboratory Manuals
3. Department magazine
4. University website
5. Event Brochures

A few evidences of the dissemination of the vision, mission and PEO statements are presented as the images below.



**Fig 1.3.1 Dissemination in HoDs cabin**



**Fig 1.3.2 Dissemination in Classrooms**



**Fig. 1.3.3 Dissemination in meeting rooms**

The dissemination of the Vision, Mission and PEO statements help the various stakeholders to realize their responsibilities and to give their support towards achieving the vision of Computer Science and Engineering. The extent of dissemination of the Vision, Mission and PEOs of the B.Tech Computer Science and Engineering program and M.Tech Computer Science and Engineering program of the Department of Science and Engineering are evaluated using feedback forms. Figure 1.3.1 depicts the level of stakeholder’s awareness on the vision and mission.



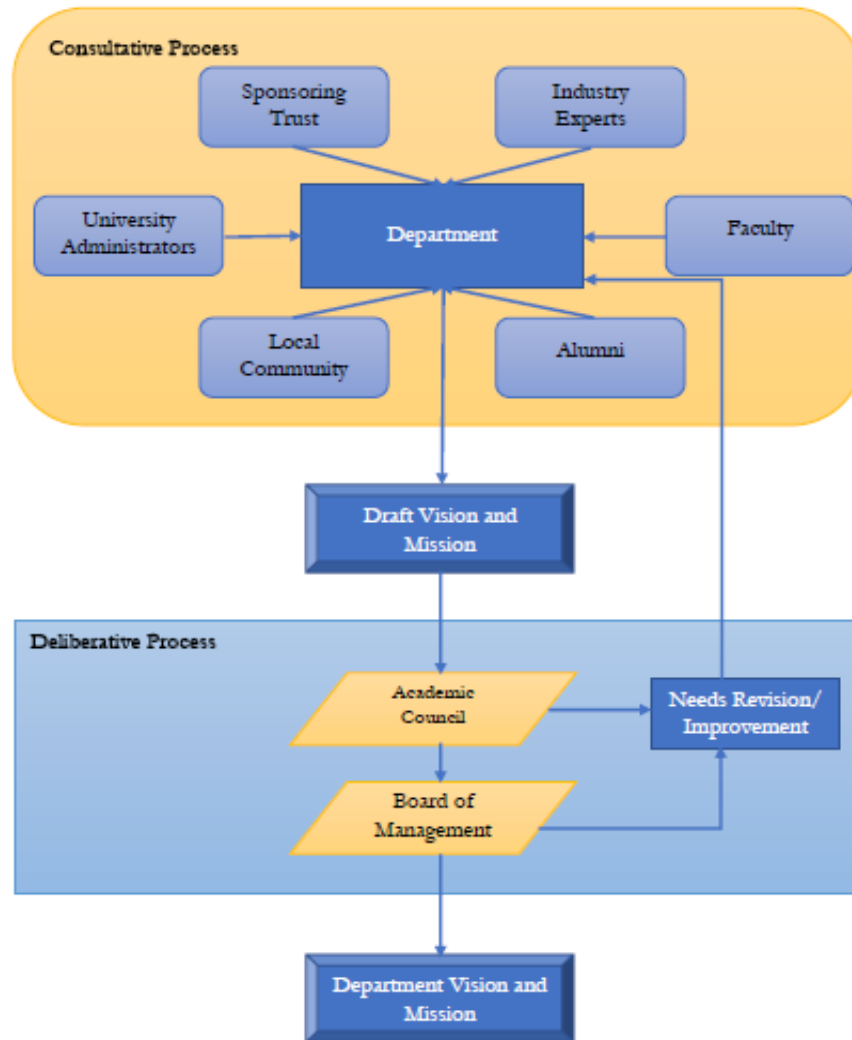
**Fig. 1.3.1 Stakeholder’s awareness on the vision and mission**

**1.4 State the process for defining the Vision and Mission of the Department, and PEOs of the program (15)**

**Process of defining Vision and Mission of the Department:**

The process of defining vision and mission as depicted in Fig.1.4.1 is carried out in two stages: viz. Consultative process, Deliberative process. During the consultative process, the department head consults with various stakeholders including the Sponsoring trust, University administrators, Local community, Industry experts, faculty, alumni about the proposed new vision and mission. Hence, the requirements of the local community, industry focus, faculty expertise, alumni interests, administrative and sponsoring supports are augmented and analyzed.

With the analyzed report, the department proposes the draft Vision and Mission statements. The draft document will be subjected to the deliberative process composing members from the Academic council and Board of Management. The deliberated Vision and Mission are then released for follow up. The process of defining the Vision and Mission of the department is depicted in Fig. 1.4.1.

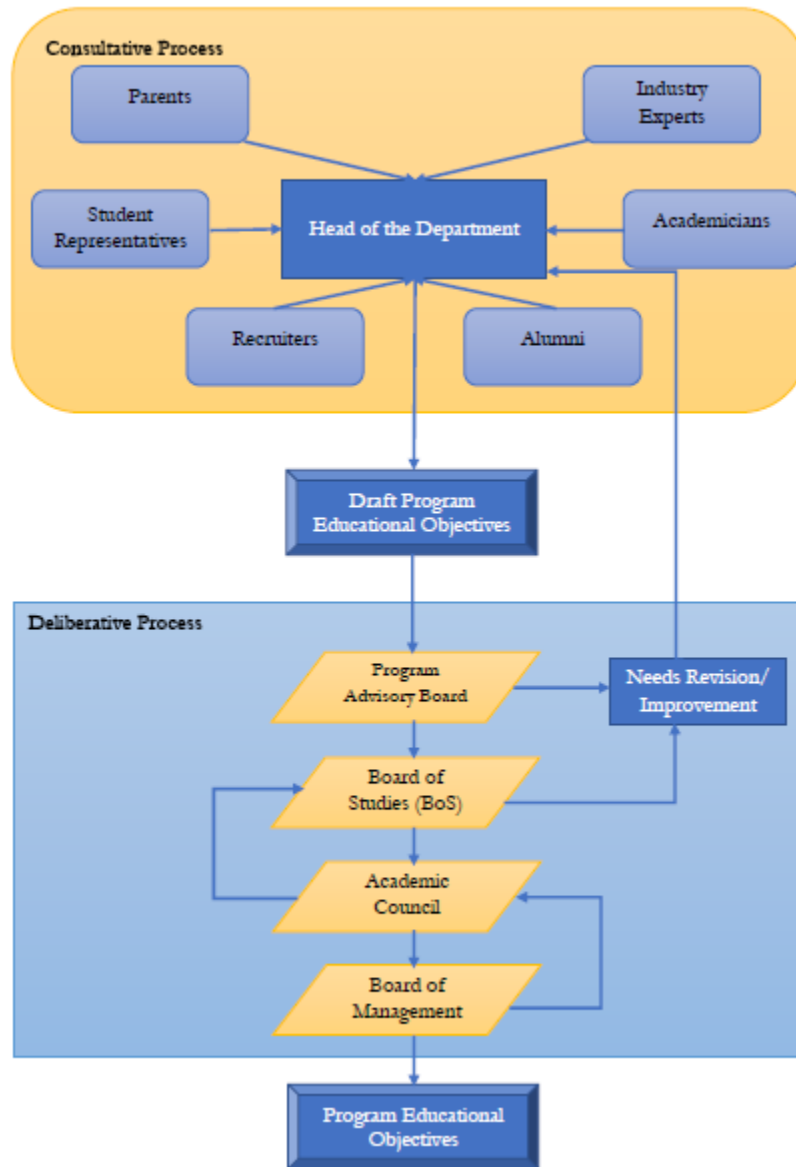


**Fig. 1.4.1 Process of defining the Vision and Mission of the Department**

**Process of defining PEOs of the Program:**

Definition of PEOs of the Program is carried out in two stages: viz. Consultative process, Deliberative process. Fig. 1.1.4.2 depicts the process of defining the PEO. During the consultative process, the department head consults with various stakeholders including the Parents, Student representatives, Recruiters, Industry experts, faculty, alumni.

With the data received from the stakeholders, the department proposes the draft PEOs of the Program. The draft document will be subjected to the deliberative process composed of members from the Program Advisory Board, Board of Studies, Academic Council and Board of Management. The deliberated PEOs are then released for follow up. The process of defining the Program Educational Objectives (PEOs) of the programme is depicted in Fig. 1.4.2.



**Fig. 1.4.2 Process of defining the Program Educational Objectives (PEOs) of the Program**

**1.5 Establish consistency of PEOs with Mission of the Department (10)**

**Establish consistency of PEOs with Mission of the Department**

The Program Educational Objectives of B.Tech., Computer Science and Engineering program are listed here:

**PEO1: TECHNICAL PROFICIENCY:**

The graduates will demonstrate technical proficiency in computer science and engineering during employment or higher studies.

**PEO2: PROFESSIONAL GROWTH:**

The graduates will imbibe problem solving skills through continuous learning and innovative mindset to provide sustainable solutions.

**PEO3: MANAGEMENT SKILLS:**

The graduates will operate in a diverse environment as a professional or an entrepreneur to solve societal problems with professional ethics.

The Program Educational Objectives of the B.Tech., Computer Science and Engineering is aligned with the mission of the Department. The mapping is illustrated in Table 1.5.1

**Table 1.5.1 Mapping of the components of mission with PEOs**

Mission	Mission Components	PEO1	PEO2	PEO3
M1	Quality Education	3	3	
M1	Quality Research	2	3	
M2	Knowledge and skills	3	3	
M2	Industry and societal needs	3	3	3
M3	Ethical values		3	3
M3	Life-long learning	3	3	3

3 - Strong Correlation

2 -Moderate Correlation

1 - Weak Correlation

The justification of mapping PEOs with Mission of the Department is described in Table 1.5.2

**Table 1.5.2 Justification of Mapping PEOs with Mission of the Department**

PEO	Component of Mission	Justification of Mapping
PEO 1	Quality Education	<ul style="list-style-type: none"> <li>• The department features highly skilled faculty members who provide students with in-depth subject knowledge through creative teaching methods.</li> <li>• The student-centric approach of the Teaching-Learning process helps the students to gain both theoretical knowledge and practical skills during their academic tenure.</li> </ul>
	Quality Research	<ul style="list-style-type: none"> <li>• Courses such as Project and other courses embedded with mini projects and pedagogical approach of research-paper based learning help the students to demonstrate technical proficiency during their higher studies</li> </ul>
	Knowledge and skills	<ul style="list-style-type: none"> <li>• Courses in various categories are developed such as Theory Course, Theory with Practical course, Integrated course and Project which help the students to attain the knowledge and skills required for a professional degree.</li> <li>• Workshops and seminars are conducted for knowledge enrichment and skill development of the students with support from subject experts serving in industry.</li> <li>• The Graduates of Computer Science and Engineering thus become technically proficient during employment.</li> </ul>
	Industry and societal needs	<ul style="list-style-type: none"> <li>• The students are provided with Industry-based courses led by instructors from IBM in four technical streams and hence they become graduates demonstrating high technical proficiency.</li> </ul>
	Life-long learning	<ul style="list-style-type: none"> <li>• Online credit transfer option is available for the students where they can learn a course with any leading University or learning platform and thus come to know about the various opportunities available.</li> <li>• Research paper-based assessment is done for certain courses and thus they are encouraged to do self-study and thus become life-long learners</li> <li>• The graduates thus become technically proficient to pursue higher studies or research</li> </ul>

PEO 2	Quality Education	<ul style="list-style-type: none"> <li>The students are provided with in-house courses, industry-tied courses, courses with virtual exchange programs and online courses, which help them to achieve problem solving skills and equip them to provide sustainable solutions</li> </ul>
	Quality Research	<ul style="list-style-type: none"> <li>The students are provided with courses such as Project Work and courses incorporated with mini projects which help them to focus on research.</li> <li>The students are motivated and assisted to publish papers, patents which help them to become graduates providing innovative and sustainable solutions</li> </ul>
	Knowledge and skills	<ul style="list-style-type: none"> <li>The students are provided with courses that focuses on improving their problem-solving skills and hence the graduates can apply the same to develop sustainable solutions</li> </ul>
	Industry and societal needs	<ul style="list-style-type: none"> <li>The students are provided with courses that focus on understanding about the computing solutions required in industry, society. This helps the students to work on real world problems.</li> </ul>
	Ethical values	<ul style="list-style-type: none"> <li>The students are empowered with problem solving skills and educated with professional ethics which help them to provide sustainable solutions with ethical values</li> </ul>
	Life-long learning	<ul style="list-style-type: none"> <li>The students are provided with project-based courses, self-study-based courses etc., which help them to acquire innovative mindset to provide sustainable solutions</li> </ul>
PEO 3	Industry and societal needs	<ul style="list-style-type: none"> <li>The students are provided opportunities to become entrepreneurs.</li> <li>The students are trained effectively to participate in campus placements. They are also well-informed and encouraged to participate in placement campus drives.</li> <li>The students are provided with courses such as Community Service Projects and Ethics which help them to act as Professional graduates on societal problems with ethics</li> </ul>
	Ethical values	<ul style="list-style-type: none"> <li>The students are provided with courses such as professional ethics which enable them to become graduates, serving as entrepreneurs and industry professionals with high ethical value</li> </ul>
	Life-long learning	<ul style="list-style-type: none"> <li>The students are encouraged to take up courses of their choice offered by other universities and online</li> </ul>



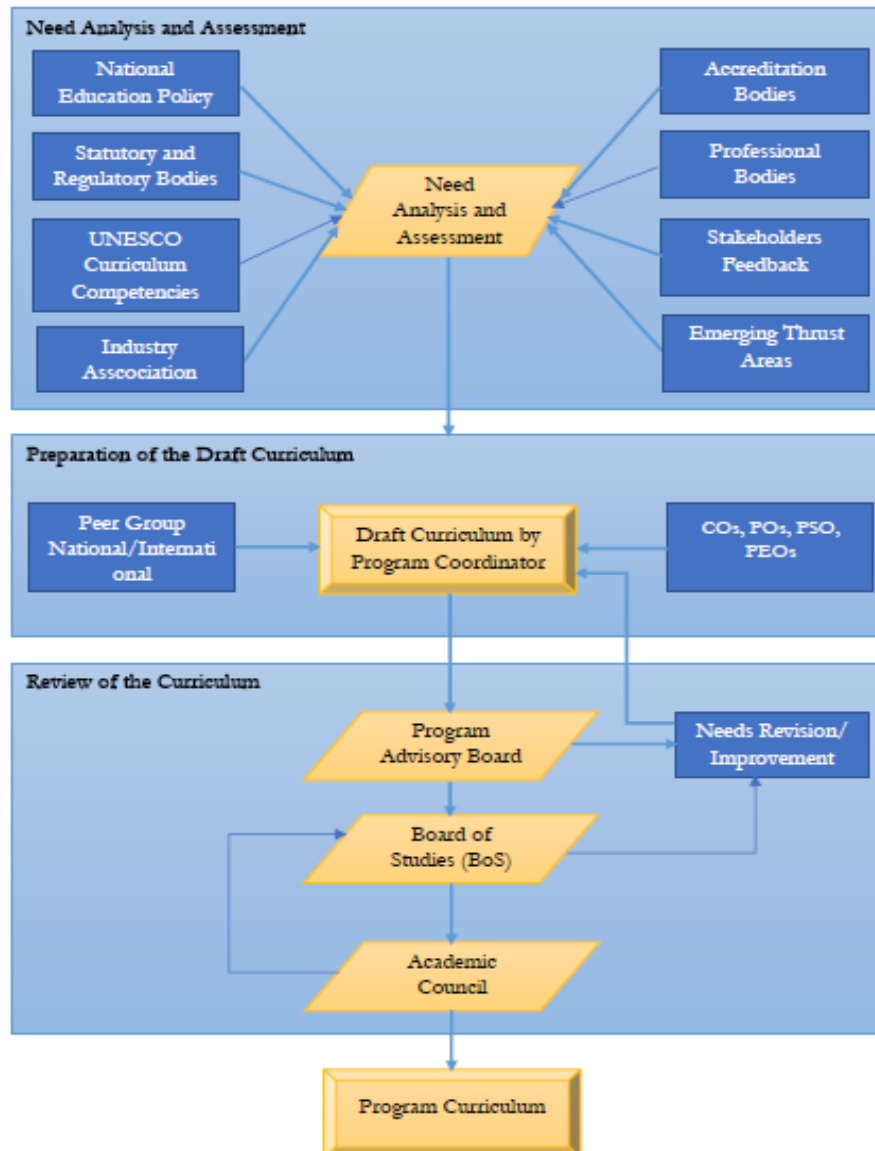
		<p>certification-based courses offered by various MOOC platforms which help them to acquire interest in learning from their experiences.</p> <ul style="list-style-type: none"><li>• Thus, the graduates continue to enhance their knowledge and skills by operating in diverse environments as a professional or as an entrepreneur</li></ul>
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CRITERIA 2	
<b>PROGRAM CURRICULUM AND TEACHING –LEARNING PROCESSES</b>	<b>100</b>

## 2.1 Program Curriculum (30)

### 2.1.1 State the Process of designing the Program Curriculum (10)

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. 2.1.1.

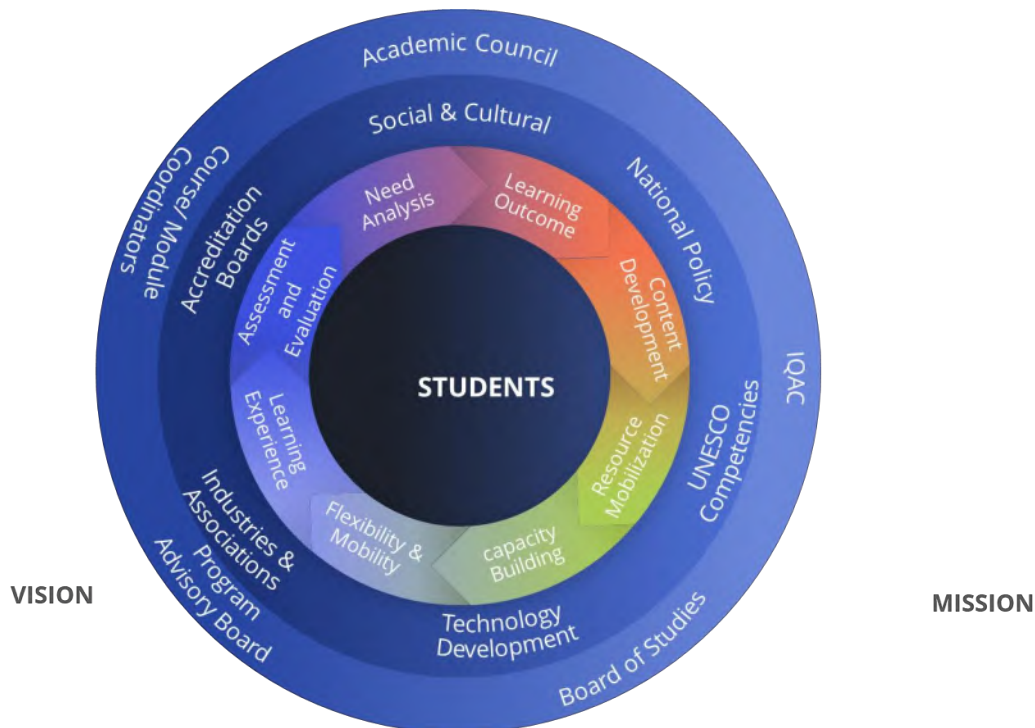


**Fig. 2.1.1 Process of Designing the Program Curriculum**

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

- i. **Need Analysis and Assessment:** Need 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, 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. 2.1.2.



**Fig. 2.1.2 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.

### 2.1.2 Structure of the Curriculum (5)

ID	Course Code	Course Title	Lecture	Tutorial	Practical	Total Hours	Theory Credits	Practical Credits	Total Credits
			(L)	(T)	(P)				
1	PHY18R174	Semiconductor Physics	3	1	2	6	4	1	5
2	CHY18R171	Chemistry	3	1	2	6	4	1	5
3	MAT18R101	Calculus and Linear Algebra	3	1	0	4	4	0	4
4	MAT18R103	Multiple Integration, Ordinary Differential Equations and Vector Spaces	3	1	0	4	4	0	4
5	MAT18R202	Probability and Statistics	3	1	0	4	4	0	4
6	BIT18R101	Biology for Engineers	3	0	0	3	3	0	3
7	EEE18R172	Basic Electrical Engineering	3	1	2	6	4	1	5
8	MEC18R151	Engineering Graphics and Design	3	0	2	5	2	1	3

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9	ECE18R221	Analog Electronics Circuits	3	0	0	3	3	0	3
10	CSE18R171	Programming for Problem Solving	3	1	2	6	4	1	5
11	ECE18R277	Digital Electronics	3	1	2	6	4	1	5
12	MEC18R152	Engineering Practices	3	0	2	5	2	1	3
13	HSS18R151	English for Technical Communication	2	0	2	4	2	1	3
14	HSS18R101	Soft skills-I	3	0	0	3	1	0	1
15	HSS18R102	Soft skills-II	3	0	0	3	1	0	1
16	HSS18R201	Soft skills-III	3	0	0	3	1	0	1
17	HSS18R001	Management Concepts and Techniques	3	0	0	3	3	0	3
18	HSS18R002	Marketing Management	3	0	0	3	3	0	3
19	HSS18R003	Organizational Psychology	3	0	0	3	3	0	3
20	HSS18R004	Project Management	3	0	0	3	3	0	3
21	HSS18R005	Stress Management and Coping Strategies	3	0	0	3	3	0	3
22	HSS18R006	Economics for Engineers	3	0	0	3	3	0	3
23	HSS18R007	Human Resource Management and Labour Law	3	0	0	3	3	0	3
24	HSS18R008	Entrepreneurship Development	3	0	0	3	3	0	3
25	HSS18R009	Cost Analysis and Control	3	0	0	3	3	0	3
26	HSS18R010	Product Design and Development	3	0	0	3	3	0	3
27	HSS18R011	Business Process Reengineering	3	0	0	3	3	0	3

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28	HSS18R012	Political Economy	3	0	0	3	3	0	3
29	HSS18R013	Professional Ethics	3	0	0	3	3	0	3
30	HSS18R014	Operations Research	3	0	0	3	3	0	3
31	HSS18R015	Total Quality Management	3	0	0	3	3	0	3
32	HSS18R016	Advanced Soft Skills	3	0	0	3	3	0	3
33	CSE18R172	Data Structure and Algorithms	3	1	2	6	4	1	5
34	CSE18R181	Computer Hardware Laboratory	0	0	3	3	0	2	2
35	CSE18R173	Design and Analysis of Algorithms	3	0	2	5	3	1	4
36	CSE18R174	Computer Architecture and Organization	3	0	2	5	3	1	4
37	MAT18R207	Discrete Mathematics	3	1	0	4	4	0	4
38	CSE18R252	Formal Language and Automata	3	0	2	5	3	1	4
39	INT18R371	Database Management Systems	3	0	2	5	3	1	4
40	CSE18R271	Object Oriented Programming	3	0	2	5	3	1	4
41	CSE18R272	Java Programming	3	0	2	5	3	1	4
42	CSE18R273	Operating Systems	3	0	2	5	3	1	4
43	CSE18R274	Compiler Design	3	0	2	5	3	1	4
44	CSE18R371	Computer Networks	3	1	2	6	4	1	5
45	CSE18R108	IT Infrastructure Landscape Overview	3	0	0	3	3	0	3
46	CSE18R254	Introduction to Python Programming	2	0	2	4	2	1	3
47	CSE18R256	Software Engineering	3	0	0	3	3	0	3

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48	CSE18R356	Software Testing	3	0	0	3	3	0	3
49	CSE18R358	Free and Open-Source Software	3	0	0	3	3	0	3
50	CSE18R360	Internet of Things	3	0	0	3	3	0	3
51	CSE18R365	Artificial Intelligence	3	0	0	3	3	0	3
52	CSE18R366	Game Theory	3	0	0	3	3	0	3
53	CSE18R367	Virtual Reality	3	0	0	3	3	0	3
54	CSE18R369	Computational Intelligence	3	0	0	3	3	0	3
55	CSE18R452	Cloud Computing Techniques	3	0	0	3	3	0	3
56	CSE18R453	Applied Cryptography and its applications	3	0	0	3	3	0	3
57	CSE18R456	Web Technology	3	0	0	3	3	0	3
58	CSE18R457	Mobile Application Development	3	0	0	3	3	0	3
59	CSE18R112	Introduction to Artificial Intelligence and Machine Learning	3	0	0	3	3	0	3
60	CSE18R212	Machine Learning	3	0	2	5	3	1	4
61	CSE18R257	Predictive Analytics	2	0	2	4	2	1	3
62	CSE18R396	Deep Learning	3	0	2	5	3	1	4
63	CSE18R490	Applications of Machine Learning in Industries	3	0	0	3	3	0	3
64	CSE18R292	Algorithm for Intelligent Systems and Robotics	3	0	2	5	3	1	4
65	CSE18R387	Computational Linguistics and Natural Language Processing	3	0	2	5	3	1	4
66	CSE18R388	Pattern and Anomaly Detection	3	0	2	5	3	1	4

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67	CSE18R110	Introduction to Internet of Things	3	0	0	3	3	0	3
68	CSE18R210	Introduction to Sensor Technology & Instrumentation	3	0	2	5	3	1	4
69	CSE18R290	Cloud Architecture and Deployment Models	3	0	2	5	3	1	4
70	CSE18R391	Smarter City	2	0	2	4	2	1	3
71	CSE18R392	IoT for Industries (Use Case Scenarios)	3	0	0	3	3	0	3
72	CSE18R263	Analytics for IoT	3	0	2	5	3	1	4
73	CSE18R379	Wireless Sensor Networks (WSN) & IoT Standards	3	0	2	5	3	1	4
74	CSE18R111	Information Security Fundamentals	3	0	0	3	3	0	3
75	CSE18R211	IT Physical Security & System Security	2	0	2	4	2	1	3
76	CSE18R375	Digital Forensics	3	0	2	5	3	1	4
77	CSE18R393	IT Network Security	3	0	2	5	3	1	4
78	CSE18R395	Information Security Governance, Management Practices, Security Audit & Monitoring	3	0	0	3	3	0	3
79	CSE18R264	IT Application Security	3	0	2	5	3	1	4
80	CSE18R291	IT Data Security	3	0	2	5	3	1	4
81	CSE18R394	Ethical Hacking & Penetration Testing	3	0	2	5	3	1	4
82	CSE18R109	Introduction to Data Analytics	3	0	0	3	3	0	3
83	CSE18R258	Descriptive Analytics	3	0	2	5	3	1	4
84	CSE18R316	BA for Industries	3	0	0	3	3	0	3



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85	CSE18R260	Data Warehousing & Multidimensional Modeling	3	0	2	5	3	1	4
86	CSE18R468	Big Data Analytics	3	0	2	5	3	1	4
87	CSE18R381	Data Visualization for Analytics	3	0	2	5	3	1	4
88	CSE18R467	Social, Web and Mobile Analytics	3	0	2	5	3	1	4
89	OEE18R014	Introduction to Web Design and Applications	3	0	0	3	3	0	3
90	OEE18R009	Laser Technology	3	0	0	3	3	0	3
91	OEE18R017	Number Theory with Applications	3	0	0	3	3	0	3
92	OEE18R001	Science Fiction	3	0	0	3	3	0	3
93	OEE18R008	Photonics and Optoelectronic Devices	3	0	0	3	3	0	3
94	OEE18R015	Functional Materials for Technological Applications	3	0	0	3	3	0	3
95	OEE18R003	Mathematical Biology	3	0	0	3	3	0	3
96	OEE18R004	Mathematical Modelling	3	0	0	3	3	0	3
97	OEE18R006	PC Hardware and TroIndustrial Chemistry for Engineers troubleshooting	3	0	0	3	3	0	3
98	OEE18R012	Cloud Computing	3	0	0	3	3	0	3
99	OEE18R010	Principles of Taxation	3	0	0	3	3	0	3
100	OEE18R002	Phonetics for Effective Communication	3	0	0	3	3	0	3
101	OEE18R022	Material Physics	3	0	0	3	3	0	3
102	OEE18R023	Space Physics	3	0	0	3	3	0	3

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103	OEE18R007	Analytical Methods in Material Science	3	0	0	3	3	0	3
104	OEE18R018	Basics of Nano Science	3	0	0	3	3	0	3
105	OEE18R020	Fuel and Energy	3	0	0	3	3	0	3
106	OEE18R021	Solar Energy	3	0	0	3	3	0	3
107	BIT18R316	Introduction to Computational Biology	3	0	0	3	3	0	3
108	BIT18R319	Environmental Microbiology	3	0	0	3	3	0	3
109	BIT18R321	Human Diseases and Prevention	3	0	0	3	3	0	3
110	CSEOPE077	Social Networks	3	0	0	3	3	0	3
111	BME18R315	Biomedical Instrumentation	3	0	0	3	3	0	3
112	CIV18R422	Disaster Management	3	0	0	3	3	0	3
113	ECE18R446	GPS Fundamentals	3	0	0	3	3	0	3
114	INT18R315	Web Programming	3	0	0	3	3	0	3
115	EIE18R312	Introduction to Nano Electronics	3	0	0	3	3	0	3
116	FT18R209	Food Processing Technology	3	0	0	3	3	0	3
117	MEC18R320	Finite Element Method	3	0	0	3	3	0	3
118	CIV18R421	Building Services	3	0	0	3	3	0	3
119	MEC18R347	3D Printing	3	0	0	3	3	0	3
120	ARC17R221	Creativity and Design	3	0	0	3	3	0	3
121	EEE18R312	Electrical Machines	3	0	0	3	3	0	3
122	INT18R322	R Programming	3	0	0	3	3	0	3

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123	ECE18R345	Consumer Electronics	3	0	0	3	3	0	3
124	AUT18R319	Automotive Air-Conditioning	3	0	0	3	3	0	3
125	CIV18R425	Environmental Impact Assessment	3	0	0	3	3	0	3
126	MEC18R323	Materials Management	3	0	0	3	3	0	3
127	ECE18R343	Analog Communication Systems	3	0	0	3	3	0	3
128	BME18R207	Medical Optics and Lasers	3	0	0	3	3	0	3
129	AUT18R204	Alternate Fuels and Energy Systems	3	0	0	3	3	0	3
130	ECE18R341	Linear Integrated Electronics	3	0	0	3	3	0	3
131	FT18R314	Packaging Technology of Foods	3	0	0	3	3	0	3
132	MEC18R348	Maintenance Engineering	3	0	0	3	3	0	3
133	MEC18R446	Industrial Psychology	3	0	0	3	3	0	3
134	BME18R314	Computers in Medicine	3	0	0	3	3	0	3
135	EIE18R402	Mechatronics	3	0	0	3	3	0	3
136	FT18R312	Fermented Food Products	3	0	0	3	3	0	3
137	EEE18R310	Solar and Wind Energy Conversion	3	0	0	3	3	0	3
138	CSE18R304	OOPS using JAVA	3	0	0	3	3	0	3
139	AER18R306	Aircraft Rules and Regulations CAR I and II	3	0	0	3	3	0	3
140	ECE18R442	Digital Communication Systems	3	0	0	3	3	0	3
141	CSEOOE049	Improving Global Health: Focusing on Quality and Safety	3	0	0	3	3	0	3

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142	MEC18R449	Engineering Design	3	0	0	3	3	0	3
143	AER18R411	Satellite Technology	3	0	0	3	3	0	3
144	ECE18R445	Telecommunication Networks	3	0	0	3	3	0	3
145	ECE18R447	VLSI Fabrication	3	0	0	3	3	0	3
146	ECE18R344	Television Engineering	3	0	0	3	3	0	3
147	AER18R402	UAV System Design	3	0	0	3	3	0	3
148	CIV18R306	Housing Planning and Management	3	0	0	3	3	0	3
149	FT18R211	Bakery and Confectionery	3	0	0	3	3	0	3
150	ECE18R243	Opto - Electronics	3	0	0	3	3	0	3
151	CSEO051	Improving Global Health: Focusing on Quality and Safety	3	0	0	3	3	0	3
152	BIT18R432	Biological Waste Water Treatment	3	0	0	3	3	0	3
153	CSEOPE024	Data Analytics with Python	3	0	0	3	3	0	3
154	CSEOOE080	Work System Design	3	0	0	3	3	0	3
155	CSE18R399	Community Service Project	0	0	3	3	0	3	3
156	CSE18R498	Project Phase I	0	0	4	4	0	2	2
157	CSE18R499	Project Phase II	0	0	16	16	0	8	8
158	CSE18R397	Industry Training	0	0	40	40	0	2	2
159	CSE18R322	Advanced Computer Architecture	3	0	0	3	3	0	3
160	CSE18R323	High Performance Computing	3	0	0	3	3	0	3
161	CSE18R324	Augmented Reality	3	0	0	3	3	0	3

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162	CSE18R325	Visual Cryptography	3	0	0	3	3	0	3
163	CSE18R420	Video Analytics	3	0	0	3	3	0	3
164	CSE18R421	Next Generation Networks	3	0	0	3	3	0	3
165	CSE18R422	Software Defined Networking	3	0	0	3	3	0	3
166	CSE18R423	Service Oriented Architecture	3	0	0	3	3	0	3
167	CSE18R424	Vulnerability Management	3	0	0	3	3	0	3
168	CSE18R352	Network and Information Security	3	0	1	4	3	0.5	3.5
169	CSE18R353	Adhoc and Sensor Networks	3	0	1	4	3	0.5	3.5
170	CSE18R354	Graph Theory and its Applications	3	1	0	4	4	0	4
171	CSE18R355	Virtualization	3	0	1	4	3	0.5	3.5
172	CSE18R454	Cyber Security and Forensics	3	0	1	4	3	0.5	3.5
173	CSE18R455	Mobile and Wireless Security	3	0	1	4	3	0.5	3.5
174	CSE18R351	Python and Script Programming	3	0	1	4	3	0.5	3.5
175	CSE18R357	Agile Methodology	3	1	0	4	4	0	4
176	CSE18R359	User Interface Design	3	0	1	4	3	0.5	3.5
177	ECE18R320	RFID and its Applications	3	1	0	4	4	0	4
178	CSE18R361	Embedded Systems and its Applications	3	0	1	4	3	0.5	3.5
179	CSE18R362	Logic and Functional Programming	3	0	1	4	3	0.5	3.5
180	CSE18R363	IoT Applications and Communication Protocols	3	0	1	4	3	0.5	3.5
181	CSE18R364	Mobile Applications and	3	1	0	4	4	0	4

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		Services							
182	CSE18R458	Software Technology and Pervasive Computing	3	1	0	4	4	0	4
183	CSE18R368	Computer Graphics and Multimedia Systems	3	0	1	4	3	0.5	3.5
184	CSE18R459	Computer Vision and Digital Imaging	3	1	0	4	4	0	4
185	CSE18R460	Natural Language Processing	3	0	1	4	3	0.5	3.5
186	CSE18R370	Big Data Analytics	3	1	0	4	4	0	4
187	CSE18R451	Machine Learning Techniques	3	1	0	4	4	0	4
188	CSE18R461	Bio Inspired Intelligence Techniques	3	0	1	4	3	0.5	3.5
189	CSE18R462	Data Visualization	3	0	1	4	3	0.5	3.5
190	CSE18R463	Analytic Tools	3	1	0	4	4	0	4
191	CSE18R464	Web Analytics and Development	3	0	1	4	3	0.5	3.5
192	CSE18R465	Data Storage Technologies and Networks	3	1	0	4	4	0	4
193	CSE18R398	Internship Training	0	0	40	40	0	2	2
194	MAN18R001	Environmental Sciences	1	0	0	1	0	0	0
195	MAN18R002	Indian Constitution	1	0	0	1	0	0	0
196	MAN18R003	Essence of Indian Traditional Knowledge	1	0	0	1	0	0	0
<b>Total</b>			<b>559</b>	<b>21</b>	<b>203</b>	<b>783</b>	<b>569</b>	<b>67.5</b>	<b>636.5</b>

**2.1.3 State the components of the curriculum (5)**

<b>Course Components</b>	<b>Curriculum Content (% of total number of credits of the program)</b>	<b>Total number of contact hours</b>	<b>Total number of credits</b>
Basic Sciences	15.63	405	25
Engineering Sciences	15	465	24
Humanities and Social Sciences	7.5	285	12
Program Core	30	870	48
Program Electives	11.25	330	18
Open Electives	11.25	270	18
Project(s)	8.12	345	13
Internships/Seminars	1.25	90	2
Any other ( <b>Mandatory Courses</b> 1. Environmental Sciences 2. Indian Constitution 3. Essence of Indian Traditional Knowledge)	0	45	0
<b>Total number of Credits</b>			<b>160</b>

**2.1.4 State the process used to identify extent of compliance of the curriculum for attaining the Program Outcomes(POs) & Program Specific Outcomes(PSOs) (10)****(a) Contribution of Curriculum Structure towards the compliance with POs and PSOs:**

The KARE Curriculum structure comprehensively addresses the Knowledge, Skill and Attitude expected of each engineering graduate covering all the POs and PSOs. It includes various course categories including Basic Science and Mathematics, Basic Engineering, Humanities and Social

Sciences, Soft Skills, Program Core, Professional and Open Electives, Community Service Project, Industry Training/ Industry Internship and Capstone Project. The curriculum also mandates complementary skill courses under non-CGPA category primarily aiming at the POs which demand more skills and attitudes. Each of three groups in non-CGPA concentrates on NSS/NCC/Sports/Extra-Curricular Activity, Co-curricular Activity and International Language/Aptitude/English Proficiency respectively. The Compliance of KARE Curriculum Structure with POs and PSOs is depicted in fig. 2.1.3.



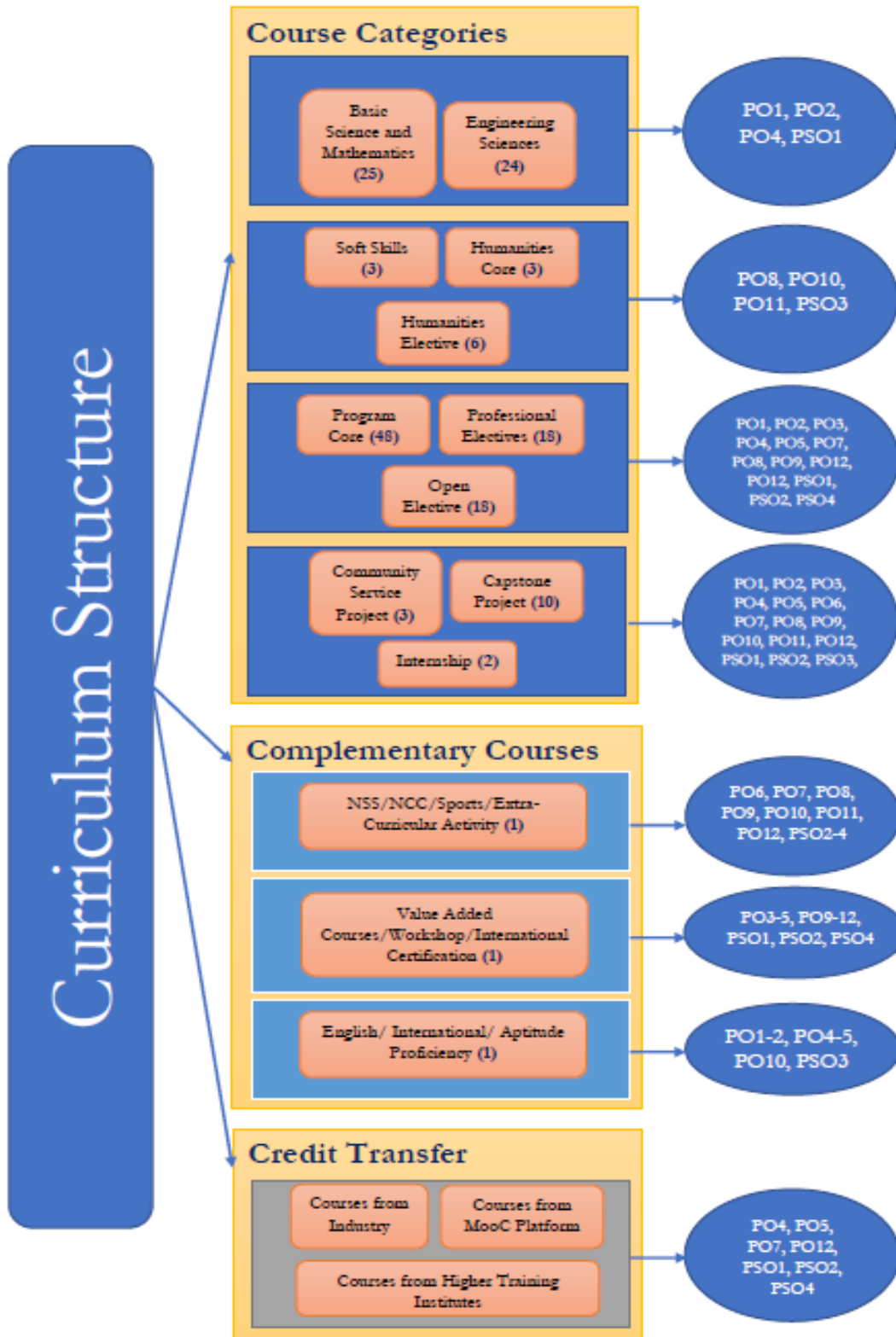
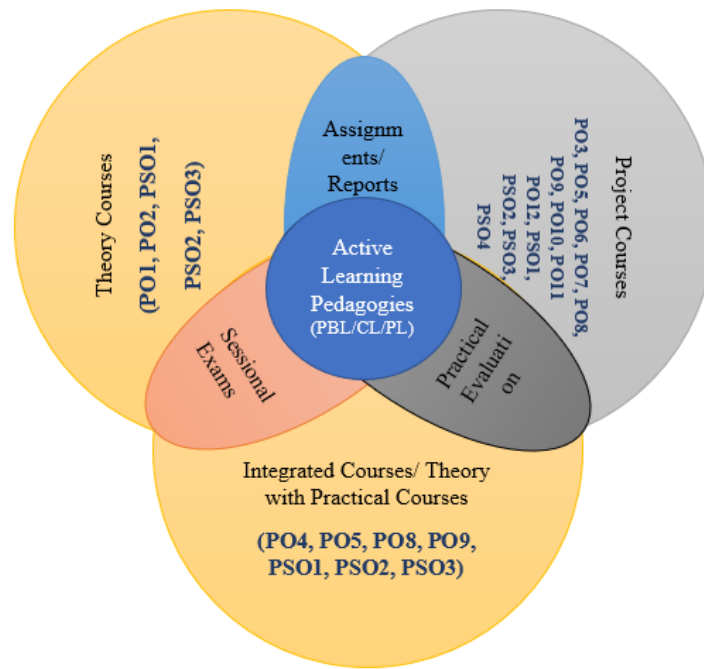


Fig. 2.1.3. Compliance of KARE Curriculum Structure with POs and PSOs

- Project courses including Community Service Project, Internship, Capstone Project have high correlation with majority of Program Outcomes including Design/development of solutions (PO3), Conduct investigations of complex problems (PO4), Modern tool usage (PO5), Contextual knowledge to the Engineer and Society (PO6), Environment and Sustainability (PO7), Ethics (PO8), Individual and team work skills (PO9), Communication (PO10), Project management and finance (PO11), Life-long learning (PO12), Problem Solving (PSO1), Professional Skills (PSO2), Communication and Team Skill (PSO3), Successful Career and Entrepreneurship (PSO4)
- Complementary courses in Group 1 correlate with Ethics (PO8), Individual and teamwork skills (PO9), Communication (PO10), Communication and Team Skill (PSO3). Group 2 courses comply strongly with Modern tool usage (PO5), Life-long learning (PO12), Professional Skills (PSO2). Courses from Group 3 have high correlation with Communication (PO10), Communication and Team Skill (PSO3)
- Courses offered by external experts from Industry, Higher Training Institutes, Online Platforms typically have higher compliance with Conduct investigations of complex problems (PO4), Modern tool usage (PO5), Life-long learning (PO12), Professional Skills (PSO2), Successful Career and Entrepreneurship (PSO4)

**(b) Correlation of Delivery and Assessment methods with POs and PSOs**

It is also envisioned that in addition to the courses (course outcomes), the delivery methods and assessment tools adopted based on the nature of the course, contribute significantly towards the attainment of POs and PSOs. The courses in various course components of KARE is offered in varied course types based on the nature of course outcomes as Theory courses (T), Integrated courses (IC), Theory with Practical component courses (TP), Project courses (P). The correlation of the delivery and assessment methods with POs and PSOs are depicted in fig. 2.1.4.



**Fig. 2.1.4 Correlation of Delivery and Assessment Methods with POs and PSOs**

The theoretical courses inculcate practices to comply with outcomes including Engineering knowledge (PO1), Problem Analysis (PO2), Problem Solving (PSO1), Professional Skills (PSO2), Communication and Team Skill (PSO3). Theory courses are usually evaluated through written sessional examinations, assignments, and quizzes which corresponds to the requirements to achieve the mapping outcomes.

IC and TP courses typically offered with active learning pedagogies including Project Based Learning (PBL), Peer-led learning (PL), Collaborative learning (CL), among others, correlate with the outcomes such as Conduct investigations of complex problems (PO4), Modern tool usage (PO5), Ethics (PO8), Individual and team work skills (PO9), Problem Solving (PSO1), Professional Skills (PSO2), Communication and Team Skill (PSO3). IC and TP courses are typically evaluated through written sessional examinations, practical assignments, among others.

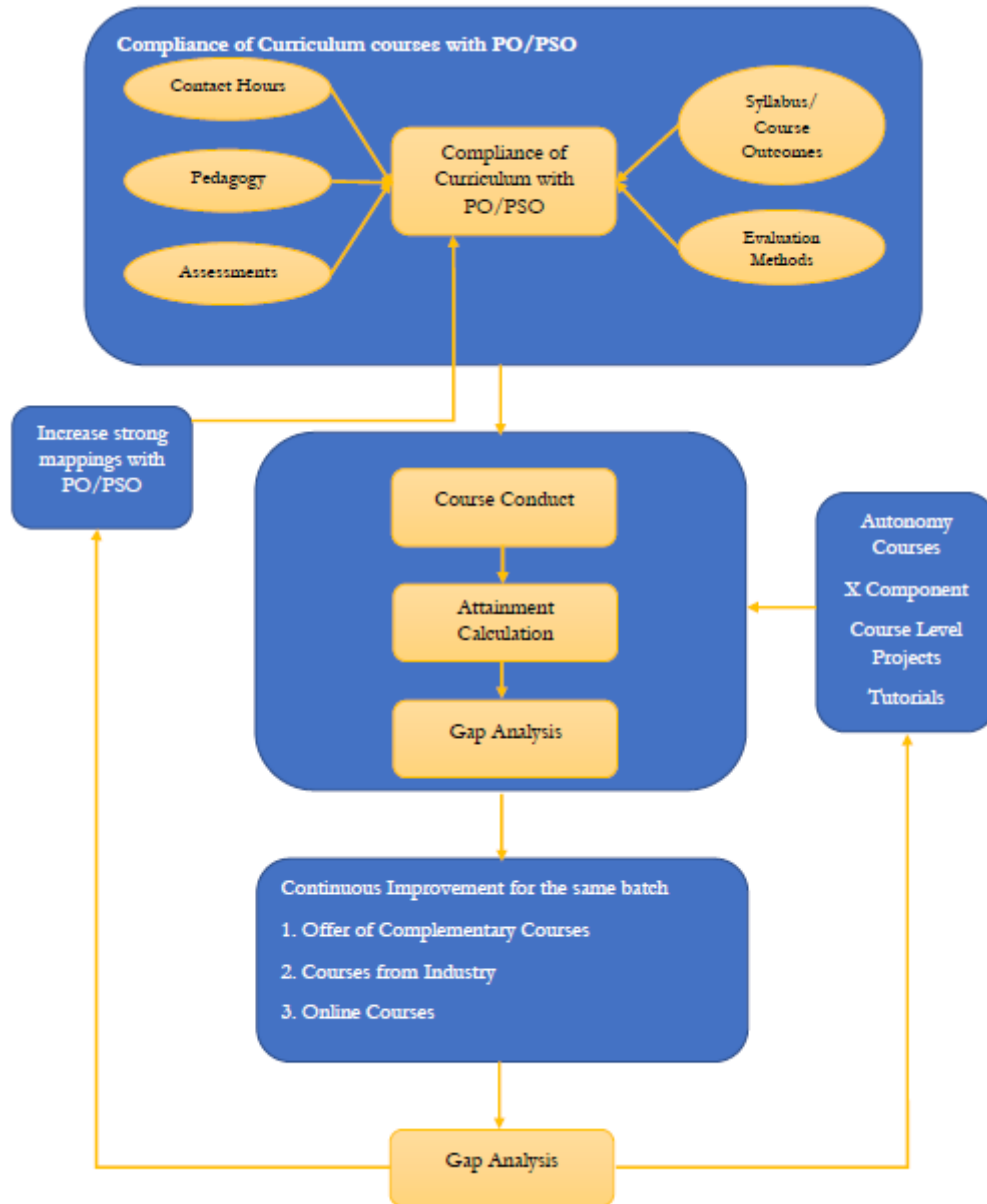
Project courses offered with high level pedagogies in student centric schemes typically map with the outcomes such as Design/development of solutions (PO3), Conduct investigations of complex problems (PO4), Modern tool usage (PO5), Contextual knowledge to the Engineer and Society (PO6), Environment and Sustainability (PO7), Ethics (PO8), Individual and team work skills (PO9), Communication (PO10), Project management and finance (PO11), Life-long learning (PO12), Problem Solving (PSO1), Professional Skills (PSO2), Communication and

Team Skill (PSO3), Successful Career and Entrepreneurship (PSO4). Project courses are evaluated through practical implementations, problem assignments, periodic reviews, among others.

Further, the extent of compliance of the curriculum was evaluated based on the program outcome attainment (which is elaborately discussed in criteria-III) for each course component in the curriculum in such a way to ensure the degree of compliance between curriculum and PO, PSO. Table 2.1.1 shows the mapping between course components present in the curriculum verses PO and PSO.

**Process used to identify extent of Compliance of the Curriculum for attaining POs and PSOs**

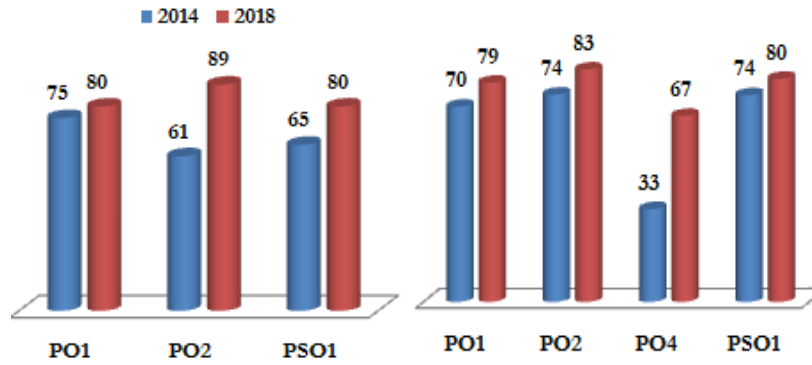
Correlation of Curriculum with POs and PSOs is depicted in three levels strong (3<sup>rd</sup> level), Medium (2<sup>nd</sup> level) and Low (1<sup>st</sup> level). The level of mapping of each course's outcome with corresponding POs and PSOs are the primary measure of compliance. The mapping is done based on various aspects including Syllabus, Pedagogy, Contact hours, Assessment and Evaluation methods. The process used to identify the compliance of curriculum for attaining POs and PSOs is depicted in fig. 2.1.5.



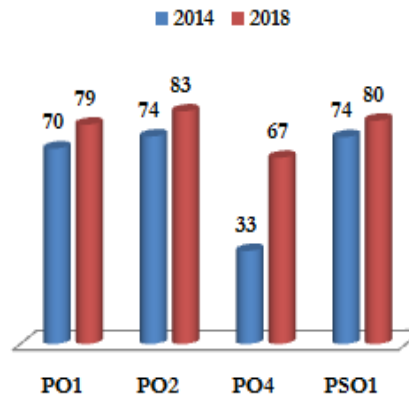
**Fig. 2.1.5 Process used to identify extent of Compliance of the Curriculum for attaining POs and PSOs**

The level of compliance of curriculum with POs and PSOs for 2014 regulation and 2018 regulation are compared across various course components and the same are depicted in fig. 2.1.6 (a-f).

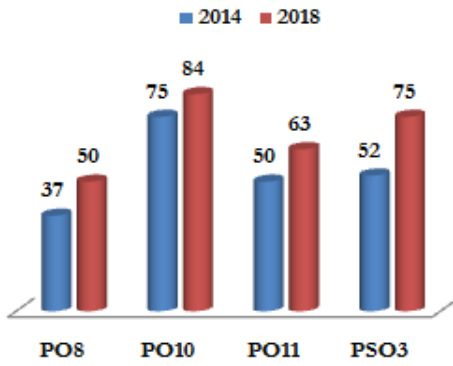
### Basic Science & Mathematics



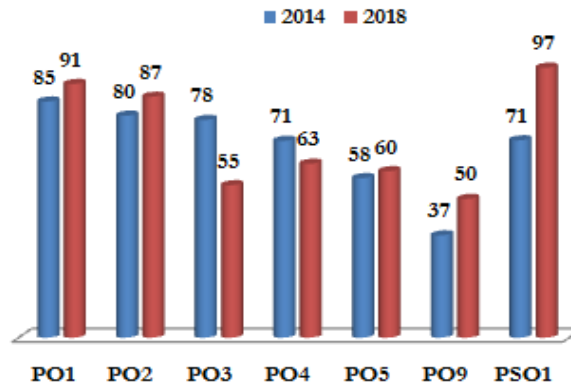
### Basic Engineering



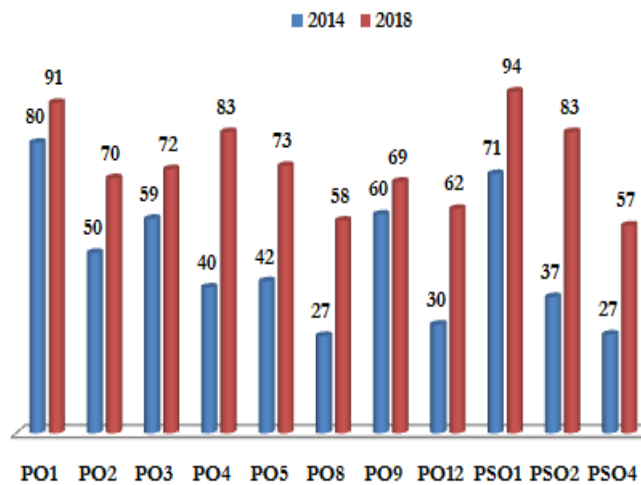
### Humanities & Social Science

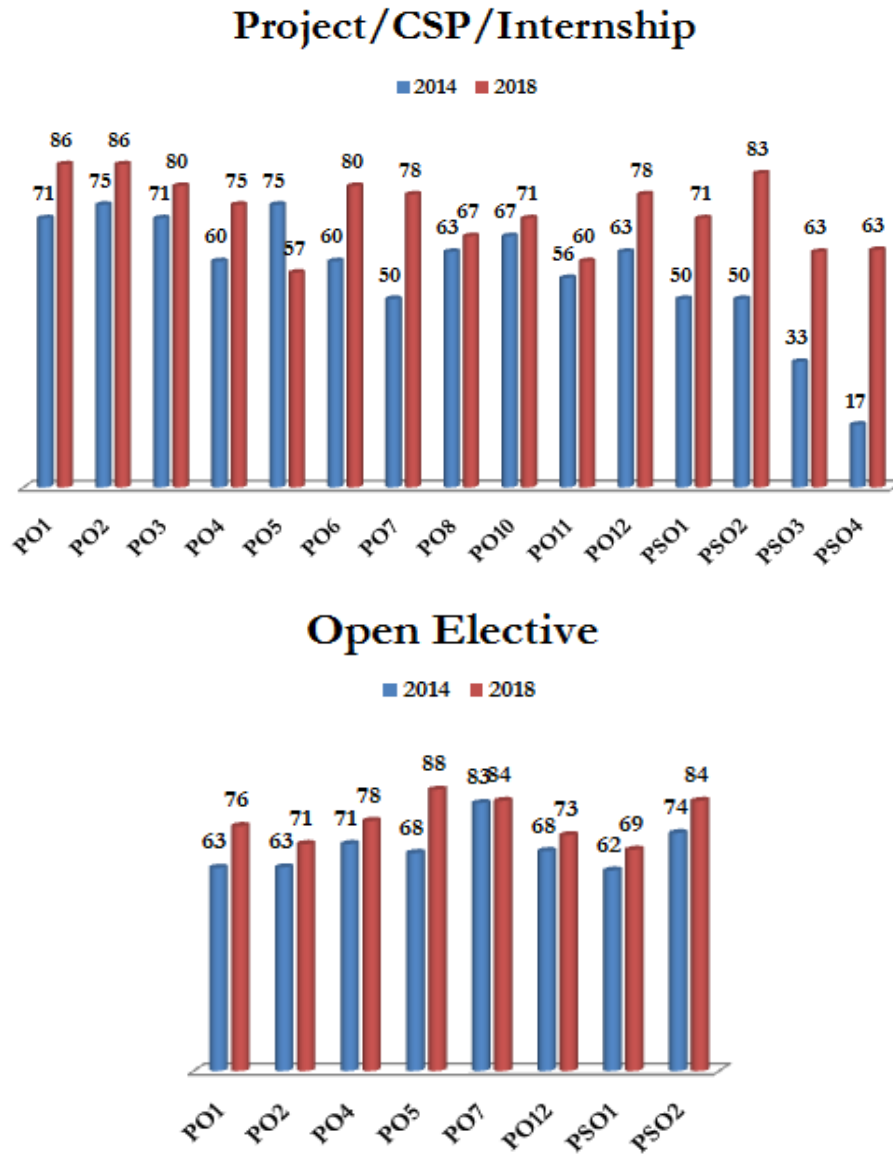


### Program Core



### Program Elective





**Fig. 2.1.6. Comparison of Compliance of Course Components with POs and PSOs for 2014 and 2018 regulations**

Based on the curriculum, the courses are conducted and outcomes are measured for POs and PSOs. In each semester, gap analysis in terms of attainment levels is ensured and subsequent improvement actions are taken in terms of complementary courses. KARE regulation inculcates a mandatory complementary course program in the name of non-CGPA. In addition, credit transfers in terms of Industry oriented courses and online courses are also offered. These complementary courses and courses offered from external experts help increase the compliance

of curriculum for attaining POs and PSOs. The mapping of various complementary/ external experts' course components is depicted in Table 2.1.1.

**Table 2.1.1 Correlation of Complementary Courses in the Curriculum with POs/PSOs**

Complementary Courses (Non CGPA/ Credit Transfer)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
Courses from Industry Experts				✓	✓		✓					✓	✓	✓		✓
Courses from Online Platforms							✓					✓	✓	✓		✓
Courses from Higher Technical Institutes				✓	✓							✓		✓		
NSS/NCC						✓	✓	✓	✓			✓			✓	
Sports						✓		✓	✓	✓	✓	✓				✓
Tech Events/ Competitions through Department / University Clubs			✓	✓	✓				✓	✓	✓	✓	✓	✓		✓
Certifications				✓	✓			✓	✓		✓	✓		✓		✓
Language Proficiency Courses										✓					✓	
Aptitude Proficiency Courses	✓	✓								✓					✓	



The gap analysis ensured after the offering of Complementary courses is refined by the inculcation of innovative course conduct practices including Autonomy courses, X Component courses, Course level projects and Tutorials. For subsequent batches, the Compliance of the curriculum is improved by mapping the Course Outcomes of various courses at higher correlation levels to the corresponding POs and PSOs.

## **2.2. Teaching - Learning Processes (70)**

### **2.2.1 Describe the Process followed to improve quality of Teaching Learning (15)**

Teaching-Learning in the department follows a student-centric process employing experiential, participative, problem solving and constructivist methodologies. Activities are included to enhance confidence and public speaking abilities of students. Objective evaluation of performance of faculties are done at regular intervals.

#### **A Adherence to Academic Calendar**

The academic calendar for the university is prepared in chronological order in the Academic office. All the departments adhere to the academic schedule proposed by the academic office related to academic and examination activities. To effectively implement the same, the CSE department also prepares an academic activity plan which includes exclusive departmental meetings such as course coordinator meeting, module coordinator meeting, Program Advisory Board (PAB) meeting, among others. For reference, the academic calendar of the institute and the department academic calendar for the odd semester for the academic year 2018-19 are presented in Fig. 2.2.1 and Fig. 2.2.2 respectively.

ACADEMIC CALENDAR FOR ODD SEMESTER 2018-2019 (Except for first year PG)		
July 2018	16 <sup>th</sup>	Reopening Day, enrollment to CGPA and Non CGPA courses
	17 <sup>th</sup>	Faculty advisor counseling to the students
	18 <sup>th</sup> - 19 <sup>th</sup>	I class committee meeting for UG and PG classes, zeroth review for final year UG project
Aug 2018	20 <sup>th</sup>	I class committee meeting for arts and science courses
	21 <sup>st</sup>	First review for Community Service Project and PG Project Phase-I
	24 <sup>th</sup> - 1 <sup>st</sup>	Sessional Examination-I and first review for final year UG Project
Sept 2018	5 <sup>th</sup> - 6 <sup>th</sup>	II class committee meeting
	7 <sup>th</sup>	Faculty advisor counseling to the students
	15 <sup>th</sup>	Last date for paying the tuition fees
	22 <sup>nd</sup>	Last date for paying arrear exam fees
	5 <sup>th</sup> - 13 <sup>th</sup>	Sessional Examination II and Second review for final year UG and PG projects
Oct 2018	16 <sup>th</sup>	Last date for paying exam fees
	22 <sup>nd</sup>	III class committee meeting
	26 <sup>th</sup>	Second review for Community Service Project
	26 <sup>th</sup>	Faculty advisor counseling to the students
	29 <sup>th</sup>	Compilation of attendance
	29 <sup>th</sup>	Submission of Non-CGPA results to COE office
	31 <sup>st</sup> - 12 <sup>th</sup>	Sessional Examination III (Except 1 <sup>st</sup> and 2 <sup>nd</sup> Year UG and PG) and Third review for final year UG and PG projects
	14 <sup>th</sup> - 18 <sup>th</sup>	End semester practical examinations and Community Service Project final review
Nov 2018	19 <sup>th</sup>	End semester theory Examinations and Make up Examinations starts
	23 <sup>rd</sup>	Non-CGPA Result Passing Meeting
	23 <sup>rd</sup> - 24 <sup>th</sup>	Viva voce for UG and PG projects
Dec 2018	5 <sup>th</sup>	End semester examination ends
	6 <sup>th</sup>	Make up examination ends
	7 <sup>th</sup>	Arrear examination starts
	10 <sup>th</sup>	Final class committee meeting
	12 <sup>th</sup>	Grade approval committee meeting
	18 <sup>th</sup>	Arrear examination ends
	20 <sup>th</sup>	Result Passing Committee Meeting
	27 <sup>th</sup>	Paper distribution to the students and Declaration of Results
	27 <sup>th</sup>	Even Semester begins

LIST OF HOLIDAYS			
S. No	Date	Day	Observances
1.	15.08.2018	Wednesday	Independence Day
2.	22.08.2018	Wednesday	Bakrid
3.	13.09.2018	Thursday	Vinayakar Chaturthi
4.	21.09.2018	Friday	Muharram
5.	02.10.2018	Tuesday	Gandhi Jayanthi
6.	17.10.2018 to 21.10.2018	-	Ayutha Pooja and Vijaya Dasami
7.	04.11.2018 to 08.11.2018	-	Deepavali
8.	21.11.2018	Wednesday	Milad-un-Nabi
9.	25.12.2018	Tuesday	Christmas

Fig 2.2.1 Odd Semester University Academic Calendar for 2018-19

Department Academic Calendar for Odd Semester 2018-2019		
(In Compliance with University Academic Calendar)		
June 2018	27th	Course Allocation
	4th	Course Coordinator Meeting - 1
	6th	Module Coordinator Meeting - 1
	7th	Autonomy Courses Selection and Audit for previous semester courses
	8th	Department Advisory Board Meeting
	11th	Department Review Meeting - 1
July 2018	16th	Reopening Day, Course Registration
	17th	Faculty Advisor Meeting - 1 (ICE Breaking Session)
	17th	Guide Allocation - Final Year UG Project
	18th - 19th	I Class Committee Meeting for both UG and PG classes
	18th - 19th	Zeroth Review for final year UG Project
	19th	Guide Allocation - Community Service Project and PG Project Phase - I
	20th	Credit Transfer Policies and Online Courses Awareness Session
	23rd	Zeroth Review for Community Service Project and PG Project Phase - I
	26th	Course Coordinator Meeting - 2
Monthly	Department Review Meeting - 2	
August 2018	21st	First Review for Community Service Project and PG Project Phase - I
	24th-1st	Sessional Examination - I & First Review for Final Year UG Project
	Monthly	Department Review Meeting - 3
September 2018	3rd	Course Coordinator Meeting - 3
	5th-6th	II Class Committee Meeting for both UG and PG classes
	7th	Faculty Advisor Meeting - 2
	15th	Last Date for Paying the Tuition Fees
	22nd	Last Date for Paying the Arrear Exam Fees
	Monthly	Department Review Meeting - 4
	5th-13th	Sessional Examination - II & Second Review for Final Year UG Project
	16th	Last Date for Paying Exam Fees
	22nd	III Class Committee Meeting for both UG and PG classes
	26th	Second Review for Community Service Project and PG Project Phase - I

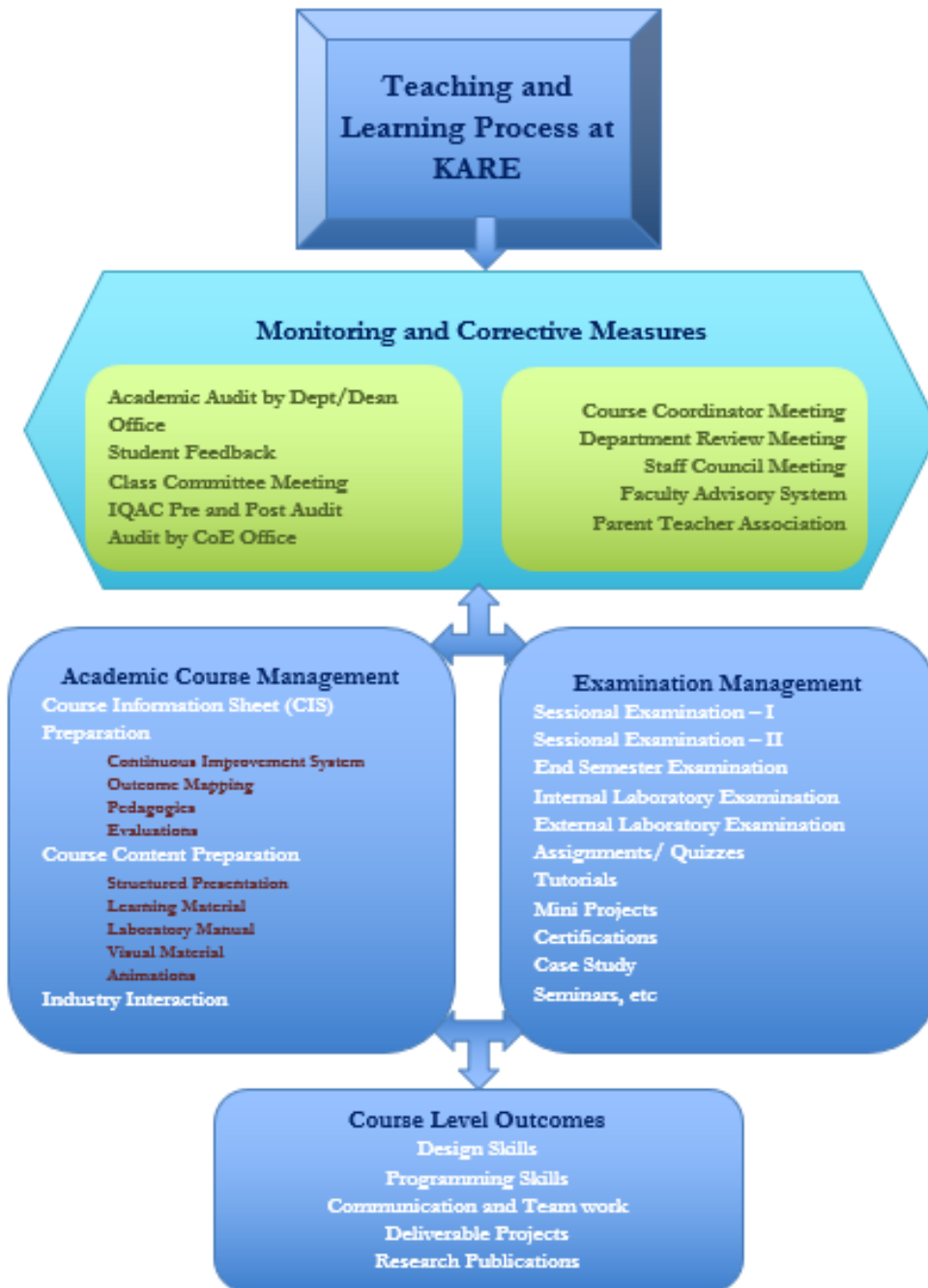
October 2018	26th	Faculty Advisor Meeting - 3
	29th	Compilation of Attendance
	29th	Submission of Non CGPA Results to the Students
	31st-12th	Sessional Examination - III (Except 1st and 2nd Year UG and PG) & Thrid Review for Final Year UG Project
	Monthly	Department Review Meeting - 5
November 2018	14th-18th	End Semester Practical Examinations and Final Review for Community Service Project
	19th	End Semester Theory Examinations and Make up Examinations starts
	23rd	Non CGPA Result Passing Meeting
	23rd-24th	Viva voce for final year UG and PG Projects
	Monthly	Department Review Meeting - 6
December 2018	5th	End Semester Examination Ends
	6th	Make up Examination Ends
	7th	Arrear Examination Starts
	10th	Final Class Committee Meeting
	12th	Grade Approval Committee Meeting
	18th	Arrear Examination Ends
	20th	Result Passing Committee Meeting
	27th	Paper Distribution to the Students and Declaration of Results
	Monthly	Department Review Meeting - 7
	27th	Even Semester Begins
	28th	Course Coordinator Meeting - 4
	29th	Module Coordinator Meeting - 1
	29th	Autonomy Courses Selection and Audit for previous semester courses
30th	Department Advisory Board Meeting	

## (b) Page 2

**Fig 2.2.2 Odd Semester Department Academic Calendar for 2018-19**

Regarding the process of teaching and learning, the methodology shown in Fig. 2.2.3 has been employed by the CSE department for each batch of students. The teaching learning process comprises various modules including academic course management, examination management, outcome visibility and assessment, monitoring, audits and corrective measures.

Academic course management includes activities pertaining to course information sheet preparation, course material preparation (e-content: structured presentation, lecture material, assignments, quizzes, tutorials, laboratory manuals, visual materials, among others) and industry interaction for required courses. Industry interactions are done through student webinars, hackathons, evaluations



**Fig. 2.2.3 Teaching Learning Process at KARE**

Examination management will compose activities pertaining to various assessment techniques with respect to the course category. In addition to the regular courses, some courses are offered in faculty autonomy mode focusing towards the Student Centric Learning (SCL) model of teaching. The autonomy is granted to the faculties handling such courses. In such courses, the assessment techniques can be chosen by the course faculty. A course being offered

in autonomy mode can have its own set of evaluation methods for internal examination. From the list of available evaluation methods (Table 2.2.1), a minimum of five evaluation methods can be selected. The same need to be duly attested by the Course Coordinator as well as the Director, IQAC. The evaluation methods and corresponding pedagogies need to be reflected appropriately in the Course Information Sheet. All these processes will be logged and audited by the Academic and IQAC Offices.

EduKare Attendance Portal at KARE enables faculty to record, manage & compile daily student attendance data. Along with student attendance, this portal also allows faculties to generate accurate student attendance reports.

#### Academic Course Management:

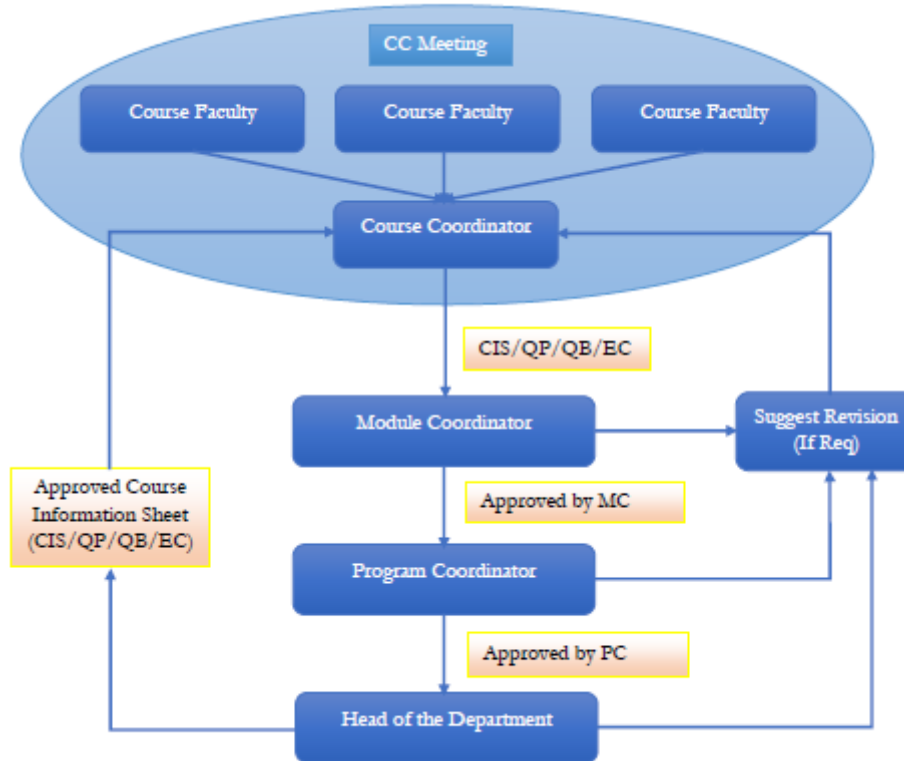
##### Course Information Sheet / Course Plan

Before the commencement of every semester, the course coordinator prepares a Course Information Sheet (CIS), which is formally approved by the module coordinator, program coordinator, and Head of the Department. CIS composes of

- Course Description
- Course Outcomes (COs)
- Mapping of COs with Program Outcomes (POs)
- Program Educational Objectives (PEOs)
- ABET Student Outcomes (SOs)
- Course Syllabus
- Course Instructors
- Course Objectives
- Instruction Methodology
- Text Books and Reference Books
- Web Resources
- Online Courses
- Course related Certifications
- Assessment Methods
- Contents to be dealt out-of-syllabus (if any)
- Journals related to the course (research-oriented courses), among others.
- Various pedagogies pertaining to the course
- Evaluation methods.

The organizational structure of the preparation, approval, release and audit of the CIS/Question Bank (QB), Question Paper (QP), Course Material: E-Content (EC) is depicted in Fig. 2.2.4. The preparation process of the CIS is initiated by the Course Coordinator (CC). CC is typically selected by the Program Coordinator based on the expertise of a faculty in the course. The CC, after initial discussions and meeting with the concerned course handling faculties will prepare the CIS with appropriate decisions on pedagogies, instruction methods, evaluation methods. The initial CC meeting also consists of an agenda to discuss in sufficient detail on the CO-PO/PSO attainment of the course during its previous run and the PO attainment of the prerequisite course (if any). Hence, continuous improvement is ensured. The best practices of the previous run of the course and the visible cons of the previous batch registered for the course and its prerequisite course are analyzed before preparing the CIS.

The prepared CIS will be submitted for the perusal and approval of the Module Coordinator (MC), a senior faculty who has expertise on the module of related courses. MC attestation of the CIS is followed by the approval of the Program Coordinator (PC). The PC ensures that the continuous improvement plans are upright, outcomes with POs, PEOs, SOs are appropriately mapped, evaluation methods are adhered to as per regulations. The PC submits the approved CIS to Head of the Department (HoD) for ratification. The approved CIS is then released to the students for reference and follow-ups. Periodic auditing through DAC, IQAC and academic office are conducted to ensure the implementation of the plans stated in the CIS. The similar procedure is adhered to the preparation of Question Paper, Question Bank and course material E-content preparation also. During questions preparation, quality is visualized by ensuring the adherence of questions pertaining to GATE, competitive exams, placements, Blooms Taxonomy level, outcomes for the appropriate course.



**Fig. 2.2.4. Organization Structure for Course Management**

**B Pedagogical Initiatives:**

Along with regular lecture mode, faculties in the Department of CSE adapts blended learning pedagogical tools like case methods, simulation, role play, group discussions, debates etc., for making the learning interactive and interesting. Student centric methods, such as experiential learning, participative learning and problem-solving methodologies are used for enhancing learning experiences. As part of the course, students are taken to industry visits for exposing them to real time scenarios. In addition, guest lectures are organized by inviting executives from the industry. The following are the various Student Centric methods to enhance Teaching- Learning.

- Explicit Teaching
- Flipped Learning
- Demonstration
- Problem Solving
- Case Study based Learning
- Interactive Instruction

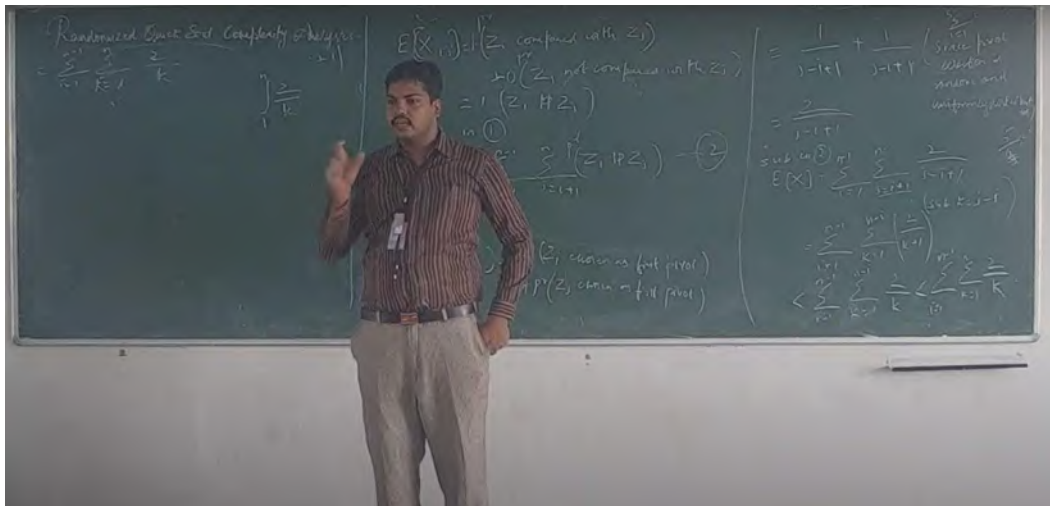


- Independent Study
- Experiential Learning
- Project Based Learning
- Learning Management System (LMS) materials, NPTEL videos
- Virtual lab
- Online Courses – NPTEL Class
- One Credit Courses
- Webinars

The curriculum has inculcated various pedagogies in Teaching and assessment. The detailed explanation of the pedagogies adopted in CSE department is given below:

**i. Explicit Teaching**

Explicit instruction is a purposeful way of overtly teaching students. It means a clear-cut and finite way of teaching that includes both instructional and delivery procedures. Most theory-based courses are being delivered through explicit teaching methods. Fig. 2.2.5 depicts the efficient implementation of explicit teaching in CSE department classrooms, captured by Impartus, the lecture capturing system embedded in the campus.

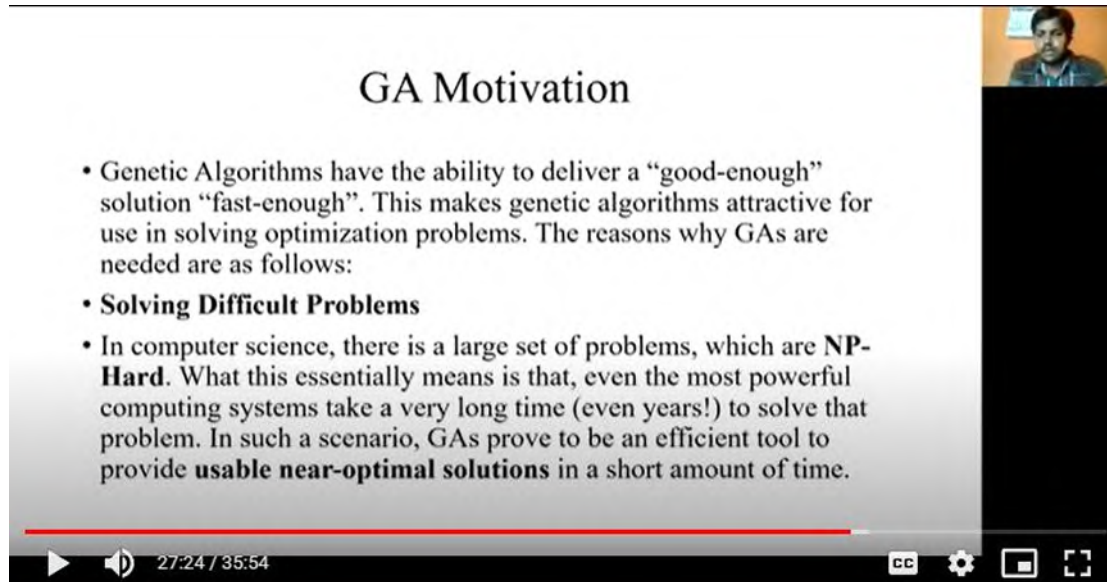


**Fig. 2.2.5. Explicit Teaching of the Course Design and Analysis of Algorithms**

**ii. Flipped Learning**

Flipped Learning aims to increase student engagement and learning by having students complete the necessary readings at home and work on live problem-solving during class time. With a flipped classroom, students watch online lectures, collaborate in online discussions, or carry out research at home, while actively engaging concepts in the classroom, with the Course Teacher's guidance. Fig. 2.2.6 is an example screenshot of implementation of the flipped

learning strategy. The videos from reputed online sites or own recordings will be shared to the students through the Google Classroom/ Drive/ other common communication mediums.



**Fig 2.2.6. Flipped Classroom Video – Genetic Algorithms in CSE18R112:  
Introduction to Artificial Intelligence and Machine Learning**

**iii. Demonstration**

This method is used to communicate an idea with the aid of visuals such as flip charts, posters, power point, etc. A demonstration is the process of teaching someone how to make or do something in a step-by-step process. As we show how, we “tell” what we are doing. A snap of the demonstration session is depicted in fig. 2.2.7.

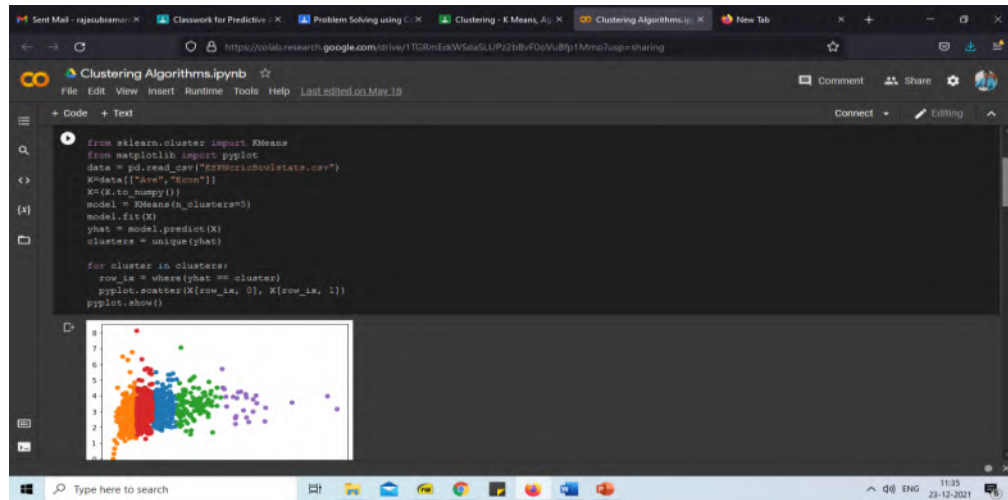


**Fig. 2.2.7. Demonstration – Course: CSE18R174: Computer Architecture and  
Organization**

**iv. Problem Solving**

This method enables the students to learn new knowledge by facing the problems to be solved. The students are expected to observe, understand, analyse, interpret, find solutions, and

perform applications that lead to a holistic understanding of the concept. Fig 2.2.8 depicts an example of the problem-solving strategy implementation.



**Fig. 2.2.8. Problem based learning: Clustering Algorithms in CSE18R212: Machine Learning**

#### v. Case Study based Learning

Case-Based Learning (CBL) is an established approach used across disciplines where students apply their knowledge to real-world scenarios, promoting higher levels of cognition. In CBL, students typically work in groups on case studies. The cases present a problem for which students devise solutions under the guidance of the instructor. Fig 2.2.9 illustrates the case study-based learning outputs achieved by our student in a specific course.

# Encryption & Decryption Using Diffie Hellman Algorithm

## INDUSTRIAL BASED PROJECT REPORT

*Submitted by*

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*In partial fulfillment for the award of the degree*

*of*

**BACHELOR OF TECHNOLOGY**

IN

**Computer Science And Engineering**



### CHAPTER 3

#### Secrecy Chat Report

Alice		Bob		Eve	
Known	Unknown	Known	Unknown	Known	Unknown
$p = 23$		$p = 23$		$p = 23$	
$g = 5$		$g = 5$		$g = 5$	
$a = 6$	$b$	$b = 15$	$a$		$a, b$
$A = 5^a \text{ mod } 23$		$B = 5^b \text{ mod } 23$			
$A = 5^6 \text{ mod } 23 = 8$		$B = 5^{15} \text{ mod } 23 = 19$			
$B = 19$		$A = 8$		$A = 8, B = 19$	
$s = B^a \text{ mod } 23$		$s = A^b \text{ mod } 23$			
$s = 19^6 \text{ mod } 23 = 2$		$s = 8^{15} \text{ mod } 23 = 2$			$s$

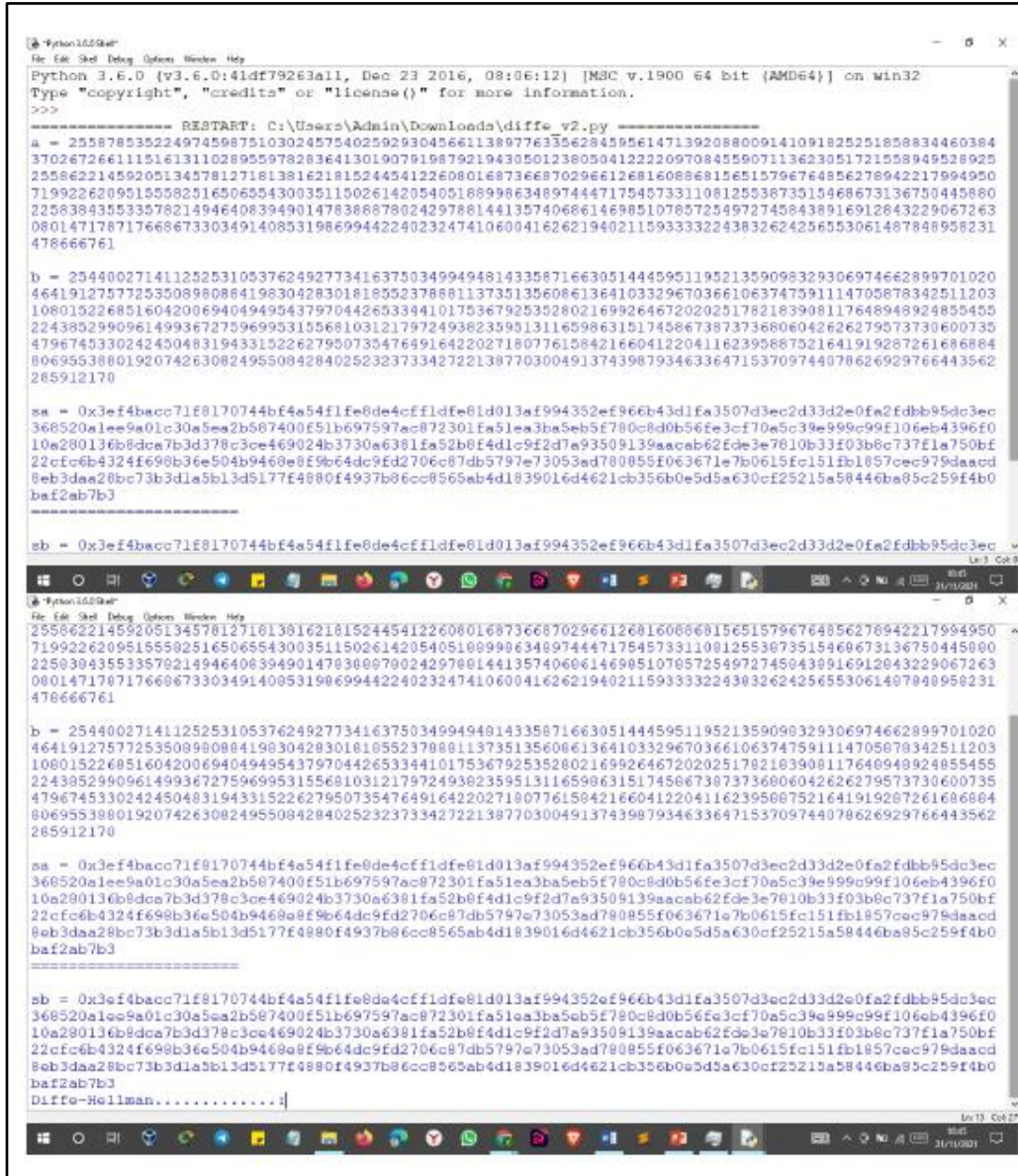
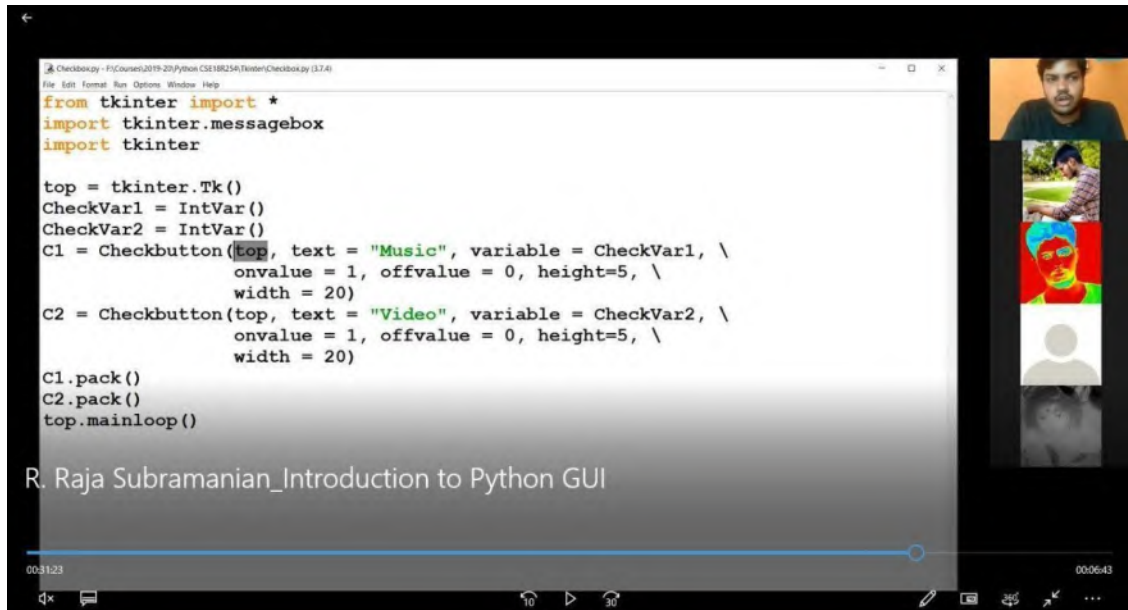


Fig. 2.2.9. Case Study Based Learning: Computer Networks

vi. Interactive Instruction

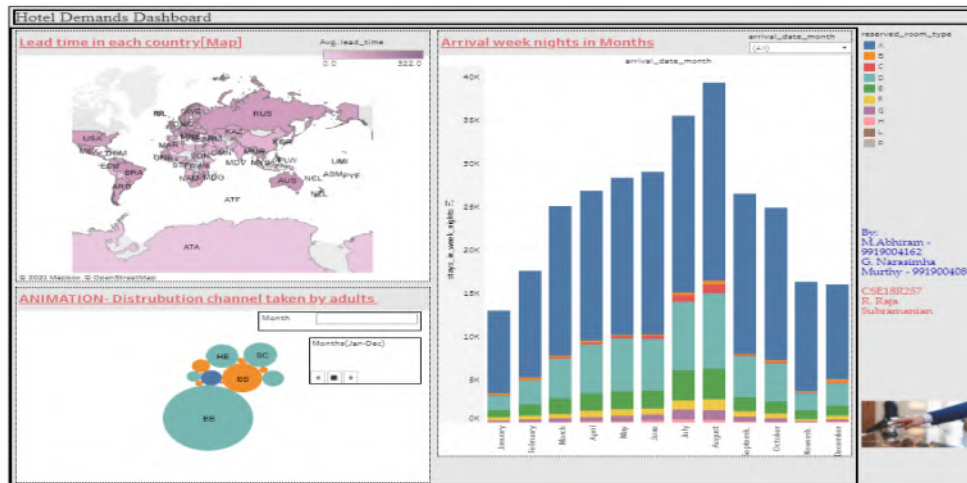
This method increases the student participation in the class. The teacher uses the questions that stimulate response, discussion, and hands-on experience. The teaching aids are designed in such a way that it impresses the students to answer and capture the student’s attention. Virtual labs are one example for interactive instruction. Fig. 2.2.10 shows the screenshot of an interactive instruction session carried out by our faculty member for a course named “Python Programming”.



**Fig. 2.2.10. Interactive instruction: Python Programming**

**vii. Independent Study**

The independent study method makes the students responsible for their own learning. The method obliges students to inquire into a subject and often to integrate knowledge from different disciplines. They develop research skills by having to select, collect, and present information. The students have to pursue following curricular components which require them to expand the boundaries of learning and exercise self-learning. These components include major project, minor project, seminar, group discussions and assignments that require the knowledge of software tools. Fig 2.2.11 shows an example of the assignment submitted by a student as part of the course CSE18R112 / Introduction to Artificial Intelligence and Machine Learning.



**Fig. 2.2.11. Assignment submitted by a student as an outcome of independent study in CSE18R112: Introduction to Artificial Intelligence and Machine Learning**

### viii. Experiential Learning

Experiential learning is an engaged learning process whereby students follow “learn by doing” and by reflecting on the experience. Experiential learning activities can include, but are not limited to, hands-on laboratory experiments, internships, and practicums. Well-planned, supervised and assessed experiential learning programs can stimulate academic inquiry by promoting interdisciplinary learning, civic engagement, career development, cultural awareness, leadership, and other professional and intellectual skills. Throughout the experiential learning process, the learner is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative, and constructing meaning, and is challenged to take initiative, make decisions and be accountable for results.

### ix. Project Based Learning (PBL)

It is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge. Students are encouraged to solve the real time problems using the skills acquired from the particular course (or) topic. Fig. 2.2.12 shows the papers published by the students and the concerned faculty as part of this process.

The screenshot shows a web browser displaying the IEEE Xplore abstract page for a paper titled "Skin cancer classification using Convolutional neural networks". The page includes the IEEE Xplore logo, navigation links, and a search bar. The abstract text is visible, along with a list of authors and a "More Like This" section.

**Abstract:**

There is a necessary need for early detection of skin cancer and can prevent further spread in some cases of skin cancers, such as melanoma and focal cell carcinoma. Anyhow there are several factors that have bad impacts on the detection accuracy. In Recent times, the use of image processing and machine vision in the field of healthcare and medical applications is increasing at a greater phase. In this paper, we are using the Convolution neural networks to detect and classify the class of cancer based on historical data of clinical images using CNN. Some of our objectives through this research are .to build a CNN model to detect skin cancer with an accuracy of >80% .to keep the false negativity rate in the prediction to below 10%.to reach

**Document Sections:**

- I. Introduction
- II. Convolution Neural Networks
- III. WorkFlow

**More Like This:**

The melanoma skin cancer detection and classification using support vector machine  
2017 IEEE Jordan Conference on Applied Electrical Engineering and Computing Technologies  
Published: 2017

(a) Research Paper 1

The screenshot shows the IEEE Xplore website interface. The browser address bar displays the URL: [ieeexplore.ieee.org/abstract/document/9377136](http://ieeexplore.ieee.org/abstract/document/9377136). The page title is "A Survey on Sentiment Analysis". The publisher is listed as IEEE. The authors are R Raja Subramanian, Nukala Akshith, Gogula Narasimha Murthy, Manchala Vikas, Srikar Amara, and Kamam Balaji. The paper has 3 citations and 239 full-text views. The abstract text is: "Sentiment analysis is one of the recent technologies under NLP (an application of AI and ML). Sentiment analysis is used in many applications for recommendation and feedback analysis. In this paper, from defining the sentiment analysis to algorithms for sentiment analysis and from the first step of sentiment analysis to evaluating the predictions of sentiment classifiers, additional feature extractions to boost performance are discussed with practical results. A brief description of complex sequence-based Neural Network sentiment classifiers with reasonable analytics is provided. The practical results declared in this paper are from the implantation of sentiment analysis on the IMDB movie reviews dataset. Evaluation metrics such as".

### (b) Research Paper 2

**Fig 2.2.12. Paper published as a result of Project pursued in Predictive Analytics Course executed in PBL Mode**

### Teaching Learning Process with PBL at KARE-CSE

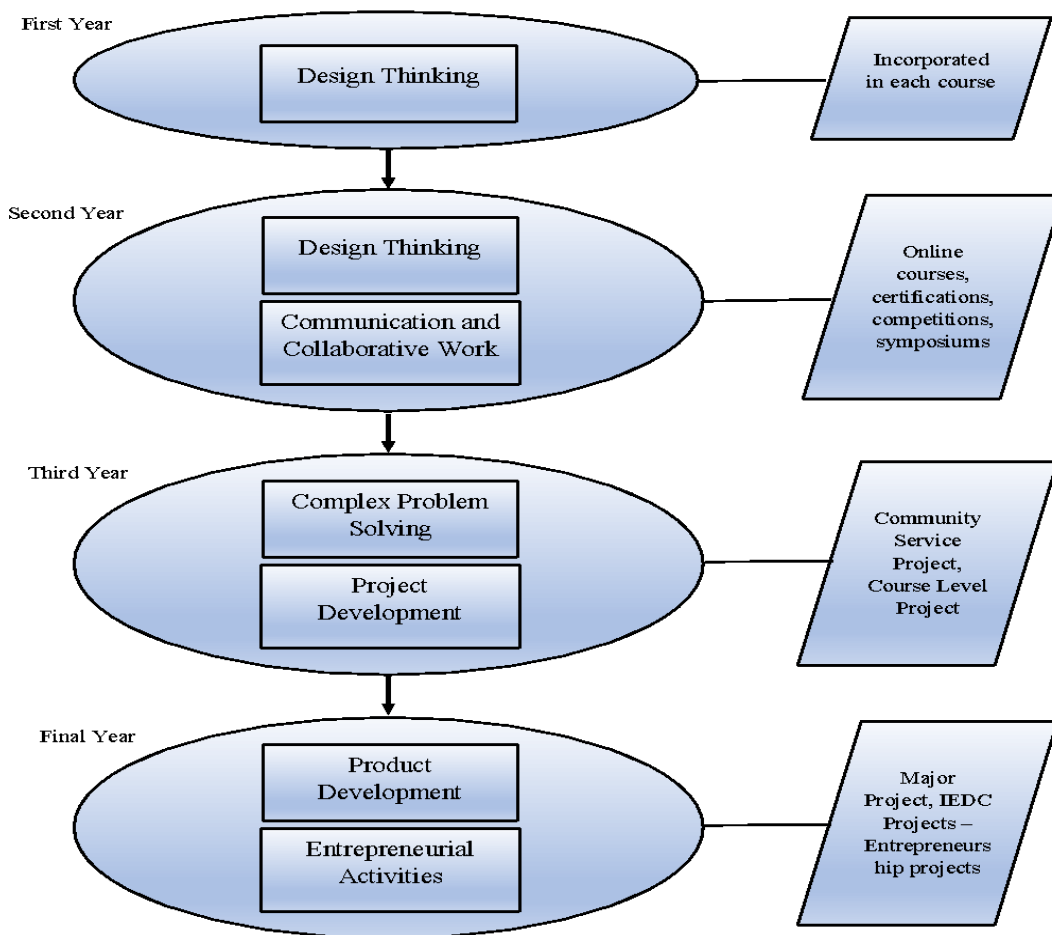
The meaning of the PBL grows from first year engineers to final year engineers as problem-based to project-based. During the final semester also, students can manipulate problems at a higher level of difficulty with a skill to implement the solution of the problem as a project. PBL assists students to gain skills at all levels progressively. In each semester, students acquire knowledge on various technologies and concepts. Thus, the level of PBL moves from narrow to broad side as the students complete each semester. KARE-SCL is a model defined and followed in KARE in various engineering courses. In the subsequent year, the skill sets mandated for the students are self-learning, communication and teamwork. The preliminary requirement for students to take part in PBL is the self-learning capability. Students approaching a complex problem can formulate it, identify the underlying challenges and strategies to solve the same through design thinking ability. Fig. 2.2.13 shows the KARE-SCL Model for imparting Project Based Learning in Engineering.

Once the learners start to solve or implement the design, they require new technologies and identification of various techniques. Techniques and algorithms can be improved through sophisticated brainstorming sessions in teams.



A proper technical communication and collaborative work is required for successful brainstorming sessions. Online courses from esteemed web sites are rich in state-of-the-art technologies. Many content-out-of-syllabus topics can be learnt by students through online courses. Mandating online course certification imposes self-learning in students. Online forums, group participation in competitions, conferences and symposiums develops communication and team work skills in students.

Having mastered the above skills in the early two years of the engineering program, prepares students to solve complex problems and develop projects. Assignments, open-book tests, model designs can include questions focusing on complex problems. Students with design, apply and analysis skills will be the strong stakeholder of a typical team project. KARE curriculum includes four credits for Community Service Project (CSP) in the third year. The project is carried out in two sessions. Session 1 comprises field visits to identify the societal problem and necessary survey of state-of-the-art techniques to solve the problem. In this period, the project design is implemented and deliverable is completed.



**Fig. 2.2.13. KARE-SCL Model for imparting Project Based Learning in Engineering**

Students are scaffolded to copyright, publish, commercialize and extend the project works. With the varied skills and having done the CSP project, the students will have complete knowledge in undertaking an industrial project through internship or a real time project in college during final semester. Minimum of one course in each semester is offered to correlate with SCL schemes and operate with PBL pedagogies.

Such courses are usually offered in autonomy mode, where subject experts are provided autonomy in teaching and evaluation. The faculty members have the flexibility to choose various evaluation methods which are shown in Table 2.2.1 for their courses. The evaluation scheme suiting their pedagogy and that supporting their SCL strategy can be used. Minimum of 5 evaluation methods out of the 12 available methods should be chosen and get the same duly approved by the Mentor and Director IQAC, before it is made operational for the course. Audits will be conducted from the office of IQAC for the smooth conduct of such courses and to evaluate the outcomes of the course.

**Table 2.2.1 Evaluation Methods for Autonomy Courses**

S.No.	Evaluation Method	Description
1.	Assignment	<ol style="list-style-type: none"> <li>At least 3 individual assignments are to be given in the entire course.</li> <li>Assignments should cover higher order Blooms Taxonomy cognitive levels and should not be based on simply copying from published texts.</li> </ol>
2.	Quizzes (incl online quiz)	<ol style="list-style-type: none"> <li>Should be designed to test the basic fundamentals in a topic. At Least 25 questions should be there in each quiz.</li> <li>Preferably, and where applicable, GATE and/or other competitive exam standards has to be maintained.</li> </ol>
3.	Mini projects	<ol style="list-style-type: none"> <li>Projects are given to teams (maximum 4 students per team)</li> <li>The projects should have well defined and achievable objectives.</li> <li>Projects have to be carried out by the students outside the regular working hours.</li> <li>Evaluation of the report will be for the batch, but viva voce and seminar (if any) will be for the individual student.</li> </ol>

4.	Experiment based evaluation	<ol style="list-style-type: none"> <li>1. Individual students should be evaluated for his/her ability to design and conduct experiments and report the findings.</li> <li>2. More weightage should be given for the analysis of the result.</li> </ol>
5.	Model design/development	<ol style="list-style-type: none"> <li>1. Individual students should be involved in the design and development of the model.</li> <li>2. Model making should involve some engineering component (in terms of analysis or its functioning) and should not merely be a model done at school level.</li> </ol>
6.	Field studies report/case	<ol style="list-style-type: none"> <li>1. Students are formed as teams with a maximum two per team.</li> <li>2. The student should be able to develop a full case study or analyze a given case based on the technical code books and other references as necessary. Generic report writings should not be encouraged.</li> </ol>
7.	Research articles-based evaluation	<ol style="list-style-type: none"> <li>1. Will be given as an individual student exercise.</li> <li>2. Reference articles should be searched from standard journals such as Elsevier/Springer etc.</li> <li>3. The objectives should be clearly defined on what is the intended outcome of the research articles study.</li> </ol>
8.	Seminars	<ol style="list-style-type: none"> <li>1. Individual student seminar.</li> <li>2. Seminar topics should be well planned, and the presentation should contain all the technical components including literature review, any methodology, analysis methods and specific conclusions.</li> </ol>
9.	Open book test	<ol style="list-style-type: none"> <li>1. Questions framed should not be directly from one or more published text books – either as solved or unsolved examples.</li> <li>2. The faculty must design the question himself, and preferably based on real time case studies.</li> </ol>
10.	Peer evaluation	<ol style="list-style-type: none"> <li>1. Only a minimal weightage upto 5 marks is permitted.</li> <li>2. The students participating in peer evaluation should be given clear guidelines for evaluation.</li> </ol>
11.	Evaluation by industry persons	<ol style="list-style-type: none"> <li>1. Industry persons can be invited to offer a real time industry problem and evaluate the students' performance.</li> <li>2. It can also include interviews by the industry persons.</li> </ol>
12.	Sessional exams/ESE	<ol style="list-style-type: none"> <li>1. 50 marks are allocated for the end semester exam but the question pattern is left to the choice of the course teacher.</li> <li>2. Sessional exams may or may not be conducted as a part of internal evaluation.</li> </ol>

**Indo Universal Collaboration for Engineering Education (IUCEE) KARE Student Chapter (IKSC)**

KARE became an IUCEE consortium member in the year 2018. IKSC is a vibrant student chapter that tries to empower the professional and employability skills of KARE students. Being part of the IUCEE Consortium, IKSC student members will have opportunities to participate in the courses, activities, conferences, symposiums, webinars, etc organized by IUCEE. Besides this, IKSC conducts activities (Technical & Non – Technical), Campaigns, Podcasts, Webinars, etc for the student members to meet the vision, mission, and core values of the chapter. Along with the skills required for a graduate, IKSC fosters the interdisciplinary knowledge of the student members.

Currently, the students are participating in the mini courses for engineering students conducted by IUCEE as part of IUCEE NEP Mission 2021. Each year, at most 10 students (maximum capacity) are selected. It is known that Project Based Learning is the foundation to become employable, a leader, and an entrepreneur. And it is the reason, the National Educational Policy (NEP) has emphasized the need for “Holistic and Multidisciplinary Education”. The six mini-courses taught by IUCEE Global Experts are given below:

- Leadership and Sustainability
- Clean and Green Campus
- Artificial Intelligence for All
- Introduction to Entrepreneurial Thinking
- Design Thinking and Community-Based Design
- Social-Emotional Learning

Each course has an objective for improving students’ skills and interdisciplinary knowledge through projects, etc. For these courses, teams are formed by the students from disciplines and they work together in completing the requirements of the course including the project as a team.

**C Methodologies to support Slow Learners and encourage Advanced Learners:**

The teaching learning process at KARE inculcates a continuous assessment system for any course. The course handling faculty assess the performance of each student and report the same to the faculty advisor of the concerned student. students are clustered in three tiers, based on their performances in examinations, as slow achievers, average learners, and fast learners.

The faculty advisors regularly conduct meetings regarding progress of their mentees and are responsible to identify students who scored less than 50% marks in their internals. The students securing less than 50% in the assessment of any course are considered as slow achievers. Student scoring in the range 50 – 75% are clustered in average learner's criteria. Fast learners are those who score more than 75% in the examinations. The methodologies followed to support various tiers of students are shown in Fig. 2.2.14. The connotation of academically slow learners means those who could not keep pace with the classroom teaching and needs extra attention so as to bring them at par with the rest of the class. Slow learners are identified based on their performance semester examinations as well as the current semester internal examinations.

Slow Achievers are motivated and trained through remedial classes, where the course handling faculty covers the portions in the pace suitable for the respective students. The course content is divided into manageable chunks in such a way that it makes the students learning the contents easier. Further wherever possible, practical examples are given to the students so that they can relate the theoretical content with the practical applications. In addition, course faculty provides subjective notes and tutorials to those students. Thus, the students strive to get better in the subsequent assessments. Such students are also given regular class tests in order to improve their performance in the internal as well as end semester exam. Further faculty members revise the tough topics as per the students' requisition. Extra classes during evening time are organized to clarify doubts. Critical topics are re-explained for better understanding by the students. Appropriate counseling with additional teaching is done which eventually results in students attending the classes regularly.

Average learners are motivated through online courses, individual assignments and brainstorming sessions. Brainstorming sessions allow a typical average learner to communicate well with a fast learner on a technological topic. This in turn will lead to a transformation of an average learner to a fast learner.

Fast learners are addressed through advanced online courses, certifications, one-credit courses from industry, honours courses, mini projects and research. These students are trained in such a way to enhance their technological knowledge over the discipline. Deliverable outcomes are visualized through their projects and research publications. Such students are further encouraged to actively participate in various social coding events to showcase their capabilities and thereby getting various career related opportunities.

Fig. 2.2.15 shows the sample achievements of some fast learner students such as silver and gold badges for tasks such as Problem Solving and Python Programming in HackerRank platform, where recruiters can identify the best talent, and make great hiring decisions in an efficient and cost-effective manner.

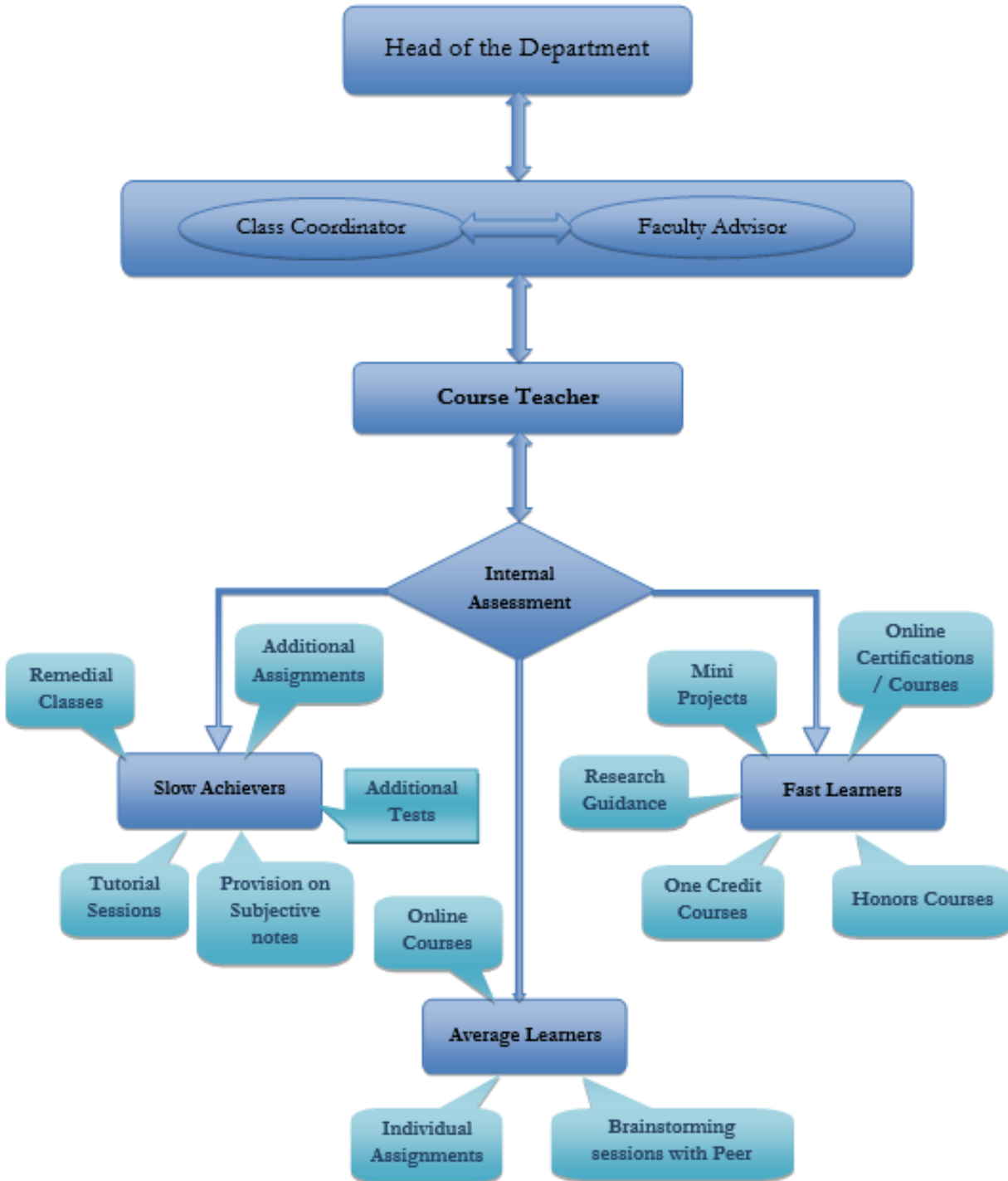
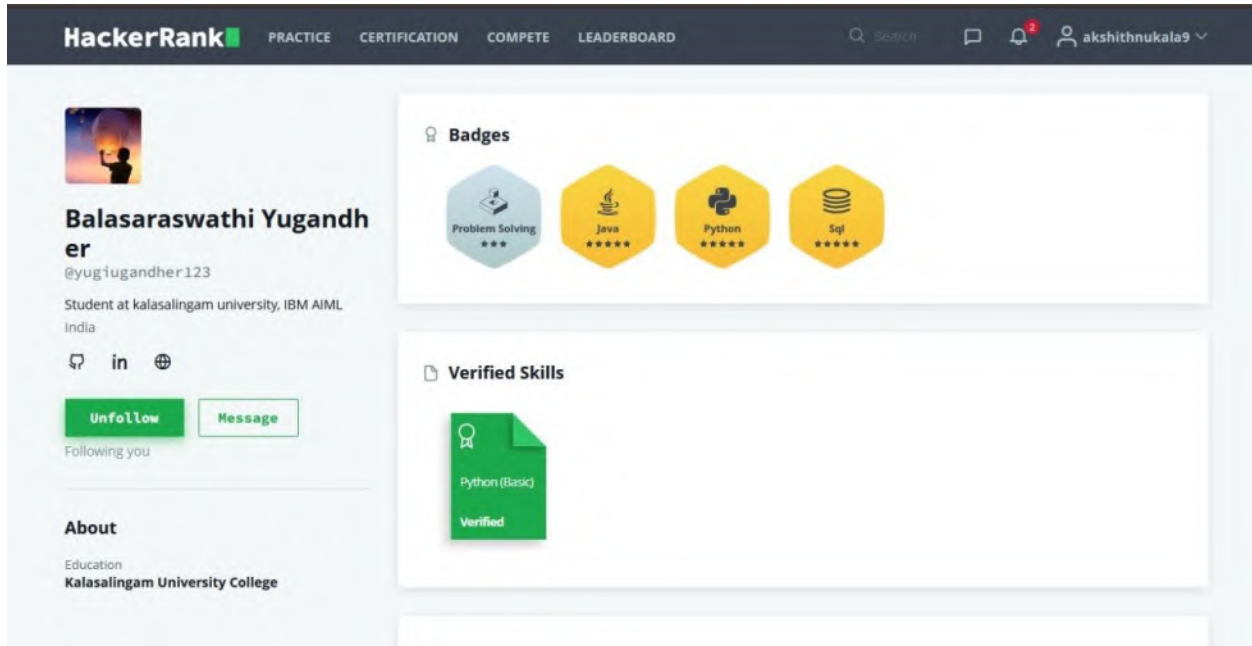
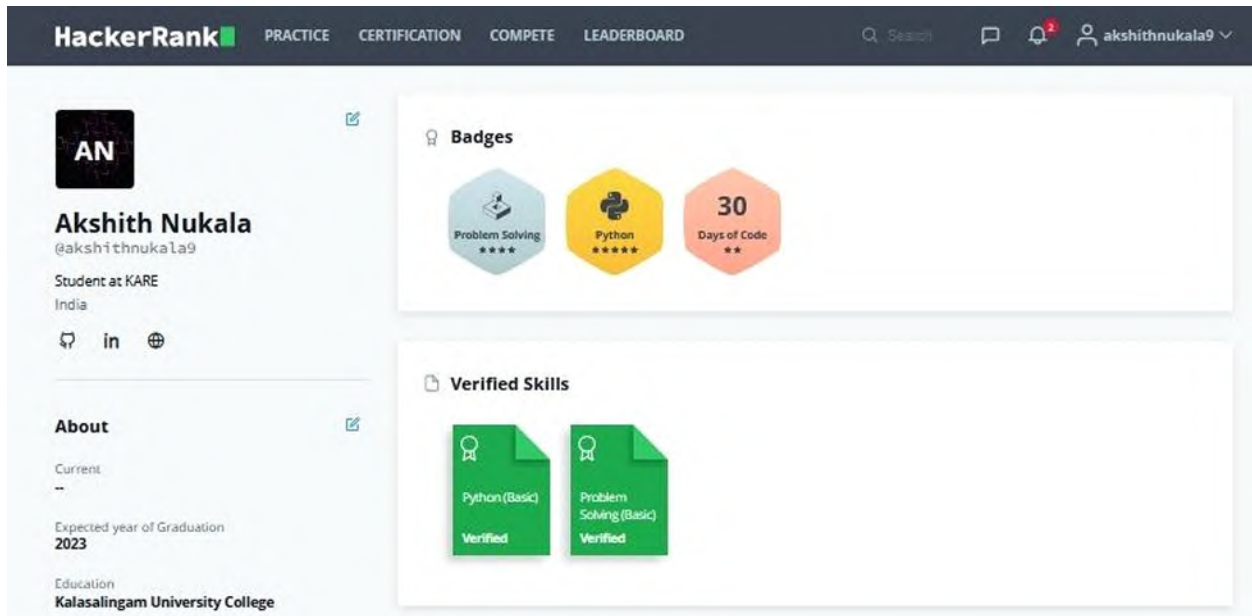


Fig. 2.2.14. Methodologies to Support Slow Achievers, Average Learners and Fast Learners



(a) Student with Gold Badge in Java, Python, SQL at Hackerrank



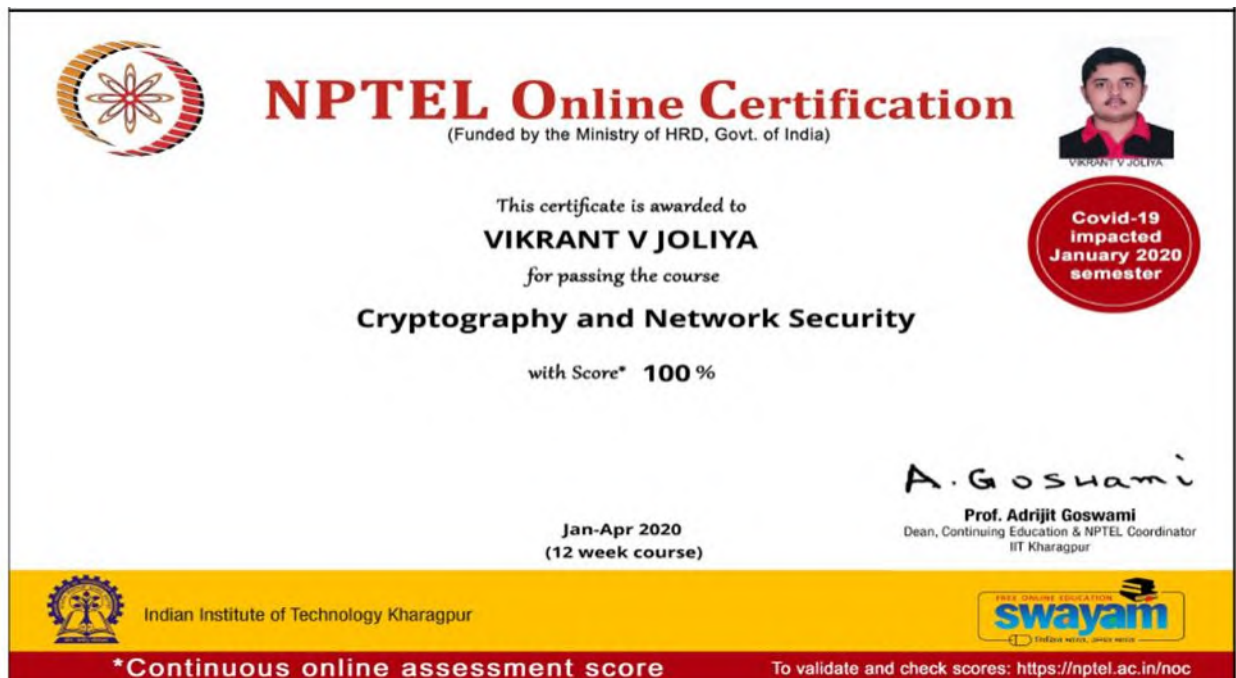
(b) Student with Gold Badge in Python at Hackerrank

Fig. 2.2.15. Achievement of Fast Learner Students in HackerRank - Sample

### Online MOOC Courses

The students are permitted to do courses in online platforms like NPTEL, CoursEra, Edx, etc for the credit replacement of elective courses. A maximum 20% of total credits can be earned by the students through online courses as prescribed by AICTE. Online courses from NPTEL, Coursera, Edx, Udemy, etc are also suggested to the students as part of assignments, X-component, self-learning to inculcate state-of-the-art knowledge on tools and technologies.

In every semester, substantial faculties and students take up courses in NPTEL and other online platforms. Such courses enhance faculty knowledge over the course/domain and students' skills pertaining to the course/domain. The sample certificates of students who have completed online courses are given in Fig. 2.2.16.



**Fig. 2.2.16a. NPTEL Certification on “Cryptography and Network Security” by a Student**



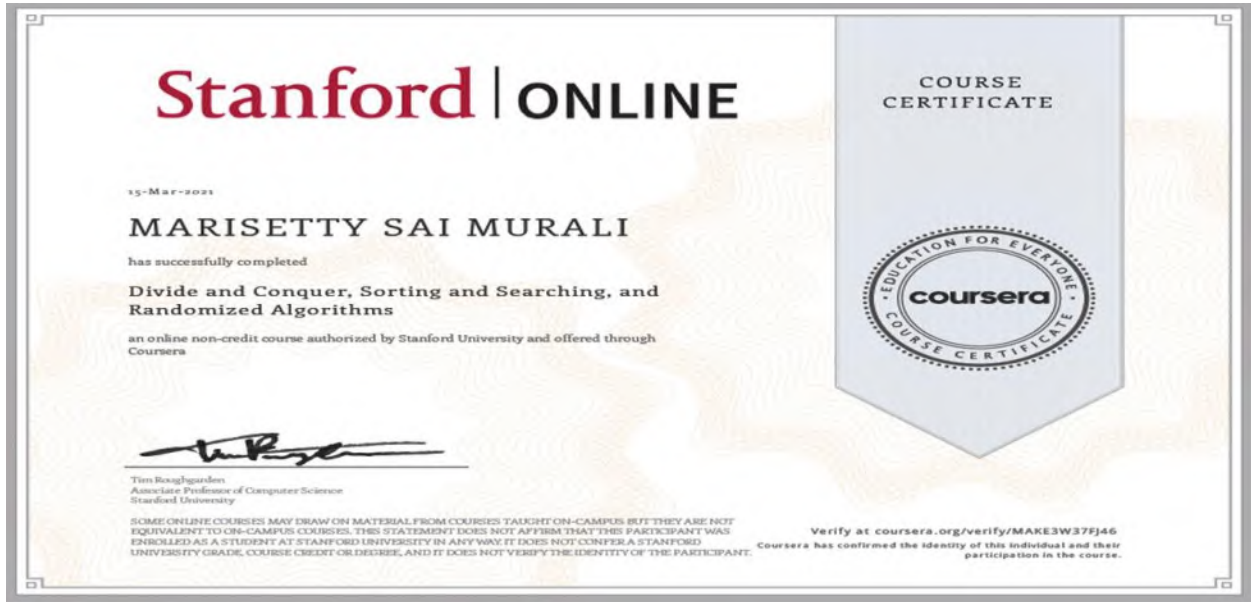
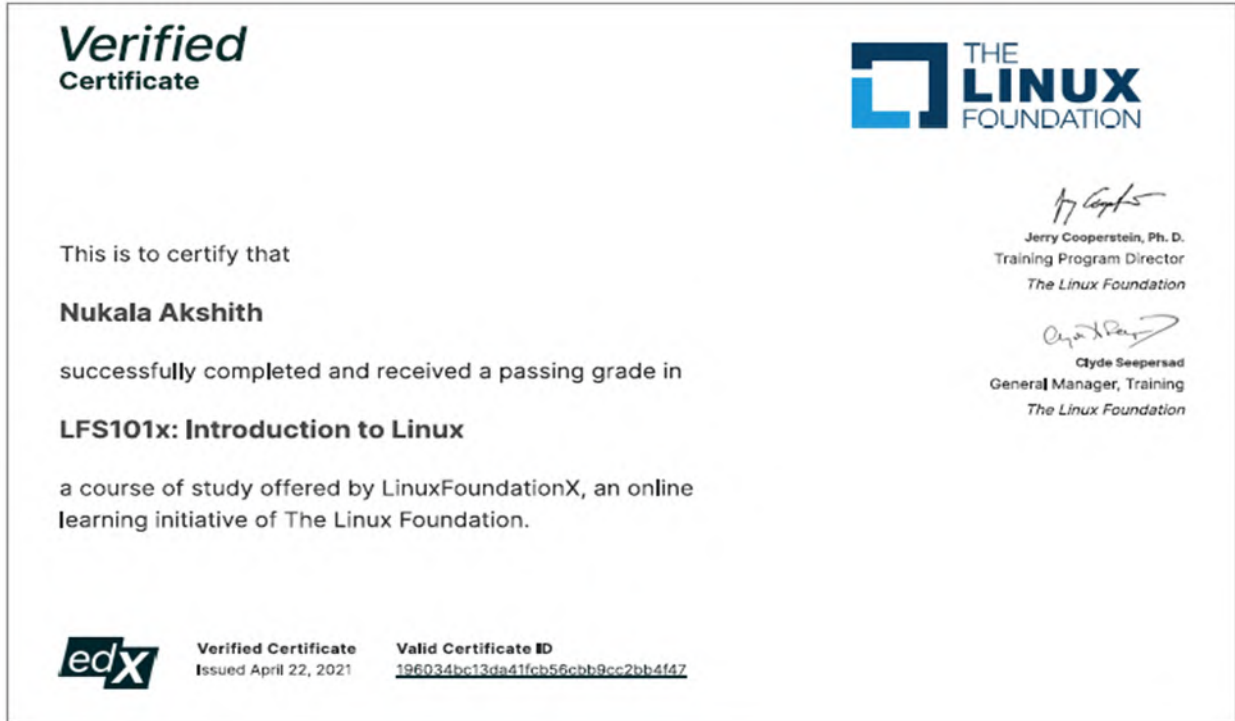


Fig. 2.2.16b. Coursera Certification on “Divide and Conquer, Searching and Sorting and Randomized Algorithms”, completed by a student as part of CSE18R173 Design and Analysis of Algorithms course



**Fig. 2.2.16c. UdeMy Certification on “Decision Trees, Random Forest, AdaBoost & XGBoost in Python”, completed by a student as part of CSE18R212 Machine Learning Course**



**Fig. 2.2.16d. EdX Certification on “Introduction to Linux” by a student**

### **Courses offered by Industry Experts**

Courses offered by Industry Experts are typically offered as one-credit courses to fulfill the thirst of fast learners in studying state-of-the-art technologies apart from curricular courses. A one credit course is typically offered as a 15-hour course. The course is open only for the fast learners. Experienced industrial experts are invited to conduct the course. The course syllabus is ensured to be beyond the program curriculum and with industry standards. Students can study a maximum of six one credit courses during their period of study. The one-credit courses can also be used for credit transfer, replacing professional elective courses with an appropriate number of credits. The syllabus is set by the industry expert and the same is approved in the BoS. The entire evaluation is carried out by the industry expert. The sample proof is shown in Fig. 2.2.17.

Name of the Code / Course: CSEX008 - Data Science with R

Dates : 14/09/2019, 15/09/2019, 27/09/2019 and 19/10/2019

Resource Person: Mr.Parthasarathy and Mr.S.Pradeep Kumar, Technical Specialist, Honeywell, Madurai



**Fig. 2.2.17. One Credit Course by Industry Experts**

### **Webinars**

Courses include a conduct of webinar from an industry expert as a pedagogical technique to inculcate industrial technology related to the course or to provide industry-oriented knowledge for the particular topic of the course. Sample proof of a webinar, brochure and certificate are shown in Fig. 2.2.18 (a-c).

**KALASALINGAM**  
ACADEMY OF RESEARCH AND EDUCATION  
(DEEMED TO BE UNIVERSITY)  
(Established in 1983 and 1988 Accredited by AICTE with 'A' Grade)

**SCHOOL OF COMPUTING**  
DEPARTMENT OF  
COMPUTER SCIENCE AND ENGINEERING  
Tech Talk Programme  
on  
Recent Trend in Artificial Intelligence  
Technologies

Registration Link:  
<https://rb.gy/ky1tjm>

Date & Time:  
25 July 2020  
11AM to 12PM

Alumini:  
Mr. Sudharshan  
Assistant System Engineer  
TCS-Chennai  
Batch (2015-2019)

SCAN ME

E-Certificates will be provided  
for all the participants

Meeting Link:  
<https://meet.google.com/ozi-inut-iip>

Dean/SOC  
**Dr.P.Deepalakshmi**

HoD/CSE  
**Dr.A.Francis Saviour  
Devaraj**

Coordinator  
**Dr.B.Pitchaimanickam  
Dr.G.Murugaboopathi**

(a) Brochure



(b) Webinar Snip



(c) Certificate

Fig. 2.2.18. Webinar on Artificial Intelligence Technologies

#### D. Quality of Classroom Teaching (Observation in a Class)

Conducive learning ambiances in the classrooms are maintained through comfort seating arrangements, good ventilation with proper lighting. The faculty adopts various innovative practices to create and improve instruction methods using pedagogical initiatives such as real examples, collaborative learning for students. These methodologies include traditional chalk & talk methods and various ICT Tools. Collaborative learning methods are used where every concept is explained with real world problems and illustrations. The Dean and Head of Department regularly visit classes to observe the teaching process and convey their suggestions and appreciations to the faculty members. Fig. 2.2.19. shows the snap of classroom ambience. Each classroom is equipped with Projectors, Screens, Board, Impartus Lecture Capture facilities, Notice boards, Boards disseminating POs, PEOs and PSOs.

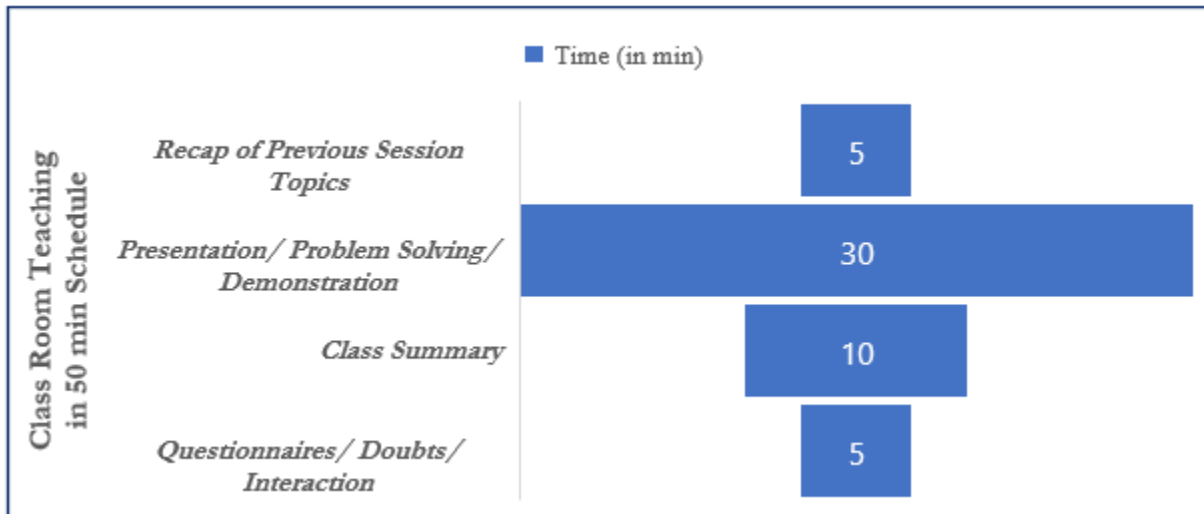


Fig. 2.2.19. Classroom ambience

The time table schedule for one of the courses “CSE18R173 - Design and Analysis of Algorithms” is depicted in fig. 2.2.20. The course consists of 3 theory hours and 2 practical hours as per the curriculum LTPC. In addition, the course is offered with X Component to inculcate advanced knowledge in terms of Competitive Coding. For this, an additional 2 hours is allotted for the course. In X Component, students are assigned with programming assignments, coding challenges in sites like Hackerrank, Project Euler. Students will be monitored and assessed based on their performance in Hackerrank and Programming Assignments. Each course chosen to offer in X Component mode will inculcate an additional art related to the course and useful for the student. A typical breakdown of an hour of class is depicted in fig. 2.2.21. Each hour begins with the review of topics discussed in the previous sessions, followed by the presentation/ problem solving of the new topic. Various pedagogies and innovative techniques are followed to keep the students engaged and active during the session. Each class ends with the mandatory summary session of the topics discussed, followed by a questionnaire/ interaction session. Periodical assessments in terms of quizzes, discussions on GATE questions of related courses, discussions on certifications available on top of the corresponding course are conducted. This makes the student comprehend the topics outside the book/syllabus and be prepared for public examinations/ certifications/ competitions/ viva voce.

Time Table Slots - CSE18R173 Design and Analysis of Algorithms - Section A								
	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8
Monday		Theory						
Tuesday	Theory							
Wednesday					Theory			
Thursday					X Component			
Friday			Practical					

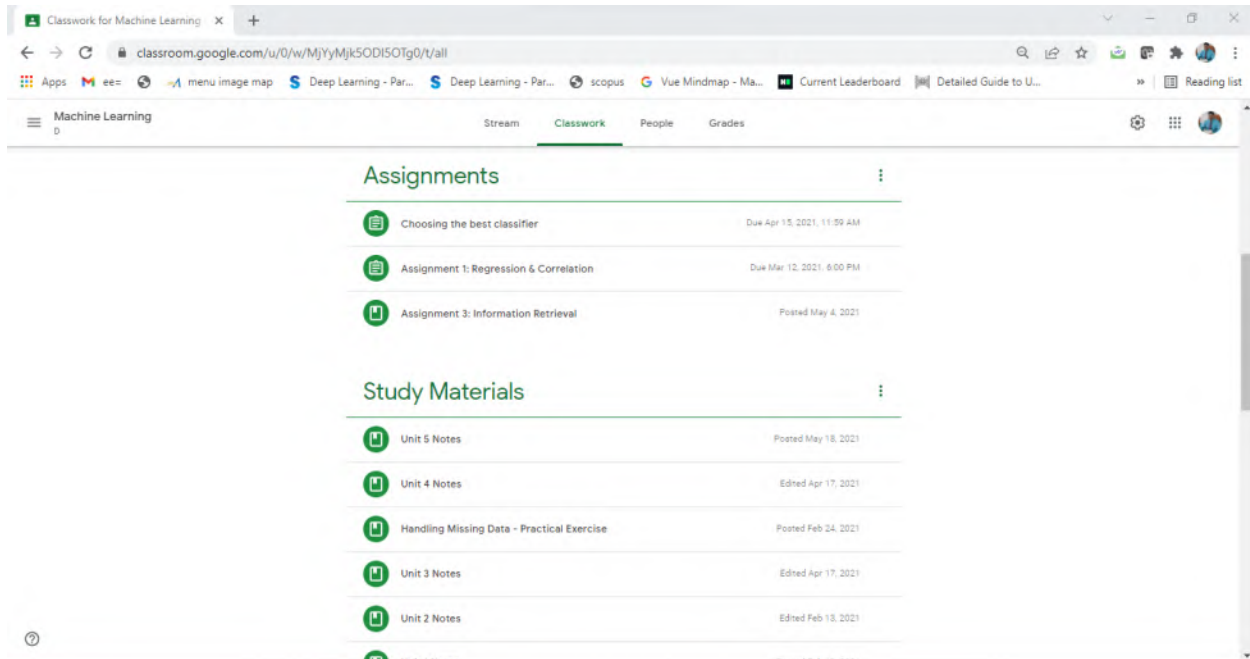
**Fig. 2.2.20. Time Table Slots for Design and Analysis of Algorithms (CSE18R173) Course**



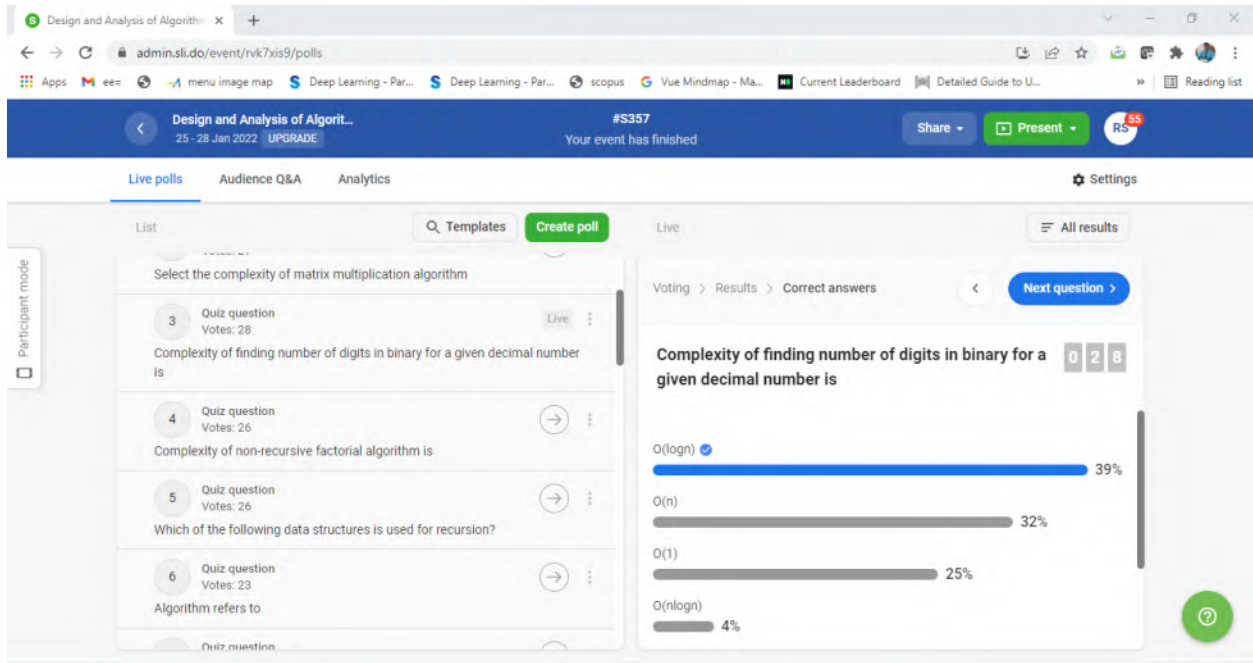
**Fig. 2.2.21. Classroom Teaching in 50 min Schedule**

### Learning Management System (LMS)

The Department of CSE at KARE makes it a mandatory process to provide all learning materials, structured presentations, visual materials, course information sheets, and evaluation methods to the students during the day 1 of the course. The materials are delivered through various LMS platforms including Google Classroom, Institute LMS, Impartus, among others.

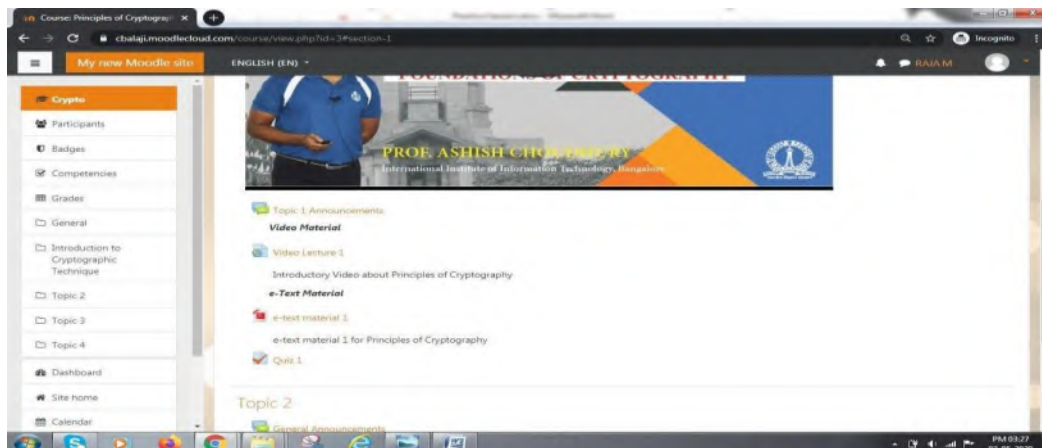


**Fig. 2.2.22. LMS – Google Classroom**



**Fig. 2.2.23. Quiz Assessment for CSE18R173 - Design and Analysis of Algorithms Course**

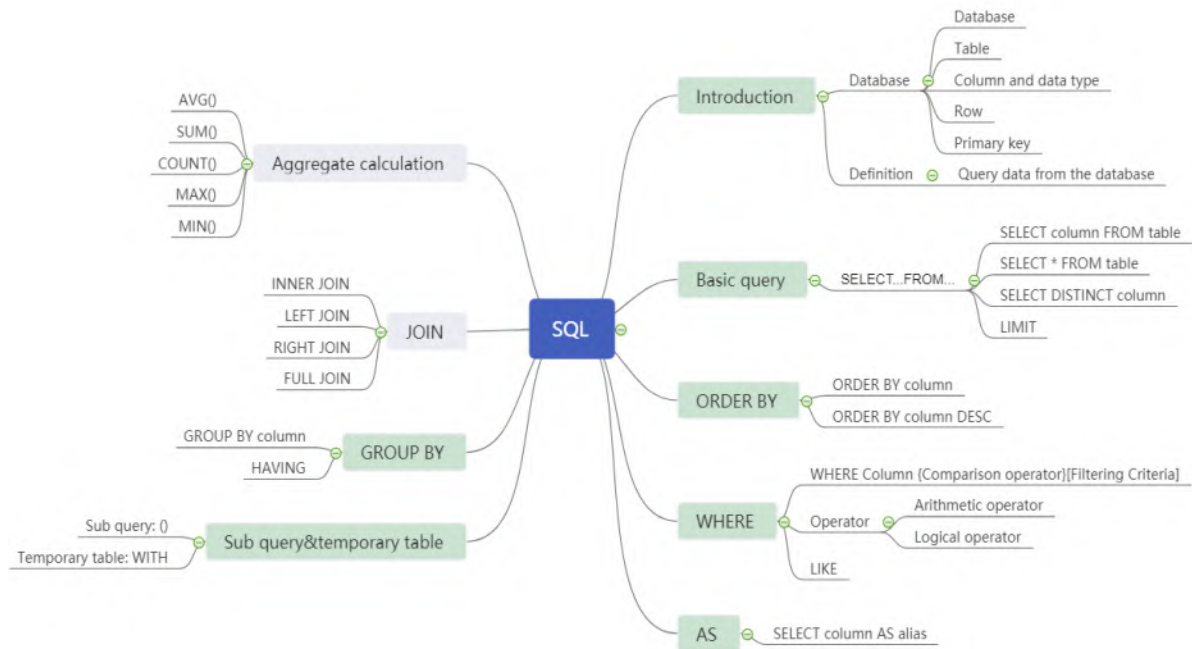
Fig. 2.2.22 shows the screenshot of Google Classroom for the course Machine Learning offered in CBCS mode. In addition, interactive classes are conducted through quizzing platforms like Slido, MyQuiz, Google forms. Fig. 2.2.23 shows the screenshot of an online quiz conducted. In addition to traditional assignments and tutorials, innovative tasks like Hackerrank Coding Challenge related to programming, data structures, design and analysis of algorithms, data visualization - dashboard creation are included in the assessment part under assignments. The department also uses Moodle, which is a free and open-source learning management system used for blended learning, distance education, flipped classroom and other content delivery is shown in Fig. 2.2.24.



**Fig. 2.2.24. LMS Module – Moodle**



The faculties in the department of CSE also use Mind Mapping tool, a useful technique that supports learning, improves information recording, shows how different facts and ideas are related, and enhances creative problem solving. Fig. 2.2.25 shows an example screenshot.



**Fig. 2.2.25. MindMap Mode for SQL : INT18R371 - Database Management System**

KARE has signed a MoU with IMPARTUS to provide a very useful facility of capturing classroom lectures and projecting to students through a well-managed portal. Impartus lecture capturing system is available in almost all classrooms and captures class lectures of all the scheduled classes as per time table. During the start of every semester, the time table slots, classes for each course, faculty name, course name/code are augmented and the Impartus portal is set for the course. Faculties are provided with Mic to record audios. The Impartus also provides facilities to edit videos, which the faculty can use to delete video frames pertaining to attendance, among others. Awards will be provided to faculty members, who scored maximum points in Impartus. Points on Impartus are usually gained through the number of student views, active in technical questions, among others. The sample screenshot of Impartus portal is depicted in fig. 2.2.26

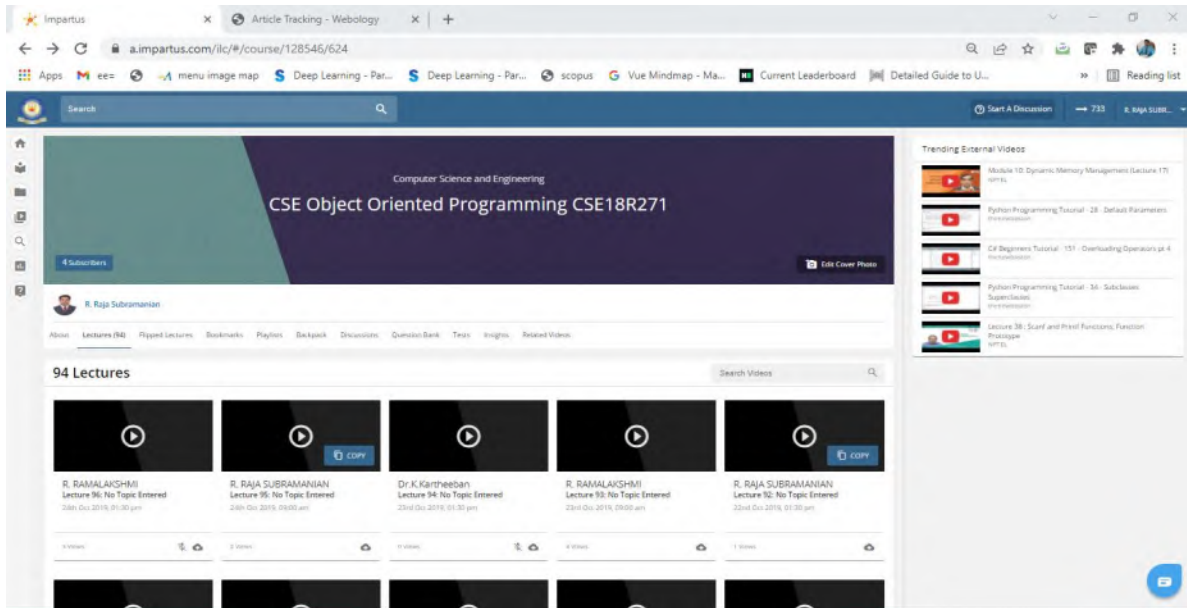


Fig. 2.2.26. Impartus Lecture Capture

Faculties of the department actively participate in online courses and refresher programs to get updated with the latest developments in the domain. Thus, continuous learning in faculties is ensured. For every new course, faculties prepare for the same by enrolling in Online courses and refresher programs. Many faculties show their expertise in their core domain knowledge through Gold/Silver/Elite Certifications in NPTEL courses. The sample certifications of the faculties for various courses are depicted in fig. 2.2.27 (a-d).



(a) NPTEL Certification on Python Programming by a Faculty



(b) NPTEL Certification on Software Testing by a Faculty



(c) ATAL FDP Certification on Artificial Intelligence by a Faculty



**(d) Coursera Certification on Data Analytics by a Faculty**

**Fig. 2.2.27. Online Course/Refresher Course Certifications by the Faculties**

**Effective functioning of Teaching Learning Process:**

The efficient use of the above described, strongly-proven, well-established teaching learning strategies has been formally studied and published as journal papers and case studies by the department faculty and students. The case studies on Student Centric Learning in Engineering Program leveraging PBL(Project based learning), effective design and implementation of B.Tech Curriculum with Industry Tie Ups are published in Journal of Engineering Education Transformations (JEET). Fig. 2.2.28 shows the screenshot of the sample journal papers published as part of this process. The faculty also participates actively in various events of Indo Universal Collaboration of Engineering Education (IUCEE). KARE-IUCEE Student Chapter is one of the actively functioning chapters amongst various IUCEE consortium institutions in the nation. Various awards and recognitions are received by the faculties of KARE – CSE for the case study of courses handled in PBL mode. Students are motivated to actively participate in IUCEE projects, webinars, events to inculcate multi-disciplinary skills, collaborative learning and design thinking.

The screenshot shows the homepage of the Journal of Engineering Education Transformations. The navigation bar includes links for HOME, ABOUT US, CURRENT, ARCHIVES, EDITORIAL BOARD, AUTHOR INDEX, and TITLE INDEX. The main content area displays the title "A Case Study on the Student Centric Course in Engineering Programme Leveraging PBL" by R. Raja Subramanian<sup>1</sup> and C. Sivapragasam<sup>2</sup>. The total views are 270. A sidebar on the right contains links for New Manuscript Submission, Advanced Search, For Readers, Author Guidelines, Submission & Review Guidelines, and Usage Statistics. The affiliations listed are: 1. Computer Science and Engineering, Kalasalingam Academy of Research and Education, Tamil Nadu, India; 2. Civil Engineering, Kalasalingam Academy of Research and Education, Tamil Nadu, India.

(a) Paper Published on PBL

The screenshot shows the journal's search interface and a specific paper page. The search bar is at the top right. Below it are navigation buttons for Home, Current, Archives, Authors, and Institutions. The paper page displays the title "Effective Design and Implementation of B.Tech (CSE) Curriculum with Industry Tie-Ups" by S. Shashi Anand<sup>1</sup>, A. Francis Saviour Devaraj<sup>2</sup>, R. Kanniga Devi<sup>3</sup>, C. Bala Subramanian<sup>4</sup>, R. Raja Subramanian<sup>4</sup>, and P. Nagaraj<sup>4</sup>. The affiliations listed are: 1. Vice President, Kalasalingam Academy of Research and Education, Anandnagar, Krishnankoil, Virudhunagar Dt, India; 2. Professor, Department of Computer Science and Engineering, School of Computing, Kalasalingam Academy of Research and Education, Anandnagar, Krishnankoil, Virudhunagar Dt, India; 3. Associate Professor, Department of Computer Science and Engineering, School of Computing, Kalasalingam Academy of Research and Education, Anandnagar, Krishnankoil, Virudhunagar Dt, India; 4. Assistant Professor, Department of Computer Science and Engineering, School of Computing, Kalasalingam Academy of Research and Education, Anandnagar, Krishnankoil, Virudhunagar Dt, India.

(b) Paper Published on Industry Oriented Teaching-Learning

**Fig. 2.2.28. Sample Journal Paper published on Teaching Learning Process by KARE CSE Faculties**

### **E. Conduct of Experiments (Observation in Lab)**

Experiments in the laboratories are conducted as per the guidelines. In addition to the regular experiments, additional problems related to the subject are given to the students which helps them to enhance their problem-solving capabilities considering real world applications. Laboratory manuals explaining the details of the experiment are available with the course teacher and students during the semester. The students record the observation in their record and submit the same for evaluation. In addition to the laboratory facilities provided by the department, various virtual lab availability and curations are introduced to the students. Hence practices in remote areas and lab-lacked areas are made possible.

## Virtual Laboratories

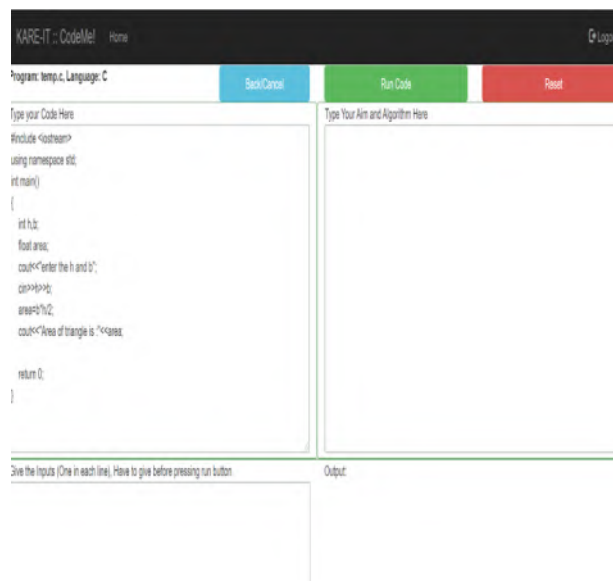
Virtual laboratories can be combined with display technologies such as interactive projectors or smartboards for an all-inclusive class, as opposed to the limited area afforded by physical workstations. The Virtual laboratories aid students to practice laboratory experiments at home and it is an effective tool to teach/learn practical courses online during pandemic situations. The list of virtual laboratories available in the Department is made visible publicly in the institute website, as shown in Fig. 2.2.29.

**Programming Vlab Link:** <https://itvlab.kalasalingam.ac.in/>

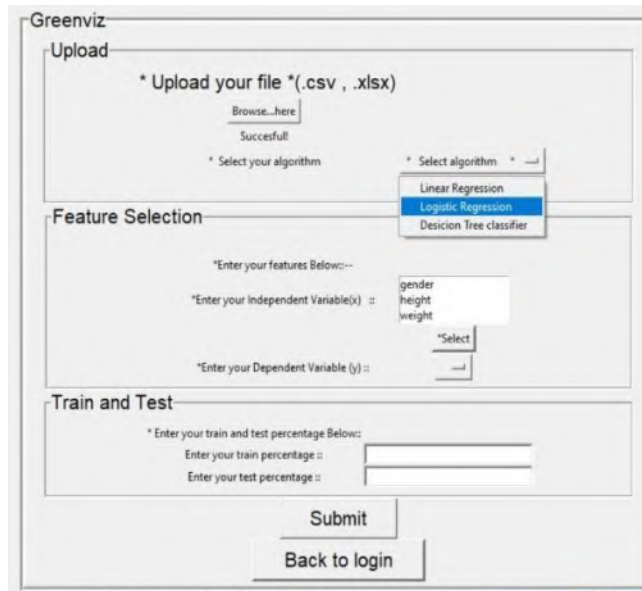
**Greenviz Machine Learning Package Link:** <https://pypi.org/project/greenviz/>



**Fig.2.2.29. Virtual Laboratory Module**



**(a) Programming Virtual Lab**

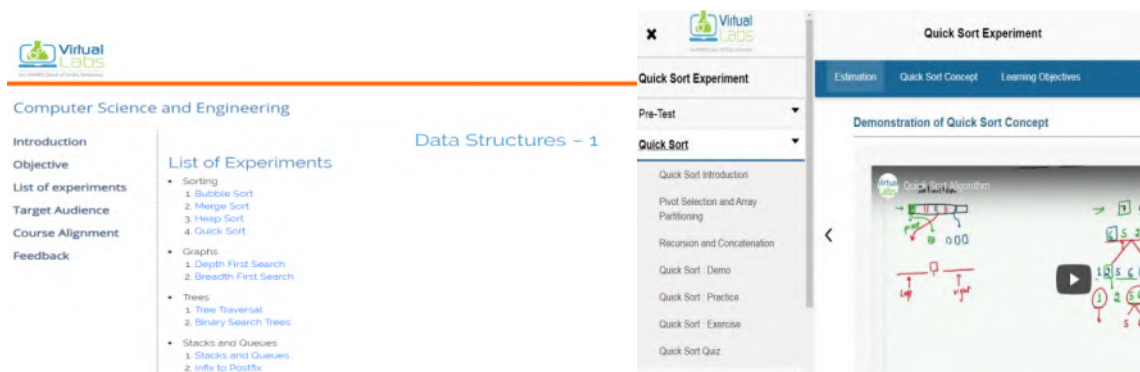


(b) Greenviz Machine Learning Package

**Fig. 2.2.30. Virtual Labs developed by the department of CSE**

Fig 2.2.30 (a) and Fig 2.2.30 (b) show the virtual lab created by the faculty members of the CSE department for the courses related to programming and machine learning respectively.

The department of CSE also uses Virtual Labs project, an initiative of Ministry of Human Resource Development (MHRD), Government of India under the aegis of National Mission on Education through Information and Communication Technology (NMEICT). Fig. 2.2.31 shows a sample screenshot using virtual labs for Data Structures subject by our faculty members and students.



**Fig. 2.2.31. Sample Screenshot using Virtual Labs for Data Structures**

**F. Continuous assessment in the laboratory**

Every week, two hours are entirely dedicated to conducting lab experiments for every lab/integrated course. In each lab session, the faculty explains the experiment to be conducted on the

appropriate platform and accordingly instructions are given to the students. Once in a month, practical test examinations are conducted as part of the continuous evaluation process. Also, for each laboratory session, observation, individual report, and viva are conducted and evaluated for assessing the students' knowledge. Model laboratory exams are conducted to check the student's progress. Finally, the end semester practical exams are conducted. The sample question and rubrics for laboratory courses assessment of the course CSE18R173 – Design and Analysis of Algorithms is given in Table 2.2.2.

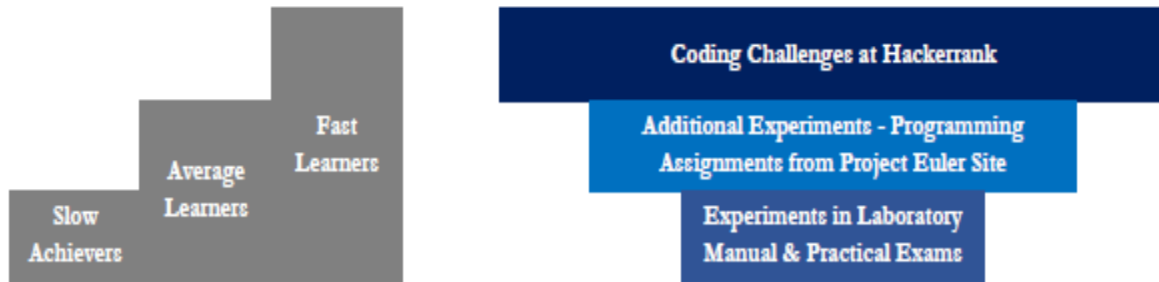
**Table 2.2.2. Sample Rubrics for Laboratory Courses Assessment**

<p><u>Problem Statement:</u></p> <p>String compression is one of the most important requirements for various applications including Google mail transfer, information retrieval among others.</p> <p>Read an essay or document from Wikipedia. Compress the file to as optimal length as possible.</p> <p>Write the compressed document to a file in the local machine. Decompress the file contents again. Ensure that lossless compression is made.</p> <p>Hint: Use Huffman Encoding Technique</p> <p>Input format:</p> <p>A link to read the contents (Set of lines (alphanumeric characters))</p> <p>Output format:</p> <p>Compressed file</p>		
Module	Rubrics for assessment	Marks (100)
Efficiency of Algorithm	<ul style="list-style-type: none"> <li>● Poor: 0 - 5 (Not able to understand what is given and what is expected)</li> <li>● Normal: 5 - 10 (Understood what is given but cant decide what is expected))</li> <li>● Good: 10 - 15 (Understood what is given and</li> </ul>	20



	<p>understood the stated expectation)</p> <p>Very Good: 15 - 20 (Understood what is given and understood the stated expectation as well as the hidden expectation)</p>	
Efficiency of program	<ul style="list-style-type: none"> <li>● Extraordinary: 35-40 Marks (With good time and space complexity)</li> <li>● Used efficient algorithms: 25 - 35</li> <li>● Met problem requirements: 15 - 25</li> <li>● Poor Logic: 0 - 15 Marks</li> </ul>	40
Output	<ul style="list-style-type: none"> <li>● Aesthetic Output: 15 – 20</li> <li>● User interactive input and output: 5 - 15</li> <li>● No proper user interactive I/O operation: 0 – 5</li> </ul>	20
Viva questions	<ul style="list-style-type: none"> <li>● Answered for more than 80 % Qs: 16 - 20 Marks</li> <li>● 50% - 80% - 11 - 15 Marks</li> <li>● 25% - 50 % - 6- 10 Marks</li> <li>● 0%-25% - 0 - 5 Marks</li> </ul>	20

Assessments in labs are conducted with various innovative pedagogies including Demonstration, Experiential Learning and Peer Evaluation. Students are assessed through challenges from public competitions, knowledge on modern tools related to the course, implementation of a mini project for the course. A typical way of continuous assessment for the course CSE18R173 - Design and Analysis of Algorithms is depicted in fig. 2.2.32a. Being a core component of the program and vital for competitive programming, the course is oriented towards developing competitive coding skills in the students. Initially all students will be trained with the laboratory manual. Based on the performance, additional experiments are provided to the students who have completed the manual questions at a faster rate. For those who excelled in the additional experiments (Fast learners), Coding challenges at Hackerrank is suggested.



**Fig. 2.2.32a. Continuous Assessment of CSE18R173 - Design and Analysis of Algorithms Lab**

Practical exams are mandated for every laboratory. Questions for practical examinations are prepared by the course faculty in consultation with the course coordinator. The question paper is provided in slots selected by the students in random. Questions cover syllabus and additional portions/ concepts learnt during lab in experiential mode. In addition to practical examinations, practical assignments and quizzes are provided to the students. A sample practical examination question paper is depicted in fig. 2.2.32b.

**Kalasalingam Academy of Research and Education**

**CSE18R171 – Programming for Problem Solving**

**Practical Examination**

Set No:	7	Faculty ID:	RRSCSE
Reg. No.		Date:	

---

1. A perfect number is a positive integer that is equal to the sum of its positive divisors, excluding the number itself. For instance, 6 has divisors 1, 2 and 3 (excluding itself), and  $1 + 2 + 3 = 6$ , so 6 is a perfect number. Create a C program to check whether the given number is perfect number. **(Create – CO3)**

2. Create a C Program that verifies password: a password should have at least one uppercase character, one lowercase character, one number, and one special symbol. A strong password should have a minimum length of 8. If all the conditions are satisfied, then print that the "Password is strong". Else print "Password is not strong". **(Create – CO2)**

**Fig. 2.2.32b. Sample Practical Exam Question Paper**

**G. Students feedback on Teaching Learning Process and Actions Taken**

Student feedback is an integral part of the Teaching Learning Process at KARE. The department collects feedback from students in various scenarios and forms for effective functioning of the teaching and learning process.

**(i) Feedback through Faculty Advisor Meeting:**



KARE CSE has an effective faculty advisory system, through which students are kept in close proximity to the Academics and other Student related activities. A semester comprises a minimum of three Faculty Advisor meetings. During the meeting, the students can convey the difficulties/ suggestions/ requirements to their faculty advisor. The faculty advisor can raise the same to the Head of the Department, through the Class Coordinator, for necessary actions.

**(ii) Feedback through Class Committee Meeting:**

The Class Committee Chairperson and class coordinator conduct the class committee meeting after a month of commencement of every semester, a minimum of two class committee meetings are conducted in every semester. All the subject handling faculty members will be present in the committee. In the class committee meeting, the student representatives composing 4-6 members of the class, participate and freely express their opinion about the courses, academic events, other student events, among others. If the students feel any inconvenience to the subjects and the faculty members, the Head of the Department will take the necessary corrective measures as raised by the class committee chairperson. The class committee chairperson, being a third person, not handling any of the courses to the class, students feel free to provide feedback.

**(iii). Intermediate Course Exit Survey:**

Intermediate Course Exit Survey is the vital component of the academic process. The Survey mandates students to provide feedback on the course, course conduct/delivery, knowledge/skills gained. The survey is analyzed at the Module Coordinator level and the same is submitted to the Head of the Department for ratification and necessary actions. The intermediate course exit survey form is depicted in fig. 2.2.33a

**KALASALINGAM**  
**ACADEMY OF RESEARCH & EDUCATION**  
**(DEEMED TO BE UNIVERSITY)**  
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 Anand Nagar, Kinnasankali - 626126, Srivilliputhur (Vic), Virudhunagar (Dt), Tamil Nadu | info@kalasalingam.ac.in | www.kalasalingam.ac.in

**STUDENT – INTERMEDIATE COURSE EXIT SURVEY FORM**

Date: \_\_\_\_\_

Course Name: Object Oriented Programming Course Code: CSE18R271

It is requested to submit the survey on the outcome of the above-mentioned course. This form is designed to evaluate the course outcomes with content delivery, teaching methodology and usefulness of the course. Students are required to give their responses in appropriate answer with tick (✓) mark.

A – Strongly Agree (5)	B- Agree (4)	C – Somewhat Agree (3)	D – Somewhat Disagree (2)			E – Strongly Disagree (1)	
SLNo	Particulars		A	B	C	D	E
1	Course supported to understand the basic concepts in Object oriented Programming.						
2	Knowledge acquired in classes, objects, and friend functions.						
3	Skill generated to code programs using OOPs concepts						
4	How do you rate the knowledge of this subject for implementation of real world problems in lifelong learning.						
5	Overall content delivery and subject information has helped me for professional development						

Please offer any other additional comments for improvement of the course.

NAME : \_\_\_\_\_

ROLL NO : \_\_\_\_\_

YEAR : \_\_\_\_\_ BRANCH : \_\_\_\_\_

**SIGNATURE**

**Fig. 2.2.33a. Student Feedback - Intermediate Course Exit Survey Form**

**(iv). Graduate Survey:**

The Graduate Survey is collected during the completion of BTech program by the student. The survey is collected and analyzed to comprehend the efficient delivery of the program to the batch. The analysis is also used to improve the quality of teaching and learning process, extracurricular activities, among others. The Graduate Survey form is depicted in fig. 2.2.33b.




	<b>KALASALINGAM</b> <b>ACADEMY OF RESEARCH AND EDUCATION</b> <b>(DEEMED TO BE UNIVERSITY)</b> <small>Under sec. 3 of UGC Act 1956. Accredited by NAAC with "A" Grade Anand Nagar, Krishnankottai - 626126, Sreeithiguttur (Via), Virudhunagar (Dt), Tamil Nadu   info@kalasalingam.ac.in   www.kalasalingam.ac.in</small>	
<b>SCHOOL OF COMPUTING</b> <b>Department of Computer Science and Engineering</b> <b><u>Graduate Survey</u></b>		
Name & Register Number:		
Year of graduation (Passed out):		
Mobile No.:	E-Mail ID:	
1. What is your general impression of the B.Tech degree program in Mathematics and Sciences? Excellent      Good      Average      Fair		
2. Role of our curriculum in making the graduates for solving real world engineering problems Strong      Moderate      Low      Not possible		
3. Give a new tool or environment how much confident are to utilize it. Extremely Good      Comfortable      Uncomfortable		
4. Are you able to formulate the problem statement and develop software based on the customer requirement? Yes      Better      No		
5. Are you able to survive towards the advancements in computing? Surely      May be      Not possible      No idea		
6. What is your involvement in organizing any seminar/ workshop/ convention/ symposium/ conference? Very much involved      Occasionally      Never		
7. Did you ever participate in NGO activities or any external social welfare association activities during the graduation? Yes      No		
8. Are you able to function effectively on teams to accomplish a common goal? Yes      Better      No		
9. Your clarity to express your ideas to be understood by technical peoples. Very Well      Moderate      Notable		
10. Any plan to do any post graduate programme? Surely and Immediately      Later      No idea		
11. Do you know the ethics followed in IT industry? Yes      No		
12. Do you know the environmental, society and economic in software development industries? Yes      No		
Signature		

Fig. 2.2.33b. Graduate Survey Form

**(iv). Student feedback on Curriculum revision:**


Students are the primary stakeholders of the Academic Program. Hence the valuable feedback of the students are collected and analyzed for curriculum development. The student feedback form for curriculum revision is depicted in fig. 2.2.33c.



## KALASALINGAM

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**SCHOOL OF COMPUTING**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**FEEDBACK FORM – STUDENT**

**Date:** \_\_\_\_\_

Students are requested to give their responses in appropriate answer with tick (✓) mark.

A – Strongly Agree (4)		B – Agree (3)		C – Somewhat Disagree (2)		D – Strongly Disagree (1)	
S. No	Particulars	A	B	C	D	C	D
1.	All the courses supported to understand the basic fundamental and concepts covered in the curriculum.						
2.	Whether all the courses are adequately mapped with the Program Specific Outcome/ Student Outcome.						
3.	Curriculum enables the desire for higher education, research and entrepreneurship						
4.	Knowledge acquired in various concepts helps to understand the real time scenario						
5.	Developed the attitude and societal responsibility through the knowledge and skills gained						
6.	How do you rate the practical knowledge for implementation of real time problems						
7.	Overall content delivery helped for professional development						
8.	Evaluation methodology helps to assess complete understanding						

Please offer any other additional comments for improvement of the course.

**NAME** : \_\_\_\_\_

**Reg. No.** : \_\_\_\_\_

**YEAR** : \_\_\_\_\_ **BRANCH** : \_\_\_\_\_ **SIGNATURE** : \_\_\_\_\_

**Fig. 2.2.33c. Student Feedback on Curriculum – Form**

**(v). IQAC Student Feedback:**

The student's feedback, as part of IQAC, is collected using the Student Information System (SIS) available in the EDU KARE SIS portal. Fig. 2.2.33d shows a sample screenshot for the feedback collected through SIS. Based on the student's feedback, various appreciations including best teacher awards are distributed which encourages faculties to work better.

The screenshot displays a web browser window with the URL [sis.kalasalingam.ac.in/course\\_feedback\\_entry?torp=Theory&staff\\_name=Ms.JJEYARANJANI&staffid=JRCSE&staff\\_id=944&course\\_id=5375&course\\_cod...](https://sis.kalasalingam.ac.in/course_feedback_entry?torp=Theory&staff_name=Ms.JJEYARANJANI&staffid=JRCSE&staff_id=944&course_id=5375&course_cod...). The page title is "Feedback - KARE". The main content area is titled "Course Feedback - Ms. J. JEYARANJANI - CSE18R274". A sidebar on the left lists various navigation options like Dashboard, Grievances, Semester, Arrear Registration, Course Reg. even 2021-22, OE-HSS Reg. even 2021-22, Grade, Seating & Time Table, Industrial Training TPO, Travel History, One Credit, Online/Intern/IT Courses, NonCGPA, and Makeup. The main content area contains a table with the following data:

S.no	Question	Ans
1	Basic Concepts are taught clearly	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
2	Course Teacher covered additional topics beyond syllabus which emphasizes on recent developments	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
3	Course Teacher used ICT tools appropriately for teaching-learning process	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
4	If this course is Integrated Course(IC) OR Theory with Practical Component (TP), the course teacher gave adequate coverage to practical component	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> It is not IC/TP course
5	The course teacher conducted online tests/quizzes	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No

**\*Fig 2.2.33d (i). Student's feedback collected on SIS Portal by IQAC**

Course Feedback - Ms.J.JEYARANJANI - CSE18R274		
S.no	Question	Ans
1	Basic Concepts are taught clearly	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
2	Course Teacher covered additional topics beyond syllabus which emphasizes on recent developments	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
3	Course Teacher used ICT tools appropriately for teaching-learning process	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
4	If this course is Integrated Course(IC) OR Theory with Practical Component (TP), the course teacher gave adequate coverage to practical component	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> It is not IC/TP course
5	The course teacher conducted online tests/quizzes	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
6	Course teacher gave adequate number of assignments	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
7	Course Teacher discussed model questions from Competitive Exams (GATE/ IES/IAS etc)	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
8	Faculty used Online based Testing and Evaluation (eg. using Google Classroom etc)	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
9	MCQ type questions testing the higher order skill of the students	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No

Fig. 2.2.33d (ii). Student’s feedback collected on SIS Portal by IQAC - Questions Page 1



S.no	Question	Ans
10	The course teacher completed all the syllabus fully through online classes	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
11	The course teacher shared the required class notes/videos	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
12	If this course is Integrated Course(IC) OR Theory with Practical Component (TP), the course teacher completed all the practical exercise either through use of virtual lab or through mini projects or during the regular offline classes	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> It is not a IC/TP course
13	The course teacher shows partiality to students	<input type="radio"/> Yes <input type="radio"/> Somewhat <input type="radio"/> No
14	Rate your satisfaction with Teaching-Learning Experience of the course	<input type="radio"/> Very Good <input type="radio"/> Average <input type="radio"/> Not Satisfied
<input type="button" value="Submit"/>		

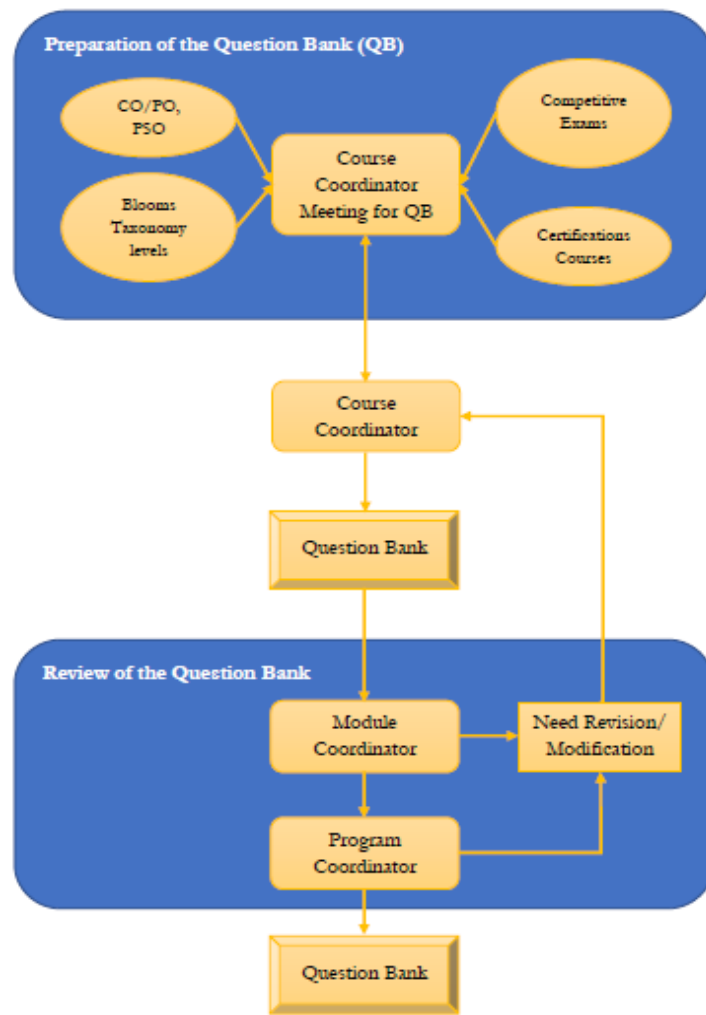
Designed and Maintained by Software Development Team, KARE.

Fig. 2.2.33d (iii). Student’s feedback collected on SIS Portal by IQAC - Questions Page 2

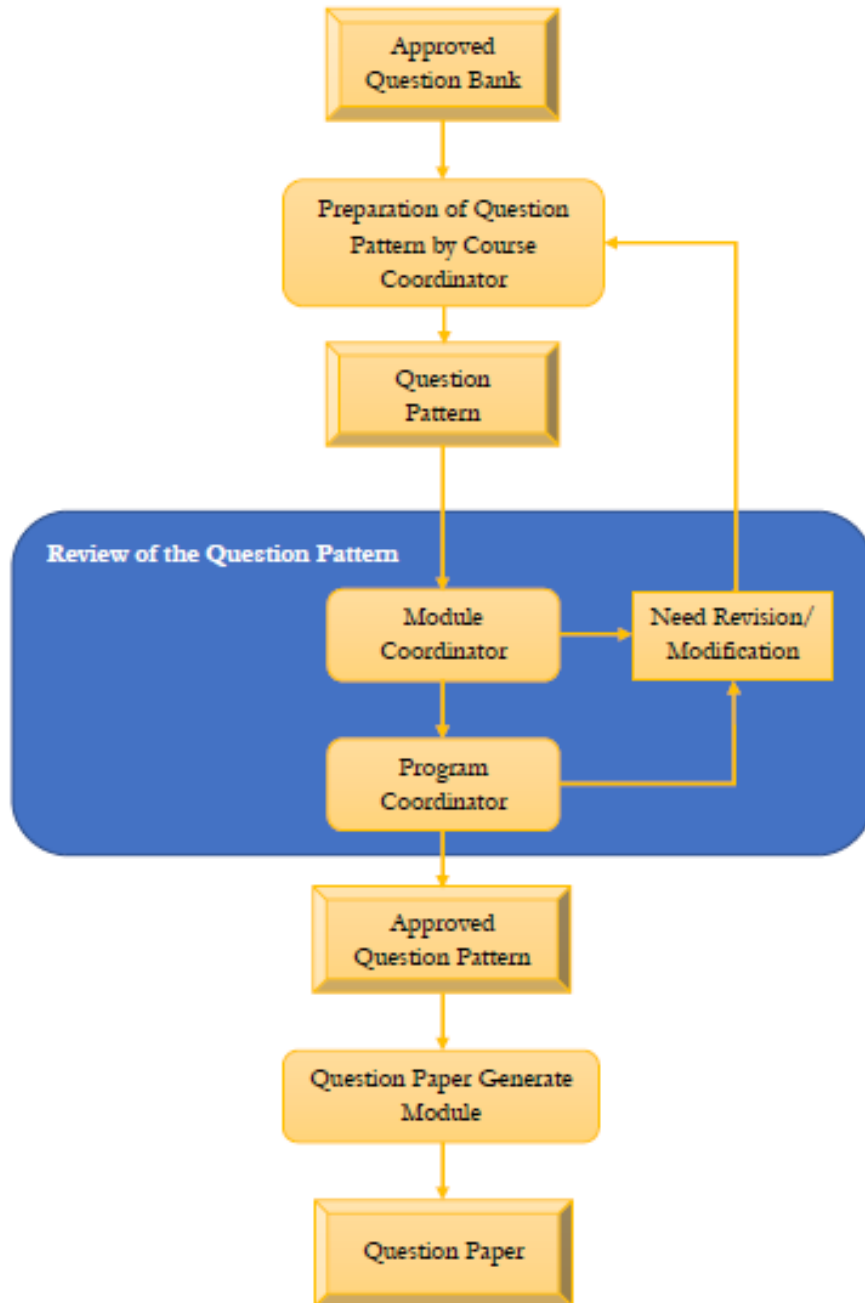
## 2.2.2 Quality of end semester examination, internal semester question papers, assignments and evaluation (15)

### A. Process for sessional exams (internal semester) question paper setting, evaluation and implementation

As per KARE regulations, the nomenclature for internal examination is sessional examination. Normally, two sessional exams are scheduled and conducted for every course in the curriculum to ensure the continuous learning through the performance assessments. In case of autonomy courses, the number of sessional examinations can be either one or two as decided by the course coordinator and approved by the mentor. The process of question bank creation is depicted in Fig. 2.2.34a and the question paper generation from question bank is illustrated in Fig. 2.2.34b.



**Fig. 2.2.34a Process of Preparing and Evaluating Question Bank**



**Fig. 2.2.34b Process of Preparing and Evaluating Question Paper**

At the beginning of every semester, COE office sends a circular for the generation/updation of question banks for the courses offered in that semester. For every course, a question bank covering all five units is to be generated / updated by the course coordinator through the question bank creation module in EDU KARE portal as shown in fig. 2.2.35a..

The course coordinator declares a meeting with the course handling faculty to discuss the requirements like number of questions to be generated under every topic, the blooms taxonomy level, COs to be covered under every topic in the curriculum, GATE questions to be covered if the course comes in GATE syllabus. Once the faculty team creates the question bank, after verification, the course coordinator enters the same in the question bank module using his/her login credentials in the EDU KARE portal and seeks the approval of the module coordinator.

The module coordinator carefully examines the question bank submitted and verifies the compliance with the COs of the course and with the POs the course is mapped. If there is any CO / PO continuous improvement suggested by the PAB, the module coordinator ensures whether it is incorporated in the submitted question bank. Then the module coordinator approves the question bank and forwards it to the approval of the program coordinator.

The Program coordinator verifies the questions bank based on the course outcome assessment and attainment plan. Upon the successful validation of the question bank, it will be forwarded to the CoE for further processing. In case the requirements are not met, both module coordinator and program coordinator can demand the course coordinator to initiate the changes to be done in the question bank. The process is repeated until the question bank is approved by both module and program coordinator.

The sessional exam question is prepared for 50 marks with 10 marks under Part-A consisting for five two marks questions and with 40 marks for Part-B consisting of 16 marks questions as well as 8 marks questions. To prepare the question paper for every sessional exam, the course coordinator prepares the question pattern by selecting the topic, blooms taxonomy level, marks to be allotted to the question. The question pattern also is to be approved by both course coordinator as well as module coordinator. The question paper generation module randomly picks the questions from the question bank mapping with the pattern set by the course coordinator. The exact question will be known to both faculty and students on the day of the exam. The screenshots of all these processes in our EDU-KARE portal is shown in Fig 2.2.35(a-e).

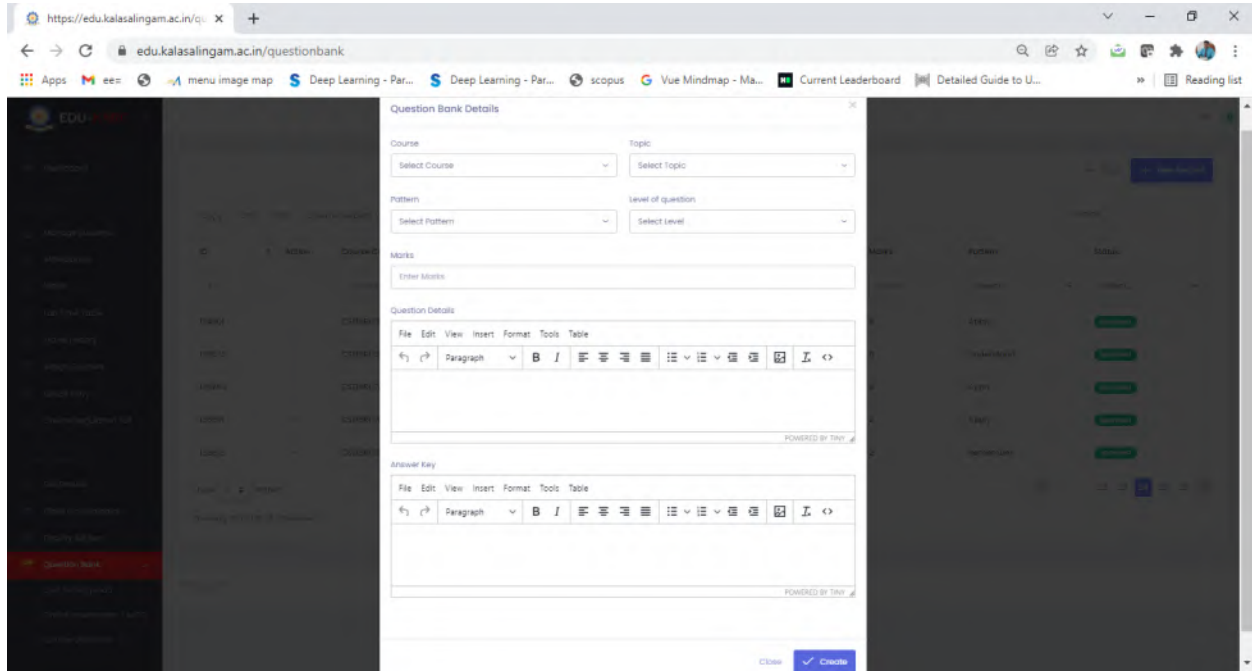


Fig. 2.2.35a Question Bank Entry in Course Coordinator Login

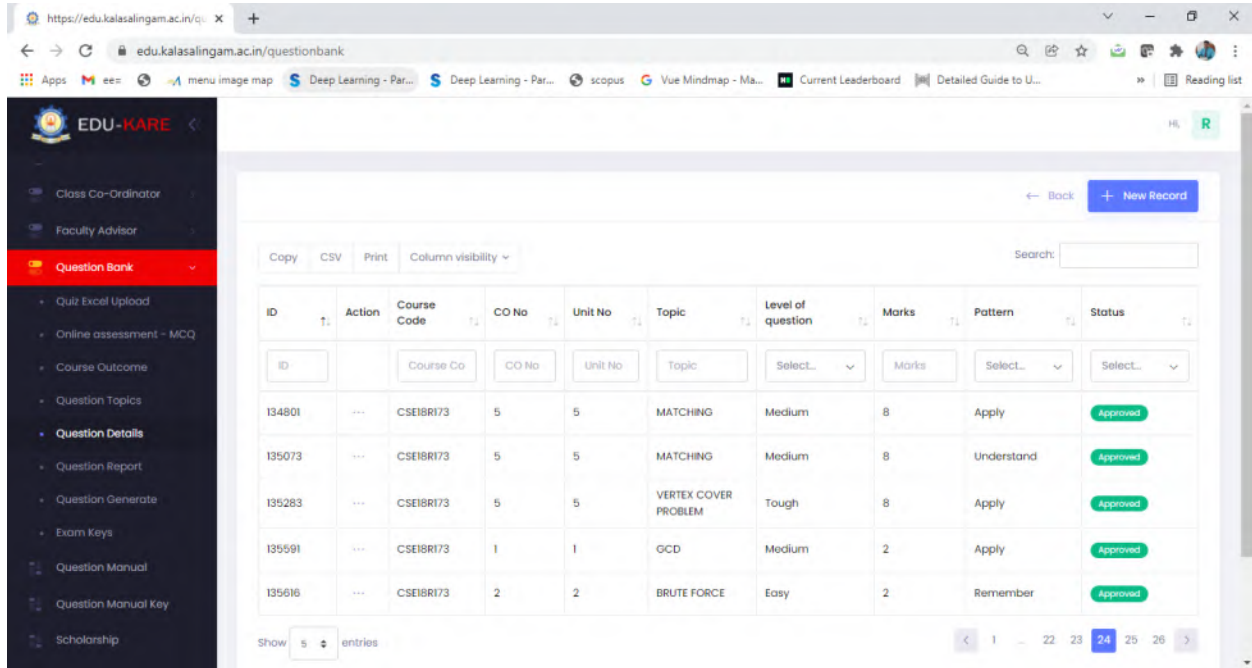


Fig. 2.2.35b Question Bank View in Course Coordinator Login

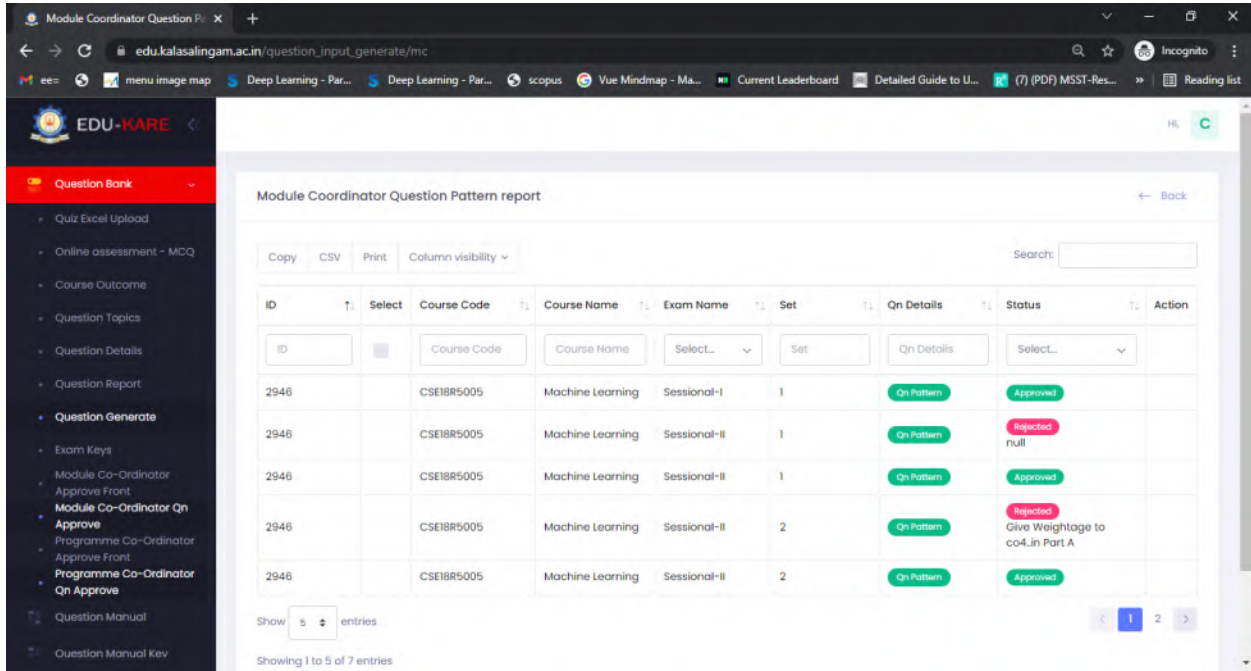


Fig. 2.2.35c Question Bank & Pattern Approval by Module Coordinator

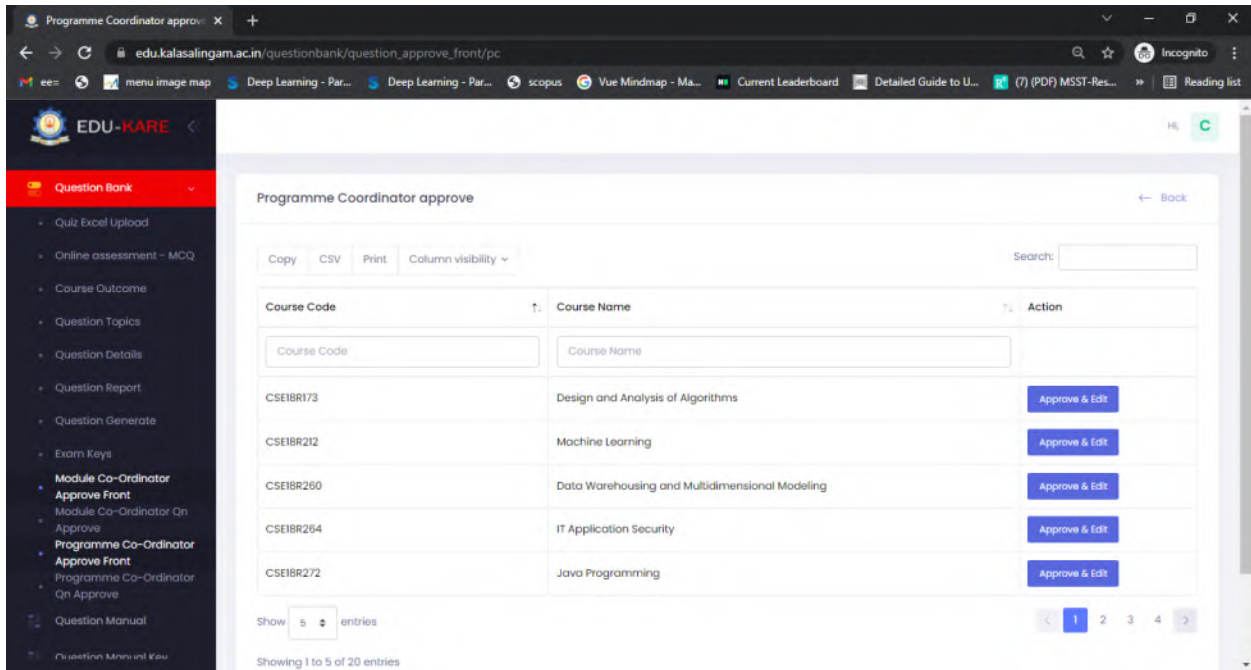


Fig. 2.2.35d Question Bank & Pattern Approval by Program Coordinator

Sessional-I - CSE18R173 - Design and Analysis of Algorithms - SET: 1

Requirements If Any  
Requirements if any... If no requirement then put -

Part Name	Qn No	QN Sub No	Topic	Marks	Remove
Part-F	1	Qn Sub No	Topic	2	X
Part-F	2	Qn Sub No	Topic	2	X
Part-F	3	Qn Sub No	Topic	2	X
Part-F	4	Qn Sub No	Topic	2	X
Part-F	5	Qn Sub No	Topic	2	X
Part-E	6	Qn Sub No	Topic	Marks	X

Add row

**Fig. 2.2.35e Question Paper Pattern Generation**

The similar process is applied in the preparation of end semester question papers also. The Controller of Examination can also receive question papers from external experts on a need basis. In such cases, the question paper will be evaluated by the audit team comprising both external experts as well as internal faculty experts.

### **Internal Assessment Methods**

The assessment components and weightage for every component vary based on the course type. The evaluation components include sessional examinations, practicals, assignments, mini projects, seminars and tutorials. Table 2.2.3 depicts the different types of courses and their evaluation scheme along weightage for every evaluation component. The evaluation components for the autonomy course may additionally include experiment based evaluation, model design / development, field visits / case studies, research article based evaluation, open book test, peer evaluation, evaluation by industry experts. As part of internal assessment, a minimum of five components need to be selected for the autonomy course and weightage can be set by the course coordinator and approved by the mentor.

**Table 2.2.3 Evaluation Scheme for the courses**

S. No.	Course Type	Mode of Examination	Weightage
1	Theory Course (T)	Sessional Examinations (two)	35%
		Assignments/ Mini Project/ Seminars/ Tutorials etc.,	15%
		End Semester Examination	50%
2	Laboratory Course (L)	Internal Assessment	50%
		External Assessment	50%
3	Integrated Course (IC)	Sessional Examinations (two)	20%
		Assignments/ Mini Project/ Seminars / Tutorials etc.,	10%
		Practical (Laboratory)	20%
		End Semester Examination	35%(T) + 15% (L) (or) 15% (T) + 35% (L)
4	Theory with Practical (TP)	Sessional Examinations (two)	20%
		Assignments / Mini Project / Seminars / Tutorials etc.,	15%
		Practical	15%
		End Semester Examination	50%

Based on the answer key, the evaluation of the sessional exam answer sheets of one section is done by the peer faculty handling the similar course to other sections. The evaluated answer scripts will be distributed to the students in order to ensure transparency and to make them learn from errors. In case, if the student wishes to reevaluate the answer sheet, the student can raise the same through the course teacher with appropriate ratifications from the course coordinator. Then, the marks will be uploaded in the EDU KARE portal within five working days of completion of the examination. Based on the assessment plan, the CO attainment for every student will be recorded. Results and analysis will be discussed in the class committee meetings as well as in the PAB meetings for further follow up. In case any change in evaluation is required for the end semester paper, the same will be done with the approval of COE.

The other internal components can be evaluated by the concerned course teacher and the same can be verified by the course coordinator.



**B. Process to ensure questions from outcomes / learning levels perspective**

The quality of questions asked in sessional exams is ensured based on the guidelines provided by KARE IQAC. Based on the nature of the course, the learning level is finalized at the time of question bank generation and the same is ensured during the pattern generation of sessional questions.

Each question in the sessional examination is mapped against the COs and Bloom's taxonomy levels in each subject. The marks obtained by each student in the respective COs for each internal assessment component is given much importance and CO-PO attainment is calculated based on the same. For each of the courses, various assessments as proposed in the evaluation schemes ensures that all the COs are equally covered in the assessments.

The usual practice is to cover CO1, CO2 in Sessional Examination 1, CO3, CO4 in Sessional examination 2, assignments / other components / end semester covering all COs, laboratory experiments covering corresponding COs. The PAB functioning in the department ensures the outcome as well as learning level coverage based on the reports from module coordinator, program coordinator. The internal / external question papers are audited by external experts from reputed institutions appointed by the Controller of Examination. The IQAC office will also conduct an audit to ensure quality, learning level coverage in each of the evaluation components. The feedback as well as the shortfall identified through these audits will be forwarded to the concerned faculty incharges.

**C. Evidence of COs coverage in class test / mid-term tests**

Despite the various level of approvals that ensures the CO mapping of the questions provided, to make it concrete, all the printed copies of sessional examination questions include the corresponding COs and the bloom's taxonomy level against each question. The sample question is attached in Fig. 2.2.36 (a-b) as evidence.

<p style="text-align: center;"><b>KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION</b> (Deemed to be University) Anand Nagar, Krishnankoil – 626 126. <b>SESSIONAL EXAMINATION – II – EVEN SEMESTER [2018-2019]</b></p>																						
Course Code/ Name	: CSE18R173-Design and Analysis of Algorithms			Date & Session	: 30.3.19/AN																	
Degree/Branch	: B.Tech./CSEUG			Duration	: 90 Minutes																	
Semester/Section	: ALL			Max. Marks	: 50 Marks																	
<b>Assessment Pattern as per Bloom's Taxonomy:</b>																						
Remember	Understand	Apply	Analyze	Evaluate	Create	Total																
4	8	30	8	0	0	50																
<b>Course Outcomes for Assessment in this Test:</b>																						
COs	Course Outcome																					
CO3	Apply algorithms for performing operations on graphs and trees.																					
CO4	Formulate novel problems, by choosing the appropriate algorithm design.																					
<b>PART – A (5 x 2 = 10 Marks)</b>																						
<b>Answer All Questions</b>																						
				<b>Pattern</b>	<b>Mapping COs</b>																	
1.	Draw the solution for 4 – Queen's problem and analyze its complexity.			Analyze	CO3																	
2.	Compare 'Backtracking' and 'Branch and Bound' Algorithms.			Analyze	CO3																	
3.	Apply Branch and Bound strategy and assign a unique job to every worker, such that, the total cost is minimized. (GATE)			Apply	CO3																	
	<p>Tasks</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>A</td> <td>18</td> <td>3</td> <td>15</td> </tr> <tr> <td>B</td> <td>4</td> <td>7</td> <td>14</td> </tr> <tr> <td>C</td> <td>13</td> <td>12</td> <td>7</td> </tr> </table> <p style="text-align: left; margin-left: 100px;">Workers</p>				1	2	3	A	18	3	15	B	4	7	14	C	13	12	7			
	1	2	3																			
A	18	3	15																			
B	4	7	14																			
C	13	12	7																			
4.	Define the term Polynomial Reducible.			Remember	CO4																	
5.	State Cook's theorem.			Remember	CO4																	

Fig. 2.2.36a Sessional Examination question – Page1

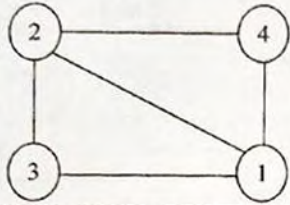


PART – B (2 ½ x 16 = 40 Marks) Answer All Questions		Pattern	Mapping COs																																					
6.	<p>Explain the algorithm for finding Hamiltonian cycle in a graph and analyze its complexity. Apply the backtracking strategy to find Hamiltonian cycles in the given graph. (GATE)</p> 	Apply Analyze	CO3	(8)																																				
7.	<p>Apply Branch and Bound strategy to find the solution of the Travelling Sales Person problem.</p> <table border="1" data-bbox="537 823 792 1171"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> </tr> </thead> <tbody> <tr> <th>A</th> <td>∞</td> <td>2</td> <td>5</td> <td>7</td> <td>1</td> </tr> <tr> <th>B</th> <td>6</td> <td>∞</td> <td>2</td> <td>5</td> <td>3</td> </tr> <tr> <th>C</th> <td>7</td> <td>6</td> <td>∞</td> <td>4</td> <td>6</td> </tr> <tr> <th>D</th> <td>10</td> <td>3</td> <td>5</td> <td>∞</td> <td>4</td> </tr> <tr> <th>E</th> <td>1</td> <td>3</td> <td>2</td> <td>8</td> <td>∞</td> </tr> </tbody> </table>		A	B	C	D	E	A	∞	2	5	7	1	B	6	∞	2	5	3	C	7	6	∞	4	6	D	10	3	5	∞	4	E	1	3	2	8	∞	Apply	CO3	(16)
	A	B	C	D	E																																			
A	∞	2	5	7	1																																			
B	6	∞	2	5	3																																			
C	7	6	∞	4	6																																			
D	10	3	5	∞	4																																			
E	1	3	2	8	∞																																			
8.	<p>a) Explain in detail about computability classes. (i) P, (ii) NP, (iii) NP Hard and (iv) NP Complete.</p> <p>b) Explain in detail about reduction techniques and apply the techniques to reduce 3 – CNF – SAT problem to Sum of Subsets problem.</p>	Understand  Apply	CO4	(8)  (8)																																				
<b>Assessment Summary:</b>																																								
COs	Remember	Understand	Apply	Analyze	Evaluate	Create	Total																																	
CO3	0	0	22	8	0	0	30																																	
CO4	4	8	8	0	0	0	20																																	
*****																																								

Fig. 2.2.36b Sessional Examination Question – Page2

**D. Quality of Assignment and its relevance to COs**

Assignments are an integral part of the continuous assessment process to ensure that students learning and thinking levels at various grounds including design thinking, problem solving, project development, among others. Similar to the sessional and end semester examinations, assignments are also prepared adhering to the CO, PO/PSO and Bloom's taxonomy. The course handling faculty decides the deadline for the assignments submission and informs the students. The submitted assignments are evaluated adhering to the standard rubrics.

Assignments mainly focus on higher order Blooms' taxonomy level like apply, analyze, create and evaluate through problem solving questions, mini project, seminar, programming assignment (debug/create), open-book test, quiz, etc. The course handling faculty also ensures the CO mapping of the allotted assignment question. The fig. 2.2.37 is an example assignment question for the course "Design and Analysis of Algorithms (CSE18R173)".

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**Department of Computer Science and Engineering**  
**Course Code: CSE18R173**  
**Course Name: Design and Analysis of Algorithms**  
**Assignment**

Course Outcomes for Assessment in this Assignment	
CO3	Apply algorithms for performing operations on graphs and trees
CO4	Formulate novel problems, by choosing the appropriate algorithm design

**(Apply and Analyze) CO3**

1. Mrs. Queen obtained an idea to start a sport telecasting channel. With the recommendations from a Cricket Professional in her area, Queen obtained a chance to telecast the Local Cricket League (LCL) in her channel. LCL, being a famous league in the city, many advertisers queued in Queen's office.

Queen accepted the applications from all the advertisers and decided to telecast all the applications. Queen struggled hard to schedule the advertisements in between the overs of the cricket match.

Can you suggest Queen with an idea, so that the advertisements can be scheduled appropriately?

Note: The time between the overs can be fixed, but each advertisement may run for different times. Suggest a suitable strategy.

**Hint: Why not Heuristics!**

**(Apply and Analyze) CO4**


2. Mr. King obtained a delivery boy job in XYZ Company. Each day the company provides King with a map of a city, consisting of different areas. King is supposed to deliver the items in each area in correct time and should return to the company at the earliest. The maps will be different each day. Can you help King to complete his work easily?

Advice by Company owner: King, if you are going to choose a shortest path from one area to another and not visiting an area more than once, then take the following advices:  
*If you follow the above criteria, you can finish the work in least time. But, who will give such a path for the given map. Time taken for finding the solution matters!!!*

Hint: You can use Branch and Bound strategy/ Approximation algorithm for solution.

**Note: If you are going for approximation, prove that the problem is in NP.**

Apply both and find which better suits King's situation with appropriate analysis (complexity) reports.

  
 Mrs. R. Sumathi,  
 Course Teacher/ CSE18R173  
 Assistant Professor/ CSE

**Fig. 2.2.37 Sample Assignment**

Table 2.2.4 indicates the rubrics followed to evaluate the student submission for the above assignment.

**Table 2.2.4 Rubrics for assignment evaluation**

<b>Parameters</b>	<b>Excellent (5)</b>	<b>Very good (4)</b>	<b>Good (3)</b>	<b>Fair (2)</b>	<b>Satisfactory (1)</b>
<b><i>Understand the problem and identify the suitable strategy for solving the problem</i></b>	Completely understand the problem and able to identify appropriate design strategies for solving the problem	Understand the problem and provide approximate design strategies to solve the algorithm	Partial understanding of the problem, with the basic knowledge on various algorithm design strategies	Doesn't clearly understand the problem and has less comprehension on algorithm design strategies.	Not able to understand the problem clearly
<b><i>Apply the strategy and design an appropriate algorithm for the problem in question</i></b>	Able to design a perfect algorithm for the underlying problem corresponding to the design	Ability to design an algorithm for solving the problem with 80% perfectness	Ability to design an algorithm with partial knowledge on the design strategies	Ability to design an algorithm partially satisfying the stated requirements.	Not able to design an algorithm for the underlying problem
<b><i>Implement the algorithm using programming languages</i></b>	Ability to implement the algorithm using programming languages without using predefined packages.	Ability to implement the algorithm using programming languages using predefined packages	Ability to implement the algorithm, using programming languages, partially satisfying the constraints	Ability to implement the algorithm with minor errors.	Not able to implement the algorithm, satisfying the constraints.
<b><i>Evaluate the algorithm analysis in respect of time and space</i></b>	Ability to perform time and space analysis accurately	Ability to perform time and space analysis with approximately	Ability to understand the time and space analysis and replicate the same for similar problems.	Ability to partially understand time and space analysis	Not able to understand the time and space analysis for a given problem

<b><i>Ability to restructure the algorithm to provide higher efficiency</i></b>	Ability to restructure the algorithm with better efficiency	Ability to restructure the algorithm with partial improvement from the previous time and space analysis	Ability to understand the restructuring of the algorithm	Ability to partially understand algorithm restructuring to improve efficiency	Not able to understand the restructuring of algorithm to improve efficiency
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**Case Studies based Assignment**

Case Study based assignment helps in the exploration of modern tools and state-of-the-art technologies. The fig. 2.2.38 shows the case study based assignment of the course CSE18R257 – Predictive Analytics.

Through the course, students learn and explore the industrial data visualization tool Tableau and perform data visualization for the real time scenario like “COVID19 Cases in India”. The sample assignment submission for the same is depicted in fig. 2.2.39. The rubrics for evaluation of the case study is depicted in Table 2.2.5.

**Table 2.2.5 Rubrics for case study evaluation**

<b><i>Parameters</i></b>	<b>Excellent (5)</b>	<b>Very good (&gt;=3.5 to &lt;5)</b>	<b>Good (&gt;=2 to &lt;3.5)</b>	<b>Fair (&gt;=1 to &lt;2)</b>
<b><i>Identification of dataset and understanding of dataset</i></b>	Web Scraping used for extracting dataset.	Dataset downloaded from benchmark site with appropriate reference	Randomly generated dataset	Dataset downloaded from non-standard site
<b><i>Application of statistical techniques</i></b>	Minimum 4 statistical techniques used	Minimum 3 statistical techniques used	Minimum 2 statistical techniques used	Minimum 1 statistical techniques used
<b><i>Data Visualization in Dashboard</i></b>	Created appealing dashboard leveraging various parameters depicting the dataset (filter/page options used)	Created appealing dashboard leveraging various parameters depicting the dataset (filter/page options not used)	Created visualization in sheets. Dashboard is not created	Created basic visualization that is depicting at most 20% of the dataset



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**Department of Computer Science and Engineering**

**Course Code: CSE18R257**


**Course Name: Predictive Analytics**

**Case Study based Assignment**

Course Outcomes for Assessment in this Assignment	
CO2	Apply mining and statistical techniques to visualize relationships between data.

**(Apply and Create) CO2**

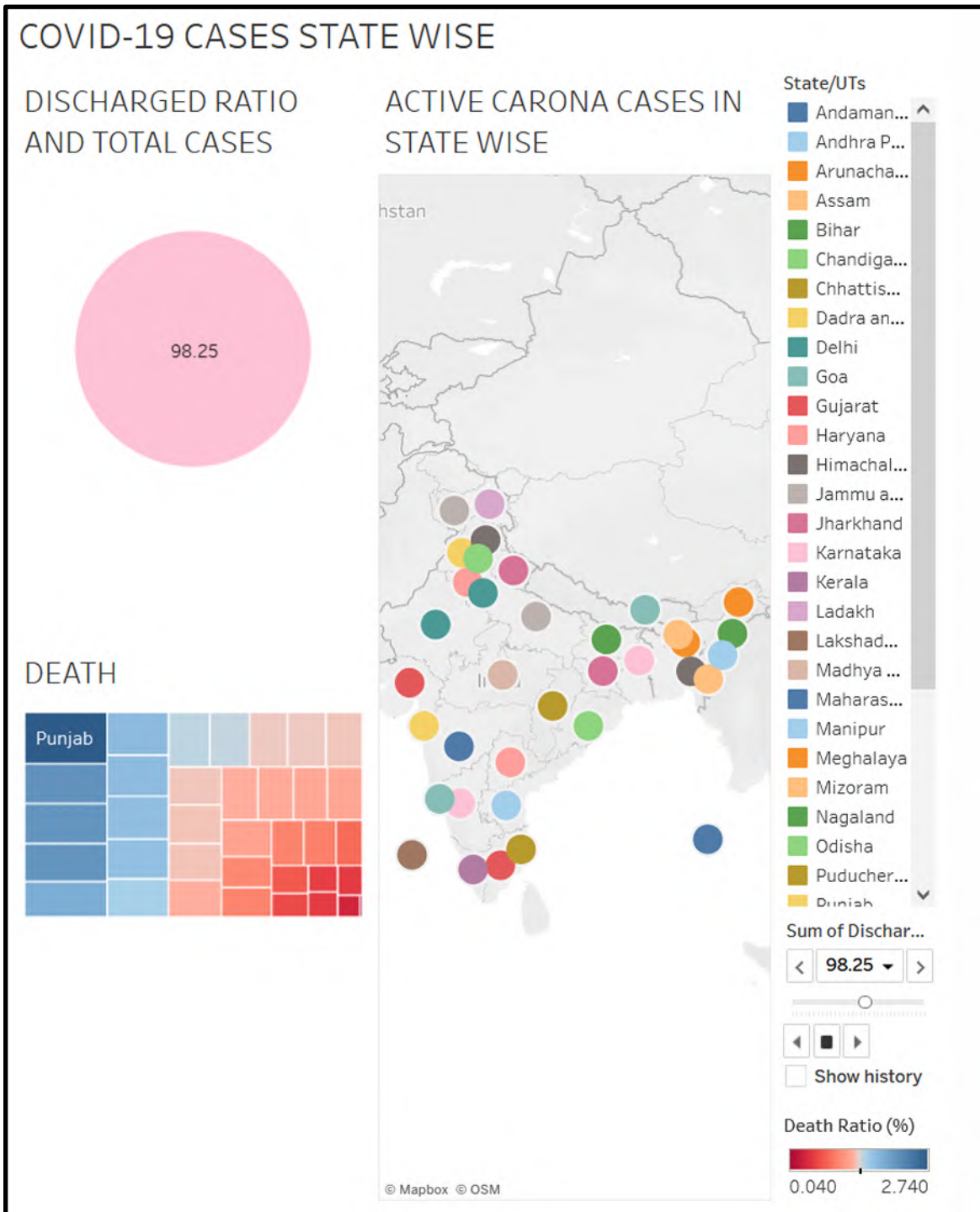
1. Develop a data visualization model depicting a real time problem scenario. The dataset can be taken from benchmarked data sites or by applying Web Scrapping technique from relevant websites. Apply data mining techniques to model the data and use the data visualization tool 'Tableau' to create appropriate visualizations. Also create a dashboard for the visualization and submit the link of the same for evaluation.



Mr. R. Raja Subramanian,  
Course Teacher/ CSE18R257  
Assistant Professor/ CSE

Fig. 2.2.38 Sample Case Study based Assignment Question





**Fig. 2.2.39 Sample Assignment Submission for the case study stated in Fig. 2.2.38**

### **2.2.3 Quality of student projects (20)**

#### **A. Identification of projects and allocation methodology to faculty member**

- According to curriculum design, students will undergo projects at various levels, starting from course level project to capstone projects.
- The project coordinator, in every level, advises the students to form a group with a maximum of three / four members on their own, based on their domain interest.
- The list of faculty members and their specialization area will be displayed in the department notice board.
- The project coordinator instructs the project team to identify the project area/title of the project and to submit one page write up about their project at the beginning of the project phases.
- The project coordinator directs the students to choose faculty/industry professionals to guide them. The project coordinator collects a list of project team, project guide name and their project area from the respective students.
- The department/project coordinator informs the industry projects students about the rules and regulations, internal guide name and working hours on the projects in the industry (if the project is being carried out in industry).
- The head of department and the project coordinator lists the types of projects based on application, product or research based with environment, safety, ethics, cost and sustainability consideration.
- Finally, the list of project teams and name of the project guide will be displayed in the department notice board with the approval of project coordinator and the program coordinator.

**Table 2.2.6 Faculty Competency Mapping for Project Allotment**

S.No.	Area of Specialization	Faculty Members
1	Artificial Intelligence	Dr. P. Sarasu
		Mr. R. Raja Subramanian
		Mr.A.Bhuvaneshwaran
		Mrs. M. Malathi
2	Big Data Analytics	Dr. S. Dhanasekaran
		Dr. T. Dhiliphan Rajkumar
		Mr. A. Karthic
		Mr. Cibi Castro
		Mr. K. Vijaykumar
		Mr. P. Nagaraj
		Mr.S.Kannudurai
		Mrs. P. Packiya Lakshmi
		Mrs. V. Manoranjithem
		Ms. A. Gurusigaamani
		Ms. G. Vidhya Shree
Ms. S. Vidya		
3	Blockchain Technology	Mr. P. Velmurugadass
4	Cloud Computing	Dr. B. S. Murugan
		Dr. K. Kartheeban
		Dr.V.Vasudevan
		Mr. L. Karuppasamy
		Mr. R. Anantha Kumar
		Mr. S. Prabhu
		Mr. S. Hariharasitaraman
		Ms. S. Jeevitha
5	Deep learning	Ms. Devisurya
6	Distributed computing	Mrs. J. Jeyaranjani
7	Fog Computing	Mr. Chittaranjan swain
8	Graph Theory	Dr. K. Karuppasamy
		Dr. R. Kanniga Devi
9	Image Processing	Dr. A. Saravanan
		Dr. N. C. Brintha
		Dr. S. Karkuzhali
		Mr. K. Vignesh
		Mrs. G. Elizabeth Rani
		Ms. R. Sumathi

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10	Internet of Things	Dr. A. Robert singh
		Mr. C. Balasubramanian
		Mr. D. Balakrishnan
		Mrs. B.Thevahi
		Ms. Jenifa
		Ms. S. Shanmugapriya
		Ms. Vijayalakshmi
		Ms.M. Umashree
11	Machine Learning	Dr. K. Murugeswari
		Dr. P. Deepalakshmi
		Dr. P. Thendral
		Dr. R. Ramalakshmi
		Dr.R.Velumani
		Ms. M. Sowmya
		Ms. RubathiSaranyaJ
12	Network & Security	Dr. A. Francis Saviour Devaraj
		Dr. B. Bensujitha
		Dr. G. Murugaboopathi
		Dr. Koteswara Rao Anne
		Dr. N. Dhinakaran
		Dr. T. Veeramakali
		Mr. M. K. Nagarajan
		Mr. M. Raja
		Mrs. B. Balakiruthiga
		Mrs.A.Nesarani
		Ms. K. Sowndaryia
		Ms. S. Manochitra
13	Soft Computing	Dr. R. Murugeswari
14	Software defined networks	Mr. K. Muthamilsudar
15	Wireless Sensor Networks	Dr. B. Pitchai Manickam
		Dr.Joshva Devadas
		Mr. M. Sankara Mahalingam
		Mr.Sankaranarayanan
		Ms. Balasubbulakshmi
		Ms. D. Kavitha
Ms. K. Sivapriya		

**B. Types and relevance of the projects and their contribution towards POs and PSOs****Types of Project Development**

KARE CSE consists of three types of projects, viz., Course level project, Community Service Project and Capstone project. The community service projects help to predict the quality of student projects based on technology, ethics and social awareness. Course level projects are used to visualize the expertise of the students in relevant courses. Capstone project mandates students to apply the prior knowledge gained to provide engineering solutions for complex problems following various design constraints and standards. These advancements in process help to prove the student technical aspect with practical tool usage for different techniques along with ethics and social awareness. Industrial projects are also inculcated at course level and capstone level. These practices help them to bridge the gap between industry and academics with research knowledge.

**i. Course Level Project**

The course level project is part of the pedagogy “Research Project-based Learning (RPBL)”. RPBL is an immersive and an interactive approach for learning an evolving courses like Predictive Analytics, Machine Learning, Internet of Things, among others, where students need to understand, analyze and prototype the project, and interpret his new findings to a novel research paper. Students come up with various projects, innovate, hypothesize, and increase the community-based problem-solving ability.

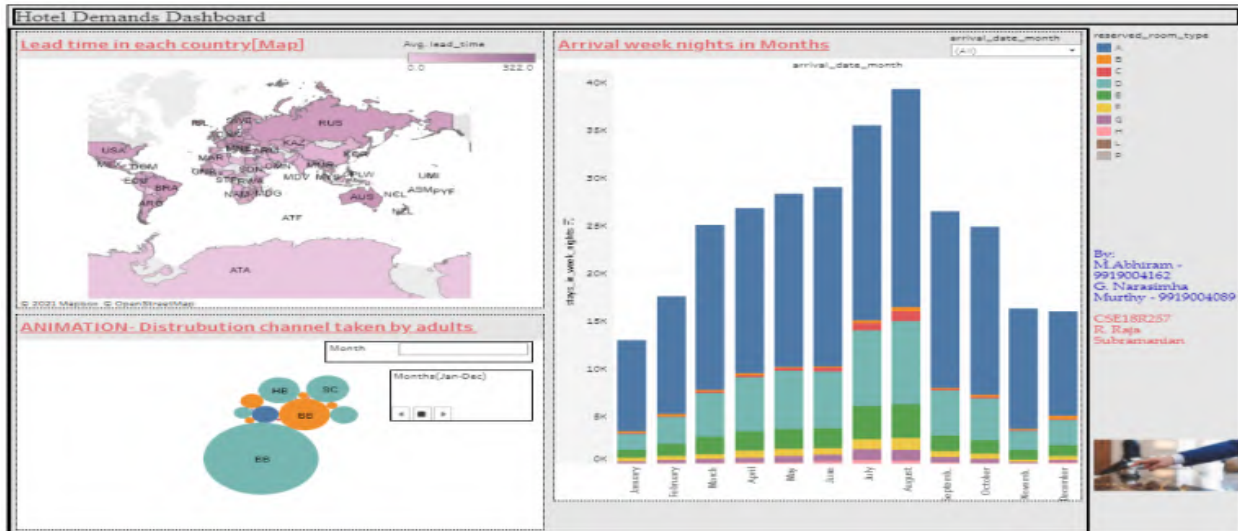
**Methodology of Research Project-based Learning**

The methodology of research project-based learning evolved with an envision to improve the student’s skills in problem solving, design thinking, time management, team work, tools usage. The observations on the conduct and outcome of the predictive analytics course through RPBL approach at KARE under faculty autonomy mode is elaborated.

In the practical manual, the initial three exercises are catered with the hands-on exercises of machine learning packages. In addition to practical exercises, the self - curated videos of Python Programming are uploaded in YouTube channel. The students are motivated to see the videos and raise their doubts. Various mini projects on Python, pertaining to machine learning / data analytics are given to the students as zeroth assignments.

Checking the authenticity of assignment submissions and project completions are tedious for the course teachers. To overcome this, two out of the five assignments are made as individual assignments. One of the two assignments is based on the real time data visualization

leveraging Tableau Visualization Tool. A sample assignment submitted by the student leveraging real time data is depicted in fig. 2.2.40. The other assignment is based on preprocessing a dataset leveraging python packages.



Assignment link:

[https://public.tableau.com/app/profile/m.abhiram/viz/Hotel\\_demands\\_Visualization/Hotel\\_demands\\_vis?publish=yes](https://public.tableau.com/app/profile/m.abhiram/viz/Hotel_demands_Visualization/Hotel_demands_vis?publish=yes)

**Fig. 2.2.40: Sample Assignment 1 – Tableau Data Visualization**

The course involves sessional examination, experiment-based evaluation, five assignments with research projects and industry expert evaluation. More efficient management of time is required for the students to excel in all the evaluations. Appropriate deadline schedules and scaffolding on tough assignments are provided from the faculty side through LMS.

For research article-based evaluation, students are asked to form teams with a max size of four students per team. During project implementations, reviews and tech talks, the contribution of individual members in the team is difficult to comprehend. Students excelling in technical competency may have less communication skills. To overcome this, during class sessions and project meets, one-to-one discussions on some students are carried out. This is useful to make the faculty understand the technical competency gained by the students in periodic intervals.

The project implementation and research article survey require more understanding of the state-of-the-art technology for the students. To make this possible, three sessions were conducted by the Subject Matter Experts (SME) from IBM. Through this, students are grouped based on their projects and appropriate scaffolding is provided to make them comprehend the research

articles and implementation processes. In addition to sessions from SME, every Tuesday day order class is dedicated exclusively for research article-based evaluation training, reviews and discussions. The outcome of this Research Project-based Learning proves its efficiency in pertaining research papers in international journals.

**ii. Community Service Project (CSP):**

Community service projects are the new experience for students to interpret their academic knowledge with real-time problems. This project gives them the exposure of how to find new problems from the needs of a community. They can obtain more knowledge on deriving and designing new projects based on a real circumstance. The students will be able to interact with real-time customers for the requirements. Based on it they can make a detailed analysis with the support of an expert. Community service projects are the pathway for a real time product development out of the need of a community.



**Fig. 2.2.41. Community Service Project - Processes of Project Identification, Monitoring and Evaluation**

### iii. Capstone Project

According to the curriculum, to fulfill the final requirement for an undergraduate degree in engineering/technology, the final year’s students should carry out the effective implementation of the Capstone project. The project must involve designing a product/service of significance to solve an open-ended problem.

Key parameters involved in a Capstone Project,



- Industry expert to be attached to a project mandatorily along with the internal guide (for industrial projects).
- Outcomes from the project must be directly correlated to problem solving in industry.
- A common event/platform to be conceived by the project guide for the student's group to present/discuss their findings to a large crowd in a real time environment. This mega event will also serve as the ideal platform where the various stakeholders can interact with the project team regarding their capstone projects.

The various activities initiated as part of the project are

**Table 2.2.7 Capstone Project - Processes of Project Identification, Monitoring and Evaluation**

S. No.	Stages	Activities	Coordinating In-Charge	Key parameters for Assessment	Continuous Assessment
1	Stage 1	Formulation of project team and selection of project supervisor based on the specialization area (interdisciplinary/cross disciplinary)	Project coordinator / Faculty Advisors	Nil	Review 1 (2 credits) "Expert Committee nominated by HoD"
2	Stage 2	Decision making based on the need analysis of industry/research problems (through iterative brainstorming sessions and input from previous design courses)	Project Coordinator / Project Supervisor	1. Industry Expert Survey (or) 2. Literature Survey (for Research Problems)	
3	Stage 3	Objectives and project plans in line with the time frame	Project Supervisor	1. Well defined project scope and objectives. 2. Students understanding of project deliverables	

4	Stage 4	Conceptual design focusing upon the deliverables of the project with support from the industrial peers.	Project Supervisor or Industry Expert	1. Fundamental design knowledge. 2. Creativity/Idea 3. Exhibiting skill sets (validation certificate to be obtained from the experts)	
5	Stage 5	Final modelling of the design using appropriate design package.	Project Supervisor / Project Coordinator	1. Competing and quality model. 2. Choice of design package. 3. Adherence to the design standards / constraints as indicated by lead societies.	Review 2 (3 credits) “Expert committee nominated by HoD”
6	Stage 6	Fabrication/simulation of prototype using optimal design	Project Supervisor	Fabrication/simulation outcomes	
7	Stage 7	Performance evaluation of real-time product/component/platforms	Project Supervisor / Project Coordinator	1. Efficiency of the deliverables 2. Workability/functionality of the deliverables 3. Fulfillment of objectives	Review 3 (3 credits) “Expert committee nominated by HoD”
8	Stage 8	Community engagement activity for project showcasing		Feedback from expert committee	
9	Stage 9	Publication outcomes/patenting	Deans, HoDs’ of the Departments	Quality / Indexing of the publication / patenting	Review 4 (2 credits) “Internal and External member nominated by CoE”
10	Stage 10	Project report compilation and Final evaluation by external expert	Project Supervisor / Project Coordinator	Evaluation of overall student performance and holistic projection of outcomes	

- The project coordinator will brief the students regarding the project group formation, guide selection and guidelines for capstone projects.

- The project team needs to do state-of-the-art research surveys from various reputed journals, as directed by the Project guide. Then the team with the consent of the guide can finalize the Project area, Title and Objectives.
- For Industrial projects, Industry experts to be attached with the group throughout the course of the project.
- Design focused issues in industry to be of primary consideration for the selection of the projects.
- Design phase in the Capstone project provides experience to the students through community engagement activity (workshop/conference/trade fair) for project showcasing.
- The various phases of the capstone project are detailed in Table 2.2.7. Each individual project team mandatorily has to complete all the 10 stages to fulfill the credit requirement.
- Capstone projects are carried out in two semesters of the final year. The two semesters are: "Theory cum project semester and Standalone project semester.
- Student groups under 'Theory cum project semester' are mandated to complete stage 1 to stage 4 to earn 2 credits. During the 'Standalone project semester', the completion of stage 5 to stage 10 will earn 8 credits to them.
- Students coming under 'Standalone Project semester' are mandated to complete stage 1 to stage 7 to earn 8 credits. During the 'Theory cum project semester', the completion of the stage 8 to stage 10 will earn them 2 credits.

Fig. 2.2.42 shows the correlation between COs and POs/PSOs for Capstone project. The CO1 is contributing to the POs and PSOs pertaining to problem identification and design thinking. CO2 is contributing towards literature survey and modern tool usage. CO3 is contributing towards implementation strategies. The CO4 is contributing towards teamwork and management. The CO5 is contributing towards presentation in viva voce, quality of project report.

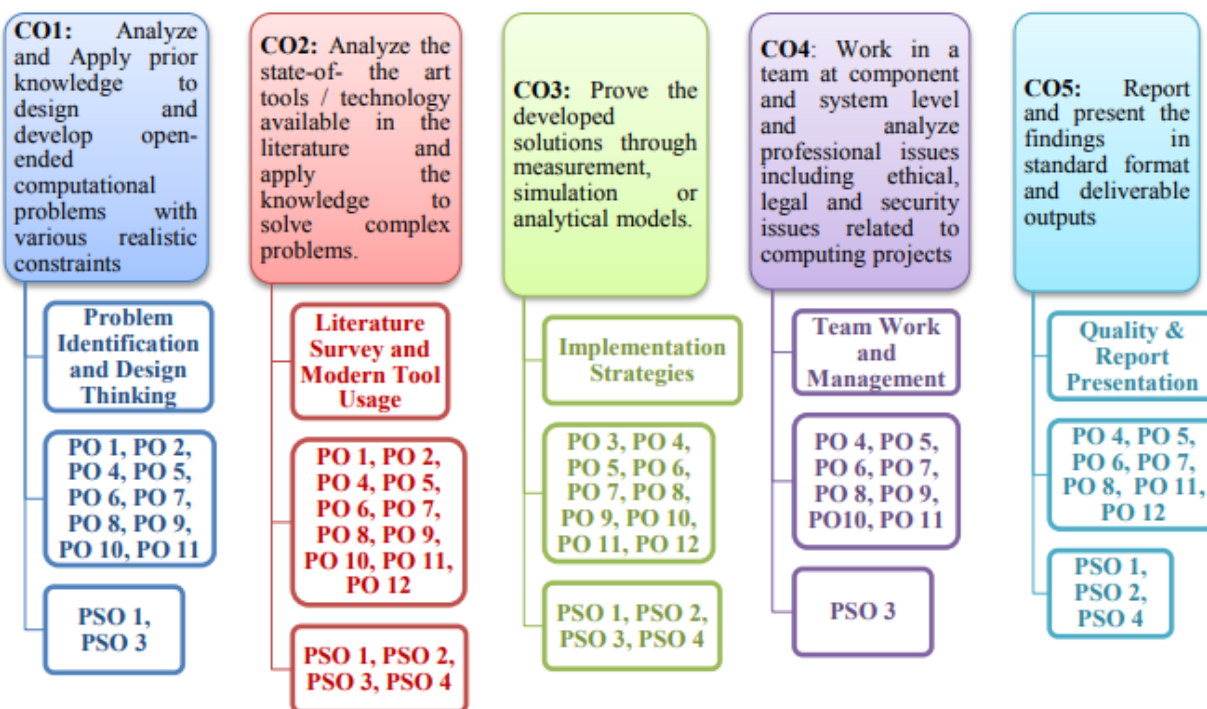


Fig. 2.2.42. Projects and their contribution towards CO, PO and PSO

**A Sample list of Course Level Project (2020 - 2021)**

Team No	Register Number	Name of the Student	Topic of Research	Eco	Env	So	Eth	H&S	Sus	Supported POs	Supported PSOs
Team 1	9919004 202	P. Shiridi Kumar	Skin cancer detection using convolutio nal neural networks							PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9919004 066	Dintakurthi Achuth					✓	✓	✓		
	9919004 152	Kovvuru Naveen Kumar Reddy									
Team 2	9919004 184	Musalappa gari Devendra Reddy	Multiplay er Online Car Racing				✓		✓	PO1, PO2, PO3, PO4,	PSO1, PSO2, PSO3, PSO4

	9919004 008	Adepudi Akash	with BCI in VR							PO5, PO6, PO7, PO9, PO10, PO11, PO12	
	9919004 154	KurapatiNi thish Reddy									
	9919004 146	KonduruY aswanth Varma									
Team 3	9919004 169	Manchala Vikas	A Survey on Sentiment Analaysis							PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO11, PO12	PSO1, PSO2, PSO3
	9919004 200	NukalaAks hith				✓	✓		✓		
	9919004 089	Gogula Narasimha Murthy									
	9919004 130	Karanam Balaji									
Team 4	9919004 138	KetepalliP oojita Lakshmi Syamala	Design and Evaluation of a Deep Learning Algorithm for Emotion Recogniti on							PO1, PO2, PO3, PO4, PO5, PO6, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9919004 054	ChunduriS andya Niharika				✓	✓		✓		
	9919004 068	Dondapati Usha Rani									
	9919004 214	Parvathare ddy Pavani									
Team 5	9919004 107	Harini Mohan	PSO Based Fuzzy- Genetic Optimizati on Technique for Face Recogniti on							PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9919004 017	Ardhala Mounika Jenny				✓	✓		✓		
	9919004 072	Dubba Sreshta									
Eco - Economic Env -Environmental So - Social Eth -Ethical H & S -Health & Safety Sus - Sustainability											

**A Sample list of Community Service Project (2021 - 2022)**

Batch No.	Reg. No.	Name	Title	Eco	Env	So	Eth	H & S	Sus	Supported Pos	Supported PSOs
1	9919004006	Achuth. Dintakurthi	AI based communication aid for physically handicapped people							PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9919004200	NukalaAkshith		✓	✓	✓	✓				
	9919004162	MadhurapanthulaAbhiram									
	9919004089	Gokula Narasimha Murthy									
2	9919004186	M.Venkatesh	Patient Health Monitoring System							PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9919004204	P. Dadavali				✓	✓	✓			
3	9919004097	Gude Balaji	Smart Glasses for Blind People Caption : The Third Eye	✓			✓	✓	✓	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9919004091	G. Mahesh									
	9919004051	C. Lakshmi									

4	9919004 221	Pilla Vishnu Vardhan Reddy	Reducing Food Waste Manageme nt System		✓				✓	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9919004 282	Thiruveedi Anjan Kumar									
	9919004 332	Krithik S									
	9918004 026	D. Suraj Hussain									
5	9919004 268	SunampalliSra vani	Traffic Analysis and Severity Prediction	✓		✓	✓		PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3	
	9919004 288	Valipi Bhanu Prakash									
Eco - Economic Env - Environmental So - Social Eth - Ethical H & S - Health & Safety Sus - Sustainability											

**A Sample list of Community Service Project (2020 - 2021)**

Batch No.	Reg. No.	Name	Title	Eco	Env	So	Eth	H & S	Sus	Supported Pos	Supported PSOs
1	9918004 001	M. Ajith Lakshman	Ultrasonic glasses for blind peoples		✓	✓	✓			PO1, PO2, PO3, PO4, PO5, PO6, PO8,	PSO1, PSO2, PSO3, PSO4
	9918004 007	P.Aravindraaj									
	9918004 014	S.R.Bharathw aj									

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	9918004 047	S.Kasiraman								PO9, PO10, PO11, PO12	
2	9819004 002	K.Nikhilsaishan nkar	Low Cost Heavy Metal Contents of Vegetables Using Microcontr oller	✓			✓	✓	✓	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9918004 055	K.Bhargav Reddy									
	9918004 044	K.Reddappare ddy									
	9918004 032	G.Chandrasek har									
3	9918004 002	AKSHAYA M	Health care system using finger print				✓	✓	✓	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9918004 003	AKSHAYA S									
	9918004 010	B.PRUDHVIS H									
	9918004 048	KAVIYA M									
4	9918004 004	A.V.N. Harshith	Assessing and Monitoring the Dietary Intake				✓	✓	✓	PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9918004 046	K. Mahesh									
	9918004 045	K. Govinda Sai									
	9918004 026	D. Suraj Hussain									
5	9918004 005	Ankit Kag	Line Man Safety(Sma				✓	✓		PO1, PO2,	PSO1, PSO2,



	9918004 008	Ramcharan Reddy	rt Circuit Breaker)								PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12	PSO3	
	9918004 052	K.Harsha Mahesh											
	9918004 050	k.Prabhu Kumar											
Eco - Economic Env - Environmental So - Social Eth - Ethical H & S - Health & Safety Sus - Sustainability													

**A Sample list of Community Service Project (2019 - 2020)**

Batch No	Regno	Name	Title	Eco	Env	So	Eth	H & S	Sus	Supported Pos	Supported PSOs
1	9917004 052	Pradeep.J	Designin g a product for dumb communi ty to recogniz e voice through hand motions by using raspberry pi 3							PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9917004 017	Praveen.B					✓	✓			
	9917004 027	Sanath.D									
2	9917004 014	Bharath Ganesh .k	Fire fighting robot remotely operated by Android							PO1, PO2, PO3, PO4, PO5, PO6, PO9,	PSO1, PSO2, PSO3, PSO4
	9917004 044	Hari Haran k				✓		✓	✓		
	9917004 065	Lakshmi Narasimma n.g									

	9917004 041	Guntaka Tendulkar Reddy	applicati on							PO10, PO11, PO12	
3	9917004 024	Bhanu Mohan	Greenob ot	✓			✓	✓		PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9917004 216	Monika Sree V									
	9517004 201	Sandhya T									
4	9917004 008	Anujaa GB	Fake news detector using machine learning				✓	✓	✓	PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9917004 087	Narayani R									
	9917004 218	Babloo Kumar									
5	9917004 058	K.Sujithred dy	Voice Based Email for Blind			✓	✓	✓	✓	PO1, PO2, PO3, PO4, PO5, PO6, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9917004 029	D.Revanth									
	9917004 043	G. Venkata Ajay Sukumar									
	9917004 210	S Akram Basha									
Eco - Economic Env - Environmental So - Social Eth - Ethical H & S - Health & Safety Sus - Sustainability											

**A Sample list of Community Service Project (2018 - 2019)**

Batch No	Regno	Name	Title	Eco	Env	So	Eth	H & S	Sus	Supported POs	Supported PSOs	
1	9916004003	M.S.Ajay	Neuro Cane For Blind Community Using Neural Network			✓	✓	✓	✓	PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3	
	9916004002	Aditya Mishra										
2	9916004004	S. AKSHYAA	Automatic Plant Watering System and Soil Moisture Sensing using IoT							PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3	
	9916004020	G. BHARATHI				✓	✓	✓	✓			
	9916004033	M. FATHIMUNISHA										
3	9916004042	G.Venkata Sai Kireeti	Smart pill box using IOT							PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4	
	9916004005	A.Likith Sai					✓		✓			
	9916004246	I.Hari Krishna										
	9916004022	CH.Srikanth										

4	9916004 025	CH.Pushyanth Reddy	Upbeat( An android health applicati on)								PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9916004 010	Srikar A					✓	✓	✓			
	9916004 027	D.Karthik										
5	9916004 023	CV.Sumanth Kalyan	Smart Home Automati on								PO1, PO2, PO3, PO4, PO5, PO6, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9916004 032	E.Jaswanth			✓		✓		✓			
	9916004 046	I.Hari Manoj										
Eco - Economic Env - Environmental So - Social Eth - Ethical H & S - Health & Safety Sustainability												

**A. Sample list of Capstone Project (2015 - 2019)**

Batch No	Regno	Name	Title	Eco	Env	So	Eth	H & S	Sus	Supported POs	Supported PSOs
1	9915004 003	S.Akshaya	Smart parking system using IOT							PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9915004 030	S.Kajolini			✓		✓		✓		
	9915004 063	S.Shunmug aprabha									

2	9915004 005	Anushiya S	Identificati on of various pathologic al disorders in human brain						✓	✓	✓	PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3	
	9915004 032	Kodieswari G												
	9915004 033	Lakshmi Narayani S												
3	9915004 025	S Jeyasheela	Fish cool algorithm									PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3	
	9515004 201	G Monika Sundari							✓			✓		
	9915004 028	B JencyaJeba mani												
4	9915004 004	Anjanadevi	Data analysis of dysgraphia									PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3	
	9915004 022	Haumshini. R							✓	✓	✓			
	9915004 034	Lakshmipri ya J												
5	9915004 027	S.Jeevanath am	Neonatal health monitoring system using SMCC									PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3	
	9915004 072	B.Sudarsan							✓	✓	✓			
	9915004 082	G.Vasagar												
Eco - Economic Env - Environmental So - Social Eth - Ethical H & S - Health & Safety Sus - Sustainability														

**A Sample list of Capstone Project (2016 - 2020)**

Batch No	Regno	Name	Title	Eco	Env	So	Eth	H & S	Sus	Supported POs	Supported PSOs
1	9916004008	A.NagaSahithi	Advanced vehicle tracking system							PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4
	9916004035	G.Prasanthi		✓	✓	✓			✓		
	9916004106	P.Rishika									
2	9916004078	M.Ganesh Reddy	Text Classification for newsgroups using machine learning							PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9916004090	M.Teja Reddy				✓	✓		✓		
	9916004041	G.Pradeep Kumar Raju									
3	9916004123	K.Priyadhara	Identification of various diseases in Guava fruit using Spiral Optimization (SPO) technique							PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9916004083	K.MeenaKumarai					✓	✓	✓		
4	9916004048	I.Rakesh Reddy	An Intelluctua			✓	✓		✓	PO1, PO2,	PSO1, PSO2,

	9916004 170	T.K.SaiCharan Reddy	I multi-traffic scene perception based on supervised learning							PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO3	
	9916004 207	U.Muni Kumar Reddy										
5	9916004 079	A..ManiKandan	Remote Monitoring Honeybee Hive							PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3, PSO4	
	9916004 117	S.M.Ponraja										
	9916004 121	A.V.Praveen Kumar				✓	✓		✓			
Eco - Economic Env - Environmental So - Social Eth - Ethical H & S - Health & Safety Sus - Sustainability												

**A Sample list of Capstone Project (2017 - 2021)**

Batch No	Regno	Name	Title	Eco	Env	So	Eth	H & S	Sus	Supported POs	Supported PSOs
1	9917004 184	N.Yogesh	Driver Drowsiness Prediction using AI							PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11,	PSO1, PSO2, PSO3, PSO4
	9917004 185	E.S.Vishnu Vardan				✓	✓	✓	✓		
	9917004 193	M.Yogesh Kumar									

										PO12	
2	9917004 019	Ch.Mahendran ath	Robust Malware							PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9917004 183	Y.Chanikya Chowdary	Detectio n for Internet of Things				✓		✓		
	9917004 154	S.Vasavi	using Deep Learning								
3	9917004 149	Sreeramdas Venkata Harendra	Altering Font Size using IRIS							PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9917004 036	Gorantla Sasi Kumar	Tracking and Depth Estimati on				✓		✓		
4	9917004 127	E. Sai Sharan	Face Mask							PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11,	PSO1, PSO2, PSO3, PSO4
	9917004 213	K. Sudheer Kumar	Detectio n using Covid 19 in	✓	✓	✓			✓		
	9917004 037	G. Madhuri	OpenCV and Deep Learning								



										PO12		
5	9917004 070	Mandi Akif Hussain	Software Detectio n using Machine Learning Algorith ms								PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
	9917004 191	N. Kedharnath				✓			✓			
	9917004 123	R. Veeharika										
Eco - Economic Env - Environmental So - Social Eth - Ethical H & S - Health & Safety Sus - Sustainability												

**A Sample list of Capstone Project (2018 - 2022)**

Batch No	Regno	Name	Title	Eco	Env	So	Eth	H & S	Sus	Supported Pos	Supported PSOs
1	9918004 026	D.Suraj Hussain	All You Need in a Virtual Classroo m							PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO12	PSO1, PSO2, PSO3, PSO4
	9918004 045	K.Govinda Sai				✓			✓		
2	9918004 001	M. Ajith Lakshmanan	MIST Disinfect		✓	✓				PO1, PO2,	PSO1, PSO2,



5	9918004 016	Buddala Akash	ABM Account Score Calculati on using DI				✓	✓	PO1, PO2, PO3, PO4, PO5, PO8, PO9, PO10, PO11, PO12	PSO1, PSO2, PSO3
Eco - Economic Env - Environmental So - Social Eth - Ethical H & S - Health & Safety Sus - Sustainability										

**Table 2.2.8 Domain Analysis of Community Service Project**

S. No.	Project Domains	2018-2019	2019-2020	2020-2021	2021-2022	Mapping with POs & PSOs
1	Android Application	11	3	6	17	PO1-PO12, PSO1-PSO4
2	Artificial Intelligence	4	2	4	2	PO1-PO12, PSO1-PSO4
3	Big Data Analytics	1	2	4	2	PO1-PO12, PSO1-PSO4
4	Cloud Computing	-	-	-	-	PO1-PO12, PSO1-PSO4
5	Image Processing	-	-	1	2	PO1-PO12, PSO1-PSO4
6	Internet of Things	35	29	15	11	PO1-PO12, PSO1-PSO4
7	Machine Learning	1	7	5	15	PO1-PO12, PSO1-PSO4
8	Natural Language Processing	1	1	2	2	PO1-PO12, PSO1-PSO4
9	Network & Security	5	2	1	3	PO1-PO12, PSO1-PSO4
10	Others	3	1	4	2	PO1-PO12, PSO1-PSO4
11	Robotics	-	1	-	-	PO1-PO12, PSO1-PSO4
12	Web Application	8	5	16	18	PO1-PO12, PSO1-PSO4

13	Wireless Sensor Networks	2	4	-	-	PO1-PO12, PSO1-PSO4
	<b>Total No. of Projects</b>	<b>71</b>	<b>57</b>	<b>58</b>		

**Table 2.2.9 Domain Analysis of Capstone Project**

S. No.	Project Domains	2015-2019	2016-2020	2017-2021	2018-2022	Mapping with POs & PSOs
1	Android Application	4	5	1	4	PO1-PO12, PSO1-PSO4
2	Artificial Intelligence	1	-	2	3	PO1-PO12, PSO1-PSO4
3	Big Data Analytics	7	1	6	7	PO1-PO12, PSO1-PSO4
4	Cloud Computing	7	7	-	2	PO1-PO12, PSO1-PSO4
5	Image Processing	-	1	3	8	PO1-PO12, PSO1-PSO4
6	Internet of Things	17	7	9	5	PO1-PO12, PSO1-PSO4
7	Machine Learning	13	26	21	22	PO1-PO12, PSO1-PSO4
8	Natural Language Processing	8	11	13	16	PO1-PO12, PSO1-PSO4
9	Network & Security	4	4	4	5	PO1-PO12, PSO1-PSO4
10	Others	1	1	-	-	PO1-PO12, PSO1-PSO4
11	Robotics	-	-	-	-	PO1-PO12, PSO1-PSO4
12	Web Application	12	7	11	6	PO1-PO12, PSO1-PSO4
13	Wireless Sensor Networks	3	-	-	-	PO1-PO12, PSO1-PSO4
	<b>Total No. of Projects</b>	<b>77</b>	<b>70</b>	<b>70</b>	<b>78</b>	

***Analysis on student projects***

Table 2.2.10 shows the total number of projects completed under community service projects by three batches of students 2015 – 2017, 2016 – 2020, 2017 – 2021 categorized as application, product and review based.

**Table 2.2.10 Analysis Support of Projects – Community Service Project**

Batch	Category of Projects		
	Application	Product	Research
2015 – 2019	38	28	5
2016 – 2020	27	24	6
2017 – 2021	43	13	2
2018 – 2022	60	11	3

Table 2.2.11 shows the total number of projects completed under capstone project by three batches of students 2015 – 2019, 2016 – 2020, 2017 – 2021 categorized as application, product and review based.

**Table 2.2.11 Analysis Support of Projects – Capstone Project**

Batch	Category of Projects		
	Application	Product	Research
2015 - 2019	60	7	10
2016 – 2020	55	3	12
2017 – 2021	50	6	14
2018 – 2022	62	5	11

### **C. Project Related to Industry**

#### **i. Industrial Projects in Capstone Project:**

Students are encouraged to carry out their project outside the campus (i.e.) preferably in Industries. If the students do their project in industries, they could get exposure to real time problems faced by the industries. Also, the students can utilize the opportunity to undergo such kind of real time projects. Further, the relationship between the industries and the institute is enhanced. It could be a chance for the students to get placement in the same companies after completing their degree. A sample list of Industry projects under capstone projects of various batches listed below:

**A Sample List of Student Industry Project****2015 - 2019 Batch**

S. No.	Students Reg.No	Name of the Students	Project Title	Company Name
1	9915004211	Gandevarkumar	Webapp	Leanpitch Technologies Private Limited
2	9915004216	G.Chaithanya	Master- client services provider android	HR Infratel Pvt LTD
3	9915004056	G. Sachin	Remote Sensing	ISRO Bangalore
	9915004127	Razia khan		
4	9915004129	Aravind	Web Based Database Retrieval Management System	AddakulasIT
5	9915004128	Ravi Venkata Sai	Multi-Utility Responsive Web App	Jen Info Solutions
6	9915004151	R Gopi Krishnan	Voice based automation using Alexa	Leanpitch
7	9915004135	E.Vamsidhar Reddy	Responsive webapp using Angular 6 and ROR	Leanpitch Technologies Private Limited
8	9915004163	P. Trived	Goskool	Senelar technologies
	9915004157	K. Gopinath		
9	9915004145	D. Yaswanth	ABEncryption based file sharing system	YoungMinds Technology Solutions Pvt Ltd
	9915004112	K. Raviteja		
	9915004205	Y. Harish Kumar		
10	9915004229	MD.Abdur Rahman	Sentiment analysis	SYMENTEX
	9915004171	K.Prajwal		

**2016 – 2020 Batch**

S. No.	Students Reg.No	Name of the Students	Project Title	Company Name
1	9916004103	Nuthi Deepthi Vijaya Lakshmi	Vehicle Number Plate Recognition In	Electronics corporation of india

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	9916004028	D Divya	Tollgate System By Using Optical Character Recognition (Ocr) In Machine Learning	Limited, Hyderabad
2	9916004036	G. Haritha	Smart Health Predicting system by using K - Means Algorithm	Electronics corporation of india Limited, Hyderabad
	9916004134	R.Harshita Naidu		
3	9916004219	G Pavan Sai	Implementation and design of web development on pictography	Keste IT Solutions, Hyderabad
	9916004038	G Maruthi		
	9916004055	K.KalyanChakravarthi		
4	9916004208	V. Jayaprakash Reddy	Hospital Management System	VNC Digital Services Pvt. Limited, Bangalore
	9916004027	D Karthik		
	9916004250	R. Tarun		
5	9916004093	M.V.Bharadwaj	Vendor Quote Tracking System and IRIS Android application	ITC infotech, bangalore
	9916004101	N.Bhargav		
6	9916004246	I Harikrishna	Kare Canteen House Using Web Development	Grepheor software Private Limited ,Hyderabad
	9916004042	GV Sai Keerti		
	9916004005	A.Likith Sai		
7	9916004077	M Harikrishna	Go With Myrowdy - The Online Shopping Web Application	Grepheor software Private Limited,Hyderabad
	9916004176	T Balamandeep		
	9916004091	M Bharatkumar		

**2018 – 2022 Batch**

S.No.	Students Reg.No.	Name of the Student	Project Title	Company Name
1	9918004046	K.Mahesh	ZOHO CRM - Slack Integration	Zoho, Tenkasi
2	9918004034	T.V.Balaji Royal	Course Management Systems	Zoho, Tenkasi
3	9819004002	KOTHARU NIKHIL SAI SHANKAR	Deployment of web application using Devops	Careerlabs, Bangalore

4	9918004059	M.Venkata Naveen	Web Application using React Js for carrier guidance	Careerlabs, Bangalore
5	9918004016	Nuddala Akash	ABM account score calculation using DI	Zoho, Tenkasi
6	9918004065	M.VenkataMithilesh	Product development using AWS	Nirman Technologies, Bangalore
	9918004099	R.Prakash		
	9918004089	P.Mukeshsai		
7	9918004178	NakkaPraneeth Reddy	Texty: A Comprehensive Language Analyser	Cognizant, Chennai
	9918004163	Appani Vignesh		

## ii. Industrial Projects at Course level

Courses modeled through the industry experts of IBM typically compose of an evaluation pertaining to project development. Such projects enhance practical knowledge of the students through PBL mode. KARE CSE inculcates a practice of providing Industry expert guidance in pursuing such course level projects. In such projects, experts from IBM will mentor and review the students. The sample list of courses that has included industrial projects at course level is enumerated below:

- CSE18R257 - Predictive analytics
- CSE18R110 - Introduction to Internet of Things
- CSE18R211 - IT Physical Security and System Security
- CSE18R292 - Algorithms for Intelligent System and Robotics
- CSE18R375 - Digital Forensics
- CSE18R352 - Big data
- CSE18R387 - Computational Linguistics and Natural Language Processing
- CSE18R210 - Introduction to Sensor Technology and Instrumentation

## D. Process for Monitoring and Evaluation

A detailed step-by- step procedure is given in below fig. 2.2.43. It describes the process of monitoring and evaluation of projects by those who undertake projects in our department.



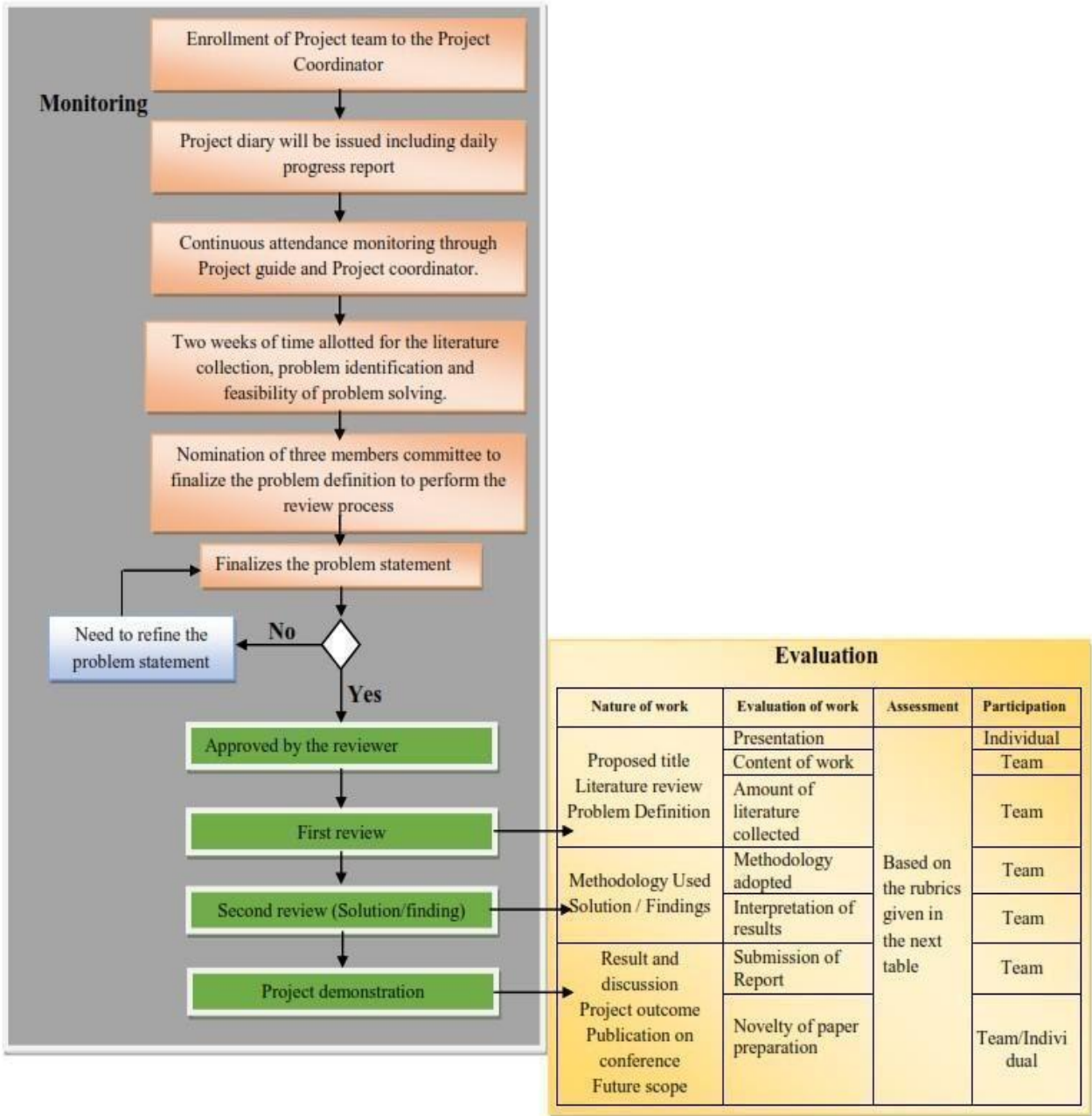


Fig. 2.2.43. Stages in the process of monitoring and evaluation

**Continuous Monitoring and Evaluation of Project**

All the student projects are centrally monitored by the Department Project Coordinator. The Students have to update their individual progress and their batch progress to their respective guides, three time a week. The guides report to the project coordinator in case of any discrepancies.

The Continuous assessment takes place through periodic reviews by industry experts and domain expert members based on monitoring and evaluation phases mentioned in three types of projects.

All the projects will be evaluated based on

- Scope, Objective, Design process, implementation methodology, performance analysis, standard consideration and future scopes.
- Project Work Demonstration
- Final Viva-voce by experts

**i. Course Level Project – Evaluation Method:**

Students Assessment for RPBL implementation consists of two parts such as internal assessment 50% of marks and external assessment as 50% of marks which is depicted in below fig. 2.44 and the detailed methods used throughout the course duration for student assessment is described in table 2.2.12. A sample snip of IBM industry experts evaluating the projects developed under aligned courses through course level project scheme is shown in fig. 2.45

**Table 2.2.12 Evaluation Methods/ Approaches used throughout the course duration**

S. No	Evaluation Method	Weightage (%)	Units covered
<b>Internal Continuous Assessment (50 marks)</b>			
1	Sessional Examination	10	III, IV
2	Assignment (3 Nos)	8	I, II, V
3	Research Article based Evaluation	13	All units
4	Experiment based Evaluation	12	All units
5	Evaluation by Industry person	7	All units
<b>External Assessment (50 marks)</b>			
6	End Semester	50	All units

## RPBL Evaluation Method

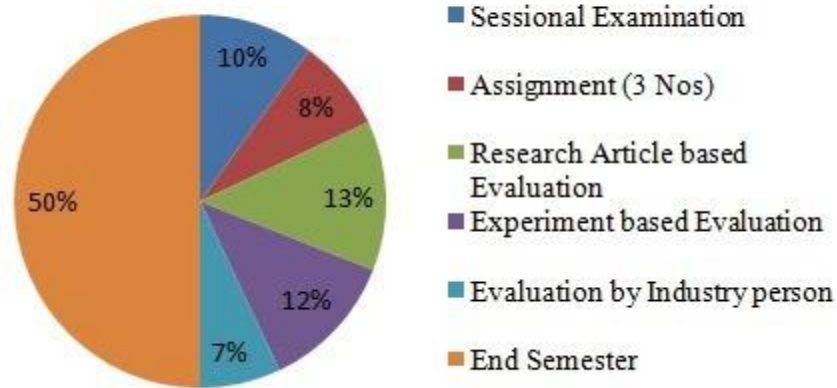


Fig. 2.2.44 RPBL Evaluation Method

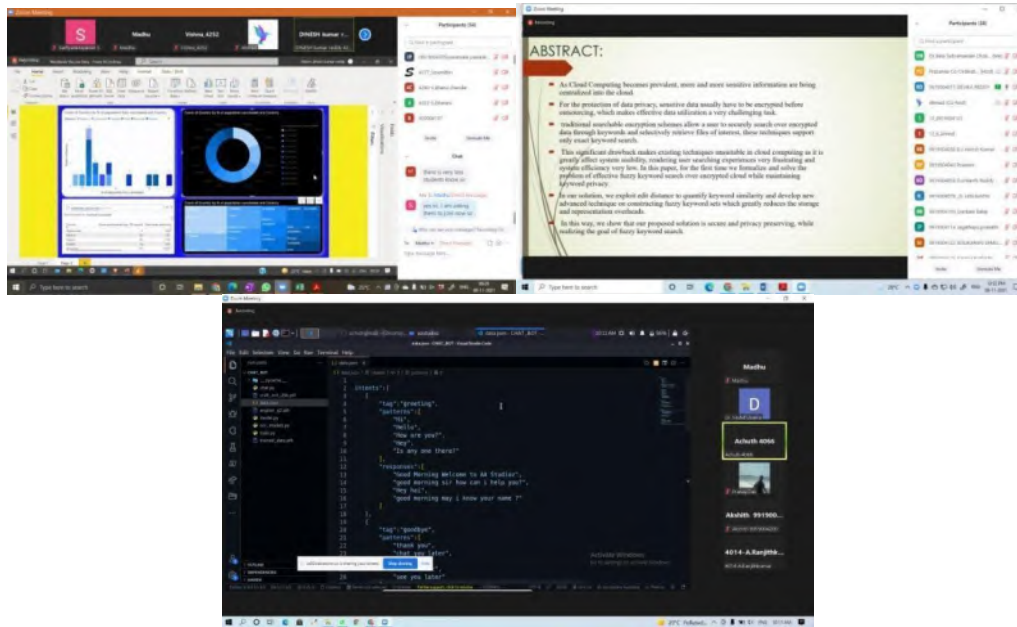
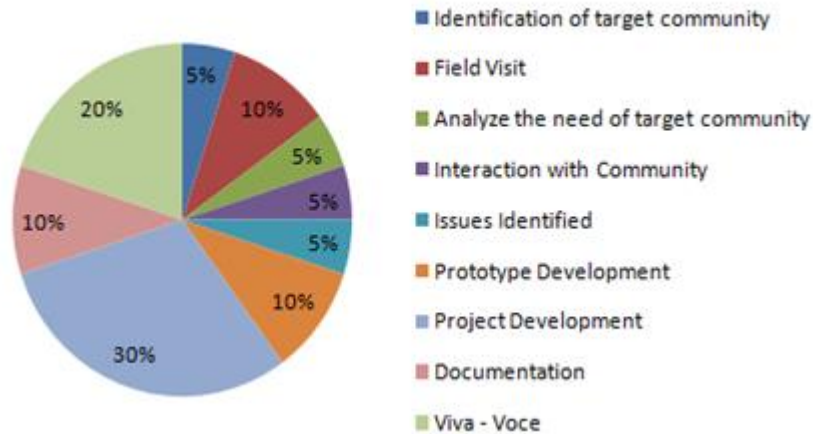


Fig. 2.2.45 IBM Industry Expert Evaluator in Course Level Project – A Sample

### ii. Community Service Project - Evaluation Method:

The progress of a project is monitored by the guide on a regular basis and the students have to report the updates to the respective guide three times a week. The continuous progress is assessed through periodic review by a panel of domain experts (zeroth review, first review and second review before viva-voce) based on rubrics given below in fig. 2.2.46.

### CSP Assessment Method

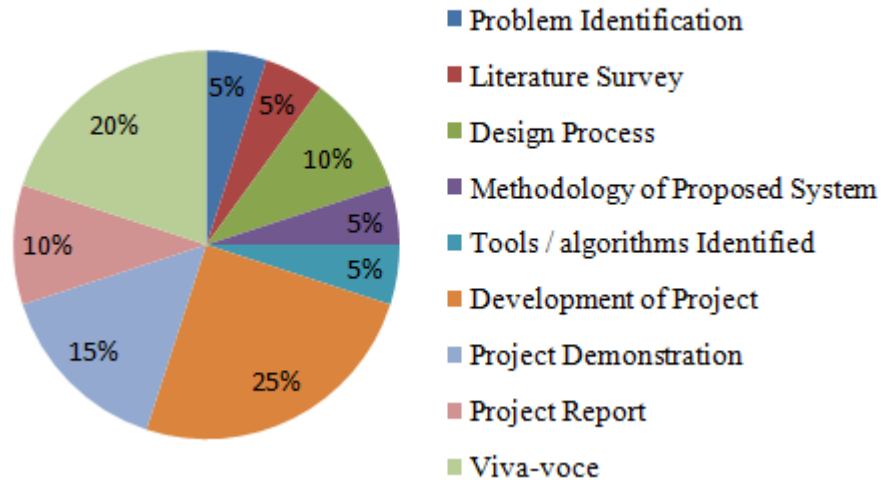


**Fig. 2.2.46 Community Service Project - Evaluation Method**

#### iii. Capstone Project – Evaluation Method:

The progress of a project is monitored by the guide on a regular basis and the students have to report the updates to the respective guide three times a week. The outcome of each stage of the project is monitored and rated by the project guide periodically. The continuous progress is assessed through periodic review by a panel of domain experts (zeroth review, first review and second review before viva-voce) based on rubrics given below in fig. 2.2.47.

### Capstone Project - Assessment Method



**Fig. 2.2,47 Capstone Project - Evaluation Method**

**E. Process to Assess Individual and Team Performance**

The individual team members in the project group can be assessed by a system called the “Peer Assessment Method”. The peer assessment system can be done with the help of a project diary given to the teams. The student teams should update the diary on a daily basis. The students will be evaluated by the peer members of the team. The project guide will monitor the same and evaluate the individual work contribution with the sample criteria mentioned below in table 2.2.13. In addition, each member of the team will also be assessed during the project review conducted by the panel members.

**Table 2.2.13 – A Sample Criteria for Peer Assessment Method**

<b>Team Work</b>	Role Play, Team Lead, Ability to work with the group, carrying out of designated tasks
<b>Communication</b>	Clarity of work submitted to the group, negotiations and providing feedbacks
<b>Project Involvement</b>	Dependability and Intellectual Collaboration
<b>Technical Learning</b>	Literature Surveys, Practical tools and Methodology implementation

The performance of each team member in every group can be rated on a linear scale. The linear scale ranges from low value as “1” to high value as “5” with anchors such as “Worst” to “Excellent”. This peer assessment method helps to balance the efficacy and practicality in assessing the individual performance in different types of projects.

Our department has framed rubrics to evaluate the students’ project. The project is evaluated based on some selected factors. The factors are collection of literature reviews, problem definition, methodology proposed, and etc. A complete rubrics description and the related mark split is given below. Based on the rubrics stated, the projects are evaluated.

**Rubrics for Assessment – Community Service Project:****Zeroth Review**

Identification of target community (20)	Level of understanding (10)	Deep study on the group (6-10)
		Limited knowledge (1-5)
		No acquaintance (0)
	Level of disclosure (10)	Use of complete sentences (5-10)

		Incoherent sentence structure (0-4)
Analyze the need of target community (20)	Level of understanding (10)	Explained logical integration (6-10)
		Explained unreasonable reasons (1-5)
		Not Studied (0)
	Justification on key points (10)	Well justified (6-10)
		Unclear justification (1-5)
		No justification (0)
Performance on Queries (10)	Level of Response (10)	Responds to all Questions (8-10)
		Responds to Most Questions (5-7)
		Responds to fewer Questions (0-4)

**First Review**

Tools identified (10)	Level of understanding (10)	Deep Learning (6-10)
		Medium Learning (1-5)
		No Idea (0)
Interaction with Community (10)	Planning (5)	Good Pre-Plan (4-5)
		On-Spot Interaction (1-3)
		No Interaction (0)
	Level of discussion (5)	Proper Discussion (3-5)
Basic Interaction (0-2)		
Response to community review (10)	Level of redefinition (10)	High (6-10)
		Medium (1-5)
		No Idea (0)
Defining modules and sub-modules (10)	Flow of problem (5)	Neatly Summarized (4-5)
		Explained In Medium Level (1-3)
		No Idea (0)
	Justification of inter-module relationship (5)	Well Justified (4-5)
		Unclear Justification (1-3)
		No Justification (0)
Performance on Queries (10)	Level of Response (10)	Responds to all Questions (8-10)
		Responds to Most Questions (5-7)
		Responds to fewer Questions. (0-4)

**Second Review**

Module Description (10)	Software/ tool identification (5)	Good (4-5)
		Basic Knowledge (1-3)
		No Idea (0)
	Justification of modules (5)	Good knowledge (4-5)
		Basic knowledge (1-3)
		No interpretation (0)
Implementation (10)	Level Of Completion (5)	Entire project (4-5)
		Partial (1-3)
		No implementation (0)
	Interpretation Of modules (5)	Excellent (4-5)
		Good (1-3)
		No Interpretation (0)
Testing and Revision (10)	Level of test (7)	Deep step by step test (5-7)
		Module wise (1-4)
		No testing (0)
	Correction/ Revision (3)	Revision claimed appropriately (3)
		No proof (0)
Documentation and Performance on Queries (20)	Content and Organization (10)	Text is Well Organized (8-10)
		Text is Fairly Well Organized (4-7)
		Text is Poorly Organized (0-3)
	Level of Response (10)	Responds to all Questions (8-10)
		Responds to Most Questions (5-7)
		Responds to fewer Questions. (0-4)

**Viva Voce**

Problem definition and design (20)	Level Of Understanding (5)	Good (4-5)
		Basic Knowledge (1-3)
		No Idea (0)
	Feasibility of Solution (5)	Highly Feasible (4-5)
		Feasible With Some Modifications (1-3)
		Major Revision Required (0)
	Flow of problem (5)	Neatly Summarized (4-5)
		Explained In Medium Level (1-3)
		No Idea (0)
	Justification of	Well Justified (4-5)

	model (5)	Unclear Justification (1-3)
		No Justification (0)
Target community interpretation (20)	Interpretation Of Problem (5)	Excellent (4-5)
		Good (1-3)
		No Interpretation (0)
	Level of Abstraction (5)	High Level (4-5)
		Low Level (1-3)
		No Abstraction (0)
	Level of discussion (5)	Proper Discussion (3-5)
		Basic Interaction (0-2)
Report on interaction (5)	Proper Discussion (3-5)	
	Basic Interaction (0-2)	
Analyze the need of target community (20)	Level of understanding (10)	Explained logical integration (6-10)
		Explained unreasonable reasons (1-5)
		Not Studied (0)
	Issues Identified (10)	Well justified (6-10)
		Unclear justification (1-5)
		No justification (0)
Testing and Revision (20)	Level of test (10)	Deep step by step test (6-10)
		Module wise (1-5)
		No testing (0)
	Correction/ Revision (10)	Minor Revision claimed appropriately (6-10)
		Major Revision claimed appropriately (1-5)
		No revision (0)
Documentation and Performance on Queries (20)	Content and Organization (5)	Text is Well Organized (4-5)
		Text is Fairly Well Organized (2-3)
		Text is Poorly Organized (0-1)
	Level of Response to queries (5)	Responds to all Questions (4-5)
		Responds to Most Questions (2-3)
		Responds to fewer Questions. (0-1)
	Contribution as a team member / single chap (5)	Responsibility taken efficiently (4-5)
		Fair cooperation / planning (1-3)
		Poor participation (0)
	Patent/publication (5)	Published /patent process completed (5)
		In process/ accepted (1-4)
		No step to publication (0)



**Rubrics for Assessment – Capstone Project:**

**Zeroth Review**

<b>Performance Criteria</b>	<b>Excellent (10-8 Marks)</b>	<b>Good (7-5 Marks)</b>	<b>Satisfactory (4-3 Marks)</b>	<b>Poor (2-1 Marks)</b>
Problem Identification (20 %)	Detailed knowledge and extensive explanation of the problem.	Good knowledge and explanation of the problem.	Average knowledge of the problem.	Minimal Knowledge of the Problem.
Identification of State-of-the-art technologies (15 %)	Comprehensive review of literature relevant to the study.	Review of the literature is fairly well organized, acknowledging the relatedness of the project.	Comprehensive review of literature relevant to the study. Moderately well organized.	Inadequate review of literature relevant to the study. Poorly organized. Lacks description of the project.
Objectives (10 %)	All objectives of the proposed work are well defined;	Good justification to the objectives;	Only Some objectives of the proposed work are well defined;	Objectives of the proposed work are either not identified or not well defined; Incomplete and improper specification
Methodology of proposed Work (10 %)	Steps to be followed to solve the defined problem are clearly specified	Methodology/steps to be followed is specified but detailing is not done	Steps are mentioned but unclear; without justification to objectives	proposed work is not identified or not well defined. Incomplete and improper specification

Tools /Algorithms identified (15 %)	Identify and employ appropriate tools and/or software engineering techniques.	Employ appropriate tools and/or software engineering techniques acquired in his course of study to the project.	Did not identify, and apply some part of the tools and/or software engineering techniques acquired.	Does not make use of tools and/or software engineering techniques relevant to the project.
Presentation (20 %)	presentations are appropriate and well arranged	Presentations are appropriate, but not well arranged. Satisfactory presentation.	Presentations are not appropriate, not well arranged.	Presentations are not appropriate, not well arranged. Poor delivery.
Viva Voce (10 %)	Answers to questions are strengthened by rationalization and explanation.	Can answer questions.	Can answer basic questions only.	Cannot answer questions.

**Project Review 1:**

Performance Criteria	Excellent (10-8 Marks)	Good (7-5 Marks)	Satisfactory (4-3 Marks)	Poor (2-1 Marks)
Novelty of the project (20%)	Project idea is very creative and original. Problem/purpose very creative or original with new and innovative ideas. Explored original topics and discovered new outcomes.	Creativity and originality in project ideas. Problem / purpose: fairly original or creative. Design/approach appropriate or innovative.	Idea of the project is Somewhat creative and original. Problem/purpose limited in originality and creativity.	Lack of Creativity and originality in project ideas. Problem / purpose lacked creativity or was not new. Duplication of previous work.

Use of appropriate tools / technologies for coding (25%)	Able to do any complicated design tasks with proper software tools /techniques	Able to do moderately difficult design tasks with proper software tools/techniques	Able to do only simple tasks with proper software tools/techniques	Cannot use proper software tools / Techniques
Work Progress (25%)	Progress is beyond expectations with respect to plan. Highly detailed discussions on milestones completed.	Progress is highly satisfactory with respect to plan. Detailed discussions on milestones completed.	Progress is mostly satisfactory with respect to plan. Some discussions on milestones completed.	Progress is not satisfactory with respect to plan. No discussions on milestones completed.
Presentation (20%)	presentations are appropriate and well arranged	Presentations are appropriate, but not well arranged. Satisfactory presentation.	Presentations are not appropriate, not well arranged.	Presentations are not appropriate, not well arranged. Poor delivery.
Viva Voce (10%)	Answers to questions are strengthened by rationalization and explanation.	Can answer questions.	can answer basic questions only.	Cannot answer questions.

**Project Review 2**

Performance Criteria	Excellent (10-8 Marks)	Good (7-5 Marks)	Satisfactory (4-3 Marks)	Poor (2-1 Marks)
Implementation of techniques / Execution of work (15%)	Excellent design and implementation. Meets all functional requirements;	Satisfactory, flexible design meeting all functional requirements; Accounts for several important constraints	Acceptable design that meets most functional requirements; Implementation mostly bug-free; Takes some account of some key constraints;	Implementation seems buggy; Little or no attention paid

Demonstration/ Quality of results (15%)	Each module is working well and properly demonstrated.	Each module is working well but not properly demonstrated.	Each module is partially working well and not properly demonstrated.	Each module is not working well and also demonstrated poorly.
Addressing the needs of Society (10%)	Developed Solution after a very detailed study on societal needs.	Developed Solution after a study on societal needs.	Developed Solution partially addresses societal needs.	Do not address societal needs.
Economical factor (10%)	Highly cost-effective Solution	Cost effective Solution	Moderately cost Effective Solution	Not affordable by the target community.
Environmental factors (10%)	Highly environmentally friendly solution	Environmentally friendly solution	Moderately environmentally friendly solution.	Adverse effects on the environment.
Publications in Journal / Conference / Project Competition	Published in Scopus Indexed Journal	Published in International conference/ Journals	Presented a paper in National Conference / Participated in project competition	Not published the work / Not participated in project competition
Organization of content and readability in the report & Plagiarism (10%)	Report is well organized and clearly written. Plagiarism check (using a software) is less than 80%	Report is organized and clearly written for the most part. Plagiarism check (using a software) is less than 60%	Report is organized, but in some areas, it is difficult to follow the flow of ideas. Originality score more than 40% and less than 60%	Report lacks an overall organization. Reader has to make considerable effort to understand the underlying logic and flow of ideas. Originality is less than 40%

Presentation (10%)	Presentations are appropriate and well arranged	Presentations are appropriate, but not well arranged. Satisfactory presentation.	Presentations are not appropriate, not well arranged.	Presentations are not appropriate, not well arranged. Poor delivery.
Viva Voce (10%)	Answers to questions are strengthened by rationalization and explanation.	Can answer questions.	can answer basic questions only.	Cannot answer questions.

### Final Project Viva

Performance Criteria	Excellent (10-8 Marks)	Good (7-5 Marks)	Satisfactory (4-3 Marks)	Poor (2-1 Marks)
Novelty in the project (15%)	Project idea is very creative and original. Problem/purpose very creative or original with new and innovative ideas. Explored original topics and discovered new outcomes.	Creativity and originality in project ideas. Problem/purpose fairly original or creative. Design/approach appropriate or innovative.	Idea of the project is Somewhat creative and original. Problem/purpose limited in originality and creativity. Design/approach only marginally appropriate or innovative.	Lack of Creativity and originality in project ideas. Problem/purpose lacked creativity or was not new. Duplication of previous work.
Module Description (20%)	Excellent design and implementation. Meets all functional requirements;	Satisfactory, flexible design meeting all functional requirements; Accounts for several important constraints	Acceptable design that meets most functional requirements; Implementation mostly bug-free; Takes some account of some key constraints;	Implementation seems buggy; Little or no attention paid

Implementation & Result (30%)	All defined objectives are achieved. Each module worked well and properly demonstrated.	All defined objectives are achieved. Each module worked well and not properly demonstrated.	Some of the defined objectives are achieved. Each module partially worked well and not properly demonstrated.	Defined objectives are not achieved. Each module is not working well and demonstrated poorly.
Project Report (15%)	Report is well organized and clearly written. Plagiarism check (using a software) is less than 80%	Report is organized and clearly written for the most part. Plagiarism check (using a software) is less than 60%	Report is organized, but in some areas, it is difficult to follow the flow of ideas. Originality scores more than 40% and less than 60%	Report lacks an overall organization. Reader has to make considerable effort to understand the underlying logic and flow of ideas. Originality is less than 40%
Conference / Journal publication / Project Competition (10%)	Published in Scopus Indexed Journal	Published in International conference/UGC Journals	Presented a paper in National Conference / Participated in project competition	Did not Present the paper in any conference / Participated in project competition
Viva Voce (10%)	presentations are appropriate and well arranged. Answers to questions are strengthened by rationalization and explanation.	Presentations are appropriate, but not well arranged. Satisfactory presentation. Can answer questions.	Presentations are not appropriate, not well arranged. can answer basic questions only.	Presentations are not appropriate, not well arranged. Poor delivery. Cannot answer questions.

**F. Quality of Completed Project/ working prototypes**

Quality of the project is determined based on the outcome, follow of design constraints along with environment, safety, ethics, cost and sustainability consideration and standards. Quality projects are disseminated and published to the science and technology domains in the following aspects:

- Publishing papers in reputed National / International Conference proceedings.
- Filing patents for novel technical ideas.
- Forwarding the best project to the science competitions
- Sending the students projects proposal to the IEDC, TNSTC project competitions for fund approval etc.

All the projects will be examined by the project coordinator and project guide, and the team of internal and external experts will be formed by the Head of the department to ensure the quality of project in terms of IEEE standards, design constraints along with environment, safety, ethics, cost and sustainability consideration and outcomes.

IQAC also will check the quality of the projects as per the given format below. At the end of the format, a sample copy of the audit report is given in fig. 2.2.48.

1. Technical content
2. Publications / Patents
3. Report Quality

**KALASALINGAM UNIVERSITY**  
(Kalasalingam Academy of Research and Education)  
Anand Nagar, Krishnankoil – 626 126  
**INTERNAL QUALITY ASSURANCE CELL (IQAC)**  
**UG PROJECT REPORT AUDIT - 2016**

**Assessment Details:**

Parameters	weightage
Technical content (A)	50 %
IQAC Audit (B=B1+B2)	
1. Publications/patents (B1)	30 %
2. Report quality (B2)	20 %

- 1. Technical Content (50%)** – Marks directly given based on the performance of internal and final project reviews (obtained from CoE Office). Only the marks of the student scoring highest in the batch is considered.
- 2. Publications/patents (30%)** – Marks awarded based on submission of manuscript as per criteria mentioned below:

S.No	Type of Publications @ @	Marks
1.	National Conference at KLU	2
2.	National Conference outside KLU	3
3.	International Conference at KLU	3
4.	International Conference outside KLU (Within Tamilnadu)	4
5.	International Conference outside KLU (Outside Tamilnadu)	5
6.	Magazine (National level)	5
7.	National Journal	6
8.	International Conference at NII/IIT	8
9.	International Journal (Scopus Indexed)	9
10.	International Journal (Thomson Reuters Impact Factor)	10

\* Marks are awarded only if the paper communicated proof is enclosed in the project report.

- 3. Report Quality (20%)** – Marks awarded based on the committee constituted to verify the project report as per IQAC guidelines (formats, downloaded content, clear definition of objectives/conclusion, matching of literature cited and references etc).

**Grade Details:**

1. Content Quality alone:

Quality Grade	Marks	Description
A*	> 45	Excellent
A	> 40	Very Good
B	> 35	Good
C	> 30	Fair
D	< 30	Needs significant improvement

2. Publications/patents and Report Quality alone:

Quality Grade	Marks	Description
A*	> 40	Excellent
A	> 35	Very Good
B	> 30	Good
C	> 20	Fair
D	< 20	Needs significant improvement

3. Overall Rating:

Quality Grade	Marks	Description
A*	A > 40 & B > 40	Excellent
A	A > 40 & B > 30	Very Good
B	A > 35 & B > 20	Good
C	A > 30 & B > 20	Fair
D	A < 30 &/or B < 20	Needs significant improvement

**Fig. 2.2.48 – A Sample copy of IQAC Project Audit Report Format**

**G. Evidences of papers published /Awards received by projects.**

The school of computing organizes an in-house project exhibition called “Aswamedha” every year. The department of CSE encourages the students to exhibit their project in this event. Eminent experts from other institutes are invited to evaluate the projects. The excellent projects are selected by the expert and will be awarded as “Best Projects” of Aswamedha. A sample glimpse of project evaluation and best project award certificates in Aswamedha are shown in fig. 2.2.49





**Fig. 2.2.49 – A sample glimpse of Project evaluation & certificates in Project Competition – Aswamedha**

IUCEE KARE Student Chapter (IKSC) also supports students to take up projects of different areas for community and technological development, and guides them in required aspects to meet the project’s aim. This helps them to learn and develop the project skills from identifying the problem to finding a potential solution that ensures end-to-end practical-based learning. Our students have participated in IUCEE Student Projects Oriented for Problem Based Learning (POPBL-2021). Its a unique opportunity given to students to get involved in doing engineering projects inspired by real-time challenges faced by local and regional industries in crafts and agro space.

Sample Awards and certificates for the best student project implementation given by IKSC shown in fig. 2.2.50.



**Fig. 2.2.50. Sample Awards and Certificates for Best Student Project by IKSC**

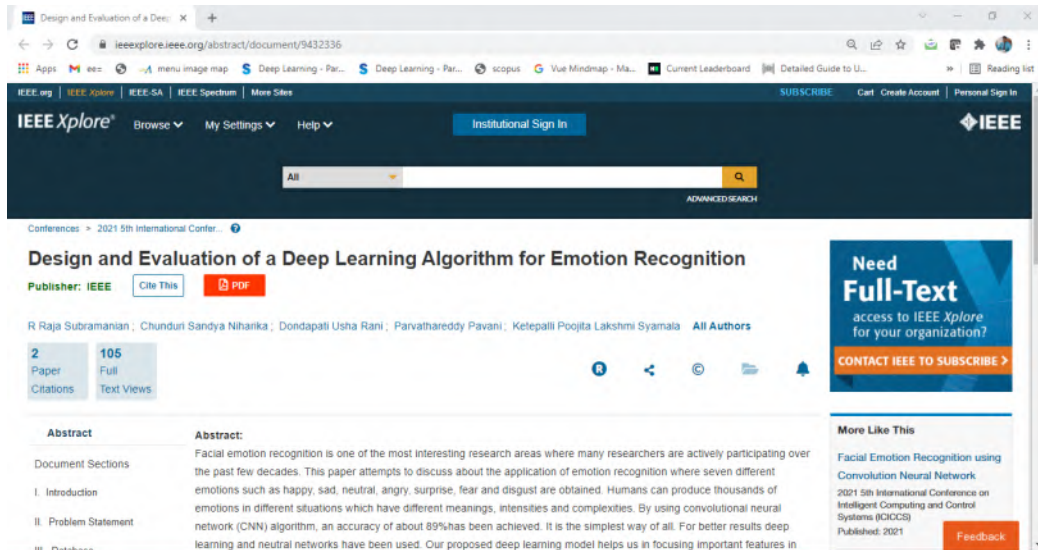
Students are encouraged to publish their project work in Journals. The students have published their project work in the International Journals indexed in SCOPUS and UGC Care. Apart from presenting their work in journals, they are also encouraged to present their work in International Conferences. The sample lists of students published their project work in Journals and conferences are depicted herewith.

**Sample List of paper published in Journals and conference**

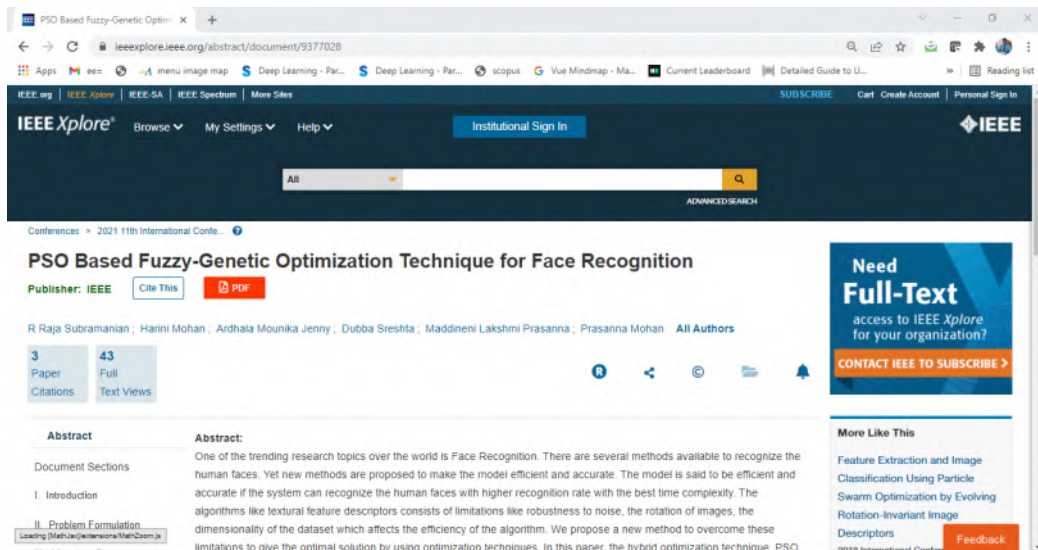
**Course Level Project – An outcome**

A few sample lists of Student Research Papers published in IEEE Xplore

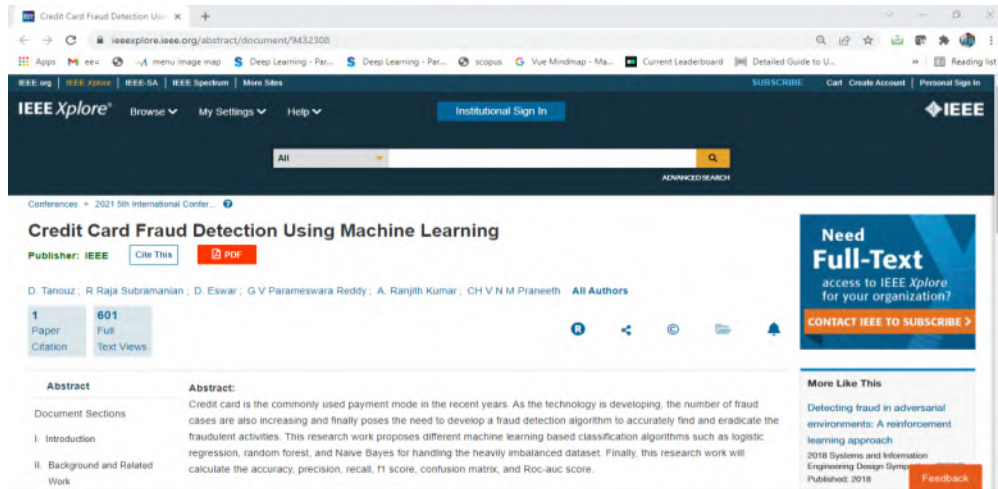
1. PSO Based Fuzzy-Genetic Optimization Technique for Face Recognition.
2. Skin cancer classification using Convolutional neural networks.
3. A Survey on Sentiment Analysis
4. Credit Card Fraud Detection Using Machine Learning
5. Design and Evaluation of a Deep Learning Algorithm for Emotion Recognition
6. Multiplayer Online Car Racing with BCI in VR



**(a) Research Paper 1**



**(b) Research Paper 2**



(b) Research Paper 3

Fig. 2.2.51. Sample screenshot of Research Paper Publication

### Community Service Project – An Outcome

A Few Sample Products developed through CSP projects:



(a) Driver Drowsiness Detection System



(b) Handy Comrade

Fig. 2.2.52 Sample Images of Products developed under CSP

**Patents Published**

- **Predictive HealthCare Recommender System** under the guidance of Mr. P. Nagaraj
- **Robotic Weed Removing Apparatus and Method thereof** under the guidance of Mr. R. Raja Subramanian
- **IoT Based Energy Conservation System** under the guidance of Mrs. J.Jeyaranjani
- **Smart Waste Management System using IoT** under the guidance of Mrs. G. Elizabeth Rani
- **Healthcare System using Fingerprint** under the guidance of Mr. K.MuthamilSudar
- **Fully Automated Solar Grass Cutter** under the guidance of Dr.R.Murugeswari

**Capstone Project – An outcome**

**Batch 2018-2022**

1. R. R. Subramanian, M. Yaswanth, B. V. Rajkumar T S, K. Rama Sai Vamsi, D. Mahidhar and R. R. Sudharsan, "Musical Instrument Identification using Supervised Learning," 2022 6th International Conference on Intelligent Computing and Control Systems (ICICCS), 2022, pp. 1550-1555, doi: 10.1109/ICICCS53718.2022.9788116.
2. R. R. Subramanian, M. S. Murali, B. Deepak, P. Deepak, H. N. Reddy and R. R. Sudharsan, "Airline Fare Prediction Using Machine Learning Algorithms," 2022 4th International Conference on Smart Systems and Inventive Technology (ICSSIT), 2022, pp. 877-884, doi: 10.1109/ICSSIT53264.2022.9716563.
3. R. R. Subramanian, T. M. DheenaDayalan, T. Badhrirajan, C. Dhinakaran, C. G. Devakirubai and R. R. Sudharsan, "An Automated House Plan Generator leveraging Genetic Algorithms," 2021 International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA), 2021, pp. 1-6, doi: 10.1109/ICAECA52838.2021.9675541.
4. S. Alagarsamy, T. T. Kumar Reddy, B. Praveen Kumar, P. S. Vineeth and A. Senthil Kumar, "A Novel Technique for Prophecy of Brain Strokes," 2022 6th International Conference on Intelligent Computing and Control Systems (ICICCS), 2022, pp. 1203-1208, doi: 10.1109/ICICCS53718.2022.9788277.
5. S. Alagarsamy et al., "Smart System for Reading the Bar Code using Bayesian Deformable Algorithm for Blind People," 2022 6th International Conference on Trends

- in Electronics and Informatics (ICOEI), 2022, pp. 424-429, doi: 10.1109/ICOEI53556.2022.9776881.
6. T. Hanumann, N. V. V. S. N. Swamy, P. Gowtham, R. Sumathi, P. Chinnasamy and A. Kalaiarasi, "Plant Monitoring System Cum Smart Irrigation using Bolt IOT," 2022 International Conference on Computer Communication and Informatics (ICCCI), 2022, pp. 1-3, doi: 10.1109/ICCCI54379.2022.9741003.
  7. B. Pitchaimanickam, R. Gayathri, G. Jyoshna and P. P. Sai, "Digital Dermatology Classification using Deep Learning Technique," 2022 6th International Conference on Intelligent Computing and Control Systems (ICICCS), 2022, pp. 1422-1428, doi: 10.1109/ICICCS53718.2022.9788133.
  8. R. R. Subramanian, M. Kancharla, S. H. Duddekula, A. V. N. Harshith, G. S. Kamisetty and R. R. Sudharsan, "Assessing and Monitoring Dietary Intake," 2021 International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA), 2021, pp. 1-4, doi: 10.1109/ICAECA52838.2021.9675677.

### **Batch 2017-2021**

1. C Bala Subramanian, EtlamJaswanth and Ch Pushyanth Reddy, "Secured Patient Record in Cloud Environment", International Journal of Advanced Science and Technology, ISSN: 2005-4238, Volume-28, Issue-7, June 2020. Page No. 105666-105684.
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## **2.2.4 Initiatives related to industry interaction (10)**

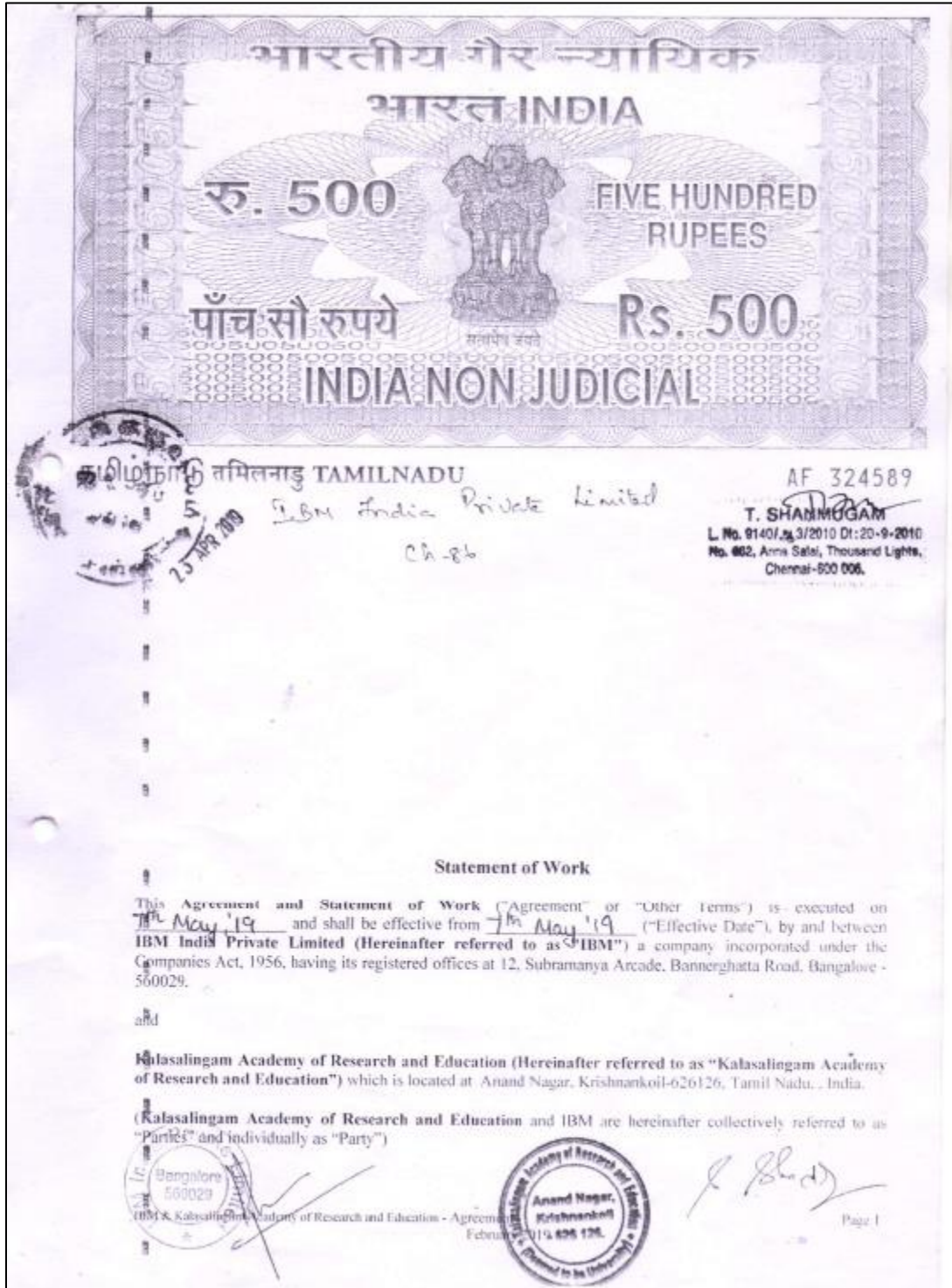
Interaction between industry and the academic institute is important to bridge the gap between the theoretical practices followed in the institute and the practical knowledge to be applied in the industry. It goes a long way towards improving a student's interpersonal skills and preparing him or her for the workforce. Interactions like these aren't always restricted to case studies or internships. Institutes also organize industry-institute interaction activities such as panels and summits to bring together thinkers, experts, and practitioners so that students can benefit greatly from rigorous mentoring by enthusiastic and highly committed industry personnel. To develop industrial skills, the CSE department at KARE has done the following.

- Industry supported laboratories
- Industry involvement in the program design and curriculum
- Industry involvement in partial delivery of regular courses for students
  - Workshop conducted by Industry Experts
  - Guest Lectures Conducted by Industry Experts
  - Training Provided by Industries to Student
  - Value Added Course Provided by Industries to Student
  - Credit Course Offering by Industries to Students
  - Industrial Collaboration Training (Co Teach Mode)
- Impact analysis of industry-institute interaction

### **A. Industry supported laboratories**

The Department of Computer Science and Engineering has signed a Memorandum of Understanding with several IT Companies like IBM, Red Hat, Microsoft. Table 2.2.15 lists

MoU signed by CSE-KARE. These MoUs are vital in developing Industry Oriented laboratories, courses, projects, certifications in the department. Sample MoUs signed with industries are shown in fig. 2.2.53 (a-b).



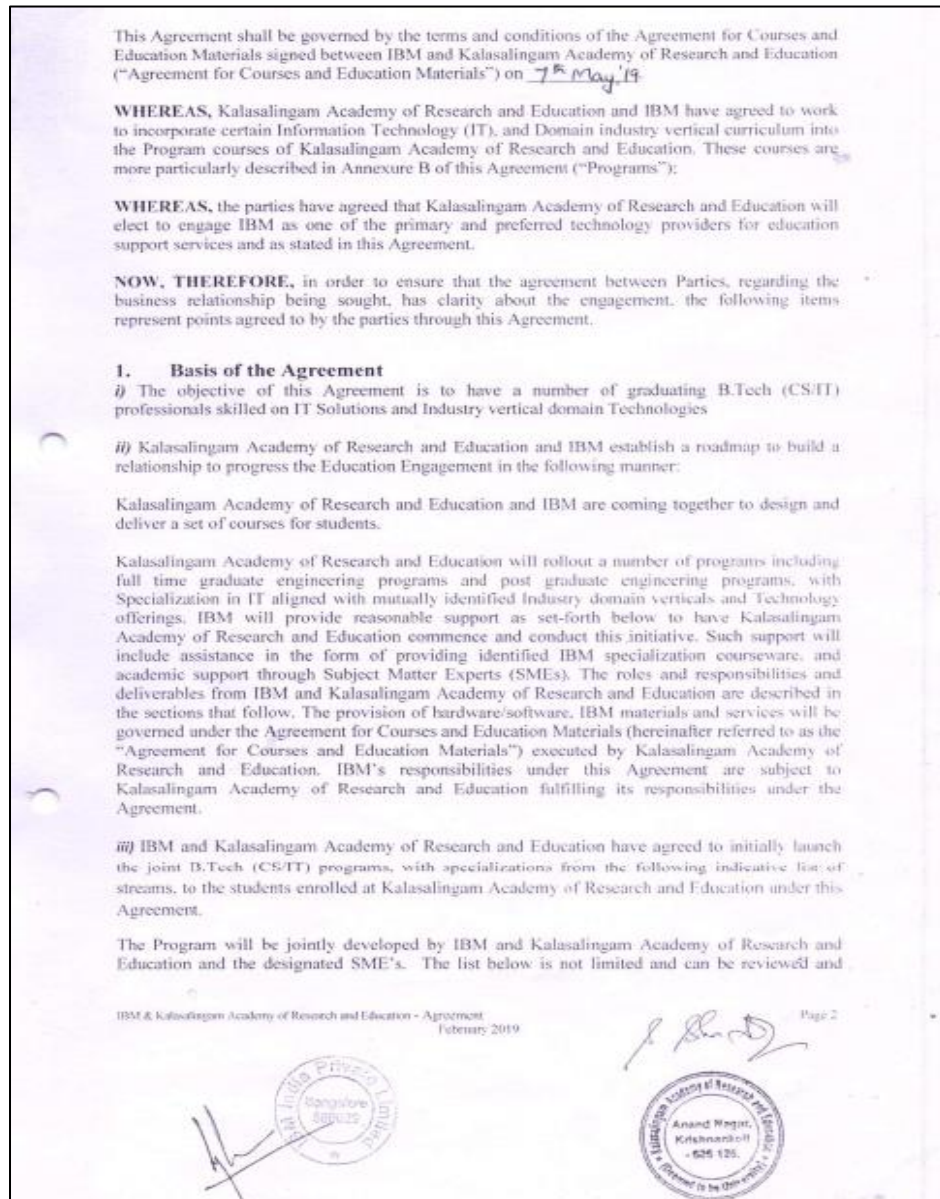


Fig. 2.2.53(a) Copy of MoU signed with IBM



Fig. 2.2.53(b) Copy of MoU signed with Redhat

**Table 2.2.15 List of MoU signed by KARE CSE**

S.No.	Name of the MoU/ Agreement	Year	Objective	Outcome
1	IBM	2019	Increase the number of graduating BTech CSE professionals skilled in IT Solutions and Industry vertical domain technologies	<ul style="list-style-type: none"> <li>● IBM is taking part in designing courses in four streams, viz., Artificial Intelligence and Machine Learning, Data Analytics, Cyber Security and Forensics, Internet of Things, and Smart City.</li> <li>● Academic Support for IBM course offerings through Subject Matter Experts taking part in partial conduct of courses, evaluation of specific component, training to student</li> <li>● Development of state-of-the-art laboratories, viz., Data Science and Visualization lab, IoT &amp; Sensor Technology lab.</li> <li>● Industry mentorship for Projects and Hackathon for allied courses</li> <li>● Students learning a minimum of 7 IBM courses in a common discipline will earn a badge from IBM in their degree.</li> </ul>

2	Red Hat	2018	Red Hat provides KARE an Internet deployed and managed Curriculum, Software, and Services and KARE provides the facilities and teachers and delivers the Courses to students	Faculties have completed RedHat Certification and used the concepts learned in teaching content-out-of-syllabus in courses including Operating Systems, as part of X-Component
3	Microsoft	2017	Provide training pertaining to faculties using Microsoft Tools	Faculties have completed Microsoft Technology Associate Certification and used the concepts learn in teaching Cloud Computing concepts to students as part of Training and X-Component

### **Laboratories established with Industry Support**

KARE CSE with the support of IBM has established state-of-the-art laboratories, Data Science and Visualization Laboratory, and IoT Sensor Technology Laboratory.

#### ***Data Science and Visualization (DSV) Lab:***

The lab is typically devoted to teaching and preliminary research on data science and visualization paradigms. The lab is established in the year 2019 along with the inculcation of various data science-related courses in the B.Tech (CSE) Curriculum. As an impact, many student projects focused on data science by applying various machine learning and artificial intelligence techniques through the available facilities in the lab, and outcomes are visualized in terms of projects and papers. The configuration of the DSV lab is depicted in Table 2.2.16

**Table 2.2.16 Data Science and Visualization Lab Configuration**

Number of Systems	System Configuration	Software Installed
65	HP 280 G2, MT Intel Core TM i5-6500 Cpu@3.20GHz 8GB DDR4 1TB HDD 19" LED Monitor DVD Writer	<ol style="list-style-type: none"> <li>1. Open-Source Software Like R, Python, Rapidminer</li> <li>2. Tableau</li> <li>3. PowerBI</li> <li>4. SQL Server Studio</li> <li>5. Visual Studio</li> <li>6. Talend</li> <li>7. SAS</li> <li>8. Apache Hadoop</li> <li>9. HDFS</li> <li>10. HIVE</li> <li>11. PIG</li> <li>12. Pydoop</li> <li>13. Vidanalytics</li> <li>14. Tubebuddy</li> </ol>

**Courses practiced in the laboratory:**

1. CSE18R258 - Descriptive Analytics
2. CSE18R467 - Social, Web and Mobile Analytics
3. INT18R371 - Database Management Systems
4. CSE18R381 - Data Visualization for Analytics
5. CSE18R257 - Predictive Analytics

**IoT and Sensor Technology Lab**

The IoT and Sensor Technology (IST) lab is established in the year 2019. The lab is established based on the students' interest in doing IoT projects with an intention to turn some of them into products. The details of the lab configuration are listed in Table 2.2.17.



**Table 2.2.17 Configuration of IST Lab**

S. No.	Item	Components	Nos
1	Desktop	Intel i7, 16 GB RAM, 1 TB HDD, MS Windows 10, Keyboard, Optical Mouse	30
2	Arduino UNO R3 Development Board	Arduino UNO R3 Development Board	30
3	Node MCU Esp8266 Development Board	Node MCU Esp8266 Development Board	30
4	Raspberry Pi 4 B model	Broadcom BCM2711, Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz 8GB LPDDR4-3200 SDRAM, 2.4 GHz and 5.0 GHz IEEE 802.11ac wireless, Bluetooth 5.0, BLE Gigabit Ethernet	30
5	Ultrasonic Sensor	Ultrasonic Sensor HC-SR04	30
6	PIR Motion Sensor	PIR Motion Sensor HC-SR501	30
7	IR Proximity Sensor	IR Proximity Sensor	30
8	Soil Moisture Sensor Module	Soil Moisture Sensor Module	30
9	Pressure Sensor	BMP180	30
10	LEDs	Red Green Blue	30 30 30
11	Tri Colour LEDs	Tricolour	30
12	Light Dependent Resistor	LDR	30
13	Temperature Analog Sensor	LM35	30
14	Temperature Digital Sensor	DHT11	30
15	Accessories	Bread Boards Jumper Wires  <ul style="list-style-type: none"> <li>• Male to Male</li> <li>• Male to Female</li> <li>• Female to Female</li> </ul>	30  120 120 120

**Courses practiced in the laboratory:**

1. CSE18R210 - Introduction to Sensor Technology and Instrumentation
2. CSE18R391 - Smarter City
3. CSE18R379 - Wireless Sensor Networks (WSN) & Application Standards
4. CSE18R263 - Analytics for IoT

**B. Industry involvement in the program design and curriculum**

Involvement of industrial experts in curriculum design plays a vital role in acquiring the required knowledge in current IT trends. The list shown in Table 2.2.18 contains the involvement of industrial experts in the B.Tech (CSE) curriculum design from the year 2017 to 2021. Through learning such industry aligned courses, the students learn the current and most demanded industry requirements and practices. This enables the students to consider appointing them in projects from the day 1 after their appointment. Industrial experts suggest the curriculum with current trends that are needed for industries.

**Table 2.2.18 Industry Expert Involvement in Curriculum Design**

S.No.	Name of the Expert	Designation	Company	Contribution	Period
1	Mr. Sathish Vishwanathan	Vice President	Next generation cloud Technologies, Bangalore.	BoS Member Industry Expert	2017 - 2018
2	Mr. Sathish Vishwanathan	Vice President	Next generation cloud Technologies, Bangalore.	BoS Member Industry Expert	2018 - 2019
3	Mr. Joseph Ronald Raj	Senior Technical Architect/ Manager	GAVS Technologies Pvt. Ltd., Chennai	BoS Member Industry Expert	2019 - 2020

<b>4</b>	Mr. Arunkumar Selvaraj	Head, Security & Compliance	Tata Consultancy Services Limited, Chennai	BoS Member Industry Expert	2020 - 2021
<b>5</b>	Mr. Ananth Kulkarni	Senior Executive	IBM Innovation Centre for Education (IBM ICE), IBM India	BoS Member Industry Expert	2020 - 2021
<b>6</b>	Mr. ViqaruddinSurki	Head, Delivery, Account & Management	IBM India	BoS Member Industry Expert	2020 - 2021
<b>7</b>	Mr. Darvin Moses	Senior Executive	Cognizant Outreach, Chennai	BoS Member Industry Expert	2020 - 2021
<b>8</b>	Mr. Ramesh	Program Manager	Youth4Job, Hyderabad	BoS Member Industry Expert	2020 - 2021
<b>9</b>	Mr. Arunkumar Selvaraj	Head, Security & Compliance	Tata Consultancy Services Limited, Chennai	BoS Member Industry Expert	2021 - 2022
<b>10</b>	Mr. Ananth Kulkarni	Senior Executive	IBM Innovation Centre for Education (IBM ICE), IBM India	BoS Member Industry Expert	2020 - 2021
<b>11</b>	Mr. ViqaruddinSurki	Head, Delivery, Account & Management	IBM India	BoS Member Industry Expert	2020 - 2021

The syllabus and instructional methods of one of the industry-oriented courses “CSE18R257 – Predictive Analytics”, is depicted in Fig. 2.2.54.



CSEI8R257	PREDICTIVE ANALYTICS	L	T	P	X	C
		2	0	2	3	3

**UNIT I INTRODUCTION TO DATA MINING** - 9 HRS  
 Introduction, What is Data Mining? Concepts of Data mining, Technologies Used, Data Mining Process, KDD Process Model, CRISP - DM, Mining on different kinds of data, Applications of Data Mining, Challenges of Data Mining.

**UNIT II DATA UNDERSTANDING AND PREPARATION-1** - 9 HRS  
 Introduction, Reading data from various sources, Data visualization, Distributions and summary statistics, Relationships among variables, Extent of Missing Data.

**UNIT III DATA UNDERSTANDING AND PREPARATION-2** - 9 HRS  
 Segmentation, Outlier detection, Automated Data Preparation, Combining data files, Aggregate Data, Duplicate Removal, Sampling DATA, Data Caching, Partitioning data, Missing Values.

**UNIT IV MODEL DEVELOPMENT & TECHNIQUES** - 9 HRS  
 Data Partitioning, Model selection, Model Development Techniques, Neural networks, Decision trees, Logistic regression, Discriminant analysis, Support vector machine, Bayesian Networks, Linear Regression, Cox Regression, Association rules.

**UNIT V MODEL EVALUATION AND DEPLOYMENT** - 9 HRS  
 Introduction, Model Validation, Rule Induction Using CHAID, Automating Models for Categorical and Continuous targets, Comparing and Combining Models, Evaluation Charts for Model Comparison, Meta-Level Modelling, Deploying Model, Assessing Model Performance, Updating a Model.

**TEXTBOOK** - Data Mining and Predictive Modelling (IBM ICE Publications)

**REFERENCES:**

- Bruce Ratner, Statistical and Machine-Learning Data Mining, CRC Press, 2011
- Eric Siegel & Thomas H. Davenport, Predictive Analytics, Wiley Publications, 2013
- James Wu and Stephen Coggeshall, Foundations of Predictive Analytics, CRC Press, 2012

**LAB EXERCISES**

1. R Programming Basics - Hands-on
2. Matrices in R
3. Introduction to dplyr Package
4. Introduction to ggplot Package
5. Association Rule Mining - Apriori
6. k Means Clustering Algorithm
7. Hierarchical Clustering Algorithm
8. Cox Regression
9. Support Vector Machine (SVM)
10. Tableau - Data Visualization
11. Animations in Tableau
12. Dashboard - Case study

Instruction Methodology:

Course Chart:	Lecture (2 Hours)		X Component (3 Hours)	
#Weeks	Topic	Pedagogy	Topic	Pedagogy
Week 1	Introduction, what is Data Mining?	Presentation	Introduction to Tableau and its usecases	Demonstration
	Concepts of Data mining, Technologies Used	Flipped Classroom		
	Data Mining Process, KDD Process Model	Presentation		
Week 2	CRISP - DM, Mining on different kinds of data	Flipped Classroom	Data Representation in Tableau	Demonstration
	Applications of Data Mining	Experiential Learning		
	Challenges of Data Mining	Presentation		
Week 3	Introduction, Reading data from various sources	Demonstration	Creating Animations with Data Streams	Demonstration
	Data visualization	Demonstration		
	Distributions and summary statistics			
Week 4	Relationships among variables	Explicit Teaching	Exploration of Problem	Project Based Learning
	Extent of Missing Data	Explicit Teaching - Chalk and Talk	Statements for Analytics Research	
Week 5	Segmentation, Outlier detection	Explicit Teaching - Chalk and Talk	Review of Literature - Analytics Projects	Project Based Learning
	Automated Data Preparation	Presentation		
Week 6	Duplicate Removal	Presentation	Introduction to R	Explicit Teaching & Demonstration
	Sampling DATA			
Week 7	Data Caching	Presentation	Data Preparation in R	Explicit Teaching & Demonstration
	Partitioning data, Missing Values	Explicit Teaching - Chalk and Talk		

Week 8	Data Partitioning, Model selection	Explicit Teaching - Chalk and Talk	Review of Project Implementation	Project Based Learning
	Model Development Techniques, Neural networks	Explicit Teaching - Chalk and Talk		
Week 9	Decision trees	Explicit Teaching & Problem Solving	Functional Programming in R	Explicit Teaching & Demonstration
Week 10	Logistic regression	Explicit Teaching		
	Week 11	Discriminant analysis	Explicit Teaching & Problem Solving	Decision trees in R
Support vector machine		Explicit Teaching - Demonstration	Logistic Regression in R	Demonstration
Week 12	Bayesian Networks	Problem Solving	Linear Regression in R	Demonstration
	Linear Regression, Cox Regression, Association rules	Explicit Teaching & Problem Solving	SVM in R	
Week 13	Introduction, Model Validation	Experiential Learning	Review of Project Implementation by IBM Experts	Project Based Learning
	Rule Induction Using CHAID	Presentation		
Week 14	Automating Models for Categorical and Continuous targets	Problem Solving	Apriori Mining in R	Demonstration
	Comparing and Combining Models	Experiential Learning		
	Evaluation Charts for Model Comparison	Problem Solving		
Week 15	Meta-Level Modeling, Deploying Model	Presentation	Evaluation of Project and Presentation of Project Report	Project Based Learning
	Assessing Model Performance, Updating a Model	Presentation		

Fig. 2.2.54 Industry Oriented Course - Syllabus and Instruction Methods

**C. Industry involvement in partial delivery of any regular courses for students**

KARE curriculum provides significant space for course offering from industry experts. The industry aligned courses are offered in various categories as follows:

- Complementary Course Offering by Industries to Students
  - Workshop conducted by Industry Experts
  - Guest Lectures Conducted by Industry Experts
  - Training Provided by Industries to Student
  - Value Added Course Provided by Industries to Student
  - Credit Course Offering by Industries to Students
  - Course Offering in Co-Teach Mode

**Complementary Course Offering by Industries to Students**

Complementary courses are offered as part of non-CGPA credits to the students. KARE curriculum mandates completion of 3 credits respectively in 3 groups of non-CGPA courses as specified in Criteria 2.1.2. Group 2 of Non-CGPA compose Workshops and Value Added Courses. In addition, Guest Lectures and Special Trainings are offered through Industry Experts on state-of-the-art technologies/tools.

**Workshops conducted By Industry Experts**

Workshops are typically conducted to provide insight on state-of-the-art tools and technologies to the students. KARE CSE conducts workshops periodically and the details are tabulated academic year wise in Table 2.2.19. Sample Proofs were shown in Fig. 2.2.55.

**Table 2.2.19 Workshop Conducted by Industrial Expert**

From	To	Title	Resource Person	Relevancy to the Course in Curriculum	Beneficiary
<b>Academic Year: 2018 -2019</b>					
8/9/2018	8/9/2018	One Day Workshop on Industrial IoT	Mr. Arumuga Perumal and Mr. B. Ananda Narayanan IETE Chairman & Secretary, Trivandrum Center	Internet of Things	70

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3/8/2018	4/8/2018	Mobile Application Development	Mr. Wilson, Pantech Solutions, Madurai.	Mobile Application Development Laboratory	30
2/4/2019	3/4/2019	A Two Days Workshop on Python Programming and Applications	Mr. Sibidharan Nandhakumar Chief Executive Officer, After tutor Medias Pvt Ltd, Chennai	Project Development / Students who have not taken Python Course in Academic participated	50
<b>Academic Year: 2019 -2020</b>					
21/09/2019	21/09/2019	Artificial Intelligence Based Expert System Using Machine Learning	Mr. G. Karudaiyar, Programmer, Robert Bosch Pvt Ltd, Bangalore	Artificial Intelligence	27
<b>Academic Year: 2020 -2021</b>					
01-11-2020	08-11-2020	Industrial databases and its applications	Mr. M. Dharmaraj, B.Tech Technical lead Automatic data processing, Chennai	Big Data Analytics	47
28-11-2020	29-11-2020	Machine Learning and its applications	Mr. Utkarsh Kapoor, Wipro Technologies Limited, Bengaluru.	Machine Learning	63
24-10-2020	30-10-2020	Computer Vision	Mr. V. M. Hariharan, CEO, VelsInfoway, Chennai.	Artificial Intelligence	65
<b>Academic Year: 2021 -2022</b>					
13-09-2021	13-09-2021	ReactJS	T. Premalatha, Software Developer, Cognizant	Full Stack Development	60



13-09-2021	13-09-2021	AI in Aviation	S. Pushparani, Team Lead, Honeywell	Artificial Intelligence	60
24-04-2022	24-04-2022	IBM Workshop cum Hackathon	Mr. Moshin, Dr. Ranga Krishnan, IBM	Artificial Intelligence, IoT	82

Fig. 2.2.55 (a-f) shows the sample brochures, banners, feedback forms and certificates of the workshop conducted by the department of CSE.



(a) Banner



(b) Inauguration



(c) Sample Certificate

Kalasalingam University  
Anand Nagar, Krishnankoil-626126  
Office of IQAC

Date: 21-09-2019

**FEEDBACK REPORT FROM EXTERNAL MEMBERS**

1. Name	: KARUPPIYAR.G
2. Designation	: SENIOR SOFTWARE DEVELOPER
3. Official Address	: COIMBATORE
4. Contribution to KLU as	: Expert / Guest Lecture / Alumni/IV/IPT/others
5. Details of Visit	:
a. Name of Dept. Visited	: CSE
b. Purpose of Visit	: GUEST LECTURE
6. General observations about KLU	: It is really good.
7. About the Visiting Department	:
Infrastructure	: EXCELLENT
Laboratories	: Great
Faculty Interaction	: Awesome
8. About the visiting department students	:
Discipline	: Good
Performance	: Good
Interaction	: Good
Subject strength	: Needs to improve
Weakness	: programming
9. Comments about KLU curriculum	:
Course Name & No	:
1.	:
2.	:
3.	:
10. (a) What are the strengths of curriculum?	:

(e) Expert Feedback

KLU / IQAC / FB

Kalasalingam University  
(Kalasalingam Academy of Research and Education)  
Krishnankoil  
Office of Dean (IQAC)

Workshop on the topic "Artificial Intelligence based expert systems using machine learning" on the topic "Systems using machine learning"

Date: 21-09-2019

Name: M.D.Sai Anand / Designation / Dept: CSE Institution: KARE

1. Please comment on the quality of lectures delivered.	Good
2. Was the interaction / doubt clearance session useful? Kindly give specific comment.	Yes it is very useful
3. How do you plan to apply the knowledge gain in your professional use?	I like to use in the future in jobs
4. What preparation, you feel, is necessary if someone has to benefit from lecture on this topic in future?	Very useful
5. Please suggest any specific topic that you feel could also have been addressed in the guest lecture	no
6. Please comment on the seminar hall facilities. (LCD Projector, Audio, AC, Seating etc)	Good
7. Please comment on the hospitality extended to you in hotel / Guest House and other wise.	Good

\* If any question not applicable please provide your feedback as N/A

Evaluating Coordinator

(f) Students Feedback

Fig. 2.2.55 (a-f) Sample Proof regarding Workshop Conducted by Industrial Expert

**Guest Lectures conducted By Industry Experts**

The various experts from industries conducted several Guest Lectures which is given as a summary in Table 2.2.20. These Guest Lectures act as a showcase of various technologies to the students. They provide insight to the students and enable students to interact with professionals.

**Table 2.2.20 Guest Lecture by Industrial Experts – Organized by CSE department**

Date	Title	Industry Expert Name	Company	Beneficiaries
<b>Academic Year: 2018 - 2019</b>				
17/8/2018	IT infrastructure and Management	Mr. Rajadurai S	HCL, Chennai	55
28/7/2018	Privacy and security in online social media	Mr. Rajadurai S	HCL, Chennai	61
16/3/2019	Technology growth in IT industry	Mr. S. Pradeep Kumar	Technology specialist, Honeywell technologies, Madurai	75
16/3/2019	Opportunity for non-developers' community	Mrs. Manjula Devi	Maitree Lead, Chennai branch, TCS, Chennai.	66
<b>Academic Year: 2019 - 2020</b>				
22/8/2019	Data analytics in current era	Mr. Solomon Krubhakara,	Data scientist and solution Architect, Intelligent Design Arena Ltd. Chennai.	68
22/8/2019	Recent trends in IT Industry	Mr. Selvakumar V R	Project Manager, Infosys Technologies Limited. Sholinganallur, Chennai.	76

<b>Academic Year: 2020 - 2021</b>				
31/07/2020	Choosing your next Step and Shaping your Career in IT	Mr. Harinath Gandhi,	Technology and strategy Leader, Integration Services &SDLC Cummins Inc, Indianapolis, Indiana, US	151
27-07-2020	How to write a good research paper	Dr. R. Venkateswaran, Senior Vice President	Persistent Systems, Ltd, Pune	220
23.07.2020	A Novel way to teach Operating Systems	Dr. AbhijatM.Vichare, ACM Eminent Speaker	Consultant at Persistent Systems Ltd, Pune	190
29.07.2020	Uncle Sam Boulevard: Road to USA	Mr. Pradeep Kumar Reddy, Lead Data Scientist	Target Corporation, Minneapolis, USA	163
14-04-2021& 15-04-2021	Machine Learning	Mr. Manish Jain, Mr. Vipul Kumar, Mr. Archit Kumar Mr. Shubham	Programmer, IBM	120
<b>Academic Year: 2021 -2022</b>				
09-09-2021& 13-09-2021	Predictive Analytics	Mr. Amit Bhat	Programmer, IBM	76

22-09-2021 & 24-09-2021	Cloud Architecture and Deployment Models	Mr. Giri Prasad	Senior Programmer, IBM	87
23.10.2021	UI Development using Tkinter	Dr. Ranga, IBM	Senior Consultant, IBM	60
23.10.2022	Introduction to MPI and OpenMP	Mr. Viquarrudin Surki	Technical Lead, IBM	63
23.04.2022	Getting started with MLOps	Dr. Venkat Subramanian	Senior Consultant, IBM	60
23.04.2022	Cyber Security Tools and Techniques	Mr. Moshin	Technical Consultant, IBM	60

### **Value Added Course by Industry experts**

Higher education institutions must augment the curriculum to better educate students to meet industry demands while also allowing them to develop their own interests and aptitudes. Value Added Courses (VAC) offered on a regular basis in our department ensures the above. These classes are taught by professionals and industry experts, and they help students stand out in the job market by adding value to their resumes. Each value-added course syllabus will be prepared by the Industry Expert with minimum experience of 8 years. The 40 hrs course syllabus, after being duly approved by the BoS, will be offered to the students. The Table 2.2.21 shows the value-added courses offered by industries to the students.

**Table 2.2.21 Value Added Courses Conducted by Industries to the students**

S.No.	Course Name	Resource Person	Date	No. of Beneficiaries
<b>Academic year 2019 -2020</b>				
1	Machine learning and Internet of Things (ACM Hackathon 2k19)	Mr. Karudaiyar Ganapathy, Senior Engineer, Robert BOSCH, Bangalore Mr. Sween Krishna, IOT Developer, Electronic for You, Cochin	10/8/19 to 14/8/19	198
2	Mule soft development	Mr. V. Ramprasanth, Technical Lead, Eon Collective, Bangalore	25, 26/01/2020 to 02/02/2020, 08 & 09/02/2020	63
3	Full Stack Management	Mr. Harsh Sharma, Associate Deep Learning Engineer, 360 DT, New Delhi	05/06/2020 to 12/05/2020	21
<b>Academic year 2020 - 2021</b>				
4	Neural Network Architectures in Computer Vision	Mr. Nithiyanandam Ramesh, Founder and President, Nephos, systems, Chennai	20- 07/2020 to 24/07/2020	157
5	Web application using Django	Mr. Nithiyanandam Ramesh, Founder and President, Nephos, systems, Chennai	07,14,18, 21,27/02/2021	194
<b>Academic year 2021 - 2022</b>				
6	CCNA CyberOps	Arunkumar Selvaraj, TCS	24/05/2022 to 28/05/2022	112
7	Practical Machine Learning Using	Dr. Venkat Subramanian, IBM	24/05/2022 to 28/05/2022	100

	Python			
8	Full Stack Development	Er. Shibir Vargheese, Associate Developer, Viberal Digital Solutions Pvt., Ltd	24/05/2022 to 28/05/2022	60
9	IoT using Arduino	Er. Pranay Das, Er. Aman, IBM, Bangalore	24/05/2022 to 28/05/2022	120

Fig. 2.2.56 shows sample proof of value-added courses. It consists of brochure, snapshots and certificates.

**Chief Patrons**

**"ILAYAVALLAL"**  
Dr. K. Sridharan  
Chancellor, KARE  
Dr. S. Shasi Anand  
Vice President, KARE  
Mr. S. Arjun Kalasalingam  
Vice President, KARE

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**Patrons**

Dr. R. Nagaraj  
Vice Chancellor, KARE  
Dr. V. Vasudevan  
Registrar, KARE

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**Organizing Chair**

Dr. P. Deepalaksmi  
Dean/SOC  
Dr. A. Francis Saviour Devaraj  
HoD/CSE

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**Coordinator**

Mr. R. Raja Subramanian  
Assistant Professor  
Department of Computer Science and Engineering  
Kalasalingam Academy of Research and Education  
Contact: 9003994408



**KALASALINGAM**  
ACADEMY OF RESEARCH & EDUCATION  
(DEEMED TO BE UNIVERSITY)  
Under sec. 3 of UGC Act 1956. Accredited by NAAC with 'A' Grade



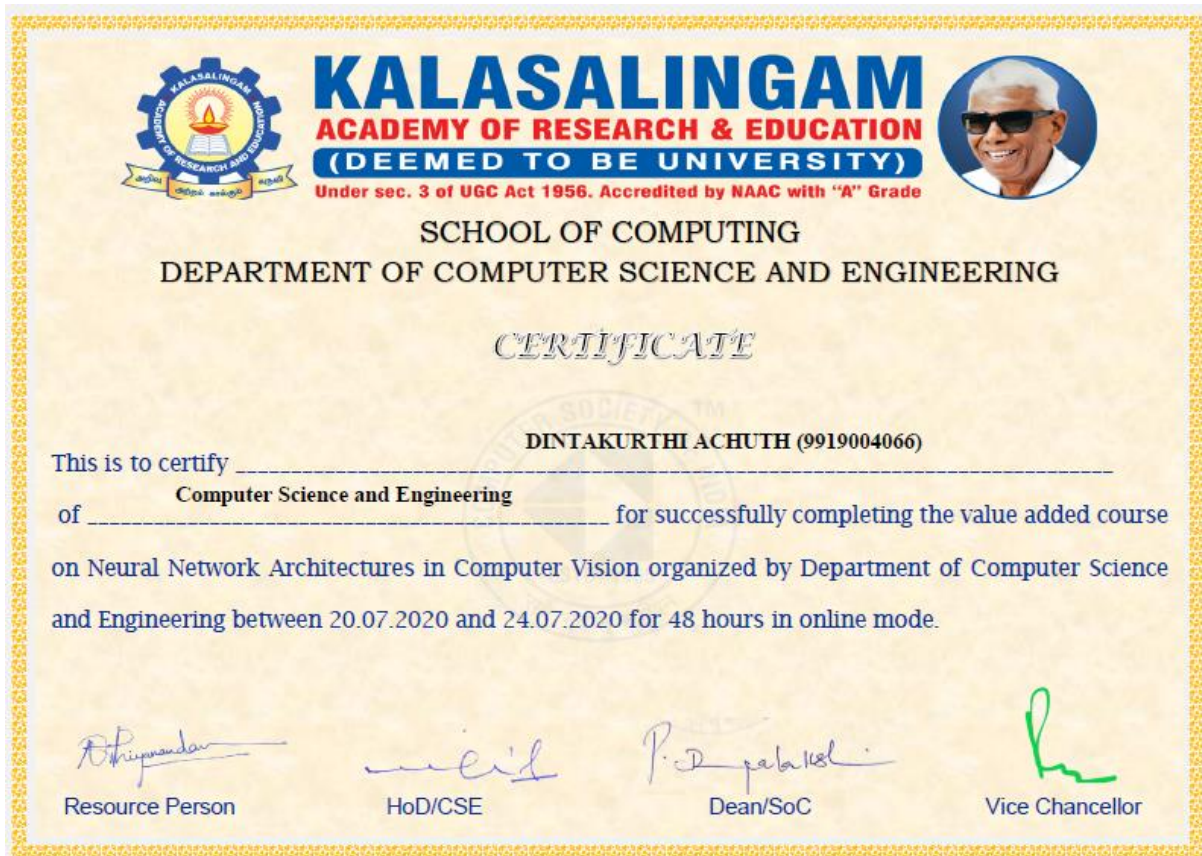
**Value Added Course**  
on  
*Neural Network Architectures in Computer Vision*  
20.07.2020 to 24.07.2020  
(40 hours)



**Organized by**  
Department of Computer Science and Engineering  
School of Computing  
Anand Nagar, Krishnankoil-626126  
Tamilnadu, India  
Website: [www.kalasalingam.ac.in](http://www.kalasalingam.ac.in)



Contents of the Value Added Course		
<b>MODULE I</b>	<b>INTRODUCTION TO IMAGE PROCESSING</b>	<b>8 hours</b>
Introduction - Image processing - Computer Vision. Image Formation - Geometric Primitives and transformations - Digital Camera.		
<b>MODULE II</b>	<b>OPERATORS AND TRANSFORMATION</b>	<b>8 hours</b>
Operators - Point Operators - Linear Filtering - Neighborhood Operators. Transformation - Fourier Transformation - Wavelets. Filters - Gaussian - Median - Dilation and Erosion. Edge Detection - Sobel and Hough.		
<b>MODULE III</b>	<b>SEGMENTATION</b>	<b>8 hours</b>
Segmentation - Active Contours - Mean Shift and Mode Finding- Watershed Algorithm - Normalized Graph Cuts. Machine Learning and Computer Vision - Supervised and Unsupervised Learning.		
<b>MODULE IV</b>	<b>DEEP NEURAL NETWORKS AND COMPUTER VISION</b>	<b>8 hours</b>
Recognition in Computer Vision - Introduction to Deep Neural Network - Artificial Neural Network - Convolutional Neural Network - Image Classification - Object Detections - SIFT - SURF.		
<b>MODULE V</b>	<b>INDUSTRIAL APPLICATIONS OF COMPUTER VISION</b>	<b>8 hours</b>
Industry DNN Architectures - GoogleNet - ResNet - Neural Network Modelling. Industrial Trend in Computer Vision - Current Research Problems.		
Resource Persons		
<b>Er. Nithiyandam Ramesh,</b> Founder and President, Nephos Systems, Chennai		





**Fig. 2.2.56 Proofs of Value-Added Course Conduct**

### **Training Provided by Industries to Students**

In addition to workshops and guest lectures, industry specific trainings are offered to students as part of Placements and Projects. The sample list of industry specific training offered to the students during the academic year 2020-21 is depicted in Table 2.2.22.

**Table 2.2.22 - List of Training Programs offered by Industries to Students**

<b>List of Training Programs - (2020-21)</b>					
<b>S. No.</b>	<b>Date of Training</b>	<b>Hours of Training</b>	<b>Name of Training</b>	<b>Number of students Attended</b>	<b>Name of the Organization</b>
1	8-06-2020 To 2-07-2020	45	TCS NINJA	120	Innovative Pvt Ltd, Chennai
2	7-08-2020 To 16-08-2020	60	Capgemini, Aspire, IBM	116	Aspirations Consulting Services Pvt Ltd, Bangalore
3	27-08-2020 To 5-09-2020	60	Automata Fix Training	125	Innovative Pvt Ltd, Chennai

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4	5-09-2020 To 14-09-2020	60	CTS Specific Training	120	SMART Resources Pvt Ltd, Chennai
5	3-10-2020 To 9-10- 2020	42	CTS Specific Training	125	FACE, Coimbatore.
6	4-01-2021 To 13-01- 2021	40	Aptitude and Technical (Programming) Training	125	AICL Communications Pvt Ltd, Mumbai
7	26-02-2021 To 28-02- 2021	18	Aspire Specific Training	120	Innovative Pvt Ltd, Chennai
8	01-03-2021 To 05-03- 2021	30	Java Specific Training	65	Free Lancer, Chennai
9	05-05-2021 To 06-05- 2021	16	Accenture Specific Training	25	SMART Resources Pvt Ltd, Chennai
7	11-05-2021 To 14-05- 2021	8	Wipro Specific Training	19	Global Talent Track, Chennai
9	24-05-2021 To 25-05- 2021	10	Capgemini Specific Training	94	SMART Resources Pvt Ltd, Chennai
10	31-05-2021 To 05-06- 2021	24	Employability skill Training	65	Global Talent Track, Chennai
11	07-06-2021 To 11-06- 2021	30	DXC and HCL Specific Training	120	SMART Resources Pvt Ltd, Chennai
	12-06-2021 To 13-06- 2021	12	DXC and HCL Specific Training- Extension	120	
12	18-06-2021 To 21-06- 2021	12	C Specific Training	60	Innovative Pvt Ltd, Chennai
13	24-06-2021 To 25-06- 2021	12	Analytical & Verbal Training	60	New Leaf Learning Solutions, Trichy

14	17-11-2021 To 24-11- 2021	20	AWS Cloud Foundation	63	AWS Solution – AICTE Eduskill Program
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### Course Offering in Co-Teach Mode

KARE CSE offers elective courses with Industry involvement in curriculum design, teaching and evaluation. Such courses are offered in Co-Teach mode. In such a mode, the faculty will undergo training from Industry in the name “Train the Trainer” (T3). The trained faculties will be handling the course to the students. In addition to the Trained faculties, Subject Matter Experts (SMEs) from industry handle some the topics in the course. In addition to teaching, SMEs also involve in evaluations and mentoring of course-level projects. Such courses are offered in Autonomy mode, where innovative assessment methods and pedagogies are adhered with the approval of IQAC. The sample evaluation scheme for one of the industry-oriented courses offered in Autonomy mode is depicted in Table 2.2.23.

**Table 2.2.23 The Evaluation Scheme of Industry Associated Courses**

S. No	Evaluation method	Weightage (%)	Units covered
<b>Internal Continuous Assessment (50 marks)</b>			
1	Sessional Examination	10	III, IV
2	Assignment (3 Nos)	8	I, II, V
3	Research Article based Evaluation	13	All units
4	Experiment based Evaluation	12	All units
<b>5</b>	<b>Evaluation by Industry person</b>	<b>7</b>	<b>All units</b>
<b>External Assessment (50 marks)</b>			
6	End Semester	50	All units

The weightages of such evaluations conducted with the support of industry experts is as per the proposal of evaluation methods submitted by the course coordinator, approved by the mentor and duly attested by the Director of IQAC. Table 2.2.24 shows the list of courses offered in Co-Teach mode.

**Table 2.2.24 Courses Associated with Industries**

S. No.	Course Code	Course Name	Industry Involved
1	CSE18R254	Introduction to Python Programming	IBM
2	CSE18R112	Introduction to Artificial Intelligence and Machine Learning	IBM
3	CSE18R212	Machine Learning	IBM
4	CSE18R257	Predictive Analytics	IBM
5	CSE18R292	Algorithm for Intelligent Systems and Robotics	IBM
6	CSE18R387	Computational Linguistics and Natural Language Processing	IBM
7	CSE18R110	Introduction to Internet of Things	IBM
8	CSE18R210	Introduction to Sensor Technology & Instrumentation	IBM
9	CSE18R290	Cloud Architecture and Deployment Models	IBM
10	CSE18R379	Wireless Sensor Networks (WSN) & IoT Standards	IBM
11	CSE18R111	Information Security Fundamentals	IBM
12	CSE18R211	IT Physical Security & System Security	IBM
13	CSE18R375	Digital Forensics	IBM
14	CSE18R264	IT Application Security	IBM
15	CSE18R291	IT Data Security	IBM
16	CSE18R109	Introduction to Data Analytics	IBM

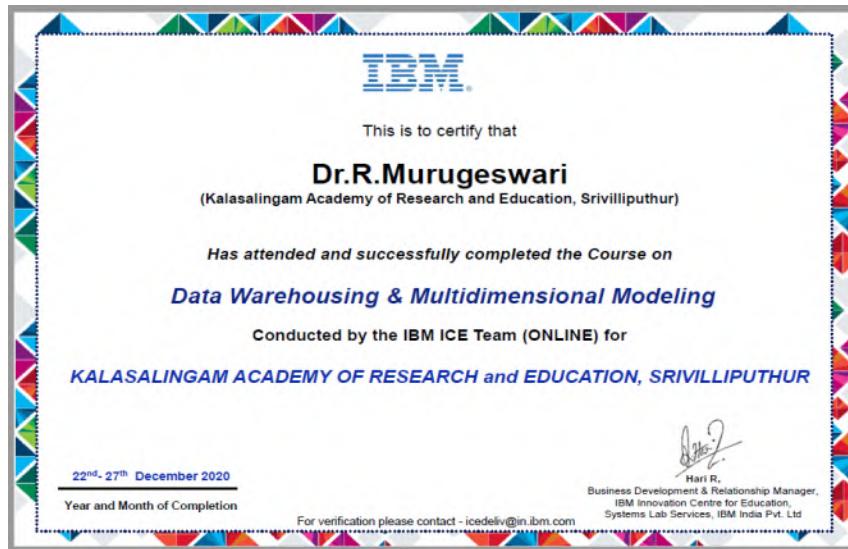
17	CSE18R258	Descriptive Analytics	IBM
18	CSE18R260	Data Warehousing & Multidimensional Modelling	IBM
19	CSE18R352	Big Data	IBM
20	CSE18R381	Data Visualization for Analytics	IBM
21	CSE18R467	Social, Web and Mobile Analytics	IBM
22	CSE18R396	Deep Learning	IBM
23	CSE18R490	Applications of Machine Learning in Industries	IBM
24	CSE18R316	BA for Industries	IBM
25	CSE18R394	Ethical Hacking & Penetration Testing	IBM
26	CSE18R395	Information Security Governance, Management Practices, Security Audit & Monitoring	IBM
27	CSE18R393	IT Network Security	IBM
28	CSE18R391	Smarter City	IBM
29	CSE18R392	IoT for Industries	IBM
30	CSE18R263	Analytics for IoT	IBM
31	CSE18R388	Pattern and Anomaly Detection	IBM

The number of faculty who have attended the training of IBM ICE courses are listed in Table 2.2.25 academic year wise. The sample certificates provided to faculty by industries are shown in Fig 2.2.57.

**Table 2.2.25: Faculty Training Provided by Industries**

Academic year	Duration	Title of Training	No. of Faculty Attended
2019-2020 (ODD)	24/06/2019-29/06/2019	IT Infrastructure Landscape Overview	15
	25/06/2019-01/07/2019	Introduction to Python Programming	14
2019-20 (EVEN)	21/11/2019 - 27/11/2019	Introduction to Data Analytics	12
	05/12/2019 - 11/12/2019	Introduction to Artificial Intelligence and Machine Learning	18
	05/12/2019 - 11/12/2019	Information Security Fundamentals	13
	11/12/2019 - 17/12/2019	Introduction to Internet of Things	17
2020-21 (ODD)	05/06/2020 - 11/06/2020	Predictive Analytics	25
	11/06/2020 - 17/06/2020	IT Physical Security and System Security	23
	16/06/2020 - 22/06/2020	Introduction to Sensor Technology and Instrumentation	15
2020-21 (EVEN)	11/12/2020 - 16/12/2020	IT Application Security	28
	18/12/2020 - 24/12/2020	Machine Learning	30
	22/12/2020 - 28/12/2020	Wireless Sensor Network and IOT Standards	15
	22/12/2020 - 28/12/2020	Data Warehousing and Multidimensional Modelling	22
2021-22 (ODD)	07/06/2021 - 12/06/2021	Cloud Architecture and Deployment Models	15
	14/06/2021 - 20/06/2021	Big Data	14
	21/06/2021 - 27/06/2021	Data Visualization for Analytics	16
	21/06/2021 - 27/06/2021	Digital Forensics	10
	28/06/2021 - 03/07/2021	Descriptive Analytics	12

28/06/2021 - 03/07/2021	IT Data Security	15
03/07/2021 - 09/07/2021	Algorithms for Intelligent Systems and Robotics	15
12/07/2021 - 18/07/2021	Computational Linguistics and Natural Language Processing	17



**Fig. 2.2.57 Sample IBM Training Certificates Provided to Faculty**

**Industrial Collaborated Training**

KARE has collaborated with the industries shown in Fig. 2.2.58 towards the faculty training. Industrial experts handle sessions to the KARE CSE faculty for the courses listed in the Table









2.2.26. Once the faculty completes the training and receives the trainer / educator certificate after the assessment, they in turn train the students. All the processes are guided through university level MoUs. Sample course completion certificates are shown in the Fig. 2.2.59.



**Fig. 2.2.58 List of Industries Collaboration with KARE**

**Table 2.2.26 AICTE approved Industrial Training to Faculty**

AICTE Approved Industrial Collaboration Training to Faculty		
Academy	Courses	Name of the Faculty Attended
	Juniper Networks Certified Associate (JNCIA) - JUNOS (R & S)	Dr. Jane Rubel Angelina Dr. R. Murugeswari
	Juniper Networks Certified Associate (JNCIA) – Cloud	Dr. S. Dhanasekaran Mr. Suresh kumar
	Juniper Networks Certified Associate (JNCIA) - Security	Dr. B. Pitchaimanickam Mr. K. Muthamilsudar
	Juniper Networks Certified Associate (JNCIA) - DevOps & Automation	Mrs. J. Jayaranjani Mrs. R. Sumathi
	Juniper Networks Certified Associate (JNCIA) - Mist AI	Dr. A. Saravanan Mr. Sathya Narayanan

	AWS Academy Cloud Foundations	Dr. C. Bala Subramanian Mr. R. Raja Sekar
	AWS Academy AI & ML Foundations	
	Any One Course from Associate Level: AWS Academy Solutions Architect AWS Academy Cloud Developing AWS Academy Cloud Operations (SysOps)	
	Red Hat Certified System Administrator (RHCSA)	Mr. P. Nagaraj Mr. Pon Suresh
	Red Hat Certified Engineer (RHCE)	
	Palo Alto Networks Certified Cybersecurity Entry-level Technician (PCCET) Cybersecurity Foundation Network Security Fundamentals Cloud Security Fundamentals Security Operations Fundamentals (SOC)	Mr. M. Raja Mr. M. K. Nagarajan
	Paloalto Certified Network Security Administrator (PCNSA) Cybersecurity Infrastructure Configuration Cybersecurity Prevention and Countermeasures	
	Blue Prism Academy Foundation	Mr. R. Raja Subramanian Dr.D.Usama
	Blue Prism Academy Developer (AD01)	
	Celonisis process mining Internship	Ms. G. Elizabethrani Dr. T. Dhiliphan Rajkumar

The sample training certificate and educator certificate obtained by our faculty are shown as a proof in Fig. 2.2.59.

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## CERTIFICATE OF COMPLETION


**Certificate of Completion**  
is hereby granted to  
**R. Raja Subramanian**  
in recognition of successful participation in  
**Blue Prism Associate Developer (EN-2021) Learning Plan**  
Date of Completion: **10/28/21**

THIS CERTIFICATE IS NOT VALID AS A FORMALLY AUTHORIZED COURSE COMPLETION OR CERTIFICATION

 **blueprism** | University


Blue Prism in partnership with EduSkills Foundation is proud to recognize  
**R Raja Subramanian**  
from  
**Kalasalingam Academy of Research and Education**  
for successfully completing the **Associate Developer Educator Training** as part of  
**BLUE PRISM ACADEMIA PROGRAM** in the field of **Robotic Process Automation**  
Date: 08/11/2021      Signature:   
Ana Howes  
Global Head of  
Education Services

 **EduSkills**  
Nation Building Through Skills

 **aws** academy

## Educator Training Certificate

Awarded to  
**BALA SUBRAMANIAN CHOKKALINGAM**  
of  
Kalasalingam Academy of Research and Education  
for successfully completing the AWS Academy Educator Training on  
**AWS Academy Cloud Foundations**



Date : 13-11-2021  
C. No : c03e3abffe67af75f97999621ce0918


  
Director  
EduSkills Foundation



Fig. 2.2.59 The sample training certificate and educator certificate of faculty



(a)



(b)

**Fig. 2.2.60 Industrial Training Certificates obtained by Students (a) AWS Academy Machine Learning, (b) Robotic Process Automation**

Through the MoUs of Red Hat and Microsoft, faculties have completed industrial trainings and the sample certificates are depicted in fig. 2.2.61. As the reflection of such trainings, faculties inculcated the topics learnt as X-Component in relevant courses in the curriculum.



**Fig. 2.2.61a. Sample Microsoft Technology Associate Certification by a Faculty**



**Fig. 2.2.61b. Sample Wipro Certification on Java Programming by a Faculty**

**D. Impact analysis of industry institute interaction and actions taken thereof**

**Impact of Industrial MoUs**

- Two industrial labs “Data Science and Visualization” and “IoT and Sensor Technology” are constructed, which acted as a catalyst for various student projects and faculty research.
- Faculty Training in terms of T3 trainings organized for various industry-oriented courses. The knowledge is inculcated in the teaching-learning process.
- Red Hat and Microsoft Certifications are done by faculties. Similar trainings conducted to the students as part of training and X-Component in relevant courses.

**Impact on Student Projects**

- Trainings on Internet of Things and Self Driving Cars:
- Impacted in the number of IoT projects in CSP projects to increase over 30 problem statements during the academic year 2018-19

- Trainings on Mobile Application Development:
- More than 11 student projects in Capstone chose Android Application as the User Interface during the academic year 2018-19
- Trainings on Machine Learning and Data Analytics:
- Impacted in the number of Applied Machine Learning projects in CSP projects to increase over 25 problem statements during the academic year 2019-20
- Trainings on Neural Networks:
- Impacted in the number of projects leveraging Deep CNN and allied architectures in Capstone to increase over 20 problem statements during the academic year 2020-21

### **Impact of Industrial Experts in Curriculum and Syllabus**

- Stream oriented professional electives are included in the curriculum. Periodic revision of syllabus on state-of-the-art courses are carried out to meet the current industrial standards
- 30 new courses are introduced through industry collaboration in the professional elective category under various streams including Artificial Intelligence and Machine Learning, Data Analytics, Cyber Security and Forensics and Internet of Things & Smart City.

### **Impact of T3 Trainings by IBM to faculties:**

- Periodic training on Industrial courses are provided to the faculties of KARE. This enhances the domain specific knowledge for the faculties.
- This reflected in the effective teaching of industrial courses.
- The number of faculties in the research group, Artificial Intelligence and Data Analytics increased with the T3 training.

### **Impact of Industry Based Evaluation in Courses**

- Substantial amounts of elective courses compose a minimum of one industry involved evaluation method in the name “Evaluation by Industry Person”.
- Under this method, Industrial Subject Matter Experts (SMEs) can conduct/organize mini projects, hackathons, case study discussions, quizzes as part of the course.
- It is evident that the inculcation of Industrial Course Oriented Projects made students get internships immediately after the course.
- As an initial initiative, through the knowledge gained through the industrial projects of the course “Predictive Analytics”,



- *2 students got internship in Reliance Netmeds in III Semester*
- *3 students got internship in Clinivatage, Data Analytics industry in III Semester*
- *10% of the students learning the course get internship, as per the analysis*
- Student research publications on industrial projects increased with such industrial courses.

### **Impact of Industrial trainings in Placement**

- Training on state-of-the-art technology and industry specific training have a great impact on the placement results of the students.
- As the reflection of MoU signed with IBM, they have come for recruitment in 2019 placement drive at KARE.
- With the periodic training, the salary package of the students has increased.
  - Around 22% of students in 2018 batch, have got greater than 4 LPA package
  - The highest salary package of students have increased up to 9 LPA
  - In 2020, the number of students with greater than 4 LPA, increased to 26%.
- Through the training on state-of-the-art technologies, a considerable number of students have gone for higher studies at National and International Universities like The University of Tampa, The University of Texas at Dallas, Wichita State University, The University of Memphis, among others.

## **2.2.5 Initiatives related to industry internship/summer training (10)**

### **A. Industrial trainings/ tours for students**

Industrial training is a type of practical training that takes place in a firm or an industrial setting to assist students in learning the necessary skills to become future professionals. The goal of KARE - industrial training is to provide candidates who want to work in the industry with the necessary practical experience and understanding of how the IT professional works in the IT Industry. It fosters a problem-solving mindset in developing the software and prepares them for future employment. Realizing this, KARE CSE Curriculum includes internship training as part of its CGPA courses. The detailed procedure of Industrial / Internship Training is shown in Fig. 2.2.62. The course code for Industrial training and Industrial Internship are,

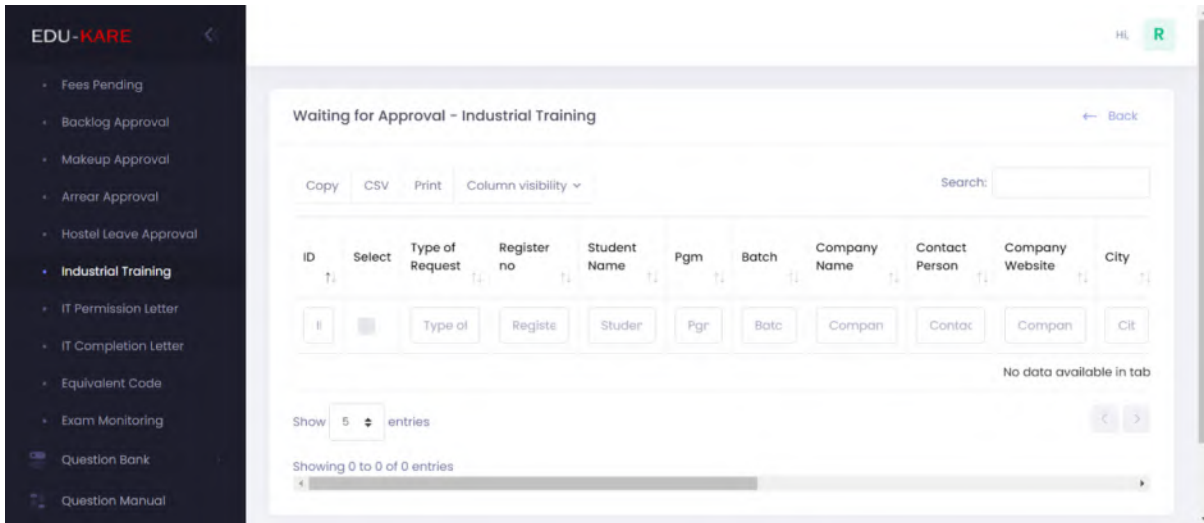
**Industrial Training – CSE18R397:** Students learn the industry-oriented technology at the industry and improve their technical project development capabilities and competency.

**Internship Training – CSE18R398:** Industry imparts practical knowledge to the students through Industrial Projects and Proof of Concepts (PoCs).

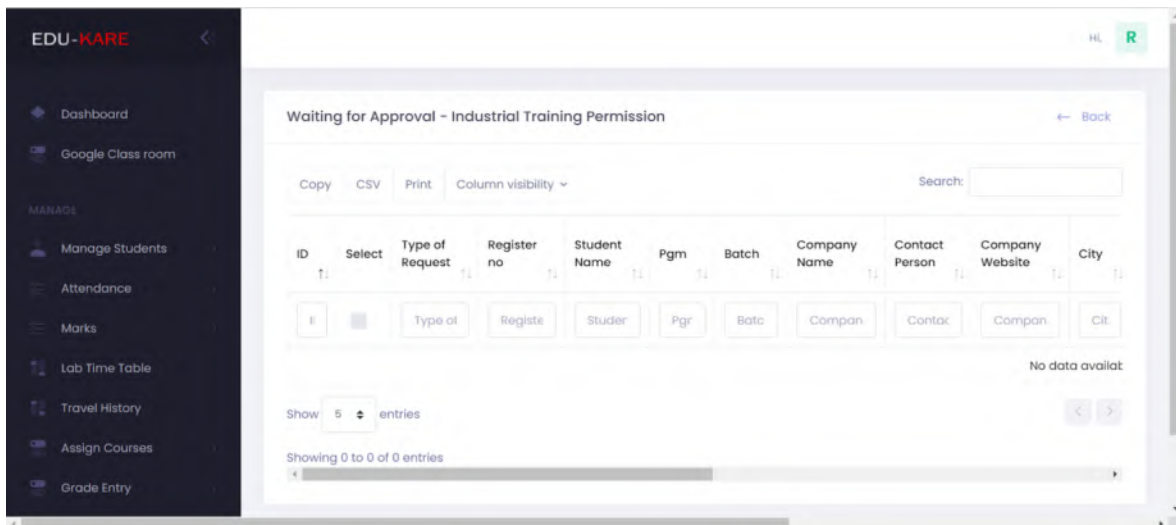


**Fig. 2.2.62 Organizational Chart for Industrial Training / Internship**

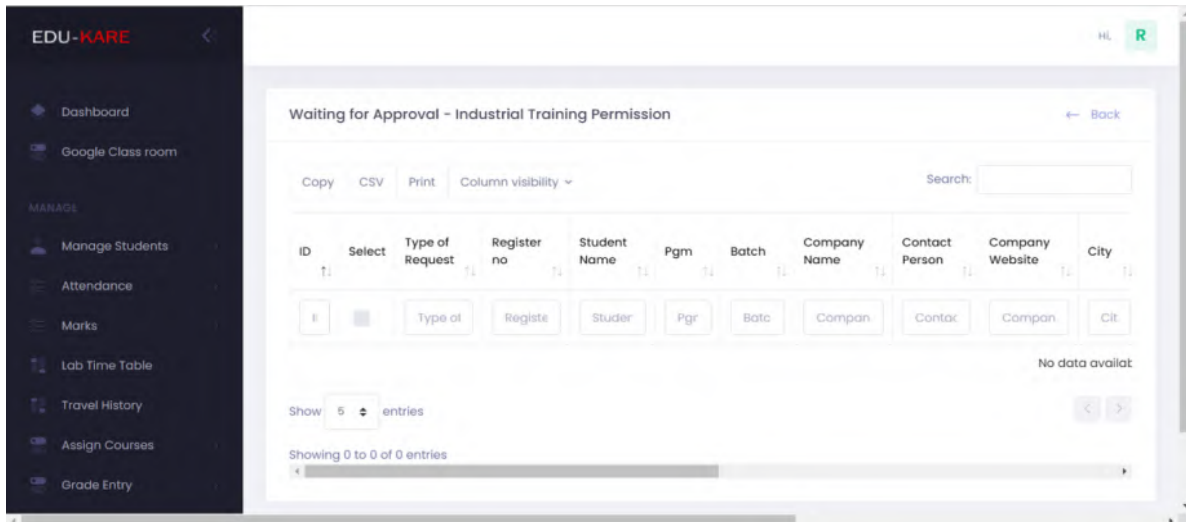
The credit allocated to the industrial training program is 2 credits. The students who wish to undergo industrial training must contact any IT based industry and they should get permission letters from concerned industries to attend training. Once it is done, they must upload the permission letter in EDU KARE software portal using their SIS (Student Information System) login credentials. The class coordinator verifies necessary details about the industry stated by the students and then forwards the same to the department industrial program training coordinator in EDU KARE portal itself. On his/her approval, it is being forwarded to the HoD and finally to the Training Placement Officer (TPO). The TPO office will approve training with those industries that are involved in product development or technical services. Industries offering only training are not preferred. The detail procedure of Industrial training process was given in Fig. 2.2.63, Fig. 2.2.64 and Fig. 2.2.65.



**Fig 2.2.63 Industrial Training Applying Procedure through KARE SIS Login**



**Fig 2.2.64 Industrial Training Permission Letter Uploading through KARE SIS Login**



**Fig 2.2.65 Industrial Training Completion Letter Uploading through KARE SIS Login**

**Table 2.2.27 Sample list of Students with corresponding industrial training details.**

Academic Year: 2018 -2019						
Batch	Name	Register Number	From	To	Title	Company
1	Amarakot a Madhu Vamsi	9916004248	10-12-2018	18-01-2019	3D Visualization And Localization Of Radiation Source In External Radiotherapy Using Inverse Linear Boltzmann Transport Equation	Bhabha Atomic Research Center, Mumbai
	Akash Awasthi	9916004229				
2	D. Muralidha r Reddy	9916004030	10-05-2019	25-05-2019	Web Application Using PHP	Web Walk Infosys
3	Aditya Mishra	9916004002	18-05-2019	04-06-2019	Cloud Services	Techknoc orp
	S.DevDha nus	9916004026				
	Moksh Kaushal	9916004088				
	Nilesh Nirav	9916004231				
4	Aditya Mishra	9916004002	18-05-2019	04-06-2019	Cloud Services	Techknoc orp
	S.DevDha nus	9916004026				
	Moksh Kaushal	9916004088				
	Nilesh Nirav	9916004231				
5	C.Naveen Kumar	9916004097	12-06-2019	28-06-2019	Web Development Using PHP	Web Walk Infosys
	J.Karthik	9916004057				
	M.Sarava nan	9916004149				
6	Naga SahithiAll	9916004008	16-05-2019	05-06-2019	Core Java	Web Walk

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	a					Infosys
	Manikanta Reddy. G. M	9916004034				
	Madhavi LathaMuvva	9917004081				
	K. Vishnu Vardhan	9917004062				
7	J.Lakshan Kumar	9916004072	24-05-2019	08-06-2019	Web Design Using Html AndCss	Nbays IT Solusenz
	E.Kanishkar	9916004056				
	K.Dharani Dharan	9916004029				
	J.S.Abishek Rosario	9916004234				
8	A.B.Aravind	9916004012	11-05-2019	28-05-2019	Web Development	Web Walk Infosys
	R.Bhuvan eswaran	9916004021				
	S.Kavin	9916004062				
	S.Krishna Mohan	9916004069				
9	K. Vignesh Varadhan	9916004189	20-05-2019	03-06-2019	Web Design And Development	Century Minds
	A. Muthu Pandi	9916004236				
10	R.Kirthika a	9916004063	13-05-2019	30-05-2019	Web Development Using PHP	Phoenix Softech
	R.Limsha Fernando	9916004073				
	Devarapalli Karthik Reddy	9916004027				

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	G.Yoheswaran	9916004198				
11	Raghupati T	9916004125	03-06-2019	20-06-2019	Web Development Using PHP	Techknocorp
	Yashwant Raja R	9916004194				
12	Renga Rajesh	9916004135	18-05-2019	01-06-2019	Web Designing	Litz Tech India Pvt Ltd
13	P. Arjun	9916004015	15-05-2019	29-05-2019	Web Based Development Using PHP	Phoenix Softech
	P. Karthikeya Maravarman	9916004059				
	M. Arjun	9916004014				
	S. Jaiwanth	9517004401				
14	Aditi.M	9916004001	15-05-2019	31-05-2019	Web Development Using PYTHON	ICore Software Technologies
	Nandhini .B	9916004230				
	K.Harish	9916004221				
15	S M Pon Raja	9916004117	15-05-2019	29-05-2019	Web Development	Cogzidel Technologies
	S Ragu	9916004127				
	T Naveen Raj	9916004098				
16	A.Manikandan	9916004079	15-05-2019	29-05-2019	Web Development	Cogzidel Technologies
	A.V.Praveenkumar	9916004121				
	R.Ramdinsh	9916004130				
17	V.Rahul	9916004128	03-06-2019	20-06-2019	Web Development Using PHP	Techknocorp
	T.Kasirajan	9916004060				

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	S.Santhosh	9916004146				
<b>Academic Year: 2019 -2020</b>						
<b>Batch</b>	<b>Name</b>	<b>Register Number</b>	<b>From</b>	<b>To</b>	<b>Title</b>	<b>Company</b>
18	B.Ramyasruthi	9917004012	06-06-2019	06-07-2019	Web Designing	Orle Technology Service Private Limited
	P.Akhila	9917004114				
	M.MadhaviLatha	9917004081				
19	V.Ratna Kumari	9917004175	05-06-2019	20-06-2019	Web design using HTML and CSS	Nbays IT Solusenz
	T.Sai Varsha	9917004158				
	T.Sandeep	9917004162				
20	K V R Nikhil	9917004061	17-05-2019	31-05-2019	MAGIK	6D Technologies
21	Mandi Akif Hussain	9917004070	01-06-2019	18-06-2019	Web designing	Nbays IT Solusenz
	RevooriVeeharika Reddy	9917004123				
	Emmadi Sujith Reddy	9917004031				
22	S.Vasavi	9917004154	03-06-2019	22-06-2019	Web development	Techkno Corp
	P.Neshma Vaishnavi	9917004202				
	M.Girija	9818004005				
	Ch.Mahendranath	9917004019				

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23	V.Venkat aSatiswar Reddy	9917004174	01-06-2019	18-06-2019	Web designing	Nbays IT Solusenz
	Thota Gopi Chand	9917004165				
	ThungaHa rshavardh an	9917004168				
24	P.Suneela	9917004093	01-06-2019	18-06-2019	Web designing	ICore Software Technolog ies
	Y.Pallavi	9917004182				
	M.Sushm a	9917004075				
25	T.Harsha Vardhan	9917004168	01-06-2019	18-06-2019	Web designing	Nbays IT Solutions
	T. Gopi Chand	9917004165				
	Vasantha Venkata Sathishwa r Reddy	9917004174				
26	Aashish Dubey K	9917004001	22-05-2019	06-06-2019	Web design using HTML and CSS	Techkno Corp
	Bharath Ganesh	9917004014				
	Anand M	9917004188				
	V Gowtham	9518004301				
27	NagellaKe dharnath	9917004191	01-06-2019	18-06-2019	Web designing	ICore Software Technolog ies
	Sreeramda s Venkata Harendra	9917004149				
28	Yeduguri Pallavi	9917004182	01-06-2019	18-06-2019	Web designing	ICore Software Technolog ies
	Meda Sushma	9917004075				



NBA SAR 2022 - DEPT OF CSE - KARE

	PaluruSun eela	9917004093				
29	M.Udaya Sree	9917004068	01-06-2019	18-06-2019	Web designing	ICore Technolog ies
	M.Madhu Priya	9917004074				
	S.Mahesh	9917004143				
30	Siddi Mahesh	9917004143	01-06-2019	18-06-2019	Web Designing	ICore Software Technolog ies
	Meda Madhu Priya	9917004074				
	Malepati Udaya Sree	9917004068				
31	C.Ritish Reddy	9917004022	28-05-2019	27-06-2019	Student Information System	Electronic s Corporatio n Of India Limited (ECIL)
	R.Srikant h	9917004120				
32	M. Chandana	9917004203	02-06-2019	22-06-2019	Web Development using PHP	ICore Software Technolog ies
	Y. YuvaSree	9818004006				
	A. Krishna	9917004007				
	V. Prashanth	9917004205				
33	Abitha	9917004002	10-05-2019	25-05-2019	Mobile application	ICore Software Technolog y
	Narayani	9917004087				
	Sangeetha	9917004130				
	Soundarya	9917004147				
34	V.Theepik ashree	9917004160	10-05-2019	25-05-2019	Mobile application	ICore

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	B.Mounika	9917004078				Software Technologies
	N.Madhumitha	9917004217				
35	G.Harshitha	9917004040	27-05-2019	09-06-2019	Web development using php	Keltron
	M.Nikitha	9917004072				
36	A.Chandana	9917004187	07-06-2019	21-06-2019	Internet of things	Kaashiv Infotech
	E.Sai Sharan	9917004127				
	G.Madhuri	9917004037				
	S.Dayakar Reddy	9917004195				
37	Anujaa.G.B	9917004008	13-05-2019	30-05-2019	IoT solutions	MAPOL Business Solutions Private Limited
38	Sandhya T	9517004201	10-06-2019	21-08-2019	Real time embedded system development for Industrial Applications	NSIC
	Chinimilli Bhanu Mohan Kumar	9917004024				
	Kodali Sudheer Kumar	9917004213				
	Tavva Mohit Venkata Naga Sai	9917004159				
39	Loksundar	9917004144	03-06-2019	20-06-2019	Web development	Phoenix

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	Yaswanthi	9917004085				Softech
	Babloo Kumar	9917004218				
<b>Academic Year: 2020 -2021</b>						
<b>Batch no</b>	<b>Name</b>	<b>Reg. No</b>	<b>From</b>	<b>To</b>	<b>Title</b>	<b>Company</b>
40	Pattipati Manohar	9917004100	08-10-2020	28/08/2020	Core Python Programming	Nanda Infotech, Coimbatore
	Kunchal a Srikanth	9917004064				
41	M.Jaswanth	9917004073	06-06-2020	25/06/2020	Face detection system	Triant Solutions, Hyderabad
	N.V.Kishore	9917004088				
	M.Mokshagni	9917004067				
42	Santhan Chowdary Ratakonda	9917004119	06./06/2020	25/06/2020	Quiz website using PHP	Triculin Tech, Hyderabad
	Jaswanth Reddy Manimala	9917004071				
	Nunna Vishnu Vamsi	9917004090				
43	G. Sriram Reddy	9917004034	03-01-2021	17/01/2021	Web development using HTML	Technocorp Software Solutions, Coimbatore
	M. Naveen	9917004079				

NBA SAR 2022 - DEPT OF CSE - KARE

	Kumar Reddy					
44	Uday Kumar Uppala	9917004171	06./06/2020	25/06/2020	Face detection System	TriculinTech,Hyderabad
	Addanki Pavan Kumar	9917004004				
	Sai Teja Varma Nagaraju	9917004082				
45	Thiruwie ddiHan umann	9918004117	08-03-2020	09-04-2020	Ethical Hacking and Cyber security (CEH-V10)	Supraja Technologies, Vijayawada
46	Mittapalli Sai Manikanta Uday	9918004071	03-01-2021	17/01/2021	Web Development	Dreams Technologies,Chennai
	M Venkat Sai Krishna	9918004072				
	T Sai Kiran	9918004229				
	B Prudhvis	9918004010				
47	Akhshaya S	9918004003	01-04-2021	18/01/2021	Core Python Programme	Falcon Square,Coimbatore
	Akhshaya M	9918004002				
	Kaviya M	9918004048				
48	Nithya K	9918004084	03-01-2021	17/01/2021	Application development using	Icore Software

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	Shreekanth S	9918004111			python	Technologies, Peelamedu,
	Sivaganesha M	9918004112				
	Subhashini S	9918004114				
49	C Divakar Reddy	9918004136	03-01-2021	17/01/2021	Web development using PHP	Falcon Square, Coimbatore
	P Gangi Reddy	9918004175				
	T Sai Vardhan Reddy	9918004153				
50	Madiredy Girish Reddy	9918004144	02-01-2021	17/01/2021	Web development using HTML	Techknocorp Software Solutions, Coimbatore
	Vangala Arun Kumar Reddy	9918004157				
	Neelam Veerendra	9918004148				
51	D Raja Shekar Raju	9918004018	03-01-2021	17/01/2021	Web development program using HTML	Smartx Connected Products Private Limited, Chennai
	D Manoj Varma	9918004020				
	K Ravi Varma	9918004042				
	G T S R K Varma	9918004027				

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52	Praveen Kumar K	98180040 03	20/05/202 0	25/07/2020	Web Application Pentester	Indian Servers, Vijayawada
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Academic Year: 2021 -2022					
Batch no	Name	Reg. No	From	To	Company
53	Dheenadayalan T M	9918004024	01-06-2021	14-06-2021	National Small Industries Corporation(A Govt of India Enterprise), Chennai
	Dhinakaran C	9918004025			
	Naveen Karthik C	9918004080			
54	Duddella Sharath	9918004179	10-06-2021	26-06-2021	Smart web Technologies, Coimbatore
	Makkena Subramanya Somasekhar	9918004233			
	Hemanth Kumar	9519004301			
55	Dommaraju Bhanu Varma	9918004213	07-06-2021	23-06-2021	SmartWeb Technologies, Coimbatore
	Aekasi Vishnu Bharath Reddy	9918004182			
	Sambareddy Sai Kumar	9918004140			
	Kunku Sai Krishna	9918004198			
56	S.Kasiraman	9918004047	01-06-2021	15-06-2021	National Small Industries Corporation(A Govt of India Enterprise), Chennai
	S.R.Bharathwaj	9918004014			
	M.Ajithlakshmanan	9918004001			

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	P.Aravindraj	9918004007			
57	Nikhil Sai Shankar Kotharu	9819004002	28-05-2021	14-08-2021	Falcon Square,Coimbatore
	Ankit Kag	9918004005			
	Reddappa Reddy Kalavapalli	9918004044			
	Bhargav Reddy Kummetha	9918004055			
58	K Govinda Sai	9918004045	04-06-2021	21-06-2021	Phoenix Softech, Madurai
	L Anjani Nandan Reddy	9918004057			
	D Suraj Hussain	9918004026			
59	DasiLikhiteswar Reddy	9918004022	14-06-2021	30-06-2021	SmartX Connected Products Pvt. Ltd, Chennai
	JeeredyHarshavardhan Reddy	9918004040			
	Yerra Anil Kumar	9918004142			
60	Kesaboyina Prabhu Kumar	9918004050	28-05-2021	14-06-2021	SmartX Connected Products Pvt. Ltd, Chennai
	BuchupalleBavesh Reddy	9918004015			
	B.Raghunath Reddy	9918004013			
	Guvvala Vishnu Vardhan Reddy	9918004036			
61	G.Charan Kumar Reddy	9918004193	06-06-2021	23-06-2021	Web walk Infosys, Madurai

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	M.Giridhar Sai Reddy	9918004199			
	N.Karthik	9918004223			
	Y.Praveen Reddy	9918004123			
62	Ananthabotla Venkata Naga Harshith	9918004004	10-06-2021	26-06-2021	Web walk Infosys, Madurai
	Dasari Bharath Chandra	9918004021			
	Kothapalli Madanamohan Reddy	9918004054			
63	Nune Veera Venkata Satya Narayana Swamy	9918004085	01-06-2021	30-06-2021	BOLT IOT, Bangalore
64	T Badhrirajan	9918004009	01-06-2021	15-06-2021	National Small Industries Corporation (A Govt of India Enterprise), Chennai
	Raja Dhananjeyan V	9918004098			
	Z Sharik Anwar	9918004110			
65	Ketham Samara Simha Reddy	9918004137	21-06-2021	07-07-2021	Falcon Square, Coimbatore
	Kotha Pradeep Reddy	9918004053			
66	Tangella Shashipreetham Reddy	9918004115	07-06-2021	21-06-2021	Web walk Infosys, Madurai
	Solipuram Sai Gnaneshwar Reddy	9918004113			
	Patapanchula Gowtham	9918004088			
	Naveen Padartha	9918004081			



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67	C. Glory Devakirubai	9918004030	28-05-2021	15-06-2021	ICORE Software Technologies, Coimbatore
	M. Malathy	9918004061			
	M. Manonmani	9918004067			
68	N Saivivek	9918004077	13-06-2021	29-06-2021	AlphatacTechnologies,B angalore.
	M Nagasai	9918004069			
	P Gnaneswar	9918004093			
	P.Sateesh Reddy	9918004201			
69	Tarunkumar Reddy T	9918004146	20-05-2021	07-06-2021	PHOENIX SOFTECH,Madurai
	Ch . Bhargav	9918004147			
	P. Sai Vineeth	9918004149			
	G. Mahesh	9918004168			
70	Ravella Harini	9918004100	06-02-2021	06-12-2021	Falcon Square,Coimbatore
	GanjiPoojithaSree Vandana	9918004029			
	Patan Dilshad	9918004087			
	Guddanti Ravindra Babu	9918004033			
71	Venkatesh C	9918004121	01-06-2021	15-10-2021	KaashivInfoTech,Chenna i
72	Gurram Vamsi	9918000403 5	02-06-2021	18-10-2021	Shiash Info Solutions Private limited, Chennai

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	M. Venkata Naveen	9918004059			
	T.Manoj Kumar	9918004133			
	K.SaiYugandar	9918004158			
73	PereddyLeelanath Reddy	9918004091	12-06-2021	29-06-2021	Shashi info solutions private limited,Chennai
	Narahari Surya Prakash	9918004079			
	Patchipulusu Mukesh Sai	9918004089			
74	N.Sai Vishal	9918004102	04-06-2021	21-06-2021	PHOENIX SOFTECH, Madurai
	M.Sasi Chandra	9918004074			
	M.Hemanth	9918004064			
75	Munaga Rakesh	9918004073	24-05-2021	19-06-2021	SmartX Connected Products Pvt. Ltd, Chennai
	Shaik MahabubShaariief	9918004108			
	Mallepalli Rakesh Reddy	9918004062			
	Pagadala Venkata Sai Ramanjeneya Reddy	9918004086			
76	Immadietty.Gokul Vamsi	9918004037	01-06-2021	30-06-2021	Bolt IoT, Bengaluru
	Gontla Chandrashekar	9918004032			
77	V Deepak Nithin Gupta	9918004210	22 / 04 / 2022	09 / 05 / 2022	Enthu Technology Solutions

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	Ch Venkat Gopi	991800417 2			
	K Karthik	991800423 1			
	B Ramcharan Reddy	991800400 8			
78	G.Deshik	991800418 7	21/4/2022	05-07-2022	Eminent Technology Solutions
	A.Naga Vardhan Reddy	991800419 1			
	J.VenkataVaradaraju	991800419 4			
	P.Sateesh Reddy	991800420 1			
79	Kalavala Naga Sai Anil	991800404 3	19/04/2022	07-05-2022	VI Solutions
	Repana Devananda	991800410 1			
	Segu Dhanush Kumar	991800410 7			
	Jinka Lakshmi Pathi	991800404 1			
80	V.Pavan Kumar Reddy	991800417 3	19/04/2022	09-05-2022	Bharath Sanchar Nigam Limited
	S.Arshad Ali	991800416 0			
	I.Ramacharan Reddy	991800413 9			
	B.Hemanth	991800417 1			
81	C.Rahul Baba	991800421	22/04/2022	09-05-	Enthu Technology

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		1	2	2022	Solutions
	K.Ganesh	991800421 2			
	Y.Manoj Kumar	991800412 4			
	K.Sai Kumar	991800421 5			
82	V.Goutham Reddy	991800412 0	19/04/202 2	09-05- 2022	Bharath Sanchar Nigam Limited
	K.Gopi Reddy	991800416 9			
	G.Jagadessh	991800414 3			
	K.Harsha Mahesh	991800405 2			
83	G.Kowshik	991800403 1	10-06- 2021	26/06/202 1	SMART WEB TECHNOLOGIES
	S.Lakshmayya	991800405 6			
	M.K.Bhaskar	991800416 6			
	B.Telesh	991800413 1			
84	V.Srijith	991800411 9	20/04/202 2	07-05- 2022	Bharath Sanchar Nigam Limited
	M.Hanumantharao	991800412 5			
	N.Mohan Kalyan	991800413 5			
85	P.Sathish Kumar Reddy	99 1800422 8	21/04/202 2	07-05- 2022	Eminent technology solutions

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	B.Murali Krishna	991800423 0			
	D.Sanjay	991800422 7			
86	Ch.Yaswanth	991800423 5	31/03/202 2	11-05- 2022	Innovent technology
87	Uppalapati Naveen	991800422 6	06-08- 2021	22/06/202 1	NANDHA INFOTECH, Coimbatore
	Ummiti Sai Uma Sandeep	991800418 8			
	Kesari Bhargava Reddy	991800419 0			
88	DadireddySharathk umar Reddy	991800401 9	20/12/202 1	15/01/202 2	SmartX Connected Products Pvt. Ltd,Chennai
	Podaralla Sreekanth Reddy	991800409 2			
	Gaddamida Hari Prasad	991800414 1			
	Ramaswamy Prakash	991800409 9			
89	P.Leelanathreddy	991800409 1	24/12/202 1	01-11- 2022	SmartX Connected Products Pvt. Ltd,Chennai
	Narahari Surya Prakash	991800407 9			
	P Mukesh Sai	991800408 9			
90	N Saivivek	991800407 7	22/12/202 1	25/01/202 2	VI Solutions,Bangalore
	P Gnaneswar	991800409 3			
	M Venkata	991800406			

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	Mithilesh	5			
91	M.Shailesh	991800410 9	14/12/021	28/12/202 1	Pofi Technologies, Coimbatore
	T.Sanathani	991800410 4			
	V.PriyaDharshini	991800409 6			
92	MarreddyVamsidh ar Reddy	991800406 8	20/01/202 2	31/01/202 2	Reality radssoon,Coimbatore
	M.Naga Sai	991800406 9			
	P.Vinay	991800409 4			
93	M.Chinnakaruppu	991800419 2	06-04- 2021	18/06/202 1	Zealsoft Technology Solutions, Madurai
	J.R.Karthikeyan	991800419 5			
	P.Sanjaypandian	991800423 2			

**Kalasalingam Academy of Research and Education**  
**School of Computing**  
**Department of CSE**  
**Rubrics for IPT**

**Total Marks – 100**

**Mark Split-up:**

1. IPT Report – 40
2. Quality of Presentation – 50
3. Question and Answer session – 10

**Mark Allotment for Report (40)**

Performance	Marks
Poor	0 – 10
Average	11 – 20
Good	21 – 30
Very good	31 -35
Excellent	36 - 40

**Mark Allotment for Quality of presentation (50)**

Module	Performance	Marks
Voice modulation & Language clarity	<ul style="list-style-type: none"> <li>• Unacceptable (0 - 2)</li> <li>• Acceptable (3 - 7)</li> <li>• Excellent (8 - 10)</li> </ul>	10
Study of Modern tools	<ul style="list-style-type: none"> <li>• Not Studied(0 - 2)</li> <li>• Usage (3 - 7)</li> <li>• Usage and Implementation (8 - 10)</li> </ul>	10
Level of Understanding	<ul style="list-style-type: none"> <li>• Unacceptable (0 - 2)</li> <li>• Acceptable (3 - 7)</li> <li>• Excellent (8 - 10)</li> </ul>	10
Gesture and Posture	<ul style="list-style-type: none"> <li>• Unacceptable (0 - 2)</li> <li>• Acceptable (3 - 7)</li> <li>• Excellent (8 - 10)</li> </ul>	10
Hands on Experience	<ul style="list-style-type: none"> <li>• Nil Experience (0 - 2)</li> <li>• Limited Experience(3 - 7)</li> <li>• Fully Experienced (8 - 10)</li> </ul>	10

**Mark Allotment for Question & Answer Session (10)**

Performance	Marks
Poor	0 – 2
Average	3 – 4
Satisfied	5 –7
Very Satisfied	8 - 10

  
 IPT COORDINATOR

  
 HOD/CSE 26/3/21

**Fig. 2.2.66 Rubrics for Industrial Training and Internship Training**



Date: 10-07-2021

To

**THE HEAD OF DEPARTMENT,**  
DEPARTMENT OF COMPUTER SCIENCE,  
KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION,  
KRISHNANKOIL - 626124.

Respected Madam/Sir,

Sub: Internship Completion Certificate.

We hereby confirm our offer to your student **Mr. BALASARASWATHI YUGANDHER (Reg. No: 9919004027)**, 3<sup>rd</sup> Year B.Tech (CSE) has successfully completed Inplant Training in Python Programming. The Training commenced in 24<sup>th</sup> June 2021 and was completed 10<sup>th</sup> July 2021 (Timing 10.30am to 5.00pm regularly). During the Training his conduct and attendance was very good (100%).

With Best Wishes

Thanking you,

Best wishes and regards,

Alphatec Technologies.

Website: [www.zaubacorp.com](http://www.zaubacorp.com)  
Contact number: 09535866270  
Email: [hralphatectechnology@gmail.com](mailto:hralphatectechnology@gmail.com)



PHOENIX SOFTECH

Date: 26-06-2021

To

**THE HEAD OF DEPARTMENT,**  
DEPARTMENT OF COMPUTER SCIENCE,  
KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION,  
KRISHNANKOIL - 626124.

Respected Madam/Sir,

Sub: IPT Completion Certificate.

We hereby confirm our offer to your student **Mr. BHOGI REDDY JAYANTH SAI (Reg. No: 9919004033)**, Second Year B.Tech (CSE) has successfully completed Inplant Training in Web Development using PHP. The Training commenced in 10<sup>th</sup> June 2021 and was completed 26<sup>th</sup> June 2021 (Timing 10.30am to 5.00pm regularly). During the Training his conduct and attendance was very good (100%).

With Best Wishes

For PHOENIX SOFTECH

S. SUKUMAR  
Project Manager

No 266, II Floor, Good Shed Street, Madurai - 625 001.  
PH : 0452-2343527, 2350078  
Website : [www.phoenixsoftech.in](http://www.phoenixsoftech.in)

Fig. 2.2.67 Sample IPT Permission Letter from industry



Fig. 2.2.68 is the evidence of the sample evaluation report of IPT following the rubrics stated above in figure 2.2.66.

**Kalasalingam Academy of Research and Education**  
**School of Computing**  
**Department of Computer Science and Engineering**  
**Academic year 2020-21**

Subject Code :CSE18R397  
 Category :Industrial Training  
 Staff Name : Mr.D.Balakrishnan

Dept : CSE  
 IPT : First

S.No	Batch no	Register Number	Name	From	To	Company	Title	IPT Report (40)	Quality of presentation	Q & A Session (10)	Total (100)
1		9917004095	Pandiyar Kartik Raja S				Core Python	35	42	8	85
2		9917004133	Santhosh Madhavan A				Core Python	35	43	8	86
3		9917004185	Vishnu Vardan E S				Programming	35	40	6	81
4	1	9917004155	Surya Velavan C G	6/25/2020	7/15/2020	Phoenix Softech	Programming	35	45	8	88
5		9917004066	Lingamdinne Sreekant			Techknocorp Software Solutions	WEB DEVELOPMENT	25	25	5	55
6		9917004083	Nagireddy Ravikumar			Techknocorp Software Solutions	WEB DEVELOPMENT	25	30	5	60
7	2	9917004033	Gajjala Sandeep kumar	6/10/2020	7/10/2020	Techknocorp Software Solutions	WEB DEVELOPMENT	25	30	7	62
8	3	9917004126	M. SAI ANAND	4/20/2020	6/15/2020	FOSSEE, IIT Bombay.	difference between the predicted GDP vs actual GDP	38	49	9	96
9	4	9917004145	S.SIVARAJA	8/2/2020	8/16/2020	Phoenix Softech	Web Development using PHP	27	25	8	60

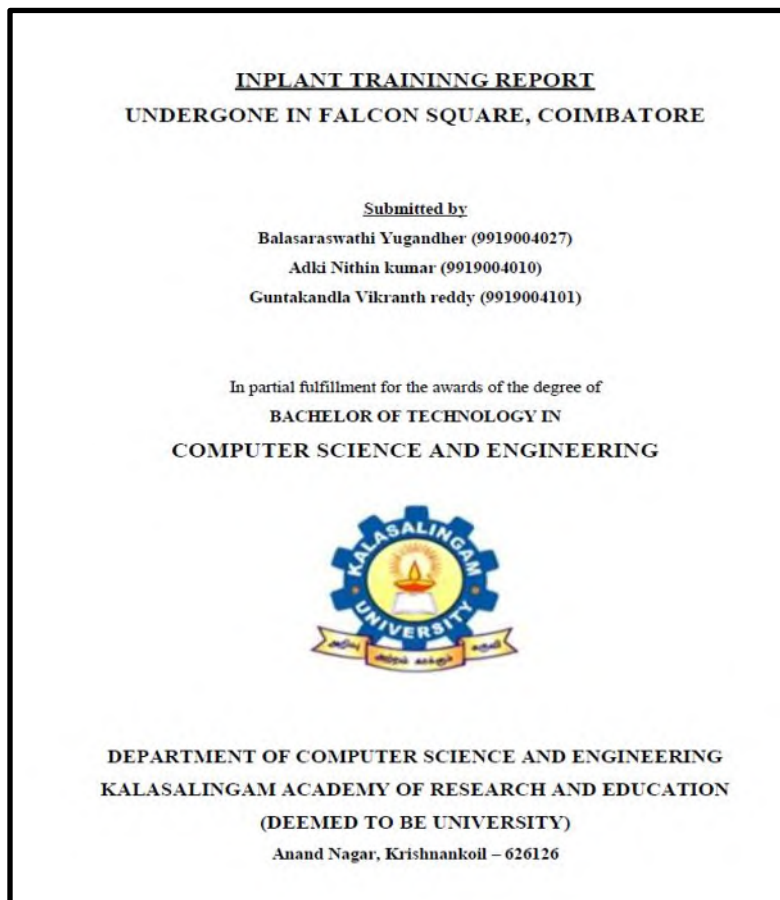
Recorded Session Link <https://drive.google.com/drive/folders/12cgavi4N0Q1FaatpjaOL0mA1DTFid9>

**Fig. 2.2.68 Evaluation Report**





Fig. 2.2.69 Sample Industrial Training Completion Certificate





Visualization of utility bills

Fig. 2.2.70 Sample Industrial Training Report

### **B. Industrial /internship /summer training of more than two weeks and post training**

#### **Assessment**

The students shall undergo industrial training in reputed industries for a minimum period of 2 weeks during the summer vacation. At the end of the training, students shall submit a report and make a presentation which will be assessed by a committee constituted by the department. In addition, the department hosts training sessions focused on current industry trends and job functions. External trainers from reputable industrial groups provide students with the most up-to-date technological developments.

The following are the industry internship/summer training initiatives, implementation, and impact analysis.

- Internships are organized by the departments industrial internship coordinator in collaboration with industry associates and student volunteers.

- A copy of the training confirmation letter (Permission Letter) is uploaded in SIS login by student to get approval from the class coordinator, industrial internship coordinator, HoD and finally by the training and placement office.
- The students report their joining and daily status to the class coordinator, as soon as they join the industry for internship.
- The faculty mentor meets with the industry supervisor and keeps in touch with him or on completion of internship the students upload their completion certificate in their SIS login. The same is verified and approved by the class coordinator, Internship Coordinator, HoD and finally by TPO.
- Then the Internship coordinator consults with HoD for internship review, on the date of review the students should present their implementation along with a project report in front of the review panel members. They evaluate the students based on the rubrics discussed in Fig. 2.2.66. Finally, the two credits are allocated to the students.

The same procedure followed in Industrial Training was followed in Internship. In addition, students can also get internships as part of Placements and other opportunities. The detailed list of students who have completed Internship is shown below academic year wise in Table 2.2.28

**Table 2.2.28: Students Done Internship**

S.No.	Register Number	Name of the Student	Duration	Industry Name
1	9916004248	AmarakotaMadhuvamsi	6 months	IIT Gandhinagar
2	9915004056	Sachin G	5 months	ISRO, Bangalore
3	9915004127	Razia Khan		
4	9916004229	Akash Awasthi	5 months	Department of Civil Engineering at IIT Kanpur
5	9916004074	M. Sai Dinesh	1 month	Shiash Info Solution Pvt Ltd
6	9916004085	M. Hemanth	1 month	Shiash Info Solution Pvt Ltd

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7	9916004142	Sana Venkateswara Rao	5 months	Soft Suave Technologies (P) Ltd.
8	9916004176	T. BalaManideep	3 months	Grepthor Software Solutions Pvt Ltd
9	9916004091	M. Bharath Kumar	3 months	Grepthor Software Solutions Pvt Ltd
10	9916004077	M. Hari Krishna	3 months	Grepthor Software Solutions Pvt Ltd
11	9916004027	Devarapalli Karthik	3 months	VNC Digital Services Pvt Ltd
12	9916004169	Prudhvi Krishna Thandra	4 months	Avancer Software Solutions Pvt. Ltd
13	9916004141	Sai Ravi Teja Garlapati	4 months	EC & G/DIT/SDD, Defence Research Development Lab (DRDL)
14	9916004040	Gundlapalli Sahana	4 moths	Young Minds Technology Solutions Pvt Ltd
15	9916004160	Sirigiri Siri Chandana	4 months	Avancer Software Solutions Pvt. Ltd
16	9916004066	KolisettyTharuni	4 months	Young Minds Technology Solutions Pvt Ltd

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17	9916004019	Bandari Vamshikrishna	4 months	Avancer Software Solutions Pvt. Ltd
18	9916004202	Manyam Vishnu Vardhan Reddy	4 months	Young Minds Technology Solutions Pvt Ltd
19	9916004217	A.Tirumala Vikas Reddy	4 months	KESTE IT Solutions
20	9916004247	V.Keerthi Vardhan		
21	9916004011	A.Sai Sri Harsha		
22	9916004068	K Vishnu Vardhan	4 months	KESTE IT Solutions
23	9916004210	G Priyanka		
24	9916004203	P Bhanu Prakash		
25	9916004208	VasanthuJeyaprakas h Reddy	5 months	VNC Digital Services Pvt Ltd
26	9916004027	Karthick Devarpalli		
27	9916004250	TarunRamagiri		
28	9916004162	K.Soundarya	6 months	Janus Technologies, chennai
29	9916004248	A. Madhu Vamsi	6 months	Zoho Corp
30	9915004184	Venna Naga Thrinadh Reddy	6 months	Zoho Corp
31	9915004215	N V Sai Teja	6 months	Zoho Corp
32	9914004052	B Venkata Sai Bharghava	6 months	Kalycito Intern
33	9914004057	Gabbtta Venkata Sai Naga Sobhan	6 months	Mazework
34	9914004040	Vasanth Kumar.V	6 months	Mazework
35	9915004196	LaveshKarnani	6 months	Amazon
36	9915004135	EguvapalliVamsidh ar Reddy	6 months	Lean Pitch
37	9915004151	R Gopi Krishnan	6 months	Lean Pitch

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38	9915004211	Gande Varun Kumar	6 months	Lean Pitch
39	9816004003	Saranya M	6 months	Global Health Care
40	9915004008	Balakumaran M	6 months	Global Health Care
41	9915004024	Jasper Jerald R	6 months	Global Health Care
42	9915004126	AmbitiHarivardhan	6 months	Global Health Care
43	9915004162	Gabburi Nikhil	6 months	Global Health Care
44	9915004177	Baram Ramesh Babu	6 months	ThinGKs Informatic
45	9915004198	N Sampath Kumar	6 months	Delta X
46	9915004198	N Sampath Kumar	6 months	Rently Software
47	9915004011	Chandhru V	6 months	Swifterz
48	9915004049	Pratheep R	6 months	Swifterz
49	9915004130	Nallani Vinodsai	6 months	Swifterz
50	9915004130	Nallani Vinodsai	6 months	Maze Work
51	9915004196	LaveshKarnani	6 months	Full Creative
52	9915004033	Lakshmi Narayani S	6 months	Eduvirtuoso
53	9915004049	Pratheep R	6 months	Eduvirtuoso
54	9915004056	Sachin G	6 months	Eduvirtuoso
55	9915004057	Santhosh Kumar P	6 months	Eduvirtuoso
56	9915004072	Sudarsan B	6 months	Eduvirtuoso
57	9915004093	Vyshali S	6 months	Eduvirtuoso
58	9915004122	Roshni B	6 months	Eduvirtuoso
59	9915004129	Nagarajugari Subramanya Sai Aravind	6 months	Eduvirtuoso
60	9915004157	Kolla Gopinath	6 months	Eduvirtuoso
61	9915004165	Vikash Kumar	6 months	Eduvirtuoso
62	9915004171	Koduru Prajwal	6 months	Eduvirtuoso
63	9915004174	Chandru R	6 months	Eduvirtuoso
64	9915004207	Mamidi Manoj Kumar	6 months	Eduvirtuoso
65	9915004233	CheekarlaBalachandra Reddy	6 months	Eduvirtuoso
66	9916004181	Vaisak S Nair	6 months	Aspire Systems

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67	9916004224	B.Satheesh Kumar	6 months	Aspire Systems
68	9916S04003	Dheekshana	6 months	GE India
69	9916004142	Sana Venkateswara Rao	6 months	Soft Suave
70	9916004193	Yalamuri Dinesh	6 months	Soft Suave
71	9519004501	KeerthanaChintalapudi	6 months	DXC Technologies
72	9917004040	GundraHarshitha	6 months	DXC Technologies
73	9917004074	Madhu Priya Meda	6 months	DXC Technologies
74	9917004075	Sushma Meda	6 months	DXC Technologies
75	9917004093	PaluruSuneela	6 months	DXC Technologies
76	9917004123	RevooriVeeharika Reddy	6 months	DXC Technologies
77	9917004182	Pallavi Yeduguri	6 months	DXC Technologies
78	9917004186	S Aishwarya	6 months	DXC Technologies
79	9917004216	Monika SreeVelampudi	6 months	DXC Technologies
80	9917004037	Gourabathuni Madhuri	6 months	DXC Technologies
81	9917004091	Padarthy Meghana	6 months	DXC Technologies
82	9917004220	Fantasy Merlin Glorina R	6 months	DXC Technologies
83	9917004175	Ranta Kumari V	6 months	DXC Technologies
84	9917004019	ChaluvadiMahendra	6 months	DXC



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		nath		Technologies
85	9917004191	Kedhar Nath	6 months	DXC Technologies
86	9917004154	Sure Vasavi	6 months	DXC Technologies
87	9917004157	RukeshTalapaneni	6 months	HIBIZ
88	9917004004	Pavankumar	6 months	DUCAN
89	9917004132	Anudeepreddy	6 months	ENSAR SOLUTIONS
90	9818004003	Praveen Kumar.K	6 months	Viberal Digital Solutions
91	9917004155	Suryavelavan.G	6 months	Viberal Digital Solutions
92	9917004156	Swetha.S	6 months	Viberal Digital Solutions
93	9917004095	Pandiyakarthish Raja	6 months	Viberal Digital Solutions
94	9519004301	Hemanth Kumar V	6 months	DXC
95	9918004003	Akshaya S	6 months	DXC
96	9918004009	Badhrirajan T	6 months	DXC
97	9918004012	SreyaBasireddy	6 months	DXC
98	9918004016	Akash Buddala	6 months	DXC
99	9918004017	Chimmili Abhilash	6 months	DXC
100	9918004021	Dasari Bharath Chandra	6 months	DXC
101	9918004022	LikhiteswarReddy Dasi	6 months	DXC
102	9918004026	Suraj Hussain Dudekula	6 months	DXC

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103	9918004035	Gurram Vamsi	6 months	DXC
104	9918004040	JeeredyHarshavardhan Reddy	6 months	DXC
105	9918004042	Kakarlapudi Ravi Varma	6 months	DXC
106	9918004046	Kancharla Mahesh	6 months	DXC
107	9918004054	KothapalliMadanamoohan Reddy	6 months	DXC
108	9918004064	MangiReddi Hemanth	6 months	DXC
109	9918004078	Nara Haritha	6 months	DXC
110	9918004084	Nithya K	6 months	DXC
111	9918004085	Nune Veera Venkata Satya Narayana Swamy	6 months	DXC
112	9918004091	PereddyLeelanath Reddy	6 months	DXC
113	9918004092	Podaralla Sreekanth Reddy	6 months	DXC
114	9918004098	Raja DhananJeyan V	6 months	DXC
115	9918004100	Ravella Harini	6 months	DXC
116	9918004104	Sanathani T	6 months	DXC
117	9918004105	SanikireddyDakshayani	6 months	DXC
118	9918004115	TangellaShashipreet ham Reddy	6 months	DXC
119	9918004118	Vadde Ravi Teja	6 months	DXC
120	9918004119	VantedduSrijith	6 months	DXC

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121	9918004126	Kalva Suneel	6 months	DXC
122	9918004130	Vanapalli Jhansi Tri Lakshmi	6 months	DXC
123	9918004132	MadakalaBadrinadh Reddy	6 months	DXC
124	9918004133	Talluri Manoj Kumar	6 months	DXC
125	9918004136	Chigicherla Divakar Reddy	6 months	DXC
126	9918004138	Bandi Praveen Kumar	6 months	DXC
127	9918004146	ThippareddyTarunk umar Reddy	6 months	DXC
128	9918004147	Chintha Bhargav	6 months	DXC
129	9918004148	Neelam Veerendra	6 months	DXC
130	9918004152	Alavakonda Sri Lakshmi	6 months	DXC
131	9918004154	Saddikuti Jeevan Reddy	6 months	DXC
132	9918004157	VangalaArunkumar Reddy	6 months	DXC
133	9918004158	Kotla Sai Yugandhar	6 months	DXC
134	9918004165	Ravi Teja Yamsani	6 months	DXC
135	9918004173	Vennapusa Pavan Kumar Reddy	6 months	DXC
136	9918004176	Karedla Muni Vardhan	6 months	DXC
137	9918004177	Gayathri Rajagopal	6 months	DXC
138	9918004178	NakkaPraneeth	6 months	DXC

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		Reddy		
139	9918004199	MaramreddyGiridhar Sai Reddy	6 months	DXC
140	9918004205	PonnadaManikanta	6 months	DXC
141	9918004207	UppalapatiYogandaSiddhardha Varma	6 months	DXC
142	9918004208	Yellampalli Sai Sreeja	6 months	DXC
143	9918004210	Vutukuri Deepak Nithin Gupta	6 months	DXC
144	9918004213	Dommaraju Bhanu Varma	6 months	DXC
145	9918004214	JabbuTaraka Siva Sai Gopi Saran	6 months	DXC
146	9918004216	Kollipara Madhuri Nikhila	6 months	DXC
147	9918004231	Karthik Kudumala	6 months	DXC
148	9918004046	Kancharla Mahesh	6 months	ZOHO
149	9918004016	Buddala Akash	6 months	ZOHO
150	9918004034	Therla Venkata Balaji Royal	6 months	ZOHO
151	9918004115	TangellaShashipreetham Reddy	6 months	ZOHO
152	9918004059	Madasani Venkata Naveen	6 months	career Labs
153	9819004002	Kotharu Nikhil Sai Shankar	6 months	career Labs
154	9918004032	Gontla Chandrashekar	6 months	career Labs

The sample proof of Internship are as follows:

- Fig. 2.2.71 shows the Circular Released for Internship,
- Fig. 2.2.72 shows the acceptance mail for Internship,
- Fig. 2.2.73 shows the sample Internship offer letter.
- Fig. 2.2.74 shows the sample Internship completion certificate.



**KALASALINGAM**  
**ACADEMY OF RESEARCH AND EDUCATION**  
**(DEEMED TO BE UNIVERSITY)**  
Under sec. 3 of UGC Act 1956. Accredited by NAAC with "A" Grade



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**KARE/OCR/Training/2019-2020/21** **Date: 04/05/2020**

**CIRCULAR**

As per the AICTE guidelines, Students are allowed to pursue Online Industrial Training / Internship / Project work during this prevailing crisis lock down period due to COVID - 19 Pandemic.

Concerned School Dean and Department HoD are requested to motivate the students to pursue online Internship to ensure the improvement in their practical knowledge and employability of the students. Also, emphasis them to go for their core companies related to their stream of studies. Students who intend to pursue their internship / fellowship at National institutes such as IIT/IISc/IISER will also be permitted.


The general procedure for availing online Industrial Training / Internship / Project work is mentioned below

**Guidelines for Online Industrial Training / Internship / Project Work**

1. Students can avail the online internship by registering through Internshala /AICTE Internship Portal. Students can also arrange for an Online Internship / Project work on their own by directly approaching an industry / organization as per the guidelines.
2. Students need to register their names with the company (preferred to do online training/ internship / project work) details in T & P office through online. Refer Circular No.: KARE/OCR/Training/2019 - 20/09 dated on 03.10.2019
3. The TPO will verify the industry / organization chosen by the students and approval will be given based on certain criteria like Company reputation, Existing projects, Previous year student's feedback on the same company.
4. Upon the approval, the Bonafide/ NOC / Requisition letter will be sent to the Company by TPO through email. Company shall send the Final permission letter to students through email.
5. The industry / organization permission letter should be submitted to TPO through online.
6. The Head of the Department is requested to allot a faculty mentor for each batch of students who are willing to go for Industrial Training/ Internship / Project work.
7. The student's will start their training / internship / project work in the date mentioned by the company. The Joining Report / Proof should be submitted

to their respective department coordinator within one week from the date of commencement of the training / internship / project work.

8. The Consolidated summary sheet along with the joining report from each department should be submitted in T & P office within one week after the commencement of the next academic year 2020 - 2021
9. The Faculty mentor should evaluate the student's performance once / twice in a week and the email communication and necessary periodic record for the evaluation should be submitted to the panel at the time of final evaluation.
10. Upon the successful completion of student's training/internship/project work, the Company will provide the Training / Internship / Project completion certificate.
11. The Completion certificate, Daily Log and Attendance Proof should be submitted to their respective department coordinator within one week after the commencement of the next academic year 2020 - 2021
12. The Consolidated summary sheet of students report along with the Completion certificate, Daily Log and Attendance Proof should be submitted in T & P office within 10 days after the commencement of the next academic year 2020 - 2021.
13. Students who have satisfied the requirement will only be considered for final evaluation.
14. Upon final verification, the final list of students who have successfully completed the online Industrial Training / Internship / Project work will be prepared by TPO and will be shared with the concerned HoD.
15. The Final Evaluation should be conducted only for the student's mentioned in the TPO List.
16. The consolidated result passing sheet with company details, attendance percentage and final evaluation score (received from the panel) should be submitted within two weeks after conducting the final evaluation.
17. TPO will submit the Final students list to the Controller of Examinations for passing the credits.

  
 Director - Corporate Relations

Copy submitted to the Chancellor & Vice President - for favour of information  
 Cc to: Vice Chancellor & Registrar  
 Cc to: All Directors, Deans, COE & HoDs  
 Cc to: Concerned Department Coordinators

Fig. 2.2.71 Circular Released for Internship

9/20/21, 4:29 PM Gmail - internship request by AKASH AWASTHI MADHU VAMSI

Madhu Vamsi <madhumarvel143@gmail.com>

---

**internship request by AKASH AWASTHI MADHU VAMSI**

Vimal mishra <vmishra@iitgn.ac.in> Tue, Dec 4, 2018 at 8:56 PM  
 To: Akash Awasthi <akashcseku123@gmail.com>  
 Cc: "deansoc@klu.ac.in" <deansoc@klu.ac.in>, madhu vamsi <madhumarvel143@gmail.com>

Dear Akash and Madhu,

I am pleased to inform you that I would be happy to host you as interns from mid January 2019 for six months. During your stay at IIT Gandhinagar you will be working on large scale data analysis and development of new tools for climate data downscaling and bias correction. This work will require excellent programming skills.

You will stay in the hostel of IIT Gandhinagar. You will receive 8000/month to cover your day-to-day expenses.

I look forward meeting you soon and I am sure you will be able to meet high expectations of the water and climate lab, IIT Gandhinagar.

Best  
 Vimal  
(Quoted text hidden)  
 --  
 Vimal Mishra, PhD  
 Associate Professor, Civil Engineering, IIT Gandhinagar, Palaj, Gandhinagar, 382355  
<http://vmishra.people.iitgn.ac.in/water&climate/>  
[https://sites.google.com/a/iitgn.ac.in/high\\_resolution\\_south\\_asia\\_drought\\_monitor/home](https://sites.google.com/a/iitgn.ac.in/high_resolution_south_asia_drought_monitor/home)  
 Twitter: @vmishrait  
 Phone: 079-324-59904 (O)  
 09687944337 (M)

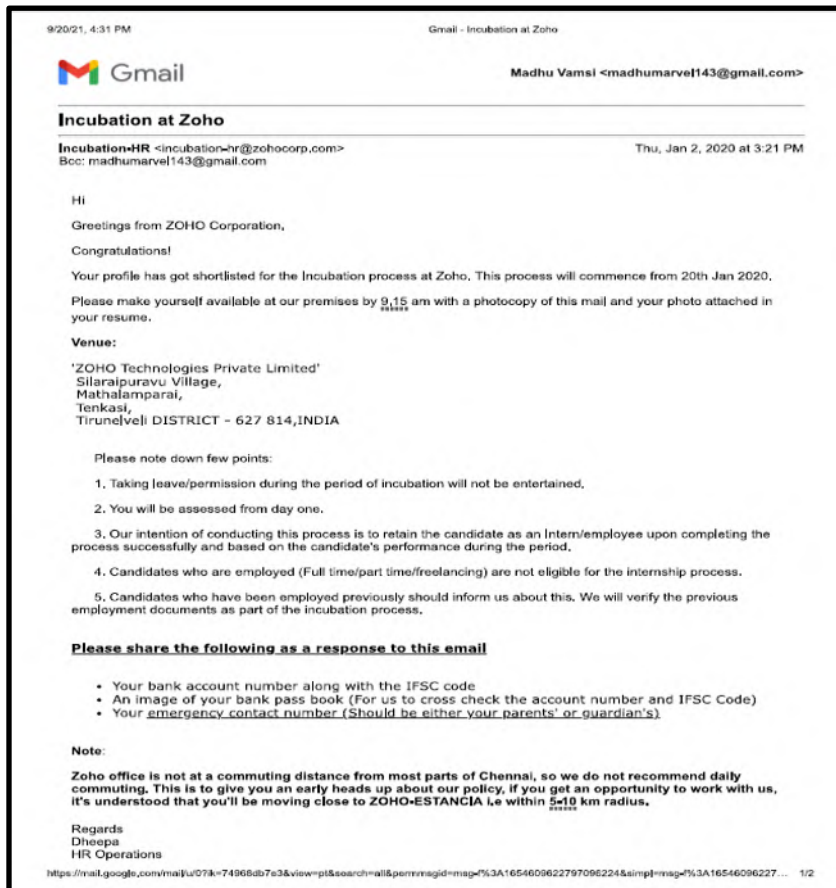


Fig. 2.2.72 Acceptance Mail for Internship



**Fig. 2.2.73 Sample Internship Offer Letter**



**Fig. 2.2.74 Sample Internship Completion Certificate**

### C. Impact Analysis of industrial training

#### Impact on Placement

- Industrial training plays a vital role towards placement. It has an excellent impact on placement records.
- In the academic year 2018 to 2019, 20% of students are placed in well reputed multinational companies with the package of 3 to 4 LPA. 30% of students are placed with the package of 2 to 3 LPA.
- In the academic year 2019 to 2020, 12% of students are placed in top MNC’s with high packages starting from 9 to 5 LPA. 20% of students are placed with the package of 3 to 4 LPA. 40% of students are placed with the package of 2 to 3 LPA.
- In the academic year 2020 to 2021, 40% of students are placed in leading IT sectors with high packages starting from 3 to 5 LPA. 25% of students are placed with the package of 2 to 3 LPA.



- The students who have done internships in reputed IT sectors were recruited in the same company with very good packages. One such proof is attached below Fig. 2.75.

### Impact on Research Cluster

- The industrial training and internship have a good impact on the department's research cluster. The Artificial Intelligence and Machine Learning (AI & ML) cluster has gained more visibility with students' contribution in research-oriented projects and publications.
- The knowledge gained during the internship regarding state-of-the-art technology and modern tools is leveraged to model deliverable projects at CSP and Capstone levels.
- The number of students performing projects in AI & ML have increased by around 30% in 2019 and 2020 project batches.



**Fig. 2.2.75 Student Done Internship at ZOHO were placed in ZOHO based on performance**

**D. Student feedback on initiative:**

Feedback is obtained from the students after the completion of the internship training program. The feedback regarding knowledge gained, ability, working environment, achievements, obstacles/challenges are received. The sample feedback copy of an internship program given by the student is depicted in Fig. 2.76. In addition, feedback from industry experts, alumni and senior students are also received, and subsequent actions will be taken to avoid the challenges or obstacles faced earlier.

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**SCHOOL OF COMPUTING**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

Internship Feedback form      DATE: 5/12/2018

NAME: SACHIN G  
REGISTER NUMBER: 991500A056  
YEAR/ SEMESTER: III/V  
DETAILS OF INTERNSHIP (COMPANY NAME/ADDRESS)  
ISRO, Bangalore  
KNOWLEDGE GAINED ON INTERNSHIP: Remote Sensing on Satellite Images  
ABILITY TO ACQUIRE NEW SKILLS: Image Processing & Program Optimization  
HOW WAS WORKING ENVIRONMENT?  
Informative & real time  
DID YOU RECEIVE ANY OUTSTANDING AWARDS DURING INTERNSHIP? No  
DID YOU FACE ANY KIND OF OBSTACLES/CHALLENGES DURING YOUR INTERNSHIP?  
Getting started with Industrial cultures took time  
DESCRIBE YOUR OVERALL EXPERIENCE Good

Sachin G  
SIGNATURE

**Fig. 2.2.76 Sample Internship Feedback Form**

**Actions on Feedbacks**

Feedbacks from students, industry providing internships, alumni are augmented, analysed and actions are taken whenever required. One of the major actions taken, from the feedback of industry experts, in the KARE regulation, is the inclusion of internship/industry training as a complementary course in non-CGPA. Later, based on AICTE model curriculum, the course is moved to CGPA courses with 2 credits, in the academic year 2018-19.

Based on the student's feedback to increase internship opportunities, industry-oriented courses are offered to the students as electives during the academic year 2019-20 and with the completion of such courses, the deserving students list are recommended to appropriate industries for possible internship opportunities.

Such practice is successful for the elective course “CSE18R257 – Predictive Analytics”. Around top-10% of the students taking the course get internships in the Data Analytics industry like Reliance Netmeds, Clinivantage Data Science Inc, among others.

In 2020-21, AICTE EduSkills Internship opportunities are exhaustively used by KARE (as specified in Criteria 2.1.4). Many faculties from CSE received Educator certificate by taking training on Industrial courses. With the Educator certificate, the faculties trained students on the corresponding courses, through which students gained AICTE internship certificates.

CRITERIA 3	
COURSE OUTCOMES AND PROGRAM OUTCOMES	175

**Define the Program Specific outcomes**

**PSO1: Problem-Solving Skills:** The ability to apply mathematics, science and computer engineering knowledge to analyze, design and develop cost effective computing solutions for complex problems with environmental considerations.

**PSO2: Professional Skills:** The ability to apply modern tools and strategies in software project development using modern programming environments to deliver a quality product for business accomplishment.

**PSO3: Communication and Team Skill:** The ability to exhibit proficiency in oral and written communication as an individual or as part of a team to work effectively with professional behaviors and ethics.

**PSO4: Successful Career and Entrepreneurship:** The ability to create an inventive career path by applying innovative project management techniques to become a successful software professional, an entrepreneur or zest for higher studies.

**3.1. Establish the correlation between the courses and the Program Outcomes (POs) & Program Specific Outcomes (PSOs)**

**Course Articulation Matrix**

<i>Course Outcome (CO)</i>		<i>Program Outcome</i>												<i>PSO</i>			
<i>Course Code / CO No</i>	<i>Statement</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<b>CSE18R272/Data Structures and Algorithms</b>																	
<b>CSE18R172.1</b>	Understand the elementary data organizations, data structure and its terminologies, basic operations and analysis of algorithms with the special focus to searching operations	3	3	3	3								2	3			
<b>CSE18R172.2</b>	Analyze linear data structures and create different linear data structures to solve real time applications	3	3	3	3								2	3			
<b>CSE18R172.3</b>	Analyze non-linear data structures such as Tree and create different tree data structures to solve real time applications	3	3	3	3								2	3			
<b>CSE18R172.4</b>	Understand and analyze various sorting and searching techniques for its efficiency	3	3	3	3								2	3			
<b>CSE18R172.5</b>	Create solutions for various real-life applications by using a non-linear data structure graph	3	3	3	3								2	3			
<b>CSE18R172.6</b>	Create efficient algorithms for real time problem statements by applying suitable data structures through working as a team and communicate effectively with technical community in both the written and oral forms	3	3	3	2	1	1	1	2	3	3	1	1	2	3	3	1
<b>CSE18R172.7</b>	Implement the problem statements in programming languages and analyze its efficiency through working as a team and communicate effectively with technical community in both the written and oral forms	3	3	3	2	2	1	1	2	3	3	1	1	1	3	3	1
<b>CSE18R172</b>	<b>Average</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>

<i>Course Outcome (CO)</i>		<i>Program Outcome</i>												<i>PSO</i>			
<i>Course Code / CO No</i>	<i>Statement</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<b>CSE18R174 Computer Architecture and Organization</b>																	
<b>CSE18R174.1</b>	Examine functional units of computer, bus structure and the different addressing modes	3												3			
<b>CSE18R174.2</b>	Apply the knowledge of algorithms to solve arithmetic unit problems	3			3	3								3			3
<b>CSE18R174.3</b>	Demonstrate single bus, multiple bus organization and pipelining concepts	3	3		3	2						2		3	2		
<b>CSE18R174.4</b>	Analyze the different types of memory like RAM,ROM, Cache memory and virtual memory concepts	3	3		3	2								3	2		
<b>CSE18R174.5</b>	Evaluate the various I/O interfaces like USB, PCI an SCSI	3	3	2	3	1	2	1				2	2	3	2		3
<b>CSE18R174.6</b>	Create efficient algorithms for implementing the different arithmetic and logic operations by applying appropriate design strategies through working as a team and communicate effectively with technical community in both the written and oral forms	3	3	2	3	1	1	1	2	3	3	1	3	3	3	3	2
<b>CSE18R174.7</b>	Implement the different architecture and analyze its performance using logic circuit design through working as a team and communicate effectively with technical community in both the written and oral forms	3	3	2	3	2	1	1	2	3	3	1	3	3	3	3	1
<b>CSE18R174</b>	<b>Average</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>

<i>Course Outcome (CO)</i>		<i>Program Outcome</i>												<i>PSO</i>			
<i>Course Code / CO No</i>	<i>Statement</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<b>CSE18R371 Computer Networks</b>																	
<b>CSE18R371.1</b>	Inspect the basics of data communication and various categories of networks and its securities	3												3	2		2
<b>CSE18R371.2</b>	Identify the technologies for error free secure transmission of data in data link layer	3												3	2		2
<b>CSE18R371.3</b>	Apply various routing protocols to select optimal path and relate addressing entities in Network layer	3	3	3	3	3	2	1				3	2	3	2		2
<b>CSE18R371.4</b>	Analyze the various security protocols at different layers of OSI architecture	3	3	3	3	3	2	1	3			3	2	3	2		2
<b>CSE18R371.5</b>	Analyze the various protocols in application layer	3	3	3	3	3	2	1				3	2	3	2		2
<b>CSE18R371.6</b>	Understand and apply different network commands through working as a team and communicate effectively with technical community in both the written and oral forms	3	3	3	3	3	1	1	2	3	3	3	2	3	3	3	1
<b>CSE18R371.7</b>	Analyze and apply the different networking concepts for implementing network solution through working as a team and communicate effectively with technical community in both the written and oral forms	3	3	3	3	3	1	1	2	3	3	3	2	3	3	3	1
<b>CSE18R371</b>	<b>Average</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>

<i>Course Outcome (CO)</i>		<i>Program Outcome</i>												<i>PSO</i>			
<i>Course Code / CO No</i>	<i>Statement</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<b>CSE18R272 Java Programming</b>																	
<b>CSE18R272.1</b>	Understand the object-oriented programming concepts	3	3	3	3	3								3	3		1
<b>CSE18R272.2</b>	Apply the fundamental programming concepts of java to develop standalone applications	3	3	3	3	3							2	3	3		2
<b>CSE18R272.3</b>	Implement window-based application applying event handling mechanisms	3	3	3	3	3							2	3	3		2
<b>CSE18R272.4</b>	Reduce the computation time to solve large computational problems using multithreaded programming	3	3	3	3	3							2	3	3		2
<b>CSE18R272.5</b>	Identify formulate and Analyze a real-world problem to provide an efficient code		3	3	3	3	2	2	2				3	3	3	3	3
<b>CSE18R272.6</b>	Apply software project development in multidisciplinary areas through working as a team and communicate effectively with technical community in both the written and oral forms						3	3	2	3	3	2	2	3	3	3	3
<b>CSE18R272.7</b>	Use modern tools to apply software engineering solutions to complex problems through working as a team and communicate effectively with technical community in both the written and oral forms								2	3	3	2		1	1	3	1
<b>CSE18R272</b>	<b>Average</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>



<i>Course Outcome (CO)</i>		<i>Program Outcome</i>												<i>PSO</i>			
<i>Course Code / CO No</i>	<i>Statement</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<b>INT18R371 Database Management Systems</b>																	
<b>CSE18R371.1</b>	Understand the features of database management systems and create conceptual models of a database using ER modeling	3	3	3	3	3								3	3		
<b>CSE18R371.2</b>	Create and populate a RDBMS with keys, constraints, queries using SQL	3	3	3	3	3								3	3		
<b>CSE18R371.3</b>	Analyze the existing design of a database schema and apply concepts of normalization to design an optimal database	3	3	3	3	3			1	1	2			3	2		
<b>CSE18R371.4</b>	Analyze various data storage and retrieval of information from database and the identify issues in query processing	3	3	3	3	2				1	2			3	3		
<b>CSE18R371.5</b>	Apply various security mechanisms to protect the data in database in real life applications	3	3	3		3	2			1	2			3	2		
<b>CSE18R371.6</b>	Apply the database concepts to develop database for a real-life application through working as a team and communicate effectively with technical community in both the written and oral forms	3	3	3		3	3	1	2	3	3	3	3	3	3	3	2
<b>CSE18R371.7</b>	Implement the problem statements more effectively by applying database programming through working as a team and communicate effectively with technical community in both the written and oral forms	3	3	3		3	3	2	2	3	3	3	3	3	3	3	2
<b>CSE18R371</b>	<b>Average</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>1</b>

<i>Course Outcome (CO)</i>		<i>Program Outcome</i>												<i>PSO</i>			
<i>Course Code / CO No</i>	<i>Statement</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<b>CSE18R499 Project Phase- II</b>																	
<b>CSE18R499.1</b>	Identify real world problems and analyze the need for computing solutions	3												3	3		
<b>CSE18R499.2</b>	Use modern tools/ theoretical concepts to apply engineering solutions to complex problems	3	3	3			3	3	3				2		3	3	3
<b>CSE18R499.3</b>	Acquire collaborative skills through working in a team to achieve common goals	3	3	3				3		3		3	3		3		
<b>CSE18R499.4</b>	Communicate to specific audience effectively in both the written and oral forms			3	3	3		3			3				2	3	
<b>CSE18R499</b>	<b>Average</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

**Program Articulation Matrix:**

<i>S. No</i>	<i>Course Code</i>	<i>Course Name</i>	<i>PO 1</i>	<i>PO 2</i>	<i>PO 3</i>	<i>PO 4</i>	<i>PO 5</i>	<i>PO 6</i>	<i>PO 7</i>	<i>PO 8</i>	<i>PO 9</i>	<i>PO 10</i>	<i>PO 11</i>	<i>PO 12</i>	<i>PSO 1</i>	<i>PSO 2</i>	<i>PSO 3</i>	<i>PSO 4</i>
1	EEE101	Basic Electrical and Electronics Engineering	3	3	0	0	0	0	0	0	2	3	0	0	0	0	0	0
2	MEC17R101	Engineering Drawing	3	3	0	0	0	0	0	0	2	3	0	0	0	0	0	0
3	CIV101	Basic Civil Engineering	3	3	0	0	0	0	0	0	2	3	0	0	0	0	0	0
4	CSE17R171	Programming Language	3	3	3	3	3	2	2	3	2	3	3	3	3	3	3	2
5	MEC17R105	Basic Mechanical Engineering	3	3	0	0	0	0	0	0	2	3	0	0	0	0	0	0

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6	MEC17R181	Engineering Practice Laboratory	3	3	0	0	0	0	0	0	2	3	0	0	0	0	0	
7	ECE18R277	Digital Electronics	3	3	3	3	3	0	2	3	2	3	2	0	3	3	2	1
8	ECE18R221	Analog Electronics Circuits	3	3	2	3	3	0	3	2	1	0	2	0	3	3	1	1
9	CHY17R171	Chemistry	3	3	1	1	1	0	2	0	0	0	0	0	3	1	0	1
10	MAT17R102	Linear Algebra, Partial Differential Equations and Complex Variable	3	3	0	0	3	0	0	0	0	0	0	0	2	0	0	0
11	PHY17R151	Materials Physics – I	3	3	2	2	3	0	0	1	1	0	1	0	3	1	0	2
12	CHY102	Environmental Science	2	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0
13	MAT17R101	Calculus and Differential Equations	3	3	0	0	3	0	0	0	0	0	0	0	2	0	0	0
14	PHY17R171	Engineering Physics	3	3	0	0	3	0	0	0	2	2	0	0	0	0	0	0
15	MAT18R202	Probability and Statistics	3	3	0	2	3	0	0	0	0	0	0	0	2	0	0	0
16	MAT18R207	Discrete Mathematics	3	3	0	2	3	0	0	0	0	0	0	0	3	0	0	0
17	BIT18R101	Biology for Engineers	3	3	0	3	2	0	0	0	0	0	0	0	0	0	0	0
18	HSS18R013	Professional Ethics	0	0	0	0	0	2	0	3	3	3	3	2	0	2	3	2
19	HSS18R015	Total Quality Management	1	0	0	0	0	2	2	2	3	3	2	2	0	0	0	2
20	HSS18R151	English for Technical Communication – I	0	0	0	0	0	0	0	1	3	3	0	2	0	0	2	0
21	HSS18R152	English for Technical Communication II	0	0	0	0	0	0	0	1	3	3	0	2	0	0	2	0
22	CSE18R181	Computer Workshop	3	2	2	2	2	0	0	2	3	3	0	3	0	3	2	3
23	CSE18R174	Computer Architecture and Organization	3	3	2	3	2	0	2	2	3	3	2	3	3	2	3	2



### 3.2. Attainment of Course Outcomes (75)

#### 3.2.1 Describe the assessment processes used to gather the data upon which the evaluation of course 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 3.4 shows the different assessment tools used for the CO attainment process.

**Table 3.4 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 thrice in a semester. Each and every sessional examination will focus on 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 in order 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.
	<i>Assignments</i>	<b>Assignment</b> An assignment is a qualitative performance assessment tool designed to assess the student's knowledge on engineering practices. It is a metric used to assess student's analytical and problem-solving abilities. Assignments should cover higher order Blooms Taxonomy cognition levels. Every student is assigned with course related tasks & assessment will be done based on their performance. An analytic rubric is developed to assess student's knowledge with respect to the learning outcomes.

	<p>Assignments can be given as Quiz, Seminar, Open Book Test, Case Studies, 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><b>Quiz</b> Quizzes will be conducted during regular class hours. Quiz should be designed to test the basic fundamentals in a topic. At least 25 questions should be there in each quiz. Preferably, and where applicable, GATE and/or other competitive exam standard has to be maintained. 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><b>Seminar</b> It should be an individual student seminar. Seminar topics are well planned as per the course outcomes of the concern course and the presentation should contain all the technical components and specific conclusions</p> <p><b>Open Book Test</b> Questions framed should not be directly from one or more published text books – either as solved or unsolved examples. The faculty must design the question himself as per course outcome of the concern course and preferably based on real time case studies.</p> <p><b>Industry Expert Evaluation</b> 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.</p> <p><b>Research Article Based Evaluation</b> 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 IEEE/Elsevier/Springer/Wiley etc. The objectives should be clearly defined on what the intended outcome of the research articles study is.</p> <p><b>Experiment based Evaluation</b> For some theory courses we are permitted to conduct experiment-based evaluation. Individual student should be evaluated for his/her ability to design and conduct experiment</p>
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		and report the findings. More weightage should be given for the analysis of the result.
<b>Direct (Laboratory Courses)</b>	<b>Internal</b>	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. The assessment is done for regular lab exercises as well as internal practical exams
	<b>Mini Project</b>	Mini projects provide an opportunity to 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.
	<b>External</b>	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.
<b>Indirect Assessment</b>	<b>Course end Survey</b>	At the end of every semester, every student is asked to give their opinion about the knowledge level attained for every course outcome of the corresponding course they have studied with assigned rubrics. The course end survey is assessed based on rubrics designed by the course coordinator.

## A2. Mark Allotment for CO assessment

Table 3.5 shows the marks allotment for each COs in the internal and external assessment. The allocation may vary depending on the course type.

**Table 3.5. Marks allotment indicatively for CO assessment for Theory Courses**

<b>COs</b>	<b>Internal Assessment</b>				<b>External Assessment</b>
	<b>SE-I</b>	<b>SE-II</b>	<b>Unit Test</b>	<b>Assignment</b>	<b>End Semester Exam</b>
CO1	30			10	20
CO2	20			10	20
CO3		30		10	20
CO4		20		10	20
CO5			20	10	20
<b>Total</b>	<b>50</b>	<b>50</b>	<b>20</b>	<b>50</b>	<b>100</b>

**Table 3.6. Weightage for CO Attainment - Theory Courses**

COs	Internal Attainment (50%)				External Attainment (50%)
	SE-I	SE-II	Unit Test	Assignment	End Semester Exam
CO1	35%			15%	50%
CO2	35%			15%	50%
CO3		35%		15%	50%
CO4		35%		15%	50%
CO5			35%	15%	50%

**Table 3.7. Marks allotment indicatively for CO assessment for Integrated Courses**

COs	Internal Assessment					External Assessment	
	SE-I	SE-II	Unit Test	Assign.	Lab Internal Assessment	End Sem Theory	End Sem Lab
CO1	30	-	-	10	-	20	
CO2	20	-	-	10	-	20	
CO3	-	30	-	10	-	20	
CO4	-	20	-	10	-	20	
CO5	-	-	20	10	-	20	
CO6	-	-	-	-	35	-	70
CO7	-	-	-	-	15	-	30
<b>Total</b>	<b>50</b>	<b>50</b>	<b>20</b>	<b>50</b>	<b>50</b>	<b>100</b>	<b>100</b>

**Table 3.8. Weightage for CO Attainment - Integrated Courses**

COs	Internal Attainment (50%)					External Attainment (50%)		Total
	SE-I	SE-II	Unit Test	Assign.	Lab Internal Assessment	End Sem Theory	End Sem Lab	Direct Attainment (Internal 50% & External 50%)
CO1	35%			15%		50%		100%
CO2	35%			15%		50%		100%
CO3		35%		15%		50%		100%
CO4		35%		15%		50%		100%
CO5			35%	15%		50%		100%
CO6					50%		50%	100%
CO7					50%		50%	100%



Table 3.5 shows the indicative marks allotment for theory courses. Every sessional exam is planned to cover a minimum of two COs of that particular course. For example, in Sessional Examination - I the split-up for 50 marks is 30 marks for CO1 and 20 marks for CO2 approximately. For Sessional Examination II, questions are planned to cover 30 marks for CO3 and remaining 20 marks for CO4. In Unit Test, 20 marks for CO5. In the end semester examination, the question paper covers all the COs with equal weightage. Assignments topics are also framed to cover all the COs with equal weightage.

Table 3.6 shows the weightage of CO attainment in theory course. The weightage has fixed as 35% from internal exam, 15% from assignment and 50% from end semester examination.

Table 3.7 shows the indicative marks allotment for Integrated (Theory + Lab) courses. All the Integrated course consists of 5 COs for Theory and 2 COs for Laboratory.

Table 3.8 shows the weightage of CO attainment in Integrated course. The weightage has fixed for theory (CO1 – CO5) as 35% from internal exam, 15% from assignment and 50% from end semester examination. The weightage fixed for laboratory (CO6 & CO7) as 50% from internal lab assessment and 50% from end semester practical exam.

### **A 3. Assessment Procedure for CO Attainment**

The assessment procedure for CO attainment is based on direct and indirect assessment. The direct Assessment is completely based on the students' performance on various descriptive examinations, assignment components and laboratory examinations. Indirect assessment is based on the survey / report taken for a particular course. While calculating the final attainment, direct assessment is given a weightage of 80% and indirect attainment with 20%. Sample CO attainment calculation performed for the course CSE18R371 – Computer Networks is explained in detail in Table 3.9.

**Table 3.9 Sample CO Attainment Calculation for the course CSE18R371 – Computer Networks**

Course Title		Computer Networks																																
Course Code		CSE18R371																																
Month and Year of Exam		Nov/Dec 2019																																
Batch		2017-2021																																
Bench Mark Score		55																																
S.No.	COs	Internal Assessment												Cumulative Internal Assessment ( 35% from SE and 15% from Assignment)																				
		SE I		SE II		Unit Test	Seminar		OBT		Quiz	Internal Lab Ass.		CO1		Att.	CO2		Att.	CO3		Att.	CO4		Att.	CO5		Att.	CO6		Att.	CO7		Att.
		CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO6	CO7	CO1	Att.	CO2	Att.	CO3	Att.	CO4	Att.	CO5	Att.	CO6	Att.	CO7	Att.	CO7	Att.					
Reg.No.	30	20	30	20	20	10	10	10	10	10	35	15	50		50		50		50		50		50		50		50		50					
1	9517004201	27	16	17	6	8	7	8	9	7	10	20	15	42.0	Y	40.0	Y	33.3	Y	21.0	N	29.0	Y	28.6	Y	50.0	Y							
2	9518004301	26	16	20	14	15	10	7	10	8	10	28	12	45.3	Y	38.5	Y	38.3	Y	36.5	Y	41.3	Y	40.0	Y	40.0	Y							
3	9518004302	18	11	20	9	7	10	8	9	7	10	28	15	36.0	Y	31.3	Y	36.8	Y	26.3	N	27.3	N	40.0	Y	50.0	Y							
4	9818004003	22	11	28	10	11	8	9	10	9	8	25	9	37.7	Y	32.8	Y	47.7	Y	31.0	Y	31.3	Y	35.7	Y	30.0	Y							
5	9818004004	24	10	14	13	17	8	7	8	9	10	23	13	40.0	Y	28.0	Y	28.3	Y	36.3	Y	44.8	Y	32.9	Y	43.3	Y							
6	9818004006	9	13	27	14	15	8	7	9	7	9	27	13	22.5	N	33.3	Y	45.0	Y	35.0	Y	39.8	Y	38.6	Y	43.3	Y							
7	9818004007	21	7	21	13	9	8	10	8	8	7	32	12	36.5	Y	27.3	N	36.5	Y	34.8	Y	26.3	N	45.7	Y	40.0	Y							
8	9917004001	10	7	23	12	8	7	8	8	7	9	31	15	22.2	N	24.3	N	38.8	Y	31.5	Y	27.5	Y	44.3	Y	50.0	Y							
9	9917004002	27	9	25	15	17	8	7	10	9	7	28	9	43.5	Y	26.3	N	44.2	Y	39.8	Y	40.3	Y	40.0	Y	30.0	Y							
10	9917004003	27	7	16	12	17	10	9	8	7	8	26	10	46.5	Y	25.8	N	30.7	Y	31.5	Y	41.8	Y	37.1	Y	33.3	Y							
11	9917004004	19	8	14	18	14	10	7	10	7	8	32	12	37.2	Y	24.5	N	31.3	Y	42.0	Y	36.5	Y	45.7	Y	40.0	Y							
12	9917004005	13	9	12	5	7	9	8	8	9	8	23	13	28.7	Y	27.8	Y	26.0	N	22.3	N	24.3	N	32.9	Y	43.3	Y							
13	9917004006	20	8	19	17	11	10	7	9	10	7	23	12	38.3	Y	24.5	N	35.7	Y	44.8	Y	29.8	Y	32.9	Y	40.0	Y							
14	9917004007	13	9	23	17	11	7	8	7	10	10	26	13	25.7	N	27.8	Y	37.3	Y	44.8	Y	34.3	Y	37.1	Y	43.3	Y							
15	9917004008	15	16	13	18	13	9	7	8	8	7	20	9	31.0	Y	38.5	Y	27.2	N	43.5	Y	33.3	Y	28.6	Y	30.0	Y							
16	9917004009	18	15	27	9	13	9	9	7	8	9	25	10	34.5	Y	39.8	Y	42.0	Y	27.8	Y	36.3	Y	35.7	Y	33.3	Y							
17	9917004010	20	13	24	6	16	7	9	9	10	7	19	15	33.8	Y	36.3	Y	41.5	Y	25.5	N	38.5	Y	27.1	N	50.0	Y							
18	9917004011	12	13	12	6	18	10	7	8	7	7	23	14	29.0	Y	33.3	Y	26.0	N	21.0	N	42.0	Y	32.9	Y	46.7	Y							
19	9917004012	17	15	19	8	11	7	8	10	10	8	35	14	30.3	Y	38.3	Y	37.2	Y	29.0	Y	31.3	Y	50.0	Y	46.7	Y							
20	9917004013	22	9	11	16	15	7	7	7	9	8	22	15	36.2	Y	26.3	N	23.3	N	41.5	Y	38.3	Y	31.4	Y	50.0	Y							
21	9917004014	26	16	13	15	9	9	9	7	10	7	16	9	43.8	Y	41.5	Y	25.7	N	41.3	Y	26.3	N	22.9	N	30.0	Y							
22	9917004015	16	10	10	14	16	7	9	8	10	8	27	12	29.2	Y	31.0	Y	23.7	N	39.5	Y	40.0	Y	38.6	Y	40.0	Y							
23	9917004016	26	14	20	18	7	10	7	9	7	7	25	14	45.3	Y	35.0	Y	36.8	Y	42.0	Y	22.8	N	35.7	Y	46.7	Y							
24	9917004017	22	16	15	14	18	9	8	7	7	10	22	14	39.2	Y	40.0	Y	28.0	Y	35.0	Y	46.5	Y	31.4	Y	46.7	Y							
25	9917004018	14	14	11	11	9	9	9	10	9	10	17	12	29.8	Y	38.0	Y	27.8	Y	32.8	Y	30.8	Y	24.3	N	40.0	Y							
26	9917004019	20	11	14	11	17	10	10	8	8	10	35	10	38.3	Y	34.3	Y	28.3	Y	31.3	Y	44.8	Y	50.0	Y	33.3	Y							
27	9917004020	18	9	10	5	8	7	7	10	8	7	24	10	31.5	Y	26.3	N	26.7	N	20.8	N	24.5	N	34.3	Y	33.3	Y							

28	9917004021	27	7	28	5	7	10	7	10	9	7	19	15	46.5	Y	22.8	N	47.7	Y	22.3	N	22.8	N	27.1	N	50.0	Y
29	9917004022	9	10	13	5	17	8	10	7	9	10	17	14	22.5	N	32.5	Y	25.7	N	22.3	N	44.8	Y	24.3	N	46.7	Y
30	9917004023	25	9	22	8	15	10	9	7	10	8	18	15	44.2	Y	29.3	Y	36.2	Y	29.0	Y	38.3	Y	25.7	N	50.0	Y
31	9917004024	22	10	26	15	8	9	10	7	9	8	22	11	39.2	Y	32.5	Y	40.8	Y	39.8	Y	26.0	N	31.4	Y	36.7	Y
32	9917004025	19	14	27	16	7	9	7	9	8	9	16	9	35.7	Y	35.0	Y	45.0	Y	40.0	Y	25.8	N	22.9	N	30.0	Y
33	9917004026	11	7	27	11	14	7	9	9	8	8	22	14	23.3	N	25.8	N	45.0	Y	31.3	Y	36.5	Y	31.4	Y	46.7	Y
34	9917004027	14	18	13	18	10	9	8	10	8	10	19	9	29.8	Y	43.5	Y	30.2	Y	43.5	Y	32.5	Y	27.1	N	30.0	Y
35	9917004028	19	16	25	17	13	9	8	9	10	10	19	15	35.7	Y	40.0	Y	42.7	Y	44.8	Y	37.8	Y	27.1	N	50.0	Y
36	9917004029	28	14	13	8	11	9	9	8	8	7	25	13	46.2	Y	38.0	Y	27.2	N	26.0	N	29.8	Y	35.7	Y	43.3	Y
37	9917004030	23	17	23	12	17	8	10	9	9	10	30	11	38.8	Y	44.8	Y	40.3	Y	34.5	Y	44.8	Y	42.9	Y	36.7	Y
38	9917004031	11	14	14	10	14	8	10	10	7	10	26	9	24.8	N	39.5	Y	31.3	Y	28.0	Y	39.5	Y	37.1	Y	30.0	Y
39	9917004032	23	10	20	11	7	10	8	9	7	7	24	10	41.8	Y	29.5	Y	36.8	Y	29.8	Y	22.8	N	34.3	Y	33.3	Y
40	9917004033	11	9	27	13	15	9	10	10	7	10	18	14	26.3	N	30.8	Y	46.5	Y	33.3	Y	41.3	Y	25.7	N	46.7	Y
41	9917004034	17	11	28	6	12	10	10	8	7	10	25	11	34.8	Y	34.3	Y	44.7	Y	21.0	N	36.0	Y	35.7	Y	36.7	Y
42	9917004035	22	10	23	17	18	7	10	10	10	9	17	12	36.2	Y	32.5	Y	41.8	Y	44.8	Y	45.0	Y	24.3	N	40.0	Y
43	9917004036	15	8	19	6	13	10	9	10	9	9	29	14	32.5	Y	27.5	Y	37.2	Y	24.0	N	36.3	Y	41.4	Y	46.7	Y
44	9917004037	28	12	22	13	14	9	8	9	7	8	21	10	46.2	Y	33.0	Y	39.2	Y	33.3	Y	36.5	Y	30.0	Y	33.3	Y
45	9917004038	28	17	11	6	8	8	9	7	8	10	24	11	44.7	Y	43.3	Y	23.3	N	22.5	N	29.0	Y	34.3	Y	36.7	Y
46	9917004040	18	13	25	8	10	10	8	10	7	10	33	15	36.0	Y	34.8	Y	44.2	Y	24.5	N	32.5	Y	47.1	Y	50.0	Y
47	9917004042	12	12	21	10	7	10	9	9	9	10	17	12	29.0	Y	34.5	Y	38.0	Y	31.0	Y	27.3	N	24.3	N	40.0	Y
48	9917004043	12	18	17	5	16	7	9	9	10	7	30	9	24.5	N	45.0	Y	33.3	Y	23.8	N	38.5	Y	42.9	Y	30.0	Y
49	9917004044	14	9	27	6	9	8	10	10	8	7	25	12	28.3	Y	30.8	Y	46.5	Y	22.5	N	26.3	N	35.7	Y	40.0	Y
50	9917004045	23	18	25	18	9	10	10	7	8	7	16	9	41.8	Y	46.5	Y	39.7	Y	43.5	Y	26.3	N	22.9	N	30.0	Y
51	9917004046	11	18	12	7	15	9	9	8	9	9	29	11	26.3	N	45.0	Y	26.0	N	25.8	N	39.8	Y	41.4	Y	36.7	Y
52	9917004047	13	17	24	13	7	8	8	10	7	8	23	12	27.2	N	41.8	Y	43.0	Y	33.3	Y	24.3	N	32.9	Y	40.0	Y
53	9917004048	18	10	25	18	10	7	8	7	7	10	25	13	31.5	Y	29.5	Y	39.7	Y	42.0	Y	32.5	Y	35.7	Y	43.3	Y
54	9917004049	14	11	25	11	14	8	9	10	10	10	23	12	28.3	Y	32.8	Y	44.2	Y	34.3	Y	39.5	Y	32.9	Y	40.0	Y
55	9917004050	10	15	15	6	14	8	7	10	10	9	23	10	23.7	N	36.8	Y	32.5	Y	25.5	N	38.0	Y	32.9	Y	33.3	Y
56	9917004052	19	9	24	11	12	8	9	8	10	7	24	12	34.2	Y	29.3	Y	40.0	Y	34.3	Y	31.5	Y	34.3	Y	40.0	Y
57	9917004053	21	16	11	13	18	9	9	7	7	10	24	11	38.0	Y	41.5	Y	23.3	N	33.3	Y	46.5	Y	34.3	Y	36.7	Y
58	9917004054	21	10	28	5	13	10	8	8	8	10	28	9	39.5	Y	29.5	Y	44.7	Y	20.8	N	37.8	Y	40.0	Y	30.0	Y
59	9917004055	24	16	19	7	13	10	8	10	8	7	34	10	43.0	Y	40.0	Y	37.2	Y	24.3	N	33.3	Y	48.6	Y	33.3	Y
60	9917004056	21	14	16	6	11	10	8	7	7	10	34	15	39.5	Y	36.5	Y	29.2	Y	21.0	N	34.3	Y	48.6	Y	50.0	Y
61	9917004057	26	14	23	11	12	8	8	8	10	8	32	9	42.3	Y	36.5	Y	38.8	Y	34.3	Y	33.0	Y	45.7	Y	30.0	Y
62	9917004058	17	17	16	7	18	7	7	9	7	10	21	15	30.3	Y	40.3	Y	32.2	Y	22.8	N	46.5	Y	30.0	Y	50.0	Y
63	9917004059	24	9	18	17	7	7	10	8	8	7	35	9	38.5	Y	30.8	Y	33.0	Y	41.8	Y	22.8	N	50.0	Y	30.0	Y
64	9917004060	25	15	18	16	16	7	8	8	9	7	28	12	39.7	Y	38.3	Y	33.0	Y	41.5	Y	38.5	Y	40.0	Y	40.0	Y
65	9917004061	23	14	16	6	13	9	7	9	7	9	25	12	40.3	Y	35.0	Y	32.2	Y	21.0	N	36.3	Y	35.7	Y	40.0	Y

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66	9917004062	15	16	26	10	9	10	10	10	8	7	24	14	32.5	Y	43.0	Y	45.3	Y	29.5	Y	26.3	N	34.3	Y	46.7	Y
67	9917004063	27	7	22	7	7	9	10	8	7	8	35	13	45.0	Y	27.3	N	37.7	Y	22.8	N	24.3	N	50.0	Y	43.3	Y
68	9917004064	10	9	20	10	14	7	10	7	10	8	33	9	22.2	N	30.8	Y	33.8	Y	32.5	Y	36.5	Y	47.1	Y	30.0	Y
69	9917004065	11	18	25	17	13	7	7	7	10	7	16	15	23.3	N	42.0	Y	39.7	Y	44.8	Y	33.3	Y	22.9	N	50.0	Y
70	9917004066	14	16	13	18	11	10	7	7	9	10	33	12	31.3	Y	38.5	Y	25.7	N	45.0	Y	34.3	Y	47.1	Y	40.0	Y
71	9917004067	18	13	27	11	10	7	8	8	9	10	25	15	31.5	Y	34.8	Y	43.5	Y	32.8	Y	32.5	Y	35.7	Y	50.0	Y
72	9917004068	21	13	19	5	16	10	7	7	9	7	31	15	39.5	Y	33.3	Y	32.7	Y	22.3	N	38.5	Y	44.3	Y	50.0	Y
73	9917004069	14	8	19	11	8	7	7	7	9	7	20	15	26.8	N	24.5	N	32.7	Y	32.8	Y	24.5	N	28.6	Y	50.0	Y
74	9917004070	17	15	25	5	8	9	9	10	9	7	21	13	33.3	Y	39.8	Y	44.2	Y	22.3	N	24.5	N	30.0	Y	43.3	Y
75	9917004071	21	9	25	11	14	9	7	7	7	8	35	9	38.0	Y	26.3	N	39.7	Y	29.8	Y	36.5	Y	50.0	Y	30.0	Y
76	9917004072	22	18	16	10	17	8	8	10	7	9	34	9	37.7	Y	43.5	Y	33.7	Y	28.0	Y	43.3	Y	48.6	Y	30.0	Y
77	9917004073	17	8	21	8	7	9	7	7	7	9	27	10	33.3	Y	24.5	N	35.0	Y	24.5	N	25.8	N	38.6	Y	33.3	Y
78	9917004074	10	16	16	15	14	7	7	8	10	8	17	15	22.2	N	38.5	Y	30.7	Y	41.3	Y	36.5	Y	24.3	N	50.0	Y
79	9917004075	14	15	10	5	7	10	7	9	7	7	34	14	31.3	Y	36.8	Y	25.2	N	19.3	N	22.8	N	48.6	Y	46.7	Y
80	9917004076	17	8	12	7	10	8	9	10	10	10	15	12	31.8	Y	27.5	Y	29.0	Y	27.3	N	32.5	Y	21.4	N	40.0	Y
81	9917004077	17	16	28	6	17	10	9	10	10	9	16	12	34.8	Y	41.5	Y	47.7	Y	25.5	N	43.3	Y	22.9	N	40.0	Y
82	9917004078	27	8	28	14	11	8	7	7	8	8	25	11	43.5	Y	24.5	N	43.2	Y	36.5	Y	31.3	Y	35.7	Y	36.7	Y
83	9917004079	12	9	14	16	15	9	9	8	9	7	32	14	27.5	Y	29.3	Y	28.3	Y	41.5	Y	36.8	Y	45.7	Y	46.7	Y
84	9917004080	14	16	13	13	12	8	8	10	7	10	20	11	28.3	Y	40.0	Y	30.2	Y	33.3	Y	36.0	Y	28.6	Y	36.7	Y
85	9917004081	16	12	23	7	10	10	9	10	10	8	22	12	33.7	Y	34.5	Y	41.8	Y	27.3	N	29.5	Y	31.4	Y	40.0	Y
86	9917004082	12	12	27	5	14	8	10	8	8	10	23	12	26.0	N	36.0	Y	43.5	Y	20.8	N	39.5	Y	32.9	Y	40.0	Y
87	9917004083	15	7	28	9	14	7	7	10	10	7	25	14	28.0	Y	22.8	N	47.7	Y	30.8	Y	35.0	Y	35.7	Y	46.7	Y
88	9917004084	27	13	22	7	7	8	9	8	9	8	27	13	43.5	Y	36.3	Y	37.7	Y	25.8	N	24.3	N	38.6	Y	43.3	Y
89	9917004085	26	18	23	7	13	10	9	7	9	8	24	9	45.3	Y	45.0	Y	37.3	Y	25.8	N	34.8	Y	34.3	Y	30.0	Y
90	9917004086	26	10	26	16	11	7	10	10	10	8	32	13	40.8	Y	32.5	Y	45.3	Y	43.0	Y	31.3	Y	45.7	Y	43.3	Y
91	9917004087	11	18	14	12	10	9	7	9	7	9	23	11	26.3	N	42.0	Y	29.8	Y	31.5	Y	31.0	Y	32.9	Y	36.7	Y
92	9917004088	18	11	12	17	9	9	8	8	10	9	26	11	34.5	Y	31.3	Y	26.0	N	44.8	Y	29.3	Y	37.1	Y	36.7	Y
93	9917004089	23	14	22	18	8	10	9	10	10	9	28	15	41.8	Y	38.0	Y	40.7	Y	46.5	Y	27.5	Y	40.0	Y	50.0	Y
94	9917004090	13	12	14	12	10	9	9	7	8	9	26	11	28.7	Y	34.5	Y	26.8	N	33.0	Y	31.0	Y	37.1	Y	36.7	Y
95	9917004091	13	8	13	12	16	10	7	8	10	10	20	9	30.2	Y	24.5	N	27.2	N	36.0	Y	43.0	Y	28.6	Y	30.0	Y
96	9917004092	24	9	20	10	9	9	8	10	10	9	24	10	41.5	Y	27.8	Y	38.3	Y	32.5	Y	29.3	Y	34.3	Y	33.3	Y
97	9917004093	21	12	16	5	13	8	9	9	7	9	28	11	36.5	Y	34.5	Y	32.2	Y	19.3	N	36.3	Y	40.0	Y	36.7	Y
98	9917004094	15	11	18	6	10	8	7	8	7	10	30	10	29.5	Y	29.8	Y	33.0	Y	21.0	N	32.5	Y	42.9	Y	33.3	Y
99	9917004095	25	12	26	16	11	7	7	7	10	9	15	12	39.7	Y	31.5	Y	40.8	Y	43.0	Y	32.8	Y	21.4	N	40.0	Y
100	9917004096	16	15	15	14	7	8	10	8	10	7	35	15	30.7	Y	41.3	Y	29.5	Y	39.5	Y	22.8	N	50.0	Y	50.0	Y
101	9917004097	9	13	21	11	8	9	9	10	10	7	15	11	24.0	N	36.3	Y	39.5	Y	34.3	Y	24.5	N	21.4	N	36.7	Y
102	9917004098	11	17	20	12	8	10	8	7	10	7	18	12	27.8	Y	41.8	Y	33.8	Y	36.0	Y	24.5	N	25.7	N	40.0	Y
103	9917004099	11	7	14	11	13	7	10	10	10	8	15	12	23.3	N	27.3	N	31.3	Y	34.3	Y	34.8	Y	21.4	N	40.0	Y

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104	9917004100	15	9	14	10	14	10	9	9	7	9	29	12	32.5	Y	29.3	Y	29.8	Y	28.0	Y	38.0	Y	41.4	Y	40.0	Y
105	9917004101	15	18	10	18	15	7	7	7	9	9	31	9	28.0	Y	42.0	Y	22.2	N	45.0	Y	39.8	Y	44.3	Y	30.0	Y
106	9917004102	21	18	21	8	11	8	10	10	8	8	33	11	36.5	Y	46.5	Y	39.5	Y	26.0	N	31.3	Y	47.1	Y	36.7	Y
107	9917004103	23	7	25	11	14	10	7	8	8	9	32	13	41.8	Y	22.8	N	41.2	Y	31.3	Y	38.0	Y	45.7	Y	43.3	Y
108	9917004104	22	12	10	14	16	8	9	9	9	10	26	12	37.7	Y	34.5	Y	25.2	N	38.0	Y	43.0	Y	37.1	Y	40.0	Y
109	9917004105	13	10	20	10	18	9	10	10	7	10	29	9	28.7	Y	32.5	Y	38.3	Y	28.0	Y	46.5	Y	41.4	Y	30.0	Y
110	9917004106	23	7	15	11	8	7	8	9	10	7	26	11	37.3	Y	24.3	N	31.0	Y	34.3	Y	24.5	N	37.1	Y	36.7	Y
111	9917004108	27	17	21	13	11	7	9	9	8	7	17	10	42.0	Y	43.3	Y	38.0	Y	34.8	Y	29.8	Y	24.3	N	33.3	Y
112	9917004109	14	10	14	13	8	9	8	7	10	9	19	10	29.8	Y	29.5	Y	26.8	N	37.8	Y	27.5	Y	27.1	N	33.3	Y
113	9917004110	13	15	11	6	16	8	7	8	8	10	27	12	27.2	N	36.8	Y	24.8	N	22.5	N	43.0	Y	38.6	Y	40.0	Y
114	9917004111	25	8	27	13	9	8	9	10	8	7	32	10	41.2	Y	27.5	Y	46.5	Y	34.8	Y	26.3	N	45.7	Y	33.3	Y
115	9917004112	28	15	18	8	12	9	7	9	10	7	32	13	46.2	Y	36.8	Y	34.5	Y	29.0	Y	31.5	Y	45.7	Y	43.3	Y
116	9917004113	14	11	18	5	13	9	7	9	8	10	22	12	29.8	Y	29.8	Y	34.5	Y	20.8	N	37.8	Y	31.4	Y	40.0	Y
117	9917004114	26	14	13	6	16	10	7	9	7	10	17	13	45.3	Y	35.0	Y	28.7	Y	21.0	N	43.0	Y	24.3	N	43.3	Y
118	9917004119	20	11	13	7	7	8	8	9	8	8	19	13	35.3	Y	31.3	Y	28.7	Y	24.3	N	24.3	N	27.1	N	43.3	Y
119	9917004120	14	15	27	13	9	9	9	9	10	7	31	14	29.8	Y	39.8	Y	45.0	Y	37.8	Y	26.3	N	44.3	Y	46.7	Y
120	9917004121	10	11	24	10	16	10	10	10	9	9	29	15	26.7	N	34.3	Y	43.0	Y	31.0	Y	41.5	Y	41.4	Y	50.0	Y
121	9917004122	16	7	27	7	15	9	9	9	8	7	35	15	32.2	Y	25.8	N	45.0	Y	24.3	N	36.8	Y	50.0	Y	50.0	Y
122	9917004123	19	11	15	18	13	8	10	8	8	7	16	13	34.2	Y	34.3	Y	29.5	Y	43.5	Y	33.3	Y	22.9	N	43.3	Y
123	9917004124	14	9	12	18	10	10	7	9	9	8	30	14	31.3	Y	26.3	N	27.5	Y	45.0	Y	29.5	Y	42.9	Y	46.7	Y
124	9917004125	21	14	12	13	8	9	7	7	7	7	19	12	38.0	Y	35.0	Y	24.5	N	33.3	Y	24.5	N	27.1	N	40.0	Y
125	9917004126	21	14	26	15	11	10	9	10	7	9	28	12	39.5	Y	38.0	Y	45.3	Y	36.8	Y	32.8	Y	40.0	Y	40.0	Y
126	9917004127	22	8	28	16	18	9	7	7	8	7	33	11	39.2	Y	24.5	N	43.2	Y	40.0	Y	42.0	Y	47.1	Y	36.7	Y
127	9917004128	21	14	12	14	10	8	8	7	8	8	19	9	36.5	Y	36.5	Y	24.5	N	36.5	Y	29.5	Y	27.1	N	30.0	Y
128	9917004129	10	16	11	7	9	7	8	7	10	8	30	9	22.2	N	40.0	Y	23.3	N	27.3	N	27.8	Y	42.9	Y	30.0	Y
129	9917004130	24	17	25	5	15	8	7	8	8	7	33	14	40.0	Y	40.3	Y	41.2	Y	20.8	N	36.8	Y	47.1	Y	46.7	Y
130	9917004131	27	13	27	6	13	8	7	7	9	9	29	15	43.5	Y	33.3	Y	42.0	Y	24.0	N	36.3	Y	41.4	Y	50.0	Y
131	9917004132	19	10	17	14	17	8	10	10	9	10	35	11	34.2	Y	32.5	Y	34.8	Y	38.0	Y	44.8	Y	50.0	Y	36.7	Y
132	9917004133	19	15	27	11	9	8	7	8	9	9	22	12	34.2	Y	36.8	Y	43.5	Y	32.8	Y	29.3	Y	31.4	Y	40.0	Y
133	9917004134	10	8	12	9	13	8	7	9	7	8	22	11	23.7	N	24.5	N	27.5	Y	26.3	N	34.8	Y	31.4	Y	36.7	Y
134	9917004135	20	8	26	13	13	8	9	8	10	9	21	15	35.3	Y	27.5	Y	42.3	Y	37.8	Y	36.3	Y	30.0	Y	50.0	Y
135	9917004136	24	15	28	17	16	10	8	10	7	10	16	12	43.0	Y	38.3	Y	47.7	Y	40.3	Y	43.0	Y	22.9	N	40.0	Y
136	9917004137	27	13	23	5	18	7	9	8	8	10	17	14	42.0	Y	36.3	Y	38.8	Y	20.8	N	46.5	Y	24.3	N	46.7	Y
137	9917004138	12	18	23	13	18	8	9	7	8	7	18	10	26.0	N	45.0	Y	37.3	Y	34.8	Y	42.0	Y	25.7	N	33.3	Y
138	9917004139	22	17	24	7	16	9	10	8	8	10	21	9	39.2	Y	44.8	Y	40.0	Y	24.3	N	43.0	Y	30.0	Y	30.0	Y
139	9917004140	13	9	13	12	18	8	10	7	10	9	25	9	27.2	N	30.8	Y	25.7	N	36.0	Y	45.0	Y	35.7	Y	30.0	Y
140	9917004142	16	11	19	14	11	7	9	10	9	10	22	10	29.2	Y	32.8	Y	37.2	Y	38.0	Y	34.3	Y	31.4	Y	33.3	Y
141	9917004143	26	8	20	14	7	7	8	8	9	8	20	11	40.8	Y	26.0	N	35.3	Y	38.0	Y	24.3	N	28.6	Y	36.7	Y

142	9917004144	23	10	14	9	15	10	9	7	8	9	27	13	41.8	Y	31.0	Y	26.8	N	27.8	Y	39.8	Y	38.6	Y	43.3	Y
143	9917004145	19	17	12	14	15	7	8	8	7	10	30	10	32.7	Y	41.8	Y	26.0	N	35.0	Y	41.3	Y	42.9	Y	33.3	Y
144	9917004146	15	7	10	11	12	9	7	9	7	8	19	14	31.0	Y	22.8	N	25.2	N	29.8	Y	33.0	Y	27.1	N	46.7	Y
145	9917004147	9	7	16	5	14	9	9	8	8	10	16	10	24.0	N	25.8	N	30.7	Y	20.8	N	39.5	Y	22.9	N	33.3	Y
146	9917004148	25	18	25	9	8	7	7	8	7	7	20	15	39.7	Y	42.0	Y	41.2	Y	26.3	N	24.5	N	28.6	Y	50.0	Y
147	9917004149	28	15	13	6	15	8	8	8	8	10	23	14	44.7	Y	38.3	Y	27.2	N	22.5	N	41.3	Y	32.9	Y	46.7	Y
148	9917004150	16	9	21	15	13	8	8	7	7	7	22	12	30.7	Y	27.8	Y	35.0	Y	36.8	Y	33.3	Y	31.4	Y	40.0	Y
149	9917004151	17	7	15	9	14	7	8	8	7	10	31	15	30.3	Y	24.3	N	29.5	Y	26.3	N	39.5	Y	44.3	Y	50.0	Y
150	9917004152	25	18	19	14	9	7	9	7	7	8	34	15	39.7	Y	45.0	Y	32.7	Y	35.0	Y	27.8	Y	48.6	Y	50.0	Y
151	9917004153	16	8	24	14	7	7	9	8	9	7	29	15	29.2	Y	27.5	Y	40.0	Y	38.0	Y	22.8	N	41.4	Y	50.0	Y
152	9917004154	26	8	11	8	16	10	9	9	7	9	18	11	45.3	Y	27.5	Y	26.3	N	24.5	N	41.5	Y	25.7	N	36.7	Y
153	9917004155	9	14	16	9	18	9	7	9	8	7	16	14	24.0	N	35.0	Y	32.2	Y	27.8	Y	42.0	Y	22.9	N	46.7	Y
154	9917004156	17	12	23	6	13	7	7	9	7	9	16	13	30.3	Y	31.5	Y	40.3	Y	21.0	N	36.3	Y	22.9	N	43.3	Y
155	9917004157	16	14	14	7	16	7	7	7	8	7	18	12	29.2	Y	35.0	Y	26.8	N	24.3	N	38.5	Y	25.7	N	40.0	Y
156	9917004158	23	15	11	5	15	8	10	10	9	10	19	13	38.8	Y	41.3	Y	27.8	Y	22.3	N	41.3	Y	27.1	N	43.3	Y
157	9917004159	21	15	18	13	10	8	8	9	8	8	30	9	36.5	Y	38.3	Y	34.5	Y	34.8	Y	29.5	Y	42.9	Y	30.0	Y
158	9917004160	23	15	25	12	11	7	9	7	9	9	32	10	37.3	Y	39.8	Y	39.7	Y	34.5	Y	32.8	Y	45.7	Y	33.3	Y
159	9917004161	25	17	17	16	16	8	10	7	9	10	28	10	41.2	Y	44.8	Y	30.3	Y	41.5	Y	43.0	Y	40.0	Y	33.3	Y
160	9917004162	27	11	15	14	16	10	9	9	10	7	33	9	46.5	Y	32.8	Y	31.0	Y	39.5	Y	38.5	Y	47.1	Y	30.0	Y
161	9917004163	10	7	18	18	17	8	8	10	7	8	15	12	23.7	N	24.3	N	36.0	Y	42.0	Y	41.8	Y	21.4	N	40.0	Y
162	9917004164	14	9	14	16	12	8	10	9	7	9	30	14	28.3	Y	30.8	Y	29.8	Y	38.5	Y	34.5	Y	42.9	Y	46.7	Y
163	9917004165	26	16	13	9	7	7	10	9	9	10	33	13	40.8	Y	43.0	Y	28.7	Y	29.3	Y	27.3	N	47.1	Y	43.3	Y
164	9917004166	9	11	19	10	13	9	9	9	9	9	19	15	24.0	N	32.8	Y	35.7	Y	31.0	Y	36.3	Y	27.1	N	50.0	Y
165	9917004167	14	14	13	16	12	9	9	9	10	9	34	13	29.8	Y	38.0	Y	28.7	Y	43.0	Y	34.5	Y	48.6	Y	43.3	Y
166	9917004168	19	16	23	15	17	8	10	8	9	7	27	9	34.2	Y	43.0	Y	38.8	Y	39.8	Y	40.3	Y	38.6	Y	30.0	Y
167	9917004169	12	11	18	7	15	10	9	9	8	9	28	9	29.0	Y	32.8	Y	34.5	Y	24.3	N	39.8	Y	40.0	Y	30.0	Y
168	9917004170	13	8	22	10	13	9	9	7	7	9	24	14	28.7	Y	27.5	Y	36.2	Y	28.0	Y	36.3	Y	34.3	Y	46.7	Y
169	9917004171	19	15	19	15	11	9	9	7	10	9	28	14	35.7	Y	39.8	Y	32.7	Y	41.3	Y	32.8	Y	40.0	Y	46.7	Y
170	9917004172	18	17	13	10	9	8	8	7	7	7	30	13	33.0	Y	41.8	Y	25.7	N	28.0	Y	26.3	N	42.9	Y	43.3	Y
171	9917004173	11	18	22	13	17	10	9	10	7	10	18	9	27.8	Y	45.0	Y	40.7	Y	33.3	Y	44.8	Y	25.7	N	30.0	Y
172	9917004174	24	10	12	6	12	9	10	7	8	9	34	12	41.5	Y	32.5	Y	24.5	N	22.5	N	34.5	Y	48.6	Y	40.0	Y
173	9917004175	25	13	11	17	11	8	10	8	10	9	34	12	41.2	Y	37.8	Y	24.8	N	44.8	Y	32.8	Y	48.6	Y	40.0	Y
174	9917004176	10	10	14	7	17	9	7	7	10	7	18	11	25.2	N	28.0	Y	26.8	N	27.3	N	40.3	Y	25.7	N	36.7	Y
175	9917004177	21	17	19	5	18	7	8	10	8	8	21	13	35.0	Y	41.8	Y	37.2	Y	20.8	N	43.5	Y	30.0	Y	43.3	Y
176	9917004178	23	17	22	5	17	8	10	10	8	10	22	9	38.8	Y	44.8	Y	40.7	Y	20.8	N	44.8	Y	31.4	Y	30.0	Y
177	9917004179	28	11	18	5	7	7	10	10	8	7	16	14	43.2	Y	34.3	Y	36.0	Y	20.8	N	22.8	N	22.9	N	46.7	Y
178	9917004180	28	14	20	8	13	8	10	10	9	8	24	12	44.7	Y	39.5	Y	38.3	Y	27.5	Y	34.8	Y	34.3	Y	40.0	Y
179	9917004181	15	9	25	5	17	9	10	7	8	10	34	15	31.0	Y	30.8	Y	39.7	Y	20.8	N	44.8	Y	48.6	Y	50.0	Y

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180	9917004182	23	10	28	16	11	7	9	7	8	10	27	9	37.3	Y	31.0	Y	43.2	Y	40.0	Y	34.3	Y	38.6	Y	30.0	Y
181	9917004183	18	11	20	17	12	7	7	7	10	10	27	9	31.5	Y	29.8	Y	33.8	Y	44.8	Y	36.0	Y	38.6	Y	30.0	Y
182	9917004184	12	14	10	11	16	8	8	8	8	7	19	15	26.0	N	36.5	Y	23.7	N	31.3	Y	38.5	Y	27.1	N	50.0	Y
183	9917004185	28	16	23	16	17	7	8	8	9	9	24	12	43.2	Y	40.0	Y	38.8	Y	41.5	Y	43.3	Y	34.3	Y	40.0	Y
184	9917004186	16	18	15	6	7	10	8	8	10	10	25	12	33.7	Y	43.5	Y	29.5	Y	25.5	N	27.3	N	35.7	Y	40.0	Y
185	9917004187	25	18	22	16	14	9	7	8	8	8	26	12	42.7	Y	42.0	Y	37.7	Y	40.0	Y	36.5	Y	37.1	Y	40.0	Y
186	9917004188	26	9	10	16	14	7	8	7	10	10	15	14	40.8	Y	27.8	Y	22.2	N	43.0	Y	39.5	Y	21.4	N	46.7	Y
187	9917004189	18	18	25	9	16	8	9	9	9	9	23	9	33.0	Y	45.0	Y	42.7	Y	29.3	Y	41.5	Y	32.9	Y	30.0	Y
188	9917004190	22	15	24	11	18	8	9	7	9	7	21	10	37.7	Y	39.8	Y	38.5	Y	32.8	Y	42.0	Y	30.0	Y	33.3	Y
189	9917004191	28	7	13	17	14	8	9	9	7	9	16	15	44.7	Y	25.8	N	28.7	Y	40.3	Y	38.0	Y	22.9	N	50.0	Y
190	9917004192	24	13	10	13	16	8	10	10	10	8	28	11	40.0	Y	37.8	Y	26.7	N	37.8	Y	40.0	Y	40.0	Y	36.7	Y
191	9917004193	11	12	18	11	7	10	8	7	7	8	17	11	27.8	Y	33.0	Y	31.5	Y	29.8	Y	24.3	N	24.3	N	36.7	Y
192	9917004194	13	10	14	17	16	8	8	10	10	8	23	12	27.2	N	29.5	Y	31.3	Y	44.8	Y	40.0	Y	32.9	Y	40.0	Y
193	9917004195	25	18	27	7	11	8	8	10	9	9	17	13	41.2	Y	43.5	Y	46.5	Y	25.8	N	32.8	Y	24.3	N	43.3	Y
194	9917004196	27	18	14	16	7	8	10	10	7	7	32	12	43.5	Y	46.5	Y	31.3	Y	38.5	Y	22.8	N	45.7	Y	40.0	Y
195	9917004197	25	9	28	11	18	7	8	7	8	7	33	11	39.7	Y	27.8	Y	43.2	Y	31.3	Y	42.0	Y	47.1	Y	36.7	Y
196	9917004198	13	11	18	18	7	9	8	7	7	8	26	15	28.7	Y	31.3	Y	31.5	Y	42.0	Y	24.3	N	37.1	Y	50.0	Y
197	9917004199	21	13	19	13	8	10	7	9	7	7	29	14	39.5	Y	33.3	Y	35.7	Y	33.3	Y	24.5	N	41.4	Y	46.7	Y
198	9917004200	9	12	26	12	15	7	9	9	10	8	21	12	21.0	N	34.5	Y	43.8	Y	36.0	Y	38.3	Y	30.0	Y	40.0	Y
199	9917004201	25	14	15	8	12	10	7	7	8	8	26	15	44.2	Y	35.0	Y	28.0	Y	26.0	N	33.0	Y	37.1	Y	50.0	Y
200	9917004202	24	13	28	6	18	8	8	10	7	10	19	14	40.0	Y	34.8	Y	47.7	Y	21.0	N	46.5	Y	27.1	N	46.7	Y
201	9917004203	27	12	27	12	16	8	7	7	7	9	27	12	43.5	Y	31.5	Y	42.0	Y	31.5	Y	41.5	Y	38.6	Y	40.0	Y
202	9917004204	18	8	26	15	10	9	10	8	7	7	28	14	34.5	Y	29.0	Y	42.3	Y	36.8	Y	28.0	Y	40.0	Y	46.7	Y
203	9917004205	26	17	24	11	11	8	8	10	8	7	23	11	42.3	Y	41.8	Y	43.0	Y	31.3	Y	29.8	Y	32.9	Y	36.7	Y
204	9917004206	21	12	12	5	8	10	8	10	7	7	31	9	39.5	Y	33.0	Y	29.0	Y	19.3	N	24.5	N	44.3	Y	30.0	Y
205	9917004208	17	18	18	7	7	9	8	10	9	9	16	13	33.3	Y	43.5	Y	36.0	Y	25.8	N	25.8	N	22.9	N	43.3	Y
206	9917004210	11	16	24	6	17	8	10	9	10	7	25	10	24.8	N	43.0	Y	41.5	Y	25.5	N	40.3	Y	35.7	Y	33.3	Y
207	9917004212	11	10	18	11	18	9	10	8	7	10	34	15	26.3	N	32.5	Y	33.0	Y	29.8	Y	46.5	Y	48.6	Y	50.0	Y
208	9917004213	11	16	16	14	12	9	7	9	9	7	27	15	26.3	N	38.5	Y	32.2	Y	38.0	Y	31.5	Y	38.6	Y	50.0	Y
209	9917004214	16	12	17	13	13	10	8	9	9	9	24	9	33.7	Y	33.0	Y	33.3	Y	36.3	Y	36.3	Y	34.3	Y	30.0	Y
210	9917004215	13	16	21	7	16	7	7	8	10	9	15	9	25.7	N	38.5	Y	36.5	Y	27.3	N	41.5	Y	21.4	N	30.0	Y
211	9917004216	12	11	18	14	11	7	9	8	8	9	29	13	24.5	N	32.8	Y	33.0	Y	36.5	Y	32.8	Y	41.4	Y	43.3	Y
212	9917004217	27	15	22	6	12	9	9	8	7	7	29	12	45.0	Y	39.8	Y	37.7	Y	21.0	N	31.5	Y	41.4	Y	40.0	Y
213	9917004218	28	11	24	5	10	9	7	9	9	9	33	10	46.2	Y	29.8	Y	41.5	Y	22.3	N	31.0	Y	47.1	Y	33.3	Y
214	9917004219	12	15	20	8	7	9	10	9	10	9	26	11	27.5	Y	41.3	Y	36.8	Y	29.0	Y	25.8	N	37.1	Y	36.7	Y
215	9917004220	17	18	16	11	10	8	7	8	10	10	28	12	31.8	Y	42.0	Y	30.7	Y	34.3	Y	32.5	Y	40.0	Y	40.0	Y
216	9917004221	14	9	16	17	7	9	7	7	9	8	32	13	29.8	Y	26.3	N	29.2	Y	43.3	Y	24.3	N	45.7	Y	43.3	Y
217	9917004222	17	13	27	10	9	8	10	7	10	9	22	14	31.8	Y	37.8	Y	42.0	Y	32.5	Y	29.3	Y	31.4	Y	46.7	Y

218	9917004223	18	7	12	14	16	9	8	10	7	7	33	15	34.5	Y	24.3	N	29.0	Y	35.0	Y	38.5	Y	47.1	Y	50.0	Y				
219	9917004224	28	10	19	14	17	7	7	8	7	10	21	12	43.2	Y	28.0	Y	34.2	Y	35.0	Y	44.8	Y	30.0	Y	40.0	Y				
220	9917004225	17	13	16	5	9	7	7	8	8	7	20	14	30.3	Y	33.3	Y	30.7	Y	20.8	N	26.3	N	28.6	Y	46.7	Y				
221	9917004226	25	9	11	14	11	9	9	9	8	7	20	10	42.7	Y	29.3	Y	26.3	N	36.5	Y	29.8	Y	28.6	Y	33.3	Y				
222	9917004227	18	16	16	12	11	10	9	10	10	8	31	12	36.0	Y	41.5	Y	33.7	Y	36.0	Y	31.3	Y	44.3	Y	40.0	Y				
223	9917004228	9	17	13	11	10	8	10	9	10	10	25	12	22.5	N	44.8	Y	28.7	Y	34.3	Y	32.5	Y	35.7	Y	40.0	Y				
224	9917004229	9	17	24	12	17	9	8	10	7	7	27	15	24.0	N	41.8	Y	43.0	Y	31.5	Y	40.3	Y	38.6	Y	50.0	Y				
225	9917004230	16	18	16	15	10	8	8	10	9	7	23	15	30.7	Y	43.5	Y	33.7	Y	39.8	Y	28.0	Y	32.9	Y	50.0	Y				
226	9917004231	28	16	16	8	8	9	7	10	10	8	26	10	46.2	Y	38.5	Y	33.7	Y	29.0	Y	26.0	N	37.1	Y	33.3	Y				
227	9917004232	23	18	23	18	16	7	9	8	7	9	31	14	37.3	Y	45.0	Y	38.8	Y	42.0	Y	41.5	Y	44.3	Y	46.7	Y				
228	9917004233	24	15	26	13	9	7	10	10	10	9	15	12	38.5	Y	41.3	Y	45.3	Y	37.8	Y	29.3	Y	21.4	N	40.0	Y				
229	9917004234	16	14	16	9	14	7	9	9	9	7	32	10	29.2	Y	38.0	Y	32.2	Y	29.3	Y	35.0	Y	45.7	Y	33.3	Y				
230	9917004235	10	11	12	16	15	9	7	8	7	10	30	15	25.2	N	29.8	Y	26.0	N	38.5	Y	41.3	Y	42.9	Y	50.0	Y				
231	9917004236	20	14	27	5	12	9	9	9	7	8	23	15	36.8	Y	38.0	Y	45.0	Y	19.3	N	33.0	Y	32.9	Y	50.0	Y				
														<b>Attained</b>				<b>190</b>		<b>199</b>		<b>191</b>		<b>157</b>		<b>184</b>		<b>179</b>		<b>231</b>	
														<b>Not Attained</b>				<b>41</b>		<b>32</b>		<b>40</b>		<b>74</b>		<b>47</b>		<b>52</b>		<b>0</b>	
																<b>CO1</b>		<b>CO2</b>		<b>CO3</b>		<b>CO4</b>		<b>CO5</b>		<b>CO6</b>		<b>CO7</b>			
																<b>231</b>		<b>231</b>		<b>231</b>		<b>231</b>		<b>231</b>		<b>231</b>		<b>231</b>		<b>231</b>	
																<b>82.3</b>		<b>86.1</b>		<b>82.7</b>		<b>68.0</b>		<b>79.7</b>		<b>77.5</b>		<b>100.0</b>			



S.No.	COs	External Assessment														Direct Attainment (35% from SE, 15% from Assignment and 50% from ESE)													
		End Semester Theory Exam										End Semester Lab Exam																	
		Reg.No.	CO1 20	Att.	CO2 20	Att.	CO3 20	Att.	CO4 20	Att.	CO5 20	Att.	CO6 70	Att.	CO7 30	Att.	CO1	Att.	CO2	Att.	CO3	Att.	CO4	Att.	CO5	Att.	CO6	Att.	CO7
1	9517004201	10	N	9	N	12	Y	10	N	14	Y	42	Y	29	Y	67.0	Y	62.5	Y	63.3	Y	46.0	N	64.0	Y	58.6	Y	98.3	Y
2	9518004301	14	Y	13	Y	15	Y	15	Y	11	Y	36	N	19	Y	80.3	Y	71.0	Y	75.8	Y	74.0	Y	68.8	Y	65.7	Y	71.7	Y
3	9518004302	18	Y	14	Y	8	N	13	Y	12	Y	65	Y	26	Y	81.0	Y	66.3	Y	56.8	Y	58.8	Y	57.3	Y	86.4	Y	93.3	Y
4	9818004003	8	N	18	Y	8	N	11	Y	12	Y	54	Y	23	Y	57.7	Y	77.8	Y	67.7	Y	58.5	Y	61.3	Y	74.3	Y	68.3	Y
5	9818004004	15	Y	11	Y	18	Y	17	Y	12	Y	37	N	23	Y	77.5	Y	55.5	Y	73.3	Y	78.8	Y	74.8	Y	59.3	Y	81.7	Y
6	9818004006	17	Y	16	Y	9	N	13	Y	15	Y	52	Y	24	Y	65.0	Y	73.3	Y	67.5	Y	67.5	Y	77.3	Y	75.7	Y	83.3	Y
7	9818004007	8	N	8	N	13	Y	16	Y	9	N	57	Y	16	N	56.5	Y	47.3	N	69.0	Y	74.8	Y	48.8	N	86.4	Y	66.7	Y
8	9917004001	12	Y	14	Y	12	Y	6	N	16	Y	34	N	15	N	52.2	N	59.3	Y	68.8	Y	46.5	N	67.5	Y	68.6	Y	75.0	Y
9	9917004002	15	Y	12	Y	18	Y	17	Y	14	Y	51	Y	21	Y	81.0	Y	56.3	Y	89.2	Y	82.3	Y	75.3	Y	76.4	Y	65.0	Y
10	9917004003	18	Y	11	Y	8	N	12	Y	13	Y	42	Y	29	Y	91.5	Y	53.3	N	50.7	N	61.5	Y	74.3	Y	67.1	Y	81.7	Y
11	9917004004	8	N	15	Y	12	Y	18	Y	13	Y	38	N	28	Y	57.2	Y	62.0	Y	61.3	Y	87.0	Y	69.0	Y	72.9	Y	86.7	Y
12	9917004005	9	N	14	Y	17	Y	12	Y	9	N	59	Y	21	Y	51.2	N	62.8	Y	68.5	Y	52.3	N	46.8	N	75.0	Y	78.3	Y
13	9917004006	16	Y	18	Y	16	Y	8	N	13	Y	67	Y	24	Y	78.3	Y	69.5	Y	75.7	Y	64.8	Y	62.3	Y	80.7	Y	80.0	Y
14	9917004007	9	N	11	Y	13	Y	13	Y	15	Y	36	N	21	Y	48.2	N	55.3	Y	69.8	Y	77.3	Y	71.8	Y	62.9	Y	78.3	Y
15	9917004008	9	N	11	Y	18	Y	17	Y	13	Y	49	Y	28	Y	53.5	N	66.0	Y	72.2	Y	86.0	Y	65.8	Y	63.6	Y	76.7	Y
16	9917004009	13	Y	17	Y	8	N	6	N	12	Y	67	Y	29	Y	58.0	Y	82.3	Y	62.0	Y	42.8	N	66.3	Y	83.6	Y	81.7	Y
17	9917004010	18	Y	8	N	13	Y	9	N	16	Y	64	Y	23	Y	78.8	Y	56.3	Y	74.0	Y	48.0	N	78.5	Y	72.9	Y	88.3	Y
18	9917004011	10	N	13	Y	10	N	11	Y	9	N	67	Y	30	Y	54.0	N	65.8	Y	51.0	N	48.5	N	64.5	Y	80.7	Y	96.7	Y
19	9917004012	16	Y	15	Y	16	Y	12	Y	11	Y	59	Y	28	Y	70.3	Y	75.8	Y	77.2	Y	59.0	Y	58.8	Y	92.1	Y	93.3	Y
20	9917004013	11	Y	12	Y	12	Y	7	N	15	Y	53	Y	19	Y	63.7	Y	56.3	Y	53.3	N	59.0	Y	75.8	Y	69.3	Y	81.7	Y
21	9917004014	17	Y	16	Y	17	Y	11	Y	14	Y	47	Y	17	Y	86.3	Y	81.5	Y	68.2	Y	68.8	Y	61.3	Y	56.4	Y	58.3	Y
22	9917004015	12	Y	18	Y	12	Y	18	Y	13	Y	68	Y	18	Y	59.2	Y	76.0	Y	53.7	N	84.5	Y	72.5	Y	87.1	Y	70.0	Y
23	9917004016	12	Y	13	Y	9	N	12	Y	16	Y	36	N	28	Y	75.3	Y	67.5	Y	59.3	Y	72.0	Y	62.8	Y	61.4	Y	93.3	Y
24	9917004017	9	N	12	Y	15	Y	13	Y	10	N	66	Y	26	Y	61.7	Y	70.0	Y	65.5	Y	67.5	Y	71.5	Y	78.6	Y	90.0	Y
25	9917004018	17	Y	11	Y	15	Y	11	Y	15	Y	70	Y	29	Y	72.3	Y	65.5	Y	65.3	Y	60.3	Y	68.3	Y	74.3	Y	88.3	Y
26	9917004019	10	N	16	Y	16	Y	15	Y	15	Y	34	N	21	Y	63.3	Y	74.3	Y	68.3	Y	68.8	Y	82.3	Y	74.3	Y	68.3	Y
27	9917004020	9	N	17	Y	17	Y	12	Y	13	Y	33	N	20	Y	54.0	N	68.8	Y	69.2	Y	50.8	N	57.0	Y	57.9	Y	66.7	Y
28	9917004021	11	Y	13	Y	12	Y	15	Y	14	Y	62	Y	28	Y	74.0	Y	55.3	Y	77.7	Y	59.8	Y	57.8	Y	71.4	Y	96.7	Y
29	9917004022	18	Y	14	Y	8	N	11	Y	11	Y	45	Y	25	Y	67.5	Y	67.5	Y	45.7	N	49.8	N	72.3	Y	56.4	Y	88.3	Y
30	9917004023	8	N	14	Y	8	N	15	Y	12	Y	45	Y	22	Y	64.2	Y	64.3	Y	56.2	Y	66.5	Y	68.3	Y	57.9	Y	86.7	Y
31	9917004024	10	N	8	N	15	Y	8	N	13	Y	53	Y	16	N	64.2	Y	52.5	N	78.3	Y	59.8	Y	58.5	Y	69.3	Y	63.3	Y
32	9917004025	17	Y	12	Y	10	N	9	N	9	N	45	Y	16	N	78.2	Y	65.0	Y	70.0	Y	62.5	Y	48.3	N	55.0	Y	56.7	Y
33	9917004026	13	Y	9	N	15	Y	6	N	10	N	63	Y	18	Y	55.8	Y	48.3	N	82.5	Y	46.3	N	61.5	Y	76.4	Y	76.7	Y

NBA SAR 2022 - DEPT OF CSE - KARE

34	9917004027	11	Y	8	N	10	N	15	Y	11	Y	54	Y	26	Y	57.3	Y	63.5	Y	55.2	Y	81.0	Y	60.0	Y	65.7	Y	73.3	Y
35	9917004028	14	Y	12	Y	8	N	16	Y	11	Y	31	N	20	Y	70.7	Y	70.0	Y	62.7	Y	84.8	Y	65.3	Y	49.3	N	83.3	Y
36	9917004029	12	Y	9	N	16	Y	18	Y	11	Y	60	Y	21	Y	76.2	Y	60.5	Y	67.2	Y	71.0	Y	57.3	Y	78.6	Y	78.3	Y
37	9917004030	12	Y	14	Y	9	N	12	Y	11	Y	54	Y	26	Y	68.8	Y	79.8	Y	62.8	Y	64.5	Y	72.3	Y	81.4	Y	80.0	Y
38	9917004031	12	Y	9	N	8	N	8	N	13	Y	56	Y	24	Y	54.8	N	62.0	Y	51.3	N	48.0	N	72.0	Y	77.1	Y	70.0	Y
39	9917004032	15	Y	9	N	15	Y	14	Y	16	Y	39	Y	22	Y	79.3	Y	52.0	N	74.3	Y	64.8	Y	62.8	Y	62.1	Y	70.0	Y
40	9917004033	8	N	14	Y	17	Y	18	Y	9	N	66	Y	26	Y	46.3	N	65.8	Y	89.0	Y	78.3	Y	63.8	Y	72.9	Y	90.0	Y
41	9917004034	15	Y	8	N	14	Y	13	Y	9	N	40	Y	26	Y	72.3	Y	54.3	N	79.7	Y	53.5	N	58.5	Y	64.3	Y	80.0	Y
42	9917004035	11	Y	10	N	13	Y	16	Y	11	Y	62	Y	18	Y	63.7	Y	57.5	Y	74.3	Y	84.8	Y	72.5	Y	68.6	Y	70.0	Y
43	9917004036	16	Y	17	Y	14	Y	10	N	10	N	57	Y	23	Y	72.5	Y	70.0	Y	72.2	Y	49.0	N	61.3	Y	82.1	Y	85.0	Y
44	9917004037	10	N	17	Y	14	Y	12	Y	14	Y	46	Y	30	Y	71.2	Y	75.5	Y	74.2	Y	63.3	Y	71.5	Y	62.9	Y	83.3	Y
45	9917004038	12	Y	8	N	11	Y	13	Y	10	N	50	Y	20	Y	74.7	Y	63.3	Y	50.8	N	55.0	Y	54.0	N	70.0	Y	70.0	Y
46	9917004040	8	N	12	Y	14	Y	18	Y	10	N	35	N	23	Y	56.0	Y	64.8	Y	79.2	Y	69.5	Y	57.5	Y	72.1	Y	88.3	Y
47	9917004042	13	Y	13	Y	15	Y	12	Y	11	Y	60	Y	17	Y	61.5	Y	67.0	Y	75.5	Y	61.0	Y	54.8	N	67.1	Y	68.3	Y
48	9917004043	8	N	12	Y	17	Y	17	Y	11	Y	31	N	15	N	44.5	N	75.0	Y	75.8	Y	66.3	Y	66.0	Y	65.0	Y	55.0	Y
49	9917004044	18	Y	12	Y	9	N	9	N	9	N	36	N	21	Y	73.3	Y	60.8	Y	69.0	Y	45.0	N	48.8	N	61.4	Y	75.0	Y
50	9917004045	15	Y	18	Y	14	Y	7	N	10	N	31	N	28	Y	79.3	Y	91.5	Y	74.7	Y	61.0	Y	51.3	N	45.0	N	76.7	Y
51	9917004046	15	Y	15	Y	17	Y	15	Y	14	Y	55	Y	29	Y	63.8	Y	82.5	Y	68.5	Y	63.3	Y	74.8	Y	80.7	Y	85.0	Y
52	9917004047	18	Y	10	N	10	N	17	Y	15	Y	37	N	19	Y	72.2	Y	66.8	Y	68.0	Y	75.8	Y	61.8	Y	59.3	Y	71.7	Y
53	9917004048	10	N	14	Y	18	Y	13	Y	14	Y	43	Y	21	Y	56.5	Y	64.5	Y	84.7	Y	74.5	Y	67.5	Y	66.4	Y	78.3	Y
54	9917004049	15	Y	16	Y	11	Y	11	Y	11	Y	58	Y	30	Y	65.8	Y	72.8	Y	71.7	Y	61.8	Y	67.0	Y	74.3	Y	90.0	Y
55	9917004050	12	Y	18	Y	12	Y	11	Y	13	Y	69	Y	23	Y	53.7	N	81.8	Y	62.5	Y	53.0	N	70.5	Y	82.1	Y	71.7	Y
56	9917004052	12	Y	8	N	13	Y	7	N	11	Y	59	Y	27	Y	64.2	Y	49.3	N	72.5	Y	51.8	N	59.0	Y	76.4	Y	85.0	Y
57	9917004053	13	Y	18	Y	13	Y	7	N	13	Y	36	N	20	Y	70.5	Y	86.5	Y	55.8	Y	50.8	N	79.0	Y	60.0	Y	70.0	Y
58	9917004054	12	Y	13	Y	15	Y	8	N	10	N	41	Y	20	Y	69.5	Y	62.0	Y	82.2	Y	40.8	N	62.8	Y	69.3	Y	63.3	Y
59	9917004055	10	N	13	Y	13	Y	8	N	9	N	68	Y	19	Y	68.0	Y	72.5	Y	69.7	Y	44.3	N	55.8	Y	97.1	Y	65.0	Y
60	9917004056	12	Y	10	N	12	Y	11	Y	12	Y	53	Y	22	Y	69.5	Y	61.5	Y	59.2	Y	48.5	N	64.3	Y	86.4	Y	86.7	Y
61	9917004057	15	Y	9	N	8	N	17	Y	10	N	51	Y	24	Y	79.8	Y	59.0	Y	58.8	Y	76.8	Y	58.0	Y	82.1	Y	70.0	Y
62	9917004058	18	Y	14	Y	11	Y	17	Y	14	Y	55	Y	29	Y	75.3	Y	75.3	Y	59.7	Y	65.3	Y	81.5	Y	69.3	Y	98.3	Y
63	9917004059	10	N	8	N	18	Y	17	Y	14	Y	56	Y	28	Y	63.5	Y	50.8	N	78.0	Y	84.3	Y	57.8	Y	90.0	Y	76.7	Y
64	9917004060	15	Y	11	Y	15	Y	9	N	16	Y	40	Y	18	Y	77.2	Y	65.8	Y	70.5	Y	64.0	Y	78.5	Y	68.6	Y	70.0	Y
65	9917004061	8	N	18	Y	8	N	6	N	13	Y	64	Y	18	Y	60.3	Y	80.0	Y	52.2	N	36.0	N	68.8	Y	81.4	Y	70.0	Y
66	9917004062	17	Y	8	N	9	N	9	N	12	Y	41	Y	29	Y	75.0	Y	63.0	Y	67.8	Y	52.0	N	56.3	Y	63.6	Y	95.0	Y
67	9917004063	11	Y	8	N	10	N	17	Y	10	N	62	Y	18	Y	72.5	Y	47.3	N	62.7	Y	65.3	Y	49.3	N	94.3	Y	73.3	Y
68	9917004064	10	N	16	Y	8	N	11	Y	14	Y	53	Y	27	Y	47.2	N	70.8	Y	53.8	N	60.0	Y	71.5	Y	85.0	Y	75.0	Y
69	9917004065	15	Y	8	N	14	Y	14	Y	10	N	67	Y	22	Y	60.8	Y	62.0	Y	74.7	Y	79.8	Y	58.3	Y	70.7	Y	86.7	Y
70	9917004066	18	Y	14	Y	12	Y	14	Y	15	Y	42	Y	17	Y	76.3	Y	73.5	Y	55.7	Y	80.0	Y	71.8	Y	77.1	Y	68.3	Y
71	9917004067	8	N	8	N	17	Y	11	Y	9	N	51	Y	20	Y	51.5	N	54.8	N	86.0	Y	60.3	Y	55.0	Y	72.1	Y	83.3	Y

72	9917004068	13	Y	12	Y	12	Y	8	N	11	Y	50	Y	16	N	72.0	Y	63.3	Y	62.7	Y	42.3	N	66.0	Y	80.0	Y	76.7	Y
73	9917004069	14	Y	8	N	8	N	9	N	13	Y	63	Y	29	Y	61.8	Y	44.5	N	52.7	N	55.3	Y	57.0	Y	73.6	Y	98.3	Y
74	9917004070	11	Y	9	N	16	Y	8	N	12	Y	39	Y	19	Y	60.8	Y	62.3	Y	84.2	Y	42.3	N	54.5	N	57.9	Y	75.0	Y
75	9917004071	15	Y	16	Y	10	N	17	Y	15	Y	60	Y	16	N	75.5	Y	66.3	Y	64.7	Y	72.3	Y	74.0	Y	92.9	Y	56.7	Y
76	9917004072	8	N	8	N	15	Y	13	Y	14	Y	62	Y	26	Y	57.7	Y	63.5	Y	71.2	Y	60.5	Y	78.3	Y	92.9	Y	73.3	Y
77	9917004073	15	Y	16	Y	12	Y	6	N	14	Y	67	Y	17	Y	70.8	Y	64.5	Y	65.0	Y	39.5	N	60.8	Y	86.4	Y	61.7	Y
78	9917004074	13	Y	12	Y	8	N	11	Y	12	Y	49	Y	30	Y	54.7	N	68.5	Y	50.7	N	68.8	Y	66.5	Y	59.3	Y	100.0	Y
79	9917004075	12	Y	18	Y	14	Y	11	Y	15	Y	39	Y	29	Y	61.3	Y	81.8	Y	60.2	Y	46.8	N	60.3	Y	76.4	Y	95.0	Y
80	9917004076	17	Y	15	Y	13	Y	11	Y	14	Y	44	Y	30	Y	74.3	Y	65.0	Y	61.5	Y	54.8	N	67.5	Y	52.9	N	90.0	Y
81	9917004077	9	N	14	Y	9	N	18	Y	12	Y	50	Y	29	Y	57.3	Y	76.5	Y	70.2	Y	70.5	Y	73.3	Y	58.6	Y	88.3	Y
82	9917004078	9	N	11	Y	16	Y	7	N	10	N	68	Y	22	Y	66.0	Y	52.0	N	83.2	Y	54.0	N	56.3	Y	84.3	Y	73.3	Y
83	9917004079	16	Y	11	Y	9	N	10	N	11	Y	63	Y	16	N	67.5	Y	56.8	Y	50.8	N	66.5	Y	64.3	Y	90.7	Y	73.3	Y
84	9917004080	17	Y	10	N	15	Y	15	Y	16	Y	42	Y	27	Y	70.8	Y	65.0	Y	67.7	Y	70.8	Y	76.0	Y	58.6	Y	81.7	Y
85	9917004081	9	N	17	Y	10	N	12	Y	10	N	48	Y	23	Y	56.2	Y	77.0	Y	66.8	Y	57.3	Y	54.5	N	65.7	Y	78.3	Y
86	9917004082	11	Y	16	Y	18	Y	16	Y	12	Y	69	Y	19	Y	53.5	N	76.0	Y	88.5	Y	60.8	Y	69.5	Y	82.1	Y	71.7	Y
87	9917004083	13	Y	13	Y	12	Y	18	Y	15	Y	39	Y	23	Y	60.5	Y	55.3	Y	77.7	Y	75.8	Y	72.5	Y	63.6	Y	85.0	Y
88	9917004084	12	Y	9	N	16	Y	8	N	12	Y	60	Y	25	Y	73.5	Y	58.8	Y	77.7	Y	45.8	N	54.3	N	81.4	Y	85.0	Y
89	9917004085	13	Y	14	Y	9	N	12	Y	9	N	63	Y	21	Y	77.8	Y	80.0	Y	59.8	Y	55.8	Y	57.3	Y	79.3	Y	65.0	Y
90	9917004086	17	Y	17	Y	17	Y	16	Y	10	N	34	N	30	Y	83.3	Y	75.0	Y	87.8	Y	83.0	Y	56.3	Y	70.0	Y	93.3	Y
91	9917004087	16	Y	12	Y	17	Y	15	Y	16	Y	46	Y	18	Y	66.3	Y	72.0	Y	72.3	Y	69.0	Y	71.0	Y	65.7	Y	66.7	Y
92	9917004088	9	N	14	Y	11	Y	12	Y	12	Y	70	Y	30	Y	57.0	Y	66.3	Y	53.5	N	74.8	Y	59.3	Y	87.1	Y	86.7	Y
93	9917004089	14	Y	11	Y	9	N	16	Y	16	Y	46	Y	28	Y	76.8	Y	65.5	Y	63.2	Y	86.5	Y	67.5	Y	72.9	Y	96.7	Y
94	9917004090	10	N	18	Y	15	Y	15	Y	9	N	53	Y	18	Y	53.7	N	79.5	Y	64.3	Y	70.5	Y	53.5	N	75.0	Y	66.7	Y
95	9917004091	15	Y	13	Y	18	Y	11	Y	12	Y	54	Y	22	Y	67.7	Y	57.0	Y	72.2	Y	63.5	Y	73.0	Y	67.1	Y	66.7	Y
96	9917004092	15	Y	10	N	8	N	12	Y	12	Y	39	Y	19	Y	79.0	Y	52.8	N	58.3	Y	62.5	Y	59.3	Y	62.1	Y	65.0	Y
97	9917004093	10	N	10	N	8	N	14	Y	9	N	65	Y	26	Y	61.5	Y	59.5	Y	52.2	N	54.3	N	58.8	Y	86.4	Y	80.0	Y
98	9917004094	16	Y	10	N	17	Y	6	N	14	Y	70	Y	18	Y	69.5	Y	54.8	N	75.5	Y	36.0	N	67.5	Y	92.9	Y	63.3	Y
99	9917004095	11	Y	15	Y	10	N	10	N	14	Y	37	N	21	Y	67.2	Y	69.0	Y	65.8	Y	68.0	Y	67.8	Y	47.9	N	75.0	Y
100	9917004096	8	N	16	Y	13	Y	13	Y	14	Y	67	Y	24	Y	50.7	N	81.3	Y	62.0	Y	72.0	Y	57.8	Y	97.9	Y	90.0	Y
101	9917004097	15	Y	14	Y	14	Y	11	Y	10	N	60	Y	24	Y	61.5	Y	71.3	Y	74.5	Y	61.8	Y	49.5	N	64.3	Y	76.7	Y
102	9917004098	12	Y	10	N	11	Y	13	Y	11	Y	69	Y	25	Y	57.8	Y	66.8	Y	61.3	Y	68.5	Y	52.0	N	75.0	Y	81.7	Y
103	9917004099	9	N	9	N	13	Y	7	N	16	Y	42	Y	16	N	45.8	N	49.8	N	63.8	Y	51.8	N	74.8	Y	51.4	N	66.7	Y
104	9917004100	9	N	14	Y	13	Y	17	Y	9	N	53	Y	23	Y	55.0	Y	64.3	Y	62.3	Y	70.5	Y	60.5	Y	79.3	Y	78.3	Y
105	9917004101	10	N	17	Y	16	Y	9	N	11	Y	70	Y	24	Y	53.0	N	84.5	Y	62.2	Y	67.5	Y	67.3	Y	94.3	Y	70.0	Y
106	9917004102	10	N	8	N	11	Y	11	Y	14	Y	43	Y	26	Y	61.5	Y	66.5	Y	67.0	Y	53.5	N	66.3	Y	77.9	Y	80.0	Y
107	9917004103	12	Y	15	Y	17	Y	6	N	14	Y	33	N	25	Y	71.8	Y	60.3	Y	83.7	Y	46.3	N	73.0	Y	69.3	Y	85.0	Y
108	9917004104	18	Y	14	Y	16	Y	9	N	12	Y	40	Y	28	Y	82.7	Y	69.5	Y	65.2	Y	60.5	Y	73.0	Y	65.7	Y	86.7	Y
109	9917004105	15	Y	18	Y	15	Y	15	Y	10	N	35	N	20	Y	66.2	Y	77.5	Y	75.8	Y	65.5	Y	71.5	Y	66.4	Y	63.3	Y

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110	9917004106	17	Y	15	Y	10	N	17	Y	12	Y	63	Y	19	Y	79.8	Y	61.8	Y	56.0	Y	76.8	Y	54.5	N	82.1	Y	68.3	Y
111	9917004108	18	Y	13	Y	17	Y	12	Y	14	Y	68	Y	28	Y	87.0	Y	75.8	Y	80.5	Y	64.8	Y	64.8	Y	72.9	Y	80.0	Y
112	9917004109	10	N	8	N	15	Y	9	N	10	N	57	Y	27	Y	54.8	N	49.5	N	64.3	Y	60.3	Y	52.5	N	67.9	Y	78.3	Y
113	9917004110	16	Y	18	Y	13	Y	14	Y	12	Y	52	Y	16	N	67.2	Y	81.8	Y	57.3	Y	57.5	Y	73.0	Y	75.7	Y	66.7	Y
114	9917004111	8	N	13	Y	17	Y	12	Y	15	Y	68	Y	16	N	61.2	Y	60.0	Y	89.0	Y	64.8	Y	63.8	Y	94.3	Y	60.0	Y
115	9917004112	8	N	9	N	15	Y	8	N	13	Y	44	Y	19	Y	66.2	Y	59.3	Y	72.0	Y	49.0	N	64.0	Y	77.1	Y	75.0	Y
116	9917004113	11	Y	15	Y	10	N	7	N	15	Y	34	N	24	Y	57.3	Y	67.3	Y	59.5	Y	38.3	N	75.3	Y	55.7	Y	80.0	Y
117	9917004114	8	N	11	Y	13	Y	7	N	16	Y	38	N	24	Y	65.3	Y	62.5	Y	61.2	Y	38.5	N	83.0	Y	51.4	N	83.3	Y
118	9917004119	18	Y	14	Y	9	N	9	N	12	Y	47	Y	16	N	80.3	Y	66.3	Y	51.2	N	46.8	N	54.3	N	60.7	Y	70.0	Y
119	9917004120	8	N	10	N	17	Y	12	Y	16	Y	55	Y	17	Y	49.8	N	64.8	Y	87.5	Y	67.8	Y	66.3	Y	83.6	Y	75.0	Y
120	9917004121	15	Y	9	N	16	Y	10	N	11	Y	44	Y	27	Y	64.2	Y	56.8	Y	83.0	Y	56.0	Y	69.0	Y	72.9	Y	95.0	Y
121	9917004122	13	Y	11	Y	11	Y	18	Y	13	Y	42	Y	23	Y	64.7	Y	53.3	N	72.5	Y	69.3	Y	69.3	Y	80.0	Y	88.3	Y
122	9917004123	8	N	9	N	14	Y	10	N	16	Y	31	N	27	Y	54.2	N	56.8	Y	64.5	Y	68.5	Y	73.3	Y	45.0	N	88.3	Y
123	9917004124	9	N	13	Y	14	Y	8	N	11	Y	60	Y	15	N	53.8	N	58.8	Y	62.5	Y	65.0	Y	57.0	Y	85.7	Y	71.7	Y
124	9917004125	18	Y	12	Y	16	Y	13	Y	14	Y	67	Y	24	Y	83.0	Y	65.0	Y	64.5	Y	65.8	Y	59.5	Y	75.0	Y	80.0	Y
125	9917004126	10	N	16	Y	14	Y	6	N	16	Y	43	Y	21	Y	64.5	Y	78.0	Y	80.3	Y	51.8	N	72.8	Y	70.7	Y	75.0	Y
126	9917004127	8	N	17	Y	17	Y	11	Y	9	N	63	Y	20	Y	59.2	Y	67.0	Y	85.7	Y	67.5	Y	64.5	Y	92.1	Y	70.0	Y
127	9917004128	14	Y	8	N	13	Y	13	Y	9	N	62	Y	27	Y	71.5	Y	56.5	Y	57.0	Y	69.0	Y	52.0	N	71.4	Y	75.0	Y
128	9917004129	18	Y	13	Y	11	Y	16	Y	14	Y	49	Y	22	Y	67.2	Y	72.5	Y	50.8	N	67.3	Y	62.8	Y	77.9	Y	66.7	Y
129	9917004130	16	Y	8	N	17	Y	16	Y	9	N	67	Y	29	Y	80.0	Y	60.3	Y	83.7	Y	60.8	Y	59.3	Y	95.0	Y	95.0	Y
130	9917004131	12	Y	11	Y	13	Y	7	N	15	Y	58	Y	21	Y	73.5	Y	60.8	Y	74.5	Y	41.5	N	73.8	Y	82.9	Y	85.0	Y
131	9917004132	16	Y	18	Y	8	N	10	N	9	N	33	N	19	Y	74.2	Y	77.5	Y	54.8	N	63.0	Y	67.3	Y	73.6	Y	68.3	Y
132	9917004133	9	N	10	N	15	Y	12	Y	10	N	51	Y	17	Y	56.7	Y	61.8	Y	81.0	Y	62.8	Y	54.3	N	67.9	Y	68.3	Y
133	9917004134	13	Y	11	Y	11	Y	12	Y	15	Y	32	N	17	Y	56.2	Y	52.0	N	55.0	Y	56.3	Y	72.3	Y	54.3	N	65.0	Y
134	9917004135	8	N	8	N	8	N	6	N	10	N	62	Y	22	Y	55.3	Y	47.5	N	62.3	Y	52.8	N	61.3	Y	74.3	Y	86.7	Y
135	9917004136	10	N	8	N	14	Y	9	N	9	N	42	Y	24	Y	68.0	Y	58.3	Y	82.7	Y	62.8	Y	65.5	Y	52.9	N	80.0	Y
136	9917004137	15	Y	14	Y	13	Y	13	Y	10	N	54	Y	16	N	79.5	Y	71.3	Y	71.3	Y	53.3	N	71.5	Y	62.9	Y	73.3	Y
137	9917004138	15	Y	13	Y	14	Y	7	N	16	Y	56	Y	24	Y	63.5	Y	77.5	Y	72.3	Y	52.3	N	82.0	Y	65.7	Y	73.3	Y
138	9917004139	10	N	15	Y	16	Y	9	N	12	Y	37	N	21	Y	64.2	Y	82.3	Y	80.0	Y	46.8	N	73.0	Y	56.4	Y	65.0	Y
139	9917004140	14	Y	16	Y	10	N	14	Y	15	Y	46	Y	19	Y	62.2	Y	70.8	Y	50.7	N	71.0	Y	82.5	Y	68.6	Y	61.7	Y
140	9917004142	14	Y	12	Y	13	Y	12	Y	13	Y	57	Y	19	Y	64.2	Y	62.8	Y	69.7	Y	68.0	Y	66.8	Y	72.1	Y	65.0	Y
141	9917004143	11	Y	15	Y	14	Y	9	N	12	Y	47	Y	27	Y	68.3	Y	63.5	Y	70.3	Y	60.5	Y	54.3	N	62.1	Y	81.7	Y
142	9917004144	10	N	12	Y	17	Y	7	N	10	N	63	Y	19	Y	66.8	Y	61.0	Y	69.3	Y	45.3	N	64.8	Y	83.6	Y	75.0	Y
143	9917004145	17	Y	8	N	11	Y	17	Y	12	Y	69	Y	17	Y	75.2	Y	61.8	Y	53.5	N	77.5	Y	71.3	Y	92.1	Y	61.7	Y
144	9917004146	8	N	9	N	15	Y	10	N	10	N	45	Y	15	N	51.0	N	45.3	N	62.7	Y	54.8	N	58.0	Y	59.3	Y	71.7	Y
145	9917004147	13	Y	17	Y	15	Y	7	N	14	Y	66	Y	16	N	56.5	Y	68.3	Y	68.2	Y	38.3	N	74.5	Y	70.0	Y	60.0	Y
146	9917004148	8	N	8	N	17	Y	6	N	11	Y	46	Y	21	Y	59.7	Y	62.0	Y	83.7	Y	41.3	N	52.0	N	61.4	Y	85.0	Y
147	9917004149	16	Y	12	Y	16	Y	17	Y	13	Y	67	Y	15	N	84.7	Y	68.3	Y	67.2	Y	65.0	Y	73.8	Y	80.7	Y	71.7	Y

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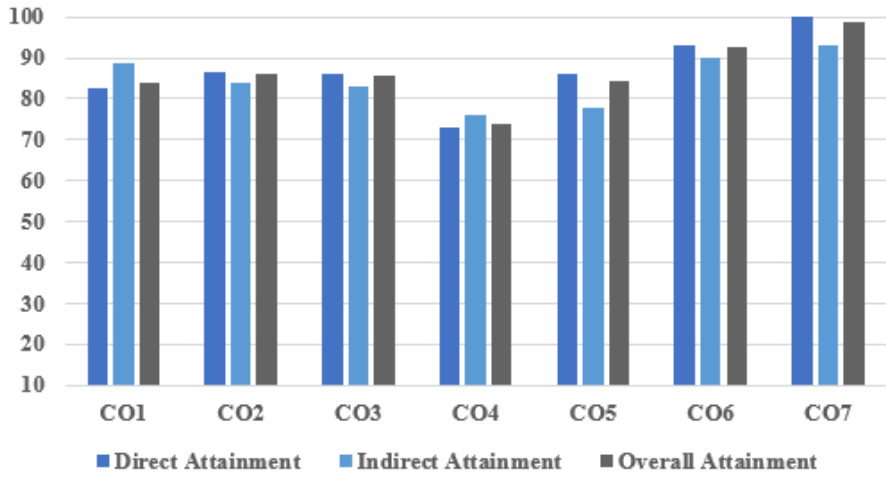
148	9917004150	9	N	16	Y	17	Y	13	Y	9	N	30	N	19	Y	53.2	N	67.8	Y	77.5	Y	69.3	Y	55.8	Y	52.9	N	71.7	Y
149	9917004151	14	Y	15	Y	11	Y	16	Y	10	N	60	Y	27	Y	65.3	Y	61.8	Y	57.0	Y	66.3	Y	64.5	Y	87.1	Y	95.0	Y
150	9917004152	13	Y	16	Y	11	Y	11	Y	9	N	54	Y	28	Y	72.2	Y	85.0	Y	60.2	Y	62.5	Y	50.3	N	87.1	Y	96.7	Y
151	9917004153	9	N	9	N	16	Y	18	Y	16	Y	48	Y	19	Y	51.7	N	50.0	N	80.0	Y	83.0	Y	62.8	Y	75.7	Y	81.7	Y
152	9917004154	11	Y	18	Y	9	N	7	N	16	Y	42	Y	24	Y	72.8	Y	72.5	Y	48.8	N	42.0	N	81.5	Y	55.7	Y	76.7	Y
153	9917004155	13	Y	11	Y	10	N	13	Y	16	Y	58	Y	18	Y	56.5	Y	62.5	Y	57.2	Y	60.3	Y	82.0	Y	64.3	Y	76.7	Y
154	9917004156	10	N	10	N	17	Y	18	Y	13	Y	63	Y	23	Y	55.3	Y	56.5	Y	82.8	Y	66.0	Y	68.8	Y	67.9	Y	81.7	Y
155	9917004157	12	Y	18	Y	10	N	17	Y	11	Y	55	Y	24	Y	59.2	Y	80.0	Y	51.8	N	66.8	Y	66.0	Y	65.0	Y	80.0	Y
156	9917004158	8	N	18	Y	16	Y	11	Y	12	Y	51	Y	15	N	58.8	Y	86.3	Y	67.8	Y	49.8	N	71.3	Y	63.6	Y	68.3	Y
157	9917004159	15	Y	13	Y	18	Y	9	N	14	Y	51	Y	17	Y	74.0	Y	70.8	Y	79.5	Y	57.3	Y	64.5	Y	79.3	Y	58.3	Y
158	9917004160	8	N	11	Y	12	Y	7	N	13	Y	42	Y	19	Y	57.3	Y	67.3	Y	69.7	Y	52.0	N	65.3	Y	75.7	Y	65.0	Y
159	9917004161	9	N	11	Y	14	Y	11	Y	14	Y	56	Y	21	Y	63.7	Y	72.3	Y	65.3	Y	69.0	Y	78.0	Y	80.0	Y	68.3	Y
160	9917004162	13	Y	12	Y	17	Y	13	Y	16	Y	42	Y	16	N	79.0	Y	62.8	Y	73.5	Y	72.0	Y	78.5	Y	77.1	Y	56.7	Y
161	9917004163	13	Y	11	Y	8	N	6	N	16	Y	67	Y	25	Y	56.2	Y	51.8	N	56.0	Y	57.0	Y	81.8	Y	69.3	Y	81.7	Y
162	9917004164	14	Y	18	Y	10	N	11	Y	16	Y	64	Y	24	Y	63.3	Y	75.8	Y	54.8	N	66.0	Y	74.5	Y	88.6	Y	86.7	Y
163	9917004165	18	Y	12	Y	10	N	17	Y	16	Y	68	Y	30	Y	85.8	Y	73.0	Y	53.7	N	71.8	Y	67.3	Y	95.7	Y	93.3	Y
164	9917004166	15	Y	8	N	17	Y	10	N	16	Y	55	Y	16	N	61.5	Y	52.8	N	78.2	Y	56.0	Y	76.3	Y	66.4	Y	76.7	Y
165	9917004167	14	Y	12	Y	14	Y	14	Y	13	Y	70	Y	20	Y	64.8	Y	68.0	Y	63.7	Y	78.0	Y	67.0	Y	98.6	Y	76.7	Y
166	9917004168	15	Y	13	Y	14	Y	13	Y	13	Y	41	Y	30	Y	71.7	Y	75.5	Y	73.8	Y	72.3	Y	72.8	Y	67.9	Y	80.0	Y
167	9917004169	18	Y	9	N	11	Y	16	Y	15	Y	45	Y	16	N	74.0	Y	55.3	Y	62.0	Y	64.3	Y	77.3	Y	72.1	Y	56.7	Y
168	9917004170	16	Y	16	Y	17	Y	11	Y	14	Y	41	Y	19	Y	68.7	Y	67.5	Y	78.7	Y	55.5	Y	71.3	Y	63.6	Y	78.3	Y
169	9917004171	14	Y	13	Y	18	Y	17	Y	16	Y	43	Y	26	Y	70.7	Y	72.3	Y	77.7	Y	83.8	Y	72.8	Y	70.7	Y	90.0	Y
170	9917004172	10	N	18	Y	16	Y	12	Y	9	N	44	Y	27	Y	58.0	Y	86.8	Y	65.7	Y	58.0	Y	48.8	N	74.3	Y	88.3	Y
171	9917004173	9	N	8	N	12	Y	11	Y	11	Y	35	N	27	Y	50.3	N	65.0	Y	70.7	Y	60.8	Y	72.3	Y	50.7	N	75.0	Y
172	9917004174	8	N	18	Y	11	Y	17	Y	11	Y	68	Y	29	Y	61.5	Y	77.5	Y	52.0	N	65.0	Y	62.0	Y	97.1	Y	88.3	Y
173	9917004175	15	Y	18	Y	16	Y	13	Y	14	Y	62	Y	24	Y	78.7	Y	82.8	Y	64.8	Y	77.3	Y	67.8	Y	92.9	Y	80.0	Y
174	9917004176	11	Y	11	Y	16	Y	17	Y	11	Y	36	N	21	Y	52.7	N	55.5	Y	66.8	Y	69.8	Y	67.8	Y	51.4	N	71.7	Y
175	9917004177	14	Y	17	Y	15	Y	14	Y	11	Y	57	Y	20	Y	70.0	Y	84.3	Y	74.7	Y	55.8	Y	71.0	Y	70.7	Y	76.7	Y
176	9917004178	15	Y	11	Y	14	Y	16	Y	11	Y	69	Y	22	Y	76.3	Y	72.3	Y	75.7	Y	60.8	Y	72.3	Y	80.7	Y	66.7	Y
177	9917004179	16	Y	13	Y	14	Y	18	Y	11	Y	48	Y	21	Y	83.2	Y	66.8	Y	71.0	Y	65.8	Y	50.3	N	57.1	Y	81.7	Y
178	9917004180	9	N	16	Y	14	Y	18	Y	15	Y	58	Y	17	Y	67.2	Y	79.5	Y	73.3	Y	72.5	Y	72.3	Y	75.7	Y	68.3	Y
179	9917004181	15	Y	16	Y	11	Y	15	Y	15	Y	30	N	15	N	68.5	Y	70.8	Y	67.2	Y	58.3	Y	82.3	Y	70.0	Y	75.0	Y
180	9917004182	15	Y	18	Y	11	Y	13	Y	15	Y	63	Y	24	Y	74.8	Y	76.0	Y	70.7	Y	72.5	Y	71.8	Y	83.6	Y	70.0	Y
181	9917004183	12	Y	18	Y	10	N	8	N	9	N	50	Y	18	Y	61.5	Y	74.8	Y	58.8	Y	64.8	Y	58.5	Y	74.3	Y	60.0	Y
182	9917004184	17	Y	15	Y	16	Y	16	Y	16	Y	67	Y	22	Y	68.5	Y	74.0	Y	63.7	Y	71.3	Y	78.5	Y	75.0	Y	86.7	Y
183	9917004185	11	Y	16	Y	10	N	10	N	12	Y	61	Y	15	N	70.7	Y	80.0	Y	63.8	Y	66.5	Y	73.3	Y	77.9	Y	65.0	Y
184	9917004186	17	Y	17	Y	11	Y	9	N	12	Y	57	Y	23	Y	76.2	Y	86.0	Y	57.0	Y	48.0	N	57.3	Y	76.4	Y	78.3	Y
185	9917004187	14	Y	16	Y	13	Y	15	Y	9	N	51	Y	26	Y	77.7	Y	82.0	Y	70.2	Y	77.5	Y	59.0	Y	73.6	Y	83.3	Y

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186	9917004188	8	N	11	Y	13	Y	6	N	9	N	55	Y	30	Y	60.8	Y	55.3	Y	54.7	N	58.0	Y	62.0	Y	60.7	Y	96.7	Y
187	9917004189	15	Y	11	Y	8	N	18	Y	10	N	30	N	17	Y	70.5	Y	72.5	Y	62.7	Y	74.3	Y	66.5	Y	54.3	N	58.3	Y
188	9917004190	10	N	17	Y	8	N	11	Y	10	N	32	N	25	Y	62.7	Y	82.3	Y	58.5	Y	60.3	Y	67.0	Y	52.9	N	75.0	Y
189	9917004191	17	Y	10	N	10	N	13	Y	12	Y	32	N	21	Y	87.2	Y	50.8	N	53.7	N	72.8	Y	68.0	Y	45.7	N	85.0	Y
190	9917004192	8	N	11	Y	18	Y	13	Y	14	Y	43	Y	18	Y	60.0	Y	65.3	Y	71.7	Y	70.3	Y	75.0	Y	70.7	Y	66.7	Y
191	9917004193	9	N	13	Y	10	N	14	Y	10	N	55	Y	24	Y	50.3	N	65.5	Y	56.5	Y	64.8	Y	49.3	N	63.6	Y	76.7	Y
192	9917004194	9	N	9	N	16	Y	6	N	13	Y	36	N	17	Y	49.7	N	52.0	N	71.3	Y	59.8	Y	72.5	Y	58.6	Y	68.3	Y
193	9917004195	10	N	10	N	8	N	12	Y	16	Y	57	Y	24	Y	66.2	Y	68.5	Y	66.5	Y	55.8	Y	72.8	Y	65.0	Y	83.3	Y
194	9917004196	11	Y	13	Y	15	Y	17	Y	10	N	46	Y	15	N	71.0	Y	79.0	Y	68.8	Y	81.0	Y	47.8	N	78.6	Y	65.0	Y
195	9917004197	16	Y	12	Y	9	N	14	Y	9	N	52	Y	16	N	79.7	Y	57.8	Y	65.7	Y	66.3	Y	64.5	Y	84.3	Y	63.3	Y
196	9917004198	18	Y	13	Y	13	Y	13	Y	12	Y	39	Y	24	Y	73.7	Y	63.8	Y	64.0	Y	74.5	Y	54.3	N	65.0	Y	90.0	Y
197	9917004199	15	Y	14	Y	8	N	7	N	15	Y	48	Y	29	Y	77.0	Y	68.3	Y	55.7	Y	50.8	N	62.0	Y	75.7	Y	95.0	Y
198	9917004200	9	N	12	Y	18	Y	16	Y	13	Y	41	Y	28	Y	43.5	N	64.5	Y	88.8	Y	76.0	Y	70.8	Y	59.3	Y	86.7	Y
199	9917004201	10	N	9	N	8	N	18	Y	14	Y	61	Y	15	N	69.2	Y	57.5	Y	48.0	N	71.0	Y	68.0	Y	80.7	Y	75.0	Y
200	9917004202	17	Y	17	Y	16	Y	17	Y	9	N	59	Y	16	N	82.5	Y	77.3	Y	87.7	Y	63.5	Y	69.0	Y	69.3	Y	73.3	Y
201	9917004203	17	Y	9	N	16	Y	12	Y	14	Y	37	N	30	Y	86.0	Y	54.0	N	82.0	Y	61.5	Y	76.5	Y	65.0	Y	90.0	Y
202	9917004204	10	N	14	Y	10	N	7	N	16	Y	49	Y	19	Y	59.5	Y	64.0	Y	67.3	Y	54.3	N	68.0	Y	75.0	Y	78.3	Y
203	9917004205	13	Y	10	N	12	Y	13	Y	14	Y	60	Y	18	Y	74.8	Y	66.8	Y	73.0	Y	63.8	Y	64.8	Y	75.7	Y	66.7	Y
204	9917004206	12	Y	13	Y	10	N	16	Y	10	N	49	Y	24	Y	69.5	Y	65.5	Y	54.0	N	59.3	Y	49.5	N	79.3	Y	70.0	Y
205	9917004208	8	N	12	Y	17	Y	12	Y	12	Y	67	Y	25	Y	53.3	N	73.5	Y	78.5	Y	55.8	Y	55.8	Y	70.7	Y	85.0	Y
206	9917004210	18	Y	11	Y	9	N	13	Y	11	Y	40	Y	22	Y	69.8	Y	70.5	Y	64.0	Y	58.0	Y	67.8	Y	64.3	Y	70.0	Y
207	9917004212	9	N	8	N	8	N	8	N	13	Y	31	N	27	Y	48.8	N	52.5	N	53.0	N	49.8	N	79.0	Y	70.7	Y	95.0	Y
208	9917004213	12	Y	11	Y	16	Y	18	Y	13	Y	50	Y	15	N	56.3	Y	66.0	Y	72.2	Y	83.0	Y	64.0	Y	74.3	Y	75.0	Y
209	9917004214	9	N	12	Y	12	Y	16	Y	9	N	44	Y	30	Y	56.2	Y	63.0	Y	63.3	Y	76.3	Y	58.8	Y	65.7	Y	80.0	Y
210	9917004215	11	Y	17	Y	9	N	11	Y	10	N	65	Y	17	Y	53.2	N	81.0	Y	59.0	Y	54.8	N	66.5	Y	67.9	Y	58.3	Y
211	9917004216	11	Y	8	N	8	N	10	N	9	N	34	N	17	Y	52.0	N	52.8	N	53.0	N	61.5	Y	55.3	Y	65.7	Y	71.7	Y
212	9917004217	16	Y	15	Y	10	N	16	Y	13	Y	35	N	16	N	85.0	Y	77.3	Y	62.7	Y	61.0	Y	64.0	Y	66.4	Y	66.7	Y
213	9917004218	10	N	14	Y	14	Y	16	Y	12	Y	33	N	16	N	71.2	Y	64.8	Y	76.5	Y	62.3	Y	61.0	Y	70.7	Y	60.0	Y
214	9917004219	8	N	12	Y	18	Y	6	N	10	N	57	Y	22	Y	47.5	N	71.3	Y	81.8	Y	44.0	N	50.8	N	77.9	Y	73.3	Y
215	9917004220	18	Y	8	N	17	Y	14	Y	16	Y	45	Y	16	N	76.8	Y	62.0	Y	73.2	Y	69.3	Y	72.5	Y	72.1	Y	66.7	Y
216	9917004221	9	N	16	Y	12	Y	9	N	13	Y	48	Y	30	Y	52.3	N	66.3	Y	59.2	Y	65.8	Y	56.8	Y	80.0	Y	93.3	Y
217	9917004222	12	Y	13	Y	14	Y	6	N	9	N	55	Y	24	Y	61.8	Y	70.3	Y	77.0	Y	47.5	N	51.8	N	70.7	Y	86.7	Y
218	9917004223	9	N	12	Y	9	N	13	Y	10	N	33	N	30	Y	57.0	Y	54.3	N	51.5	N	67.5	Y	63.5	Y	70.7	Y	100.0	Y
219	9917004224	18	Y	9	N	14	Y	8	N	12	Y	31	N	27	Y	88.2	Y	50.5	N	69.2	Y	55.0	Y	74.8	Y	52.1	N	85.0	Y
220	9917004225	9	N	14	Y	18	Y	14	Y	15	Y	48	Y	25	Y	52.8	N	68.3	Y	75.7	Y	55.8	Y	63.8	Y	62.9	Y	88.3	Y
221	9917004226	14	Y	10	N	18	Y	6	N	12	Y	68	Y	21	Y	77.7	Y	54.3	N	71.3	Y	51.5	N	59.8	Y	77.1	Y	68.3	Y
222	9917004227	13	Y	18	Y	16	Y	9	N	15	Y	64	Y	29	Y	68.5	Y	86.5	Y	73.7	Y	58.5	Y	68.8	Y	90.0	Y	88.3	Y
223	9917004228	8	N	11	Y	11	Y	11	Y	15	Y	59	Y	22	Y	42.5	N	72.3	Y	56.2	Y	61.8	Y	70.0	Y	77.9	Y	76.7	Y

223	9917004228	8	N	11	Y	11	Y	11	Y	15	Y	59	Y	22	Y	42.5	N	72.3	Y	56.2	Y	61.8	Y	70.0	Y	77.9	Y	76.7	Y
224	9917004229	17	Y	18	Y	14	Y	9	N	10	N	54	Y	16	N	66.5	Y	86.8	Y	78.0	Y	54.0	N	65.3	Y	77.1	Y	76.7	Y
225	9917004230	13	Y	17	Y	16	Y	6	N	9	N	38	N	19	Y	63.2	Y	86.0	Y	73.7	Y	54.8	N	50.5	N	60.0	Y	81.7	Y
226	9917004231	8	N	18	Y	9	N	9	N	10	N	57	Y	21	Y	66.2	Y	83.5	Y	56.2	Y	51.5	N	51.0	N	77.9	Y	68.3	Y
227	9917004232	9	N	15	Y	18	Y	14	Y	12	Y	30	N	29	Y	59.8	Y	82.5	Y	83.8	Y	77.0	Y	71.5	Y	65.7	Y	95.0	Y
228	9917004233	17	Y	15	Y	14	Y	10	N	16	Y	64	Y	21	Y	81.0	Y	78.8	Y	80.3	Y	62.8	Y	69.3	Y	67.1	Y	75.0	Y
229	9917004234	8	N	13	Y	12	Y	16	Y	10	N	31	N	26	Y	49.2	N	70.5	Y	62.2	Y	69.3	Y	60.0	Y	67.9	Y	76.7	Y
230	9917004235	9	N	14	Y	8	N	13	Y	13	Y	59	Y	23	Y	47.7	N	64.8	Y	46.0	N	71.0	Y	73.8	Y	85.0	Y	88.3	Y
231	9917004236	10	N	16	Y	18	Y	7	N	11	Y	56	Y	27	Y	61.8	Y	78.0	Y	90.0	Y	36.8	N	60.5	Y	72.9	Y	95.0	Y
		CO1	147	CO2	170	CO3	167	CO4	153	CO5	168	CO6	188	CO7	199	CO1	191.0	CO2	200.0	CO3	199.0	CO4	169.0	CO5	199.0	CO6	215.0	CO7	231.0
			84		61		64		78		63		43		32	CO1	40.0	CO2	31.0	CO3	32.0	CO4	62.0	CO5	32.0	CO6	16.0	CO7	0.0
			231		231		231		231		231		231		231	CO1	231.0	CO2	231.0	CO3	231.0	CO4	231.0	CO5	231.0	CO6	231.0	CO7	231.0
			63.6		73.6		72.3		66.2		72.7		81		86	CO1	82.7	CO2	86.6	CO3	86.1	CO4	73.2	CO5	86.1	CO6	93.1	CO7	100.0

CO Attainment



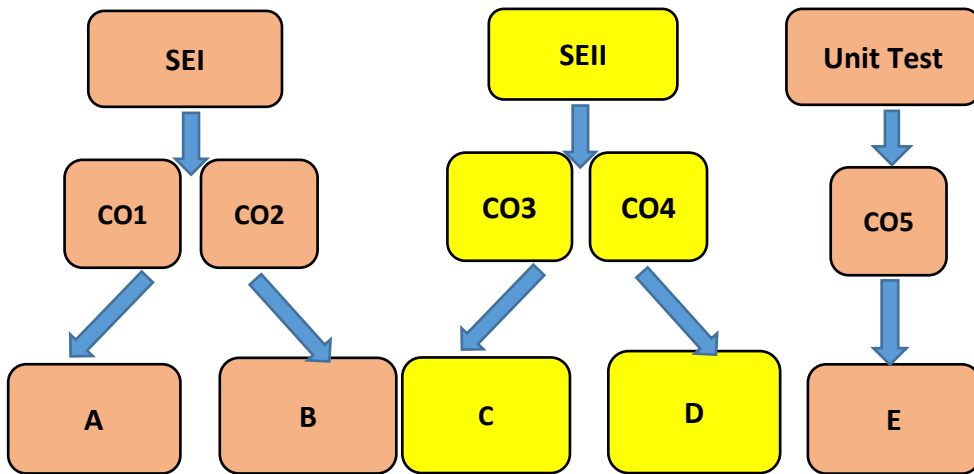
COs	Direct Attainment	Indirect Attainment	Overall Attainment	Attainment Level
CO1	82.7	88.7	83.9	3
CO2	86.6	84.0	86.1	3
CO3	86.1	83.1	85.5	3
CO4	73.2	76.2	73.8	2
CO5	86.1	77.8	84.5	3
CO6	93.1	90.1	92.5	3
CO7	100.0	93.1	98.6	3
Average Attainment Level				2.8

**Attainment Level**

- 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

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

**i. Sessional Examination and Unit Test**



**Fig 3.3. Contribution of COs in sessional and Unit Test examination**

Let us consider,

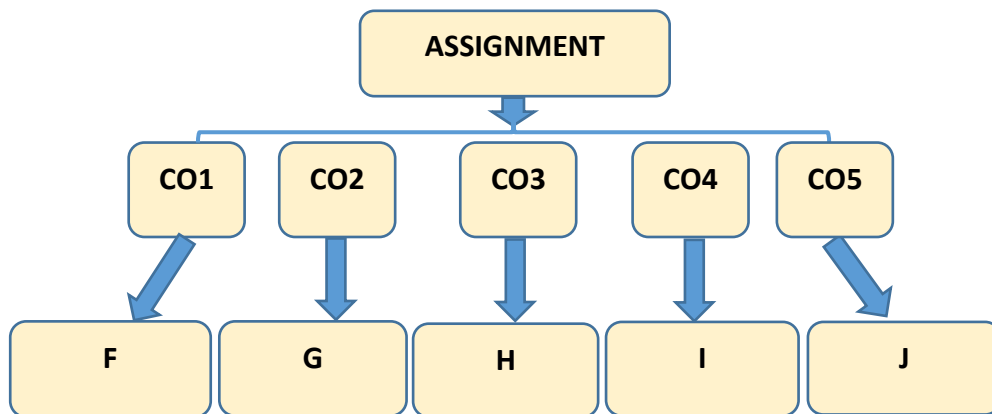
A - Contribution of CO1 in sessional examination I

B - Contribution of CO2 in sessional examination I

C - Contribution of CO3 in sessional examination II

D - Contribution of CO4 in sessional examination II

E - Contribution of CO5 in unit test



**Fig 3.4. Contribution of COs in assignment**

**ii. Assignment**

Let us consider,

F - Contribution of CO1 in Assignment.

G - Contribution of CO2 in Assignment.

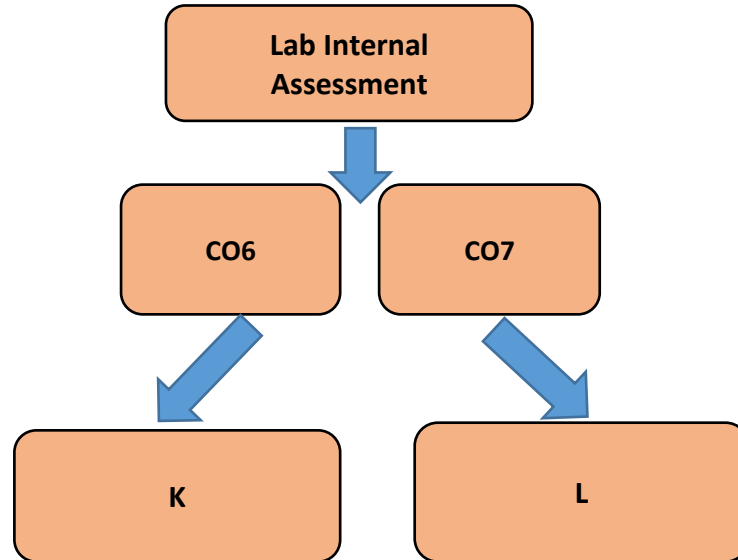
H - Contribution of CO3 in Assignment.



I - Contribution of CO4 in Assignment.

J - Contribution of CO5 in Assignment.

### iii. Laboratory Internal Assessment:



**Fig 3.5. Contribution of COs in Lab internal Assessment**

K - Contribution of CO6 in Lab internal assessment

L - Contribution of CO7 in Lab internal assessment

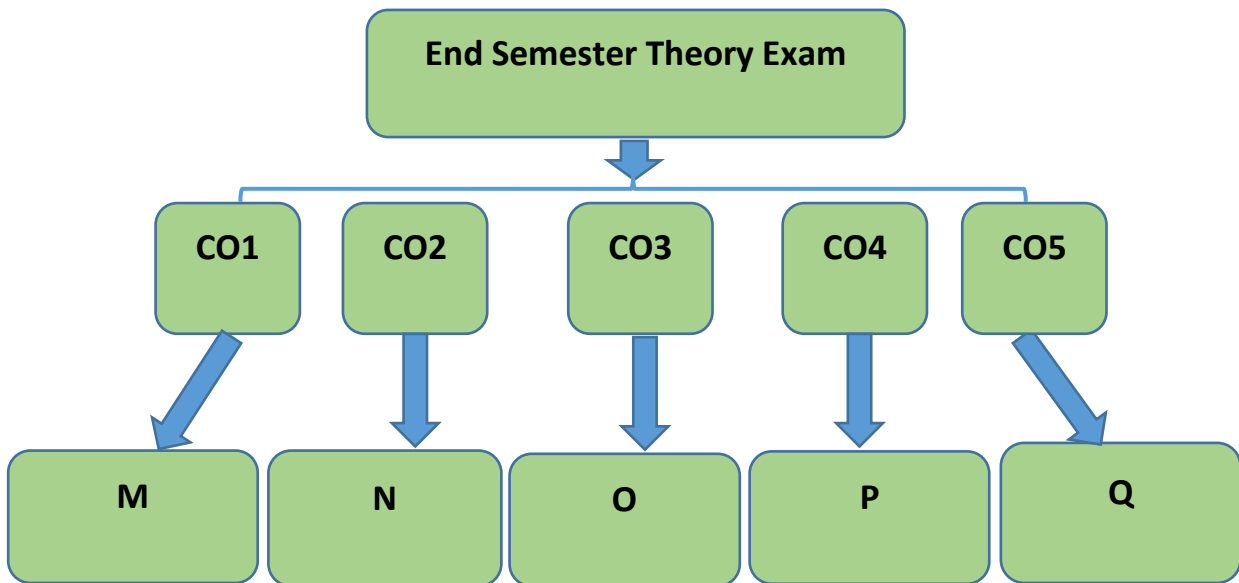
The course CSE18R371 / Computer Networks (Integrated course) offered during odd semester of third year of study for the batch 2017-21 is selected for CO attainment calculations. Fig 3.3, Fig 3.4 and Fig 3.5 shows the contribution of COs in sessional examinations, assignments and Lab internal assessment respectively. The benchmark score for a particular course is usually selected by course coordinator based upon previous year's results for this course and approved in the Program Advisory Board (PAB). To understand the calculations shown in Table 3.9, 'Y' indicates **CO attained** when the score of the individual is greater than the benchmark score and 'N' indicates **Not Attained**. Considering Table 3.9, the student shown in **Serial No:16 with** registration number 9917004009 scored 18 marks out of 30 marks for CO1 (A=18) from sessional exam - 1 and scored 9 marks out of 10 marks for CO1 (F=9) from the assignment. So, the cumulative internal attainment is calculated as per the assessment weightage Table 3.8 (35% from sessional exam and 15% from assignment). For CO1,  $A=18/30$  and  $H=9/10$  ( $35\%$  of A +  $15\%$  of H) is 34.5 out of 50. It indicates that the score is greater than the benchmark score fixed ( $34.5 > 50 \times (55/100)$ ). So, his attainment is marked as 'Y' for CO1 in case of internal assessment. To calculate the total number of students attained, we count the number of Y and N for each COs. The total number of Y and N is 190 and 41 respectively for CO1 out of 231 students. Therefore, the percent of students attained

CO1 from cumulative internal examination results 82.3% (i.e.  $190 / 239 = 82.3\%$ ) considering the bench mark. Similarly, we find all the COs attainment for this particular course through all the cumulative internal assessment. The calculated values are as follows.

- Attainment of CO1 = 82.3%
- Attainment of CO2 = 86.1%
- Attainment of CO3 = 82.7%
- Attainment of CO4 = 68%
- Attainment of CO5 = 79.7%
- Attainment of CO6 = 77.5%
- Attainment of CO7 = 100%

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

**i. End Semester Examination - Theory**



**Fig 3.6. Assessment process of CO attainment for End semester theory exam**

Let us consider,

M - Contribution of CO1 in End semester theory examination

N - Contribution of CO2 in End semester theory examination

O - Contribution of CO3 in End semester theory examination

P - Contribution of CO4 in End semester theory examination

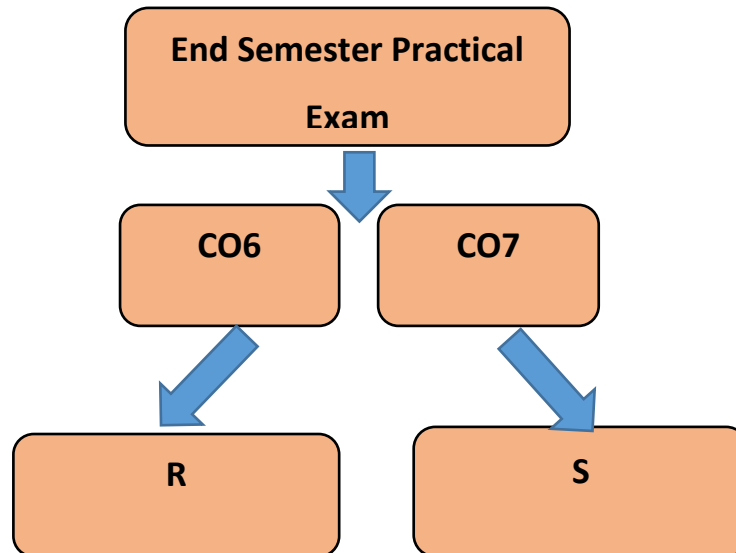
Q - Contribution of CO5 in End semester theory examination

**i. End Semester Examination - Practical**

Let us consider,

R - Contribution of CO6 in End semester practical examination

S - Contribution of CO7 in End semester practical examination



**Fig 3.7. Assessment process of CO attainment for End semester practical exam**

Fig 3.6 and Fig 3.7 shows the assessment process for end semester theory and practical examinations respectively for the same course, CSE18R371/Computer Networks. The same student with registration number 9917004009 (Serial No.16) scored 13 out of 20 in CO1, that is 65%. This is also above the benchmark score and therefore the student attained in CO1. The total number of students appeared and number of attainments for CO1 is 63.6%.

The calculated values are as follows,

Attainment of CO1 in End semester = 63.6%

Attainment of CO2 in End semester = 73.6%

Attainment of CO3 in End semester = 72.3%

Attainment of CO4 in End semester = 66.2%

Attainment of CO5 in End semester = 72.7%

Attainment of CO6 in End semester = 81%

Attainment of CO7 in End semester = 86%

**The direct CO attainment for the course CSE18R371 Computer Networks** is calculated in Table 3.10. It is calculated based on the weightage given below.

**Table 3.10. Direct Attainment for CSE18R371 – Computer Networks**

<i>Course Outcome (CO)</i>	<i>Attainment Contribution (50% of Internal + 50% of External)</i>	<i>No of Students Attained</i>	<i>Percentage of CO Attainment (%)</i>
CO1	35% of A + 15% of F + 50% of M	191	82.7
CO2	35% of B + 15% of G + 50% of N	200	86.6
CO3	35% of C + 15% of H + 50% of O	199	86.1
CO4	35% of D + 15% of I + 50% of P	169	73.2
CO5	35% of E + 15% of J + 50% of Q	199	86.1
CO6	50% of K + 50% of R	215	93.1
CO7	50% of L + 50% of S	231	100

**In-Direct CO attainment****Course exit survey:**

At the end of every semester, for every course offered to the students during that semester, a course end survey is conducted to assess the CO attainment from student point of view. Figure 3.8 is the scanned copies of Course exit survey form. The survey form includes questionnaires for the entire COs with a provision to mark whether the course has supported to build the knowledge or skill as mentioned in every CO of that course. Students will tick on the appropriate option on a five-point scale. Considerations on surveys are made as the marks calculated based on normalized value.

Again, the course CSE18R371 – Computer Networks, for CO1, 205 students chose the points 3 and above out of 231 students (88.7%). Similarly, 84%, 83.1%, 76.2%, 77.8%, 90.1% and 93.1% is attained for CO2, CO3, CO4, CO5, CO6 and CO7 respectively based on the students' answers. The indirect CO attainment for CSE18R371 – Computer Networks course is calculated in Table 3.9.

**Table 3.11 Indirect CO attainment for CSE18R371 – Computer Networks**

<i>COs</i>	<i>Percentage of Indirect Attainment</i>
<b>CO1</b>	<b>88.7</b>
<b>CO2</b>	<b>84.0</b>
<b>CO3</b>	<b>83.1</b>
<b>CO4</b>	<b>76.2</b>
<b>CO5</b>	<b>77.8</b>
<b>CO6</b>	<b>90.1</b>
<b>CO7</b>	<b>93.1</b>

**Overall CO attainment**

The overall CO attainment is calculated from direct and indirect attainment for every individual course. As already conveyed, the weightage given for direct attainment is 80% and 20% for indirect attainment.

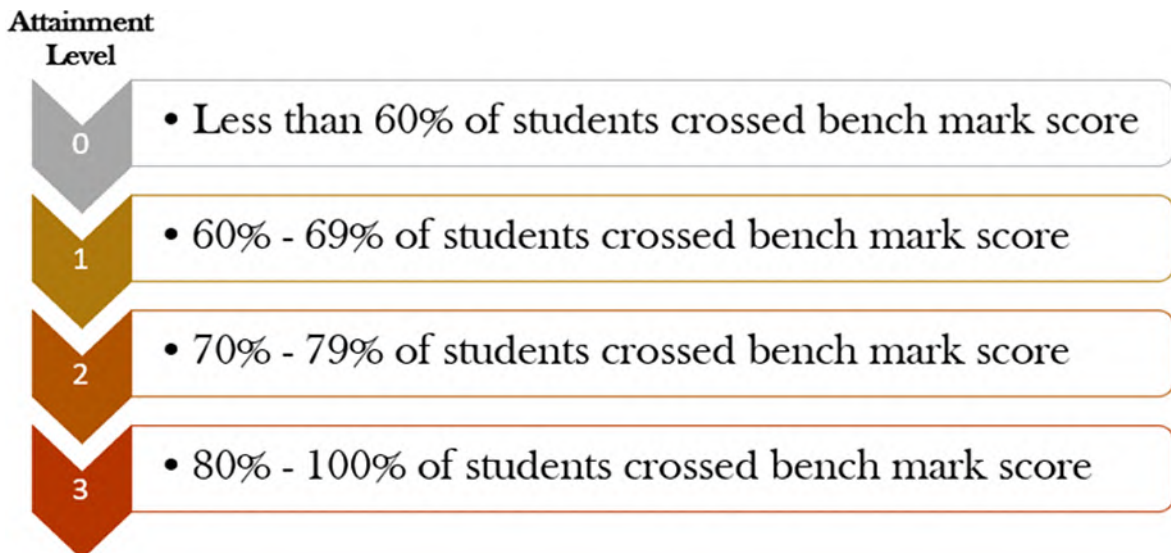
For the course CSE18R371 – Computer Networks, the overall CO attainment is calculated in Table 3.12.

**Table 3.12 Indirect CO attainment for CSE18R371 – Computer Networks**

COs	Direct Attainment	Indirect Attainment	Overall Attainment
CO1	82.7	88.7	83.9
CO2	86.6	84.0	86.1
CO3	86.1	83.1	85.5
CO4	73.2	76.2	73.8
CO5	86.1	77.8	84.5
CO6	93.1	90.1	92.5
CO7	100.0	93.1	98.6

**A.3.3 Attainment level**

The attainment level is calculated by referring the Fig 3.8, which clearly states 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. Finally, if attainment value is greater than 80% then the attainment level is 3.



**Fig 3.8. Attainment level indicators**

Table 3.13 shows the overall CO attainment with attainment level for the course CSE18R371 – Computer Networks.

**Table 3.13 Overall CO attainment with attainment level for the course CSE18R371 – Computer Networks.**

COs	Direct Attainment	Indirect Attainment	Overall Attainment	Attainment Level
CO1	82.7	88.7	83.9	3
CO2	86.6	84.0	86.1	3
CO3	86.1	83.1	85.5	3
CO4	73.2	76.2	73.8	2
CO5	86.1	77.8	84.5	3
CO6	93.1	90.1	92.5	3
CO7	100.0	93.1	98.6	3
<b>Average Attainment Level</b>				<b>2.8</b>

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

**Table 3.14 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"> <li>➤ Three sessional exams are conducted for every course</li> <li>➤ SE-I evaluates CO1 and CO2</li> <li>➤ SE-II evaluates CO3 and CO4</li> <li>➤ Unit Test evaluate CO5</li> <li>➤ The question papers are strictly prepared by using bloom's taxonomy.</li> <li>➤ The quality of question papers is ensured as follows.</li> </ul> <div style="text-align: center;"> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 0 auto;">Preparation of Question paper by course coordinator</div> <div style="font-size: 2em; margin: 5px 0;">↓</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 0 auto;">Module Coordinator verifies the question paper as per the bloom's taxonomy and GATE standards</div> <div style="font-size: 2em; margin: 5px 0;">↓</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 0 auto;">Program Coordinator Approval</div> </div>
	<i>End Semester Examination</i>	<ul style="list-style-type: none"> <li>➤ Two sets of question papers for each course are prepared in accordance with blooms taxonomy by internal experts.</li> <li>➤ Another set of question papers for each course is prepared in accordance with blooms taxonomy by external experts from reputed institutions like (NIT and Renowned institutions).</li> <li>➤ The End semester examination evaluates CO1, CO2, CO3, CO4 and CO5</li> <li>➤ Valuation are done by external experts</li> </ul>

		<ul style="list-style-type: none"> <li>➤ The controller of examination allocates internal and external experts to audit the question paper before examination to maintain the curriculum content and to avoid conflict on examinations. and also, to ensure the quality of valuation. Controller of examination allocates external experts for post auditing the corrected papers.</li> </ul>
<i>Direct Assessment Tools</i>	<i>Assignment</i>	<ul style="list-style-type: none"> <li>➤ Five assignments are given for every course corresponding to the COs. The assignments are given based on the knowledge level to be attained for every COs.</li> <li>➤ The course teacher will choose any one of the following tools for the assessment of the assignment.</li> <li>➤ Online / Offline Quiz</li> <li>➤ Mind Mapping</li> <li>➤ Online Coding Contest (Hackerrank, Mercer Mettl, Coderbyteetc)</li> <li>➤ Practical Assignment</li> <li>➤ Seminar</li> <li>➤ Assignments using innovative ICT tools – Hot potatoes, Puzzles, Placards, etc.</li> </ul>
	<i>Observation (Laboratory Sessions, Practical Examination)</i>	<ul style="list-style-type: none"> <li>➤ To evaluate student's practical knowledge with their programming level capabilities, evaluation is done for every lab session. Two lab internal assessments are done for the lab courses per semester.</li> <li>➤ The strength of the students in using their skills and tools in the laboratory is also evaluated in external laboratory examinations.</li> </ul>
	<i>Project and Community service projects</i>	<p><b>1. Main Project</b></p> <ul style="list-style-type: none"> <li>➤ Ten credits are allocated for project work</li> <li>➤ Project Review Committee constituted by project coordinator evaluates the continuous internal assessment based on the rubrics assigned by project coordinator</li> <li>➤ External experts evaluate the projects based on the rubrics assigned by the project coordinator during the viva voce exam.</li> </ul> <p><b>2. Community service project (CSP):</b></p> <ul style="list-style-type: none"> <li>➤ CSP is carried out in two phases in the third year with a total credit of three.</li> <li>➤ The CSP projects are evaluated by internal experts and CSP coordinator based on the rubrics assigned by CSP coordinator.</li> </ul>

<b>Indirect Assess ment Tools</b>	<b>Course end Survey</b>	<ul style="list-style-type: none"> <li>➤ Survey has been taken for all the courses at the end of every semester</li> <li>➤ The course teachers collect a variety of feedback through this survey about the attainment course outcomes from the students after learning entire courses.</li> <li>➤ The questionnaires are framed by the course coordinator to ensure the knowledge levels of all the course outcomes of the corresponding course.</li> <li>➤ The survey is evaluated based on a 5-point scale correlation level against all the course outcomes of the corresponding course.</li> </ul>
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### 3.2.2. Record the attainment of Course Outcomes of all courses with respect to set attainment levels

The target percentage of marks scored by the students is set by the course coordinator after approval by Program Advisory Board at the beginning of the semester. Table 3.15 shows the CO attainment for the batch 2017 – 2021.

**Table 3.15 Coursewise CO Attainment for the batch 2017-2021**

S. N o	Course Code	Course Name	CO Attainment
1	EEE17R151	Basic Electrical and Electronics Engineering	2.14
2	MEC17R101	Engineering Drawing	2.2
3	CIV17R101	Basic Civil Engineering	2
4	CSE17R171	Programming Language	2.43
5	MEC17R105	Basic Mechanical Engineering	2.2
6	MEC17R181	Engineering Practice Laboratory	2.4
7	ECE18R277	Digital Electronics	2.57
8	ECE18R221	Analog Electronics Circuits	2.2
9	CHY17R171	Chemistry	2.14
10	MAT17R102	Linear Algebra, Partial Differential Equations and Complex Variable	2
11	PHY17R151	Materials Physics – I	2.2
12	CHY17R101	Environmental Science	2
13	MAT17R101	Calculus and Differential Equations	1.83
14	PHY17R171	Engineering Physics	2



15	MAT18R202	Probability and Statistics	1.83
16	MAT18R207	Discrete Mathematics	2.17
17	BIT18R101	Biology for Engineers	2.2
18	HSS18R013	Professional Ethics	2.2
19	HSS18R015	Total Quality Management	2.4
20	HSS18R151	English for Technical Communication – I	2.2
21	HSS18R152	English for Technical Communication II	2.2
22	CSE18R181	Computer Workshop	3
23	CSE18R174	Computer Architecture and Organization	2.43
24	CSE18R172	Data Structure and Algorithms	2.57
25	CSE18R271	Object Oriented Programming	2.29
26	CSE18R273	Operating Systems	2.14
27	CSE18R173	Design and Analysis of Algorithms	2.14
28	CSE18R272	Java Programming	2.43
29	CSE18R252	Formal Language and Automata	2.4
30	CSE18R371	Computer Networks	2.57
31	CSE18R274	Compiler Design	2.43
32	CSE18R399	Community Service Project	3
33	INT18R371	Database Management Systems	2.71
34	CSE18R499	Project Work – Phase I	3
35	CSE18R498	Project Work – Phase II	3



<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>PSO</i>				
			<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
<i>Graduate Survey</i>	Yearly	Program Coordinator	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Alumni survey</i>	Yearly	Program Coordinator	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Employer survey</i>	Yearly	Program Coordinator	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The process of direct attainment assessment tool attainment is explained in table 3.17. It describes processes involved in theory courses and practical / laboratory courses under the category of direct assessment. Indirect assessments are completely based on surveys at the end of the semester as well as the program. Weightage is 80% for direct assessment (theory courses and practical / laboratory courses), 20% for indirect assessment.

**Table 3.17 List of Direct Assessment Tool for PO /PSO attainment**

<i>S. No</i>	<i>Assessment Tool</i>	<i>Method / Processes</i>
1	<i>Sessional Examinations</i>	<p>The course outcome attainment is the source input to calculate the PO attainment. The CO attainments are calculated based on the outcome of the following activities:</p> <ol style="list-style-type: none"> <li>1. Conducting three Sessional examinations per semester to evaluate the continuous performance of the students.</li> <li>2. Questions are set by the course coordinator.</li> <li>3. Questions are based on standard level by following Bloom's Taxonomy for evaluation.</li> <li>4. Valuations are made through sharing / exchanging the answer papers within the department by the course experts.</li> <li>5. Sessional examination question papers and answer scripts are audited regularly.</li> </ol>
2	<i>Assignment</i>	<ol style="list-style-type: none"> <li>1. An assignment is a qualitative performance assessment tool designed to assess the student's knowledge on engineering practices.</li> <li>2. Assignments should cover higher order Bloom's Taxonomy cognitive levels. Every student is assigned with course related tasks &amp; assessment will be done based on their performance. An analytic rubric is developed to assess student's knowledge with respect to the learning outcomes.</li> <li>3. Assignments can be given as Quiz, Seminar, Open Book Test, Case Studies, Industry expert-based evaluation, Research Article based evaluation etc. The course coordinator will fix any of the above corresponding to the course outcomes.</li> </ol>

<i>S. No</i>	<i>Assessment Tool</i>	<i>Method / Processes</i>
3	<i>End semester examinations</i>	<ol style="list-style-type: none"> <li>1. End semester examination questions set by internal / external experts.</li> <li>2. Valuation is made by different external experts and answer scripts are distributed to the students to maintain transparency in evaluation.</li> </ol>
4	<i>Laboratory (Internal Assessment and End semester Practical Examination)</i>	<ol style="list-style-type: none"> <li>1. 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. The assessment is done for regular lab exercises as well as internal practical exams.</li> <li>2. Practical examination is focused on assessing the practical knowledge, skill, and attitude of the students.</li> <li>3. The external examinations for laboratory courses are conducted at the end of the semester for three hours. It is evaluated based on rubrics framed by the course coordinator for the corresponding lab course.</li> </ol>
5	<i>Project</i>	<ol style="list-style-type: none"> <li>1. Students are assigned either internal or external projects.</li> <li>2. The project review committee is formed internally to approve and evaluate the research in four stages as (i) Zeroth Review; (ii) First Review and (iii) Second Review and (iv) Third Review.</li> <li>3. Students need to volunteer to present their project in reputed conferences / symposium organized by leading academic institutes.</li> <li>4. External Examiners are invited to evaluate the project through the viva voce examination.</li> </ol>

The table 3.18 shows the process of indirect attainment tools for PO/PSO attainment.

**Table 3.18 List of Indirect Assessment Tool / Processes for PO attainment**

<i>S. No</i>	<i>Assessment Tool</i>	<i>Method Description / Processes</i>
1.	<i>Alumni survey</i>	<ol style="list-style-type: none"> <li>1. Survey is made with a set of Questionnaires which was prepared based on POs.</li> <li>2. This survey is taken from graduated students.</li> </ol>
2.	<i>Graduate Survey</i>	<ol style="list-style-type: none"> <li>1. Survey made with a set of Questionnaires which was prepared based on POs.</li> <li>2. This survey is taken from the students completing the graduation at the end of that academic year after their final semester.</li> </ol>
3.	<i>Employer Survey</i>	<ol style="list-style-type: none"> <li>1. Survey made with a set of Questionnaires which was prepared based on POs.</li> <li>2. These surveys have been taken with the employer of the passed-out students.</li> </ol>
4.	<i>Co-Curricular and Extra Curricular activities (Non-CGPA)</i>	At the end of every academic year, the Non-CGPA coordinator will review the statistics of students who have participated in professional bodies/student chapters/workshops/seminars/ conferences/ paper presentations

		/internships /industry visitsetc and gained the pass certificate in the concerned co-curricular / extra-curricular course.
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### **Direct Assessment**

The POs and PSOs are quantitatively measured by assigning weights with respect to the correlation of CO and POs/PSOs 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.

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

**Table 3.19 Model calculation for PO1 attainment for 2017 – 2021 batch**

<i>Sub Code</i>	<i>PO1 Correlation</i>	<i>Correlation level</i>	<i>CO Attainment</i>	<i>Model Calculation [Wi X CO Attained]</i>
1	EEE17R151	3	2.14	2.14
2	MEC17R101	3	2.2	2.2
3	CIV17R101	3	2	2
4	CSE17R171	3	2.43	2.43
5	MEC17R105	3	2.2	2.2
6	MEC17R181	3	2.4	2.4
7	ECE18R277	3	2.57	2.57
8	ECE18R221	3	2.2	2.2
9	CHY17R171	3	2.14	2.14
10	MAT17R102	3	2	2
11	PHY17R151	3	2.2	2.2
12	CHY17R101	2	2	1.34
13	MAT17R101	3	1.83	1.83
14	PHY17R171	3	2	2
15	MAT18R202	3	1.83	1.83
16	MAT18R207	3	2.17	2.17
17	BIT18R101	3	2.2	2.2
18	HSS18R015	1	2.4	0.792
19	CSE18R181	3	3	3

<i>Sub Code</i>	<i>PO1 Correlation</i>	<i>Correlation level</i>	<i>CO Attainment</i>	<i>Model Calculation [Wi X CO Attained]</i>
20	CSE18R174	3	2.43	2.43
21	CSE18R172	3	2.57	2.57
22	CSE18R271	3	2.29	2.29
23	CSE18R273	3	2.14	2.14
24	CSE18R173	3	2.14	2.14
25	CSE18R272	3	2.43	2.43
26	CSE18R252	3	2.4	2.4
27	CSE18R371	3	2.57	2.57
28	CSE18R274	3	2.43	2.43
29	CSE18R399	3	3	3
30	INT18R371	3	2.71	2.71
31	CSE18R499	3	3	3
32	CSE18R498	3	3	3
Total Value				72.752
<b>PO1 Attainment = <math>\frac{72.752}{32}</math></b>				<b>2.273</b>

Model calculation for PO attainment for first program outcome PO1 is given in Table 3.19. A Similar procedure has been followed to calculate remaining PO / PSO attainment for the concerned batch. Table 3.20 shows the PO attainment through direct measures for the 2017-2021 batch.

**Table 3.20 shows the Direct PO attainment for the Batch 2017-2021**

<i>PO Attainment</i>	<i>PO1</i>	<i>PO2</i>	<i>PO3</i>	<i>PO4</i>	<i>PO5</i>	<i>PO6</i>	<i>PO7</i>	<i>PO8</i>	<i>PO9</i>	<i>PO1 0</i>	<i>PO1 1</i>	<i>PO1 2</i>	<i>PSO 1</i>	<i>PSO 2</i>	<i>PSO 3</i>	<i>PSO 4</i>
<i>Direct Attainment</i>	2.2	2.2	2.1	2.1	2.1	1.9	2.0	1.7	1.8	2.3	1.8	2.0	2.3	2.1	1.9	1.5
	7	4	9	8	3	0	1	4	8	3	5	9	0	2	1	0

### Indirect Assessment

The various indirect attainment tools are,

1. Graduate Survey
2. Employer Survey
3. Alumni Survey
4. Co-Curricular and Extra Curricular Activities (Non-CGPA)

### Graduate Survey

Graduate Feedback survey is conducted to determine the strength of attainment level of POs/PSOs at the end of every academic year from the current graduates of the programme. Figure 3.9 is the scanned copy of the Graduate feedback form. The survey form includes questionnaires for all the POs and PSOs with a provision to mark whether the programme has supported to build the knowledge and skills. For every question, students can tick on the appropriate column given as five-point scales. Considerations on surveys are made as the marks calculated based on normalized value.



**SCHOOL OF COMPUTING**  
**DEPARTEMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**GRADUATE FEEDBACK SURVEY ON PROGRAMME**

Name of the Graduate	B. Ramegh Babu
Year of Passing	2019

Please Indicate how well do you achieved these objectives for this programme B.Tech (Computer Science and Engineering). Please use a scale of 1 to 5 to rate how strongly you feel you have achieved these objectives.

\* (1 indicating NOT and 5 indication STRONGLY achieved them)

Objectives	5	4	3	2	1
PO1: Engineering knowledge: I have gained an in-depth knowledge of mathematics, computer science and engineering as it applies to computer hardware and software.	✓				
PO2: Problem analysis: I have an ability to identify, formulate, and solve hardware and software computing problems, accounting for the interaction between hardware and software.	✓				
PO3: Design/development of solutions: I am able to apply my engineering knowledge to design hardware and software systems, components, or processes to meet desired needs within realistic constraints.	✓				
PO4: Conduct investigations of complex problems: I am able to design and conduct experiments, as well as to organize, analyze and interpret data.		✓			
PO5: Modern tool usage: I have had the opportunity to use the techniques, skills, and modern engineering tools necessary for computer engineering practice.		✓			
PO6: The engineer and society: Able to show the understanding of impact of engineering solutions in a global on the society, economic, environmental.			✓		
PO7: Environment and sustainability: I am able to understand the impact of the computer based solutions in societal and environmental context.			✓		
PO8: Ethics: I have had the opportunity to learn professional, legal, and ethical issues and responsibilities.			✓		
PO9: Individual and team work: I have the training necessary to work individually or as a member with responsibility to function on multi-disciplinary teams.	✓				
PO10: Communication: I am able to communicate effectively in speech and in writing, including documentation of hardware and software systems.		✓			
PO11: Project management and finance: I have had the opportunity to learn and apply engineering and management knowledge and techniques to estimate time and resources needed to complete a computer engineering				✓	

PO12: Life-long learning: I have an ability to acquire new knowledge in the computing discipline and to engage in life-long learning.		✓			
PSO1 : Problem-Solving Skills : I have the ability to apply engineering knowledge to analyze, design and develop cost effective computing solutions for complex problems.	✓				
PSO2: Professional Skills: I have the ability to apply modern tools and strategies in software project development using modern programming environments to deliver a quality product for business accomplishment.	✓				
PSO3: Communication and Team Skill: I have the ability to exhibit proficiency in oral and written communication as individual or as part of a team to work effectively with professional behaviours and ethics.		✓			
PSO 4: Successful Career and Entrepreneurship: I have the ability to create a inventive career path by applying innovative project management techniques to become a successful software professional, an entrepreneur or zest for higher studies.				✓	

Please offer any other additional comments.

*P. S. S.*  
Signature

**Fig.3.9. Scanned copy of Graduate Feedback Form**

**Alumni Survey**

Alumni feedback survey is conducted to determine the strength of attainment level of POs/PSOs at the end of every academic year from the alumni **upto three years after the graduation from the programme.** Figure 3.10 is the scanned copy of Alumni feedback form. The survey form includes questionnaires for all the POs with a provision to mark whether the programme has supported to build the knowledge and skill. Students can tick on the appropriate column in five-point scales. Considerations on surveys are made as the marks calculated based on normalized value.





**KALASALINGAM**  
**ACADEMY OF RESEARCH & EDUCATION**  
**(DEEMED TO BE UNIVERSITY)**  
 Under sec. 3 of UGC Act 1956. Accredited by MARC with "A" Grade



SCHOOL OF COMPUTING  
 DEPARTEMENT OF COMPUTER SCIENCE AND ENGINEERING  
ALUMNI SURVEY ON PROGRAMME

Name of the Graduate	E. ARAVIND
Year of Passing	2018
Current Employer	WIPRO
Position & Job Function	Software Developer.

Please indicate how well do you achieved these objectives for this programme B.Tech (Computer Science and Engineering). Please use a scale of 1 to 5 to rate how strongly you feel you have achieved these objectives.

\* (1 indicating NOT and 5 indication STRONGLY achieved them)

Objectives	5	4	3	2	1
How far did the VISION and MISSION of the department accomplish your professional career?	✓				
How do you rate the engineering knowledge obtained during course period? (PO1)	✓				
How do you find the programme related to problem analysis? (PO2)		✓			
Were able to design solutions for complex engineering problems? (PO3)		✓			
Did you use research-based knowledge for interpreting your data during project work? (PO4)		✓			
How this programme helped in applying modern tool usage for your problems? (PO5)		✓			
How do you rate your understanding of impact of engineering solutions in a global on the society, economic, environmental aspects? (PO6)		✓			
Did you understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. (PO7)		✓			
Were you able to apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice? (PO8)		✓			
Did you have opportunity to function as an individual or in a team? (PO9)	✓				

How do you rate your skill of communicating effectively in speech and in writing, including documentation of hardware and software systems? (PO10)		✓		
Were you able to manage project and finance aspects effectively in your work environment? (PO11)			✓	
How far this programme helped you to acquire new knowledge in the computing discipline and to engage in life-long learning? (PO12)			✓	
Whether this programme cultivated the skills to design, develop, implement computer programs and use knowledge in various domains to identify research gaps and hence to provide solution to new ideas and innovations? (PSO1)	✓			
Were you able to apply modern tools and strategies in software project development using modern programming environments to deliver a quality product for business accomplishment. (PSO2)		✓		
Were you able to work with and communicate effectively with professionals in various fields with professional behaviours and ethics? (PSO3)		✓		
Were you able to create a inventive career path by applying innovative project management techniques to become a successful software professional, an entrepreneur or zest for higher studies. (PSO4)			✓	

Please offer any other additional comments.

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*G. Chand*  
Signature

**Fig.3.9. Scanned copy of Alumni Feedback Form**

**Employer Survey:**

Employer Feedback is conducted every academic year to determine the strength of the attainment level of POs/PSOs from the employer. Figure 3.11 is the scanned copy of the Employer feedback form. The survey form includes questionnaires for all the POs/PSOs with a provision to mark whether the programme has supported to build the knowledge as per levels 1, 2 & 3 (i.e. Somewhat Satisfied, Satisfied and Extremely Satisfied). Considerations on surveys, The marks are calculated based on normalized values.



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SCHOOL OF COMPUTING  
 DEPARTEMENT OF COMPUTER SCIENCE AND ENGINEERING

Employer Feedback Survey

The faculty and students of KARE are dedicated to the continuous improvement of engineering programmes. The information that you provide through this survey will be very helpful in this process. We appreciate your help in filling out this survey. Thank you for your cooperation and support.

Name of the Employer : A. DINESH  
 Designation : Senior Software Architect  
 Name of the Company/Organization : Accenture  
 Address : IBC Knowledge Park, Bangalore

Please Indicate how well do you agree with each Program Outcomes POs and PSOs as a predicted accomplishment for this programme B.Tech (Computer Science and Engineering).

Programme Outcomes (POs)	Extremely Satisfied	Satisfied	Somewhat Satisfied
What is your impression about the overall skills of the KARE graduates?			
PO1: Engineering knowledge: How satisfied were you with the information provided by the department about the skills and knowledge of the student for campus recruitment?	✓		
PO2: Problem analysis: How do you rate our students' ability to identify, formulate, and solve hardware and software computing problems?	✓		
PO3: Design/development of solutions: How did you find our student, with respect to design and development of new products or solutions?	✓		
PO4: Conduct investigations of complex problems: Your view on our students, regarding investigating new problems in the industry and interpretation of data.	✓		
PO5: Modern tool usage: How fit is our graduate in applying modern tools for solving problems?	✓		
PO6: The engineer and society: How responsible are our graduates in contextual knowledge to assess societal, health, safety, legal and cultural issues?		✓	
PO7: Environment and sustainability: Your rating on our student in handling environmental contexts?		✓	
PO8: Ethics: Your opinion about our graduates with respect to their ethical and moral values?	✓		

PO9: Individual and team work:How do our students present themselves individually and in team work?	✓		
PO10: Communication:Our student's skill in communicatingeffectively in speech and in writing, including documentation of software systems.	✓		
PO11: Project management and finance:How do you find our students performance in understanding project management and financial principles of the company?	✓		
PO12: Life -long learning:Rating of our students with respect toattitude and willingness for lifelong learning?		✓	
<b>Program Specific Outcomes(PSOs)</b>	<b>Extremely Satisfied</b>	<b>Satisfied</b>	<b>Somewhat Satisfied</b>
PSO1 : Problem-Solving Skills : Are our graduates able to find problems in various domains of Computer Science and provide innovative solutions?	✓		
PSO2: Professional Skills:Are our graduates able to apply modern tools and strategies in software project development using modern programming environments to deliver a quality product for business accomplishment.	✓		
PSO3: Communication and Team Skill: Are our graduates able to work with, and communicate effectively with professionals in various fieldswith professional behaviours and ethics.?	✓		
PSO 4: Successful Career and Entrepreneurship: Are our graduates able to create a inventive career path by applying innovative project management techniques to become a successful software professional, an entrepreneur or zest for higher studies.		✓	

Your detailed comments on our graduate employees: (Optional).

Entrepreneurship oriented outcomes can be focused in life-long learning & project management contents

Thank you for taking the time to answer our questions. Your feedback is tremendously valuable to us.

  
Signature

**Fig.3.11. Scanned copy of Employer Feedback Form**

**Co-Curricular and Extra Curricular Activities:**

Our university offers the following co-curricular and extra-curricular activities under the category Non-CGPA courses. All the courses under this category have been designed for the overall development of the students passing out of the Institution. As per our university regulation the student must complete three credits and a minimum of one credit in all three groups of this category. The table 3.21 shows the list of Non-CGPA courses.

**Table 3.21 – List of Non-CGPA Courses for 2017-2021 Batch**

<i>Sl. No.</i>	<i>Group</i>	<i>Course Code</i>	<i>Course Name</i>
1	I	NG18R1001	NCC
2		NG18R1002	NSS
3		NG18R1003	Sports
		NG18R1004	Extracurricular Activities
4	II	NG18R2002	Value Added Course
5		NG18R2003	International Certification (Technical)
		NG18R2004	Cocurricular Activities
7	III	NG18R3002	English Proficiency Certification (TOFEL/IELTS/BEC)
8		NG18R3003	Aptitude Proficiency Certification (GRE/GMAT/CAT/GATE..)
9		NG18R3004	National / International Languages (Hindi / French / German / Japanese / Korean..)

The details for NG18R2002 -VALUE ADDED COURSE is presented in table 3.22.

**Table 3.22 - Details NG18R2002Value Added Courses**

<b>S. No</b>	<b>Conditions / attributes</b>	<b>Fulfilling requirement(s)</b>
1.	Pre-requisites / Eligibility conditions	A Bonafide student of the Kalasalingam Academy of Research and Education
2.	Detailed course content / syllabus	As prescribed by the course teacher / Course coordinator in consultation with the Director - Academic
3.	Duration of the course, total number of hours and minimum attendance requirement	40 Hours duration Minimum attendance: 80 %.
4.	Number of contact hours and practice hours per week	As laid down by the course teacher / Coordinator
5.	Assessment Procedure – Tests, Examination	Assessment will be done by the teacher at the end of the course
6.	Criteria for allocation of credits and conditions for repeating the training, in case of failure.	The students should score a minimum of 60% marks.
7.	Any rules to be adhered to, specific to the individual courses	Nil
8.	List of value-added courses offered and its content	The value-added courses and its content will be specified by the course coordinator after getting approval from respective BoS.

The department level non-CGPA coordinator will review and collect the status of completion of non-CGPA courses by the students. At the end of every academic year, the non-CGPA coordinator will prepare the statistics of students who have participated in professional bodies / student chapters / workshops / seminars/ conferences / paper presentations / internships /industry visits etc. This statement is considered to indirectly assess the POs.

The indirect attainment for PO and PSOs are listed in Table 3.23.

**Table 3.23 shows the Indirect PO attainment for the Batch 2017-2021**

<i>PO Attainment</i>	<i>PO 1</i>	<i>PO 2</i>	<i>PO 3</i>	<i>PO 4</i>	<i>PO 5</i>	<i>PO 6</i>	<i>PO 7</i>	<i>PO 8</i>	<i>PO 9</i>	<i>PO 10</i>	<i>PO 11</i>	<i>PO 12</i>	<i>PS O1</i>	<i>PS O2</i>	<i>PS O3</i>	<i>PS O4</i>
<i>Graduate Survey</i>	3	3	3	3	3	2	2	2	3	3	3	3	3	3	3	2
<i>Employer Survey</i>	3	3	3	3	2	2	2	3	2	2	2	3	2	2	2	2
<i>Alumni Survey</i>	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3	2
<i>Non CGPA</i>	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
<i>Average</i>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2.5</b>	<b>2.2</b>	<b>2.2</b>	<b>2.5</b>	<b>2.7</b>	<b>2.7</b>	<b>2.7</b>	<b>3</b>	<b>2.7</b>	<b>2.7</b>	<b>2.7</b>	<b>2.2</b>

Final PO Attainment level is considered as 80% from direct assessment and 20% from indirect assessment.

**For Example:** PO1 attainment is 2.27 from direct assessment and 3 from indirect assessment.

Hence, final PO attainment is calculated as follows

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

$$\Rightarrow 2.27 \times 0.8 + 3 \times 0.2$$

$$\Rightarrow \mathbf{2.42}$$

The Program Advisory Board (PAB) of Computer Science and Engineering program will fix the target value for POs and PSOs attainment based on the observations learned from previous batch POs and PSOs attainment. For the 2017-2021 batch, the PAB has a fixed target attainment value as 2 for all POs and PSOs. We have observed that PO1 attainment value was 2.42. It's greater than our target attainment (2). Therefore, PO1 has been attained. Similarly, the attainments are calculated for all the POs and PSOs and the same are tabulated in the table 3.24.

**Table 3.24 shows the Overall PO Attainment for the Batch 2016-2020**

<i>PO Attainment</i>	<i>PO1</i>	<i>PO2</i>	<i>PO3</i>	<i>PO4</i>	<i>PO5</i>	<i>PO6</i>	<i>PO7</i>	<i>PO8</i>	<i>PO9</i>	<i>PO10</i>	<i>PO11</i>	<i>PO12</i>	<i>PSO1</i>	<i>PSO2</i>	<i>PSO3</i>	<i>PSO4</i>
<i>Direct Attainment</i>	2.27	2.24	2.19	2.18	2.13	1.90	2.01	1.74	1.88	2.33	1.85	2.09	2.30	2.12	1.91	1.50
<i>Indirect Attainment</i>	3.00	3.00	3.00	3.00	2.50	2.25	2.25	2.50	2.75	2.75	2.75	3.00	2.75	2.75	2.75	2.25
<i>Overall Attainment</i>	2.42	2.39	2.35	2.34	2.21	1.97	2.06	1.89	2.06	2.41	2.03	2.27	2.39	2.24	2.08	1.65

### 3.3.2. Provide results of evaluation of each PO & PSO (65)

#### Results and level of attainment of each PO/PSO

##### Direct Attainment:

S.No.	Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
1	EEE17R151	2.14	2.14							1.43	2.14						
2	MEC17R101	2.20	2.20							1.47	2.20						
3	CIV17R101	2.00	2.00							1.34	2.00						
4	CSE17R171	2.43	2.43	2.43	2.43	2.43	1.63	1.63	2.43	1.63	2.43	2.43	2.43	2.43	2.43	2.43	1.63
5	MEC17R105	2.20	2.20							1.47	2.20						
6	MEC17R181	2.40	2.40							1.61	2.40						
7	ECE18R277	2.57	2.57	2.57	2.57	2.57		1.72	2.57	1.72	2.57	1.72		2.57	2.57	1.72	0.85
8	ECE18R221	2.20	2.20	1.47	2.20	2.20		2.20	1.47	0.73		1.47		2.20	2.20	0.73	0.73
9	CHY17R171	2.14	2.14	0.71	0.71	0.71		1.43						2.14	0.71		0.71
10	MAT17R102	2.00	2.00			2.00								1.34			
11	PHY17R151	2.20	2.20	1.47	1.47	2.20			0.73	0.73		0.73		2.20	0.73		1.47
12	CHY17R101	1.34	1.34					2.00									
13	MAT17R101	1.83	1.83			1.83								1.23			
14	PHY17R171	2.00	2.00			2.00				1.34	1.34						
15	MAT18R202	1.83	1.83		1.23	1.83								1.23			
16	MAT18R207	2.17	2.17		1.45	2.17								2.17			
17	BIT18R101	2.20	2.20		2.20	1.47											
18	HSS18R013						1.47		2.20	2.20	2.20	2.20	1.47		1.47	2.20	1.47
19	HSS18R015	0.79					1.61	1.61	1.61	2.40	2.40	1.61	1.61				1.61
20	HSS18R151								0.73	2.20	2.20		1.47			1.47	
21	HSS18R152								0.73	2.20	2.20		1.47			1.47	
22	CSE18R181	3.00	2.01	2.01	2.01	2.01			2.01	3.00	3.00		3.00		3.00	2.01	3.00
23	CSE18R174	2.43	2.43	1.63	2.43	1.63		1.63	1.63	2.43	2.43	1.63	2.43	2.43	1.63	2.43	1.63
24	CSE18R172	2.57	2.57	2.57	2.57	1.72			1.72	2.57	2.57	0.85	1.72	2.57	2.57	2.57	0.85



25	CSE18R271	2.29	2.29	2.29	2.29	2.29	1.53		2.29	2.29	2.29	1.53	1.53	2.29	2.29	1.53	1.53
26	CSE18R273	2.14	1.43	1.43	1.43	2.14	1.43	1.43	1.43	1.43	2.14	1.43	1.43	2.14	1.43	1.43	0.71
27	CSE18R173	2.14	2.14	1.43	2.14	1.43	1.43		1.43	2.14	2.14	1.43	2.14	2.14	1.43		1.43
28	CSE18R272	2.43	2.43	2.43	2.43	2.43	1.63		2.43	2.43	2.43	1.63	2.43	2.43	2.43	1.63	1.63
29	CSE18R252	2.40	2.40	2.40	2.40	2.40	1.61		0.79	0.79	2.40	1.61	1.61	2.40	2.40	1.61	2.40
30	CSE18R371	2.57	2.57	2.57	2.57	2.57	1.72	1.72	1.72	2.57	2.57	2.57	2.57	2.57	1.72	2.57	1.72
31	CSE18R274	2.43	1.63	2.43	1.63	1.63				0.80	2.43	1.63	1.63	2.43	1.63	1.63	0.80
32	CSE18R399	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.01	2.01	3.00	2.01	3.00	3.00	3.00	2.01	2.01
33	INT18R371	2.71	2.71	2.71	2.71	2.71	2.71	1.82	1.82	1.82	1.82	2.71	2.71	2.71	2.71	1.82	0.89
34	CSE18R498	3.00	3.00	3.00	3.00	3.00		3.00		3.00	2.01	3.00		3.00	3.00	2.01	
35	CSE18R499	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
<b>Average</b>		<b>2.27</b>	<b>2.24</b>	<b>2.19</b>	<b>2.18</b>	<b>2.13</b>	<b>1.90</b>	<b>2.01</b>	<b>1.74</b>	<b>1.88</b>	<b>2.33</b>	<b>1.85</b>	<b>2.09</b>	<b>2.30</b>	<b>2.12</b>	<b>1.91</b>	<b>1.50</b>

**Indirect Attainment:**

<i>PO Attainment</i>	<i>PO1</i>	<i>PO2</i>	<i>PO3</i>	<i>PO4</i>	<i>PO5</i>	<i>PO6</i>	<i>PO7</i>	<i>PO8</i>	<i>PO9</i>	<i>PO10</i>	<i>PO11</i>	<i>PO12</i>	<i>PSO1</i>	<i>PSO2</i>	<i>PSO3</i>	<i>PSO4</i>
<i>Graduate Survey</i>	3	3	3	3	3	2	2	2	3	3	3	3	3	3	3	2
<i>Employer Survey</i>	3	3	3	3	2	2	2	3	2	2	2	3	2	2	2	2
<i>Alumni Survey</i>	3	3	3	3	2	2	2	2	3	3	3	3	3	3	3	2
<i>Non CGPA</i>	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
<i>Average</i>	<b>3</b>	<b>3.00</b>	<b>3.00</b>	<b>3.00</b>	<b>2.50</b>	<b>2.25</b>	<b>2.25</b>	<b>2.50</b>	<b>2.75</b>	<b>2.75</b>	<b>2.75</b>	<b>3.00</b>	<b>2.75</b>	<b>2.75</b>	<b>2.75</b>	<b>2.25</b>

**Overall Attainment:**

<i>PO Attainment</i>	<i>PO1</i>	<i>PO2</i>	<i>PO3</i>	<i>PO4</i>	<i>PO5</i>	<i>PO6</i>	<i>PO7</i>	<i>PO8</i>	<i>PO9</i>	<i>PO10</i>	<i>PO11</i>	<i>PO12</i>	<i>PSO1</i>	<i>PSO2</i>	<i>PSO3</i>	<i>PSO4</i>
<i>Direct Attainment</i>	2.27	2.24	2.19	2.18	2.13	1.90	2.01	1.74	1.88	2.33	1.85	2.09	2.30	2.12	1.91	1.50
<i>Indirect Attainment</i>	3.00	3.00	3.00	3.00	2.50	2.25	2.25	2.50	2.75	2.75	2.75	3.00	2.75	2.75	2.75	2.25
<i>Overall Attainment</i>	2.42	2.39	2.35	2.34	2.21	1.97	2.06	1.89	2.06	2.41	2.03	2.27	2.39	2.24	2.08	1.65

<b>CRITERIA 4</b>	
<b>STUDENT'S PERFORMANCE</b>	<b>100</b>

Table 4.1 Enrolment Ratio

<b>Item (Information to be provided cumulatively for all the shifts with explicit headings, wherever applicable)</b>	<b>CAY (2021-2022)</b>	<b>CAYm1 (2020-2021)</b>	<b>CAYm2 (2019-2020)</b>	<b>CAYm3 (2018-2019)</b>	<b>CAYm4 (2017-18)</b>	<b>CAYm5 (2016-17)</b>	<b>CAYm6 (2015-16)</b>	<b>CAYm7 (2014-15)</b>
Sanctioned intake of the program (N)	<b>240</b>	<b>240</b>	<b>240</b>	<b>240</b>	<b>240</b>	<b>240</b>	<b>240</b>	<b>60</b>
Total number of students admitted in first year minus number of students migrated to other programs/ institutions, plus no. of students migrated to this program(N1)	<b>240</b>	<b>240</b>	<b>240</b>	<b>218</b>	<b>224</b>	<b>236</b>	<b>232</b>	<b>60</b>
Number of students admitted in 2 <sup>nd</sup> year in the same batch via lateral entry (N2)	<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>4</b>
Separate division students, if applicable (N3)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Total number of students admitted in the program (N1+N2+N3)	<b>242</b>	<b>240</b>	<b>242</b>	<b>221</b>	<b>231</b>	<b>239</b>	<b>236</b>	<b>64</b>

Table 4.2

Year of entry	Total No of students admitted in the program (N1+N2+N3) (As defined above)	Number of students who have successfully graduated in stipulated period of study without Backlog/year of study (Without Backlog means no compartment or failures in any semester/year of study)			
		I Year	II Year	III Year	IV Year
CAY(2021-22)	242 (240+2+0)				
CAYm1(2020-21)	240 (240+0+0)	240			
CAYm2 (2019-20)	242 (240+2+0)	240	241		
CAYm3 (2018-19)	221(218+3+0)	177	174	174	
CAYm4 (2017-18)	231(224+7+0)	138	135	133	133
CAYm5 (LYG) (2016-17)	239	128	108	108	108
CAYm6 (LYGm1) (2015-16)	236	93	77	76	76
CAYm7 (LYGm2) (2014-15)	64	41	29	28	28

Table 4.3

Year of entry	Total No of students admitted in the program (N1+N2+N3) (As defined above)	Number of students who have successfully graduated in stipulated period of study) [Total of with Backlog + without Backlog]			
		I Year	II Year	III Year	IV Year
CAY(2021-22)	240 (240+2+0)				
CAYm1(2020-21)	240 (240+0+0)	240			
CAYm2 (2019-20)	242 (240+2+0)	240	241		
CAYm3 (2018-19)	221(218+3+0)	218	220	220	
CAYm4 (2017-18)	231(224+7+0)	224	231	231	231
CAYm5 (LYG) (2016-17)	239 (236+3)	236	239	239	218

CAYm6 (LYGm1) (2015-16)	236 (232+4)	232	227	227	226
CAYm7 (LYGm2) (2014-15)	64 (60+4)	60	59	59	57

#### 4.1. Enrolment Ratio (20)

Enrolment Ratio=  $N1/N=100$

	N (From Table 4.1)	N1 (From Table 4.1)	Enrollment Ratio [(N1/N)*100]
2021-22 (CAY)	240	240	100
2020-21 (CAYm1)	240	240	100
2019-20 (CAYm2)	240	240	100
2018-19 (CAYm3)	240	218	90.83

Average [(ER1+ER2+ER3)/3]: 100

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

##### 4.2.1. Success rate without backlogs in any semester/year of study (15)

*SI= (Number of students who have graduated from the program without backlog)/(Number of students admitted in the first year of that batch and actually admitted in 2nd year via lateral entry and separate division, if applicable)*

*Average SI = Mean of Success Index (SI) for past three batches*

*Success rate without backlogs in any semester/year of study = 15 × Average SI*

Item	Last Year of Graduate minus 1, LYGm1(2020-21)	Last Year of Graduate minus 2, LYGm1(2019-20)	Last Year of Graduate minus 3, LYGm2 (2018-19)	Last Year of Graduate minus 4, LYGm3 (2017-18)
Number of students admitted in the corresponding First Year + admitted in 2 <sup>nd</sup> year via lateral entry and separate division, if applicable	231	239	236	64
Number of students who have graduated without backlogs in the stipulated period	133	108	76	28
Success Index (SI)	0.57	0.45	0.32	0.44
Average	0.44*15=6.70			

#### 4.2.2. Success rate in stipulated period of study [5]

*SI= (Number of students who graduated from the program in the stipulated period of course duration)/ (Number of students admitted in the first year of that batch and actually admitted in 2nd year via lateral entry and separate division, if applicable)*

*Average SI = mean of Success Index (SI) for past three batches  
Success rate = 5 × Average SI*

Item	Last Year of Graduate minus 1, LYGm1(2020-21)	Last Year of Graduate minus 2, LYGm1(2019-20)	Last Year of Graduate minus 3, LYGm2 (2018-19)	Last Year of Graduate minus 3, LYGm2 (2017-18)
Number of students admitted in the corresponding First Year + admitted in 2 <sup>nd</sup> year via lateral entry and separate division, if applicable	231	239	236	64
Number of students who have graduated	222	218	226	57
Success Index (SI)	0.96	0.91	0.96	0.89
Average Success Index	<b>0.94*5= 4.71</b>			

### 4.3. Academic Performance in Second Year (10)

*Academic Performance = Average API (Academic Performance Index), where*

*API = ((Mean of 2<sup>nd</sup>Year Grade Point Average of all successful Students on a 10 point scale) or(Mean of the percentage of marks of all successful students in Second Year/10)) x (number of successful students/number of students appeared in the examination)*

*Successful students are those who are permitted to proceed to the Third year*

Academic Performance	CAYm2 2019-20	CAYm3 2018-19	LYG 2017-18	LYG 2016-17
Mean of CGPA or Mean Percentage of all successful students(X)	8.15	7.44	6.83	6.04
Total no. of successful students (Y)	242	220	231	239
Total no. of students appeared in the examination (Z)	242	220	231	239
API = X* (Y/Z)	8.15	7.44	6.83	6.04
Average API=(AP1+AP2+AP3)/3	<b>7.47</b>			
Assessment [1.5*Average API]	<b>11.21</b>			

**4.4. Placement, Higher Studies and Entrepreneurship (30)**

Assessment Points = 30 × average placement

Item	CAYm1 2020-21	CAYm2 2019-20	CAYm3 2018-19	CAYm3 2017-18
Total No. of Final Year Students (N)	231	239	227	59
No. of students placed in companies or Government Sector (x)	214	199	189	53
No. of students admitted to higher studies with valid qualifying scores (GATE or equivalent State or National Level Tests, GRE, GMAT etc.) (y)	8	7	11	4
No. of students turned entrepreneur in engineering/technology (z)	Nil	Nil	1	Nil
$x + y + z =$	222	206	201	57
Placement Index : $(x + y + z) / N$	0.96	0.90	0.89	0.97
Average placement = $(P1 + P2 + P3) / 3$	0.91			
Assessment Points = 30 × average placement	27.5			

**Program Name : Computer Science & Engg.****Assessment Year : 2020-21 (CAYm1)**

S. No	Student Name	Enrollment no	Employee Name	Appointment No
1	SANDHYA T	9517004201	LEGATO	LEGSAN24062021
2	V.GOWTHAM	9518004301	TNQ	TNQGOW2512021
3	PRAVEEN SV	9518004302	INTELLECT DESIGN	INTPRA25072021
4	CHINTALAPUDI KEERTHANA	9519004501	DXC	DXCCHI20042021
5	PRAVEEN KUMAR K	9818004003	VIBERAL DIGITAL SOLUTIONS	VIBPRA22042021
6	T.KAILASH	9818004004	TNQ	TNQKAI25012021
7	MADDIREDDY GIRIJA	9818004005	HCL TECHNOLOGIES	HCLMAD15112021
8	YANAMALA DODDI YUVASREE	9818004006	HCL TECHNOLOGIES	HCLYAN05012022



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9	SHIBIN VARGHESE	9818004007	VIBERAL DIGITAL SOLUTIONS	VIBSHI17082021
10	AASHISH DUBEY K	9917004001	ADANI	ADAAAS22102021
11	T.ABITHA	9917004002	TNQ	TNQABI25012021
12	A.SIVASANKAR REDDY	9917004003	TNQ	TNQSIV25012021
13	ADDANKI PAVAN KUMAR	9917004004	RIA INTERNATIONAL	RIAADD05062021
14	A. AJITHKUMAR	9917004005	LUMINA DATAMATICS	LUMAJI16112021
15	S. AJITHA	9917004006	LUMINA DATAMATICS	LUMAJI16112021
16	ANNAVARAM KRISHNA	9917004007	CTS	CTSANN30072021
17	ANUJAA G B	9917004008	EXPLEO	EXPANU01112021
18	A.PAVAN SAI KUMAR	9917004009	FUTURE GENERALI	FUTPAV28122020
19	RITHVIK AVULA	9917004010	SUTHERLAND	SUTRIT02022021
20	BADDAM SWACHITH REDDY	9917004011	VINS INFOTECH	VINBAD26082021
21	RAMYA SRUTHI	9917004012	MONTBLEU	MONRAM08062021
22	BELLAMKONDA PRANAY	9917004013	LUMINA DATAMATICS	LUMBEL16112021
23	BHARATH GANESH K	9917004014	TNQ	TNQBHA25012021
24	BHATTI MOHAMMAD AZZAM	9917004015	AGILISIUM	AGIBHA20082021
25	B. VENKATA KOUSHIK KUMAR	9917004016	MONTBLEU	MONVEN21062021
26	BOBBA PRAVEEN KUMAR	9917004017	SOUTHERN ILLINOIS UNIVERSITY	EDWPRA21811800
27	CHALLA HARINATH REDDY	9917004018	ROCHESTER INSTITUTE OF TECHNOLOGY	ROCCHA08192021
28	CHALUVADI MAHENDRANATH	9917004019	DXC	DXCCHA06042021
29	CHANDU HARISH KUMAR	9917004020	TNQ	TNQCHA25012021
30	CHELURU BHUVANESWARI	9917004021	ACCENTURE	ACCHE16082021

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31	CHILUKA RITISH REDDY	9917004022	TEXAS A&M UNIVERSITY	TEXCHI6279110139
32	CHIMMANI VIDYA SAGAR	9917004023	MONTBLEU	MONCHI21062021
33	CHINIMILLI BHANU MOHAN KUMAR	9917004024	AGILISIUM	AGICHI040102021
34	CHITRAGARI GANESH VARMA	9917004025	LEGATO	LEGCHI24062021
35	DAVULURI MANI KUMAR	9917004026	LEADPRO	LEADAV22022021
36	DEVARAPALLI SANATH REDDY	9917004027	FUTURE GENERALI	FUTDAV28122020
37	DHINESH KANNAN .S	9917004028	TNQ	TNQDHI25012021
38	ELUKUNTLA SOWJANYA	9917004030	WIPRO	WIPELU12062021
39	E SUJITH REDDY	9917004031	THE UNIVERSITY OF MEMPHIS	THEESUU0083120
40	GAJAVALLI BHANU PRAKASH	9917004032	TNQ	TNQGAJ25012021
41	G.SANDEEP KUMAR REDDY	9917004033	TNQ	TNQSAN25012021
42	G. SRIRAM REDDY	9917004034	LUMINA DATAMATICS	LUMSRI16112021
43	GONUGUNTLA BHARATH	9917004035	CTS	CTSGON30072021
44	GORANTLA SASI KUMAR	9917004036	BRADLEY UNIVERSITY	BRAGOR00033534
45	GOURABATHUNI. MADHURI	9917004037	LEGATO	LEGGOU24062021
46	GOWDU PAVAN KUMAR GOWD	9917004038	FUTURE GENERALI	FUTGOW28122020
47	GUNDRU HARSHITHA	9917004040	DXC	DXCGUN23122021
48	G VINOD KUMAR	9917004042	INFOSYS	INFVIN17082021
49	GURRAM VENKATA AJAY SUKUMAR	9917004043	FUTURE GENERALI	FUTGUR28122020
50	HARIHARAN	9917004044	FUTURE GENERALI	FUTHAR28122020
51	S.HARI SANKAR	9917004045	TNQ	TNQHAR25012021
52	HIPUTHIYABHANU A	9917004046	WIPRO	WIPHIP20102021
53	S.M.HRUISHIKESH SRIKUMAR	9917004047	TNQ	TNQHRU25012021

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54	IYER KARTHIK VISHWANATHAN	9917004048	KRYPT	KRYIYE23072021
55	JAKKAMPUTI VINAY KUMAR	9917004049	VINS INFOTECH	VINJAK28062021
56	J.SAI NAVEEN	9917004050	TNQ	TNQSAI25012021
57	JONNADULA PRADEEP	9917004052	WIPRO	WIPJON12062021
58	K. JOTHILAKSHMI	9917004053	TNQ	TNQ JOT25012021
59	KALISSETTI SUDHEER	9917004054	TNQ	TNQKAL25012021
60	KALVA SAI MOHITH	9917004055	LEGATO	LEGKAL25062021
61	KAMISSETTY JASWANTH MANIKANTA	9917004056	EXPLEO	EXPKAM10122021
62	K ANKI REDDY	9917004057	SUTHERLAND	SUTANK02022021
63	K.SUJITH REDDY	9917004058	TNQ	TNQSUJ25202021
64	N.KAVI SAILA SREE	9917004059	ASPIRE SYSTEMS	ASPKAV10122020
65	K. SREEDHAR BABU	9917004060	ASPIRE SYSTEMS	ASPSRE10122020
66	K V R NIKHIL	9917004061	LEGATO	LEGNIK22042021
67	K.VISHNU VARDHAN	9917004062	TNQ	TNQVIS25012021
68	KUDUMULA SASI KIRAN REDDY	9917004063	INFOSYS	INFKUD17082021
69	SRIKANTH KUNCHALA	9917004064	TNQ	TNQSRI25012021
70	LAKSHMI NARASIMMAN G	9917004065	TNQ	TNQLAK25012021
71	LINGAMDINNE SREEKANTH REDDY	9917004066	DXC	DXCLIN25082021
72	MADINENI MOKSHAGNI	9917004067	VINS INFOTECH	VINMAD26082021
73	MALEPATI UDAYA SREE	9917004068	LEGATO	LEGMAL24062021
74	M.NIKHITHA	9917004069	MONTBLEU	MONNIK21062021
75	MANDI AKIF HUSSAIN	9917004070	LEGATO	LEGMAN24062021
76	M.NIKITHA	9917004072	FUTURE GENERALI	FUTNIK28102020
77	JASWANTH MATTEPU	9917004073	SUTHERLAND	SUTJAS02022021
78	MADHU PRIYA	9917004074	TEXAS A&M UNIVERSITY	TEXMAD62791101 3
79	MEDA SUSHMA	9917004075	DXC	DXCMED21042021
80	M.RAMANA SAI MADHAV	9917004076	WIPRO	WIPRAM12062021

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81	M.THULASI REDDY	9917004077	EKALAIV INFOTECH	EKATHU01022021
82	B.MOUNIKA	9917004078	WIPRO	WIPMOU23112021
83	MUKKAMALLA NAVEEN KUMAR REDDY	9917004079	LEADPRO	LEAMUK22022021
84	MUSIRIKA MUKESH REDDY	9917004080	CAPGEMINI	CAPMUS09072021
85	M.MADHAVI LATHA	9917004081	WIPRO	WIPMAD12072021
86	N.SAI TEJA VARMA	9917004082	LEGATO	LEGSAI24062021
87	NAGIREDDY RAVIKUMAR	9917004083	TCS	TCSNAG03062021
88	NALLAMOTHU MAHESH	9917004084	TNQ	TNQNAL25012021
89	NALLAPANENI YASWANATHI	9917004085	HCL TECHNOLOGIES	HCLNAL21012022
90	NARASIMHA C	9917004086	HCL TECHNOLOGIES	HCLNAR21122020
91	R. NARAYANI	9917004087	ASPIRE SYSTEMS	ASPANAR10122020
92	N.V.KISHORE	9917004088	K12 TECHNO	K12KIS25052021
93	NAVEENAN.P	9917004089	TNQ	TNQNAV25012021
94	NUNNA VISHNU VAMSI	9917004090	INTELLECT DESIGN	INTNUN25072021
95	PADARTHI MEGHANA	9917004091	DXC	DXCPAD15042021
96	PALLE ANIL KUMAR REDDY	9917004092	HCL TECHNOLOGIES	HCLPAL19112021
97	P.SUNEELA	9917004093	DXC	DXCSUN20042021
98	PALURI AMARNATH REDDY	9917004094	TCS	TCSPAL09012021
99	PANDIYAN KARTIK RAJA S	9917004095	VIBERAL DIGITAL SOLUTIONS	VIBPAN19022021
100	PASUMARTHI YASWANATH SAI VARUN	9917004096	INFOSYS	INFPAS17082021
101	PASUPULETI SIVA KRISHNA	9917004097	MPHASIS	MPHPAS12082021
102	PATAN ANSAR KHAN	9917004098	FUTURE GENERALI	FUTPAT28122020
103	PATHI VENKATA SUDHEER	9917004099	TNQ	TNQPAT25012021
104	PATTIPATI MANOHAR	9917004100	VINS INFOTECH	VINPAT26082021

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105	PEDDAVANDLA GIRISH KUMAR REDDY	9917004101	THE UNIVERSITY OF TEXAS AT DALLAS	THEPED2021592
106	PERUMALLAVENKA TABALAKOUSIK	9917004102	INFOSYS	INFPER17082021
107	POLAVARAPU THARUN KUMAR	9917004103	TCS	TCSPOL09012021
108	POLIMERA OBULA REDDY	9917004104	VINS INFOTECH	VINPOL26082021
109	AYYAPPA P	9917004105	TNQ	TNQAYY25012021
110	POOLA MANJUNATH REDDY	9917004106	TNQ	TNQPOO25012021
111	M. PRABHA	9917004108	TNQ	TNQPRA25012021
112	PRABHU SHANKAR R	9917004109	ASPIRE SYSTEMS	ASPPRA10122020
113	M.PRAKASH	9917004110	TNQ	TNQPRA25012021
114	PRANAV.J	9917004111	ASPIRE SYSTEMS	ASPPRA10122020
115	PREETHI S	9917004112	EQUITAS	EQUPRE13042021
116	PULI MANMADARAO	9917004113	VINS INFOTECH	VINPUL24082021
117	PUSAPATI AKHILA	9917004114	FUTURE GENERALI	FUTPUS28102020
118	RATAKONDA SANTHAN CHOWDARY	9917004119	FUTURE GENERALI	FUTRAT28102020
119	RAVULAPLLI SRIKANTH	9917004120	TNQ	TNQRAV25012021
120	R.MADAN MOHAN REDDY	9917004121	TNQ	TNQMAD25012021
121	REDROUTHU SAI VARA PRASAD	9917004122	ACCENTURE	ACCRED24122021
122	REVOORI VEEHARIKA REDDY	9917004123	LEGATO	LEGREV24062021
123	R.ROHITH	9917004124	INTELLECT DESIGN	INTROH24072021
124	R.SABIK ALI	9917004125	LEADPRO	LEASAB22022021
125	SAI ANAND M	9917004126	VINS INFOTECH	VINSAI26082021
126	SAI SHARAN E	9917004127	LEGATO	LEGSAI24062021
127	SAKAM VENKATA SURENDRA REDDY	9917004128	WIPRO	WIPSAK06082021
128	SANGAVAIM	9917004129	ASPIRE SYSTEMS	ASPSAN10122020
129	S. SANGEETHA	9917004130	TNQ	TNQSAN25012021
130	SANJEEV KARTHIK K	9917004131	LUMINA DATAMATICS	LUMSAN16112021
131	SANKALAMADDI ANUDEEP REDDY	9917004132	DELITE SOFTWARE	DELSAN21092020

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132	SANTHOSH MADHAVAN. A. K	9917004133	ASPIRE SYSTEMS	ASPSAN10122020
133	J.SARAVANAKUMAR	9917004134	SUTHERLAND	SUTSAR02022021
134	SEETHAA S	9917004135	INTELLECT DESIGN	INTSEE25072021
135	SEETHAGARI VENKATA LOKESHWARA REDDY	9917004136	ASPIRE SYSTEMS	ASPSEE10122020
136	SEGU VENKATA SAI CHARAN HARSHITH	9917004137	WIPRO	WIPSEG05072021
137	SHAIK HAMEED	9917004138	SUTHERLAND	SUTSHA02022021
138	SHAIK MAHAMMED NADEEN	9917004139	VINS INFOTECH	VINSHA26082021
139	SHREEHARI UMASHANKAR.S	9917004142	TNQ	TNQSHR25012021
140	SIDDI MAHESH	9917004143	MONTBLEU	MONSID21062021
141	LOKSUNDAR GANTHI	9917004144	ANALYTICS QUOTIENT	ANALOK25062021
142	S.SIVARAJA	9917004145	TNQ	TNQSIV25012021
143	A.L.SOMESHWARA	9917004146	TNQ	TNQSOM25012021
144	K.SOUNDARYA	9917004147	EKALAIV INFOTECH	EKASOU01022021
145	P. SREE SURYA	9917004148	SUTHERLAND	SUTSRE02022021
146	SREERAMDAS VENKATA HARENDRA	9917004149	ASPIRE SYSTEMS	ASPSRE25072021
147	R.SRINIVASAN	9917004150	ASPIRE SYSTEMS	ASPSRI10122020
148	A.SUBRAMANIYAN	9917004151	8 K MILES	8KMSUB31032022
149	SUNIL KUMAR.U	9917004152	TNQ	TNQSUN25012021
150	S SUDHEER KUMAR	9917004153	ACCENTURE	ACCSUD03092021
151	SURE VASAVI	9917004154	LEGATO	LEGSUR24062021
152	SURYA VELAVAN C G	9917004155	VIBERAL DIGITAL SOLUTIONS	VIBSUR29032021
153	S.SWETHA	9917004156	VIBERAL DIGITAL SOLUTIONS	VIBSWE29032021
154	TALAPANENI RUKESH	9917004157	HIBIZ SOLUTIONS	HIBTAL27012021
155	TATA SAI VARSHA	9917004158	THE UNIVERSITY OF TAMPA	THETAT3003166
156	TAVVA MOHIT VENKATA NAGA SAI	9917004159	MONTBLEU	MONTAV21062021
157	THEEPIKASHREE V	9917004160	EXPLEO	EXPTHE01112021

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158	THIMMISSETTY PAVAN KUMAR	9917004161	TNQ	TNQTHI25012021
159	THIPPANNAGARI SANDEEP	9917004162	TNQ	TNQTHI25012021
160	M.THIRUMALAI SELVAN	9917004163	TNQ	TNQTHI25012021
161	THOORPINTI NARESH KUMAR REDDY	9917004164	ASPIRE SYSTEMS	ASPTHO10122020
162	T. GOPI CHAND	9917004165	TNQ	TNQGOP25012021
163	THOTA VENKATA SUDHARSHAN	9917004166	ASPIRE SYSTEMS	ASPTHO22072021
164	UMESH CHANDRA	9917004167	ASPIRE SYSTEMS	ASPUME10122020
165	T.HARSHA VARDHAN	9917004168	ASPIRE SYSTEMS	ASPHAR10122020
166	T.SUMANTH	9917004169	TNQ	TNQSUM25012021
167	TUGUTLA PRASANTH RAYALU	9917004170	MPHASIS	MPHTUG12082021
168	UDAY KUMAR UPPALA	9917004171	ASPIRE SYSTEMS	ASPUDA10122020
169	V.SAMARA AHA REDDY	9917004172	TNQ	TNQSAM25012021
170	V.VANMATHI	9917004173	WIPRO	WIPVAN 032021
171	VENKATA SATISWAR REDDY VASANTHA	9917004174	ASPIRE SYSTEMS	ASPVEN10122020
172	VATTIGUNTA RATNA KUMARI	9917004175	LEGATO	LEGVAT24062021
173	VELLANKI SRI SAI RAJA HARSHITH	9917004176	ASPIRE SYSTEMS	ASPVEL10122020
174	VIGNESH.S	9917004177	TNQ	TNQVIG25012021
175	E.VIJAYALAKSHMI	9917004178	NTT DATA	NTTVIJ25072021
176	VOLETI NAGA VENKATA SAI RAJESH	9917004179	TCS	TCSVOL09012021
177	YARABAKA NITEESH KUMAR REDDY	9917004180	ASPIRE SYSTEMS	ASPYAR10122020
178	Y MADHU SUDAN REDDY	9917004181	WIPRO	WIPMAD14072021
179	YEDUGURI PALLAVI	9917004182	DXC	DXCYED11102020

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180	YENDLURI CHANIKYA CHOWDARY	9917004183	ZUARI TECH	ZUAYEN29122020
181	N.YOGESH	9917004184	ASPIRE SYSTEMS	ASPYOG10122020
182	E.S.VISHNUVARDAN	9917004185	TNQ	TNQVIS25012021
183	AISHWARYA S	9917004186	DXC	DXCAIS25112020
184	AKKALA CHANDANA	9917004187	CTS	CTSAKK23032021
185	ANAND. M	9917004188	TNQ	TNQANA25012021
186	M.DINESH KUMAR	9917004189	TNQ	TNQDIN25012021
187	P.MANIKANDAPRAB HU	9917004190	TNQ	TNQMAN25012021
188	NAGELLA KEDHARNATH	9917004191	DXC	DXCNAG13052021
189	T.SANGEETH KUMAR	9917004192	SUTHERLAND	SUTSAN02022021
190	YOGESH KUMAR M	9917004193	HCL	HCLYOG28012021
191	D ANAND PRAKASH	9917004194	ASPIRE SYSTEMS	ASPANA10122020
192	S.DAYAKAR REDDY	9917004195	FUTURE GENERALI	FUTDAY28122020
193	SANKATALA SUDHEER KUMAR	9917004196	WIPRO	WIPSAN18082021
194	DUDIPALA VINEETH	9917004197	MPHASIS	MPHDUD05082021
195	DEVARASAN SAILLA	9917004198	MIND TREE	MINDEV28062021
196	RAJEEV	9917004200	LUMINA DATAMATICS	LUMRAJ16112021
197	T. GEETHA	9917004201	HCL TECHNOLOGIES	HCLGEE 05122021
198	POLAMRAJU NESHMA VAISHNAVI	9917004202	INFOSYS	INFPOL17082021
199	MEKALA CHANDANA	9917004203	WILEY	WILMEK19082021
200	V.PRASHANTH	9917004205	LEGATO	LEGPRA26042021
201	SYED SHAHID BASHA	9917004206	LEGATO	LEGSYE24062021
202	DESU LAKSHMI LOKESH	9917004208	CTS	CTSDES230232021
203	SHAIK.AKRAM BASHA	9917004210	TNQ	TNQSHA25012021
204	KODALI SUDHEER KUMAR	9917004213	KPIT	KPIKOD11052021
205	UPPUTHOLLA KESAVA	9917004214	WIPRO	WIPUPP11102021



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206	ALAVALAPATI TEJASWAR REDDY	9917004215	CTS	CTSALA01082022
207	MONIKA SREE VELAMPUDI	9917004216	LEGATO	LEGMON24062021
208	MADHUMITHA N	9917004217	NETLINK	NETMAD19072021
209	BABLOO KUMAR	9917004218	LUMINA DATAMATICS	LUMBAB16112021
210	B.KISHORE	9917004219	TNQ	TNQKIS25012021
211	FANTASY MERLIN GLORINA R	9917004220	LEGATO	LEGFAN25062021
212	SAI KIRAN DANGETI	9917004221	ASPIRE SYSTEMS	ASPSAI22072021
213	ARUMUGA THILAGARAJ C	9917004222	VINSINFO	VINARU10072020
214	VARNA B K	9917004223	VINSINFO	VINVAR10072020
215	AYYAKKANNU P	9917004224	VINSINFO	VINVAR10072020
216	SURENDRAN S	9917004225	VINSINFO	VINVAR10072020
217	AYSHA BEEVI P M	9917004226	VINSINFO	VINAYS10072020
218	REVATHI L	9917004227	VINSINFO	VINREV10072020
219	KANDASAMI A	9917004228	VINSINFO	VINKAN10072020
220	VINOTHINI V	9917004229	VINSINFO	VINVIN10072020
221	MURUGESWARY K	9917004230	VINSINFO	VINMUR10072020
222	KUMARA RAJA S	9917004231	VINSINFO	VINKUM10072020

Assessment Year : 2019-20 (CAYm2)

S. No	Student Name	Enrollment no	Employee Name	Appointment No
1	IMMADISETTY HARI MANOJ	9916004046	NETTYFISH	NETIMA19082020
2	INUKOLLU ACHYUTH RAMI REDDY	9916004047	EXIDE LIFE INSURANCE	EXIINU07032020
3	JEGANATH S	9916004052	VINS INFOTECH	VNSJEG10082020
4	KAMBALA KALYAN CHAKRA VARTHI	9916004055	NETTYFISH	NETKAM19082020
5	KASIRAJAN T	9916004060	NETTYFISH	NETKAS19082020
6	KOLISETTY THARUNI	9916004066	CTS	CTS140009670
7	KOVVUR VISHNU VARDHAN REDDY	9916004068	CTS	CTS14000968
8	LAGHUMAVARAPU MANISH KUMAR	9916004071	CTS	CTS14000969
9	MAHESWARI S	9916004076	TCS	TCSLDT201955043 21

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10	MANIKANDAN A	9916004079	CTS	CTSAMA29062020
11	MANNAVARAPU VENKATA LOKESH	9916004081	CTS	CTS14000970
12	MOHANRAJ R	9916004087	CTS	CTS14000971
13	MUMMANENI BHARATH KUMAR	9916004091	NETTYFISH	NETMUM19082020
14	MYNAMPATI VENKATA SARASCHANDRA BHARADWAJ	9916004093	WILEY	WILMYN03062020
15	NAVEEN KUMAR C	9916004097	NETTYFISH	NETNAV19082020
16	NUTHALAPATI CHAKRAVARTHI	9916004102	VINS INFOTECH	VNSNUT10082020
17	ORUGANTI S R SRIVATHSAVA SHARMA	9916004105	CTS	CTS14000972
18	PABBISSETTY NAGA LAKSHMI	9916004107	CTS	CTSPAB29062020
19	PON RAJA S M	9916004117	SEVEN HILLS	SEVPON06032020
20	RAGOORU THARUN KUMAR	9916004126	NETTYFISH	NETRAG19082020
21	RAGU S	9916004127	VINS INFOTECH	VINRAG10082020
22	RENGA RAJESH P	9916004135	ZEALOUS	ZEAREN03112020
23	RODDAM MOHAMMED SHAHID	9916004137	TCS	TCSLDT20195504421
24	RUPANAGUDI ARIFHUSSAIN	9916004138	TCS	TCSLDT20195503724
25	SANTHOSH T	9916004147	ZEALOUS	ZEASAN03112020
26	SHAIK MOTHADUVARI MAHAMMAD IRFAN	9916004151	TCS	TCSLDT20195504724
27	SHAIK NAGUR SHARIEF	9916004152	VINS INFOTECH	VINSHA10082020
28	SHARMITHA P	9916004154	SCHNEIDER ELECTRIC	SCHSHA02112020
29	SHARUN T	9916004156	SUTHERLAND	SUTSHA02122019
30	SIDDIQ MOHAMMED B	9916004159	VINS INFOTECH	VISID10082020
31	SIVABALAN M	9916004161	TCS	TCSLDT20195508824
32	THIRUMALAIRAJA G N	9916004173	NETTYFISH	NETTHI19082020
33	VAIRAMUTHU S	9916004180	EXIDE LIFE INSURANCE	EXIVAI07032020
34	VALLABHANENI SAITEJA	9916004183	NETTYFISH	NETVAL19082020
35	MANYAM VISHNU VARDHAN REDDY	9916004202	NETTYFISH	NETMAN19082020

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36	PUTHUREDDY VAISHNAV KUMAR REDDY	9916004204	NETTYFISH	NETPUT19082020
37	POOLA UPENDRA	9916004206	EXIDE LIFE INSURANCE	EXIPOO07032020
38	LOMATI VEERA REDDY	9916004209	VINS INFOTECH	VINLOM10082020
39	PICHIKA MOUNIKA RAJESWARI	9916004211	EXIDE LIFE INSURANCE	EXIPIC07032020
40	ALLA TIRUMALA VIKAS REDDY	9916004217	VINS INFOTECH	VINALL10082020
41	GANDHAM PAVAN SAI	9916004219	NETTYFISH	NETGAN19082020
42	HARISH K	9916004221	VINS INFOTECH	VINHAR10082020
43	RAMANNAGARU DHEERAJ KUMAR REDDY	9916004223	NETTYFISH	NETRAM19082020
44	SUNIL KUMAR J ROHIT	9916004227	NETTYFISH	NETSUN19082020
45	KANDUKURU VAMSI	9916004228	NETTYFISH	NETKAN19082020
46	BANDLA NANDINI	9916004230	EXIDE LIFE INSURANCE	EXIBAN07032020
47	ANUP RAJ	9916004242	VINS INFOTECH	VINANU07032020
48	AMARAKOTA MADHUVAMSI	9916004248	CTS	CTSAMM29062020
49	SOMAVARAPU JEEVAN	9916004249	TCS	TCSSOM24032020
50	VANI K	9817004002	WIREILLA NET SOLUTIONS	WIRVAN06032020
51	ARUL ANISH AKILAN G	9916004252	NETTYFISH	NETARU19082020
52	DEETSHANA S	9916004254	ZEALOUS	ZEADDEE03112020
53	NEELAVATHY E	9916004256	NETTYFISH	NETNEE19082020
54	AMARA SRIKAR	9916004010	OKLAHOMA STATE UNIVERSITY	OKLAMA2034064 0
55	THOLLA CHANDRA SEKHAR	9916004174	WICHITA STATE UNIVERSITY	WICTHOA568R54 4
56	SAI RAVI TEJA GARLAPATI	9916004141	WRIGHT STATE UNIVERSITY	WRISAI624053000
57	KARTHICK V I	9916004222	THIAGARAJAR SCHOOL OF MANAGEMENT	THIKAR20130562
58	AJAY M S	9916004003	LORD JEGANNATH COLLEGE OF ENGINEERING AND TECHNOLOGY	LORAJA20631003

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59	CHINNI VENKATA SUMANTH KALYAN	9916004023	UNIVERSITY OF HERTFORDSHIRE	UNICHI21022351
60	ASHOK LAWRENCE J	9817004001	LEAD PRO	LEAASH01022020
61	NIRMALA C	9817004003	LEAD PRO	LEANIR01022020
62	ADITI M	9916004001	CTS	CTS14000839
63	AKURATHI LIKITHSAI	9916004005	ZENOPSYS	ZENAKU11112019
64	ALEX AAKASH A	9916004007	TCS	TCSLDT201955029 60
65	ALLA NAGA SAHITHI	9916004008	CTS	CTS14000896
66	SAI SRI HARSHA	9916004011	CTS	CTS14000937
67	AREM SUDHEER KUMAR REDDY	9916004013	VIRTUSA	VIRARE01102022
68	ARJUN P	9916004015	LEAD PRO	LEAARJ01022020
69	ATCHAIYA B	9916004018	JMAN GROUPS	JMAATC01022020
70	CHITTAMURU PUSHYANTH REDDY	9916004025	LEAD PRO	LEACHI01022020
71	DEVARAPALLI KARTHIK	9916004027	ZENOPSYS	ZENDEV11112019
72	DEVENDRASINGH DIVYA	9916004028	ZENOPSYS	ZENED11112019
73	DODDAMREDDY MURALIDHAR REDDY	9916004030	LEAD PRO	LEADOD01022020
74	DUDIPALA PRANEETH	9916004031	CTS	CTS14000914
75	ETLAM JASWANTH	9916004032	ZENOPSYS	ZENETL11112019
76	FATHIMUNISHA M	9916004033	CTS	CTS14000856
77	GANESH KRISHNA B	9916004036	SBL KNOWLEDGE SERVICES	SBIGAN04032020
78	HARITHA GODA	9916004037	CTS	CTS14000868
79	GORAPARTHI MARUTHI	9916004038	ZENOPSYS	ZENGOR11112019
80	GUNDLAPALLI SAHANA	9916004040	CTS	CTS14000854
81	GURIJALA VENKATA SAI KIREETI	9916004042	CTS	CTS14000927
82	HARINI J	9916004045	LEAD PRO	LEAHAR01022020
83	ISUKAPALLI RAKESH REDDY	9916004048	CTS	CTS14000912
84	JANANI R	9916004049	LEAD PRO	LEAJAN01022020
85	JASWANTHA RAAJ A	9916004050	LEAD PRO	LEAJAS01022020
86	KARTHIK J	9916004057	CTS	CTS14000932
87	KARTHIKEYA MARA VARMAN P	9916004059	LEAD PRO	LEAKAR01022020
88	KASTHURI M	9916004061	LEAD PRO	LEAKAS01022020

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89	KAVIN S	9916004062	LEAD PRO	LEAKAV01022020
90	MOUNIKAKODELA	9916004064	CTS	CTS14340986
91	KONJETI CHIRANJEEVI SAILIKITH	9916004067	LEAD PRO	LEAKON01022020
92	LAKSHAN KUMAR J	9916004072	LEAD PRO	LEALAK01022020
93	LIMSHA FERNANDO	9916004073	CSS CORPORATION	CSSLIM0912020
94	MADA SAI DINESH	9916004074	CTS	CTS14000836
95	MALAPATI HARIKRISHNA	9916004077	CTS	CTS14000838
96	GANESH REDDY MANGUNURU	9916004078	CTS	CTS14000902
97	MEENA G	9916004082	IBM	IBMMEE06112019
98	K.MEENAKUMARI	9916004083	CTS	CTS14341000
99	MEHTA MAHARSHI NILESHBHAI	9916004084	TCS	TCSLDT201952656 91
100	MEREDDY HEMANTH REDDY	9916004085	CTS	CTS14000915
101	MOKSH KAUSHAL	9916004088	TCS	TCSLDT201955043 54
102	MOMIDI JAYA KRISHNA CHAITANYA	9916004089	ZENOPSYS	ZENMOM1111202 0
103	MUKKU TEJA REDDY	9916004090	CTS	CTS14000863
104	MUTTHAM PRADEEP	9916004092	CTS	CTS14000840
105	NAGALAPURAM BHARGAVNATH	9916004094	TCS	TCSLCT201927684 10
106	NAGENDLA SARATH	9916004095	CTS	CTS14000852
107	THARAK NARREDLA	9916004096	CTS	CTS14000867
108	NAVEENRAJ T	9916004098	LEAD PRO	LEANAV01022020
109	NETHI AKHILA	9916004099	IBM	IBMNET06112019
110	NIRAIMATHI R C	9916004100	LEAD PRO	LEACNI01022020
111	NULIGOMMU BHARGAV	9916004101	MPHASIS	MPHNUG04102019
112	NUTHI.DEEPTHI VIJAYA LAKSHMI	9916004103	CTS	CTS14000944
113	OGURI VYSHNAVI	9916004104	CTS	CTS14000945
114	P RISHIKA	9916004106	MPHASIS	MHPRI04012019
115	PACHIPULUSU ASRITH	9916004108	ZENOPSYS	ZENPAC11112020
116	PADARTI RAGHAVENDRA SWAMI	9916004110	LEAD PRO	LEAPAD01022020
117	PANDEESWARI J	9916004112	CTS	CTS14000900
118	PASUPULETI JAYANTH	9916004114	TCS	TCSLCT201927087 21

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119	PENUGONDA SAIKEERTHANA	9916004116	CTS	CTS14000882
120	POOJA	9916004118	CTS	CTS14340988
121	PRAVEEN KUMAR A V	9916004121	LEAD PRO	LEAPRA01022020
122	P.PREETHI	9916004122	CTS	CTS14340999
123	PRIYADHARA K	9916004123	LEAD PRO	LEAPRI01022020
124	PUNOGOTI VIDYA SAGAR	9916004124	TCS	TCSLCT201926934 26
125	RAGHUPATHI T	9916004125	CTS	CTS14000942
126	RAHUL V	9916004128	CTS	CTS14000951
127	RAJESWARI RAJU	9916004129	CTS	CTS14000846
128	RAM DINESH R	9916004130	LEAD PRO	LEARAM01022020
129	RAMASAKTHI GURUSAMY	9916004131	CTS	CTS14000930
130	NIKHIL MOURYA RAVELLA	9916004133	HEXAWARE	HEXNIK20112019
131	RAVUVARI HARSHITHA NAIDU	9916004134	CTS	CTS14000916
132	P.RESHMI	9916004136	CTS	CTS14340938
133	SABERA SJ	9916004140	CTS	CTS14000874
134	SANA VENKATESWARA RAO	9916004142	SOFTSUAVE	SOFSAN30092019
135	SANJAY KUMAR RAVICHANDRAN	9916004143	CTS	CTS14000858
136	SANTOSH S	9916004148	TCS	TCSLCT201927682 55
137	M SARAVANAN	9916004149	CTS	CTS14000952
138	V.S.SHARMILAA THAARANI	9916004153	CTS	CTS14000918
139	M.SWASHI	9916004157	CTS	CTS14340985
140	SHRUTHI P	9916004158	IBM	IBMSHI08112019
141	SIRIGIRI SIRI CHANDANA	9916004160	WIPRO	WIPSIR25052020
142	SOUNDARYA K	9916004162	TCS	TCSLCT201926906 37
143	STANLEY G	9916004164	TCS	TCSLCT201927682 54
144	SUBATHIRA A	9916004165	IBM	IBMSUB08112019
145	SWATHY S	9916004167	TCS	TCSLDT201955029 98
146	SWEDA PREETHY R	9916004168	ZENOPSYS	ZENSWE11112020
147	THANDRA PRUDHVIKRISHNA	9916004169	TCS	TCSLCT201926888 90

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148	SAICHARAN REDDY	9916004170	TCS	TCSLDT201955086 14
149	THOTA VISHNU GUPTA	9916004175	TCS	TCSLDT201955025 86
150	TIPPANABOINA BALA MANIDEEP	9916004176	CTS	CTS14000894
151	TUGUTLA PAVANRAYALU	9916004177	CTS	CTS14110105
152	UTKARSH KAPOOR	9916004179	TCS	TCSLCT201927682 52
153	VAISAK S NAIR	9916004181	ASPIRE SYSTEMS	ASPVAI31012020
154	J.VAISHALI	9916004182	CTS	CTS14340939
155	VARATHA RAMAN S	9916004184	TCS	TCSLCT201927071 41
156	VENKANNAGARI PRUDHVI TEJA REDDY	9916004185	LEAD PRO	LEAVEN01022020
157	S VIDHYA	9916004186	CTS	CTS14000946
158	VIDHYA A M	9916004187	LEAD PRO	LEAVID01022020
159	VIGNESH VARADHAN K	9916004189	LEAD PRO	LEAVIS01022020
160	VISHANTHINI DEVI M	9916004191	WIPRO	WIPVIS25052020
161	VUTUKURI NIKHIL MANI KUMAR	9916004192	LEAD PRO	LEAVUT01022020
162	YALAMURI DINESH	9916004193	SOFTSUAVE	SOFYAL30092019
163	YASHWANT RAJA R	9916004194	LEAD PRO	LEAYAS01022020
164	YOHESWARAN G	9916004198	SBL KNOWLEDGE SERVICES	SBLYOH04032020
165	BOMMIREDDY NARENDRA REDDY	9916004199	LEAD PRO	LEABOM01022020
166	DEVAKI VENKATESH	9916004200	CTS	CTS14000922
167	PALADUGU BHANU PRAKASH	9916004203	TCS	TCSLCT201927380 57
168	UNDELA MUNI KUMAR REDDY	9916004207	CTS	CTS14000949
169	VASANTHU JAYAPRAKASH REDDY	9916004208	TCS	TCSLCT201927764 60
170	GELIVI PRIYANKA	9916004210	CTS	CTS14000947
171	VANKADARI HARSHA PRANEETHA REDDY	9916004212	LEAD PRO	LEAVAN01022020
172	KURUBA LAVANYA	9916004213	CTS	CTS14000903
173	RALLAPALLI MALASREE	9916004214	CTS	CTS14000861
174	PRANATHI SIVVA	9916004215	CTS	CTS14000938

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175	T.SARANYA	9916004216	CTS	CTS14340987
176	SATHEESH KUMAR B	9916004224	ASPIRE SYSTEMS	ASPSAR10122020
177	MUTHU RAMYA S	9916004226	LEAD PRO	LEAMUT01022020
178	NILESH NIRAV	9916004231	MPHISIS	MPHNIL04102019
179	MUKUNDAN V	9916004233	SBL KNOWLEDGE SERVICES	SBLMUK04032020
180	ABISHEK ROSARIO J S	9916004234	LEAD PRO	LEAABI01022020
181	S.KARPAGAM	9916004235	SBL KNOWLEDGE SERVICES	SBLSKAR04032020
182	MUTHU PANDI A	9916004236	LEAD PRO	LEAAMU01022020
183	RAMANATHAN D	9916004237	ZENOPSYS	ZENRAM11112019
184	SUNDARI VELAPPAN	9916004238	CTS	CTS14000904
185	KUNDETI YASWANTH NAIDU	9916004240	CTS	CTS14110130
186	NARAYANAN I K	9916004243	LEAD PRO	LEANAR01022020
187	SINGAM NAGA NEHANTH	9916004244	CTS	CTS14000862
188	JAJAM SURENDRA RAO	9916004245	CTS	CTS14000870
189	INDLAMURI HARIKRISHNA	9916004246	LEAD PRO	LEAIND01022020
190	V KEERTHIVARDHAN	9916004247	CTS	CTS14000872
191	RAMAGIRI TARUN	9916004250	LEAD PRO	LEATRA01022020
192	ADITYA MISHRA	9916004002	NETTYFISH	NETADI19082020
193	AKSHYAA S	9916004004	TCS	TCSL/DT20196504335
194	ALAGAPPAN L	9916004006	TCS	TCSL/DT20196504396
195	ARAVIND A B	9916004012	VINS INFOTECH	VINARJ10082020
196	ARJUN M	9916004014	NETTYFISH	NETARJ19082020
197	ASHWINI KUMAR	9916004017	CTS	CTS14000973
198	BANDARI VAMSHIKRISHNA	9916004019	CTS	CTS14000973
199	BHARATHI G	9916004020	WIREILLA NET SOLUTIONS	WIRBHA06032020
200	BHUVANESWARAN R	9916004021	KOTAK	KOTBHU10022020
201	CHITIKI PHANINDHAR REDDY	9916004024	NETTYFISH	NETCHI19082020
202	DHARANI DHARAN K	9916004029	NETTYFISH	NETDHA19082020
203	GAJJALA MOOLA MANIKANTA REDDY	9916004034	VINS INFOTECH	VINGAJ10082020
204	GAJULA PRASANTHI	9916004035	KOTAK	KOTGAJ10022020
205	GOWTHAMAN M	9916004039	NETTYFISH	NETGOW19082020



206	GUNTAMADUGU PRADEEP KUMAR RAJU	9916004041	NETTYFISH	NETGUN19082020
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**Assessment Year : 2018-19 (CAYm3)**

S.No	Student Name	Enrollment no	Employee Name	Appointment No
1	EGUVAPALLI VAMSIDHAR REDDY	9915004135	LEAN PITCH	LEAEGU20082018
2	VISHAL RAJ A	9915004142	HGS	HGSVIS24112018
3	DALU SAI PAVAN	9915004144	THINKSYNQ	THIDAL21012019
4	DOMMARAJU YASWANTH	9915004145	THINKSYNQ	THDOM21012019
5	MOHANASUNDARA M S	9915004146	HGS	HGSMOH24112018
6	VIGNESH.P	9915004148	THINKSYNQ	THIVIG21012019
7	R GOPI KRISHNAN	9915004151	LEAN PITCH	LEARGO20082018
8	JESWIN RATHISH DAVID J	9915004152	KOTAK	KOTJES24012019
9	K MAMTA	9915004153	TCS	TCSKMA09102018
10	SENAPATHI UJWALA	9915004154	HGS	HGSSEN24112018
11	SUDHARSAN M	9915004155	IGENIUS	IGESUD02032019
12	KOLLA GOPINATH	9915004157	EDUVIRTUOSO	EDUKOL30042019
13	SAIEMPU SAI KUMAR	9915004158	IGENIUS	IGESAI02032019
14	NADAKUDITI L N MANIKANTA	9915004159	KOTAK	KOTNAD2412019
15	GABBURI NIKHIL	9915004162	GLOBAL HEALTH CARE	GLOGAB02032019
16	PABBA TRIVED	9915004163	THINKSYNQ	THIPAB24012019
17	VIKASH KUMAR	9915004165	EDUVIRTUOSO	EDUVIK30042019
18	YEDLAPALLI DEEPAK BABJI	9915004166	HGS	HGSYAD24112018
19	YADLAPALLI SIVA NAGA KALYAN	9915004167	THINKSYNQ	THIYAD21012019
20	KODURU PRAJWAL	9915004171	CTS	CTS13062991
21	RAVI ASMITHA	9915004173	CTS	CTS13062992
22	CHANDRU R	9915004174	EDUVIRTUOSO	EDUCHA30042019
23	BARAM RAMESH BABU	9915004177	HEXAWARE	HEXBAR10122018
24	MAMILLA UDAYA SRI	9915004181	HGS	HGSMAM24112018
25	BODAGALA VISHNU VARDHAN	9915004183	GLOBAL HEALTH CARE	GLOBOD02032019

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26	VENNA NAGA THRINADH REDDY	9915004184	ZOHO	ZOHVEN03062019
27	JAMBULAPATI MEGHANA	9915004185	IBM	IBMJAM29112018
28	SWARNA HARSHINI M L	9915004186	IBM	IBMSWA29112018
29	B SAI VARSHIT	9915004189	HGS	HGSBSA24112018
30	BATHULA SOMU	9915004190	HGS	HGSBAT24112018
31	LAVESH KARNANI	9915004196	AMAZON	AMALAV29112018
32	N SAMPATH KUMAR	9915004198	TCS	TCSDT20173892755
33	MEDURI BABY SUSMITHA	9915004200	IBM	IBMMED29112018
34	YANAMADALA HARISH KUMAR	9915004205	HGS	HGSYAN24112018
35	MAMIDI MANOJ KUMAR	9915004207	EDUVIRTUOSO	EDUMAM30042019
36	DAKE LOKESH BABU	9915004208	THINKSYNQ	THI21012019
37	GANDE VARUN KUMAR	9915004211	LEAN PITCH	LEAGAN20082018
38	N V SAI TEJA	9915004215	ZOHO	ZOHNVS03062019
39	EMMADI NITHISH REDDY	9915004216	THINKSYNQ	THIEMM21012019
40	GUNDU VENKATA MANASA	9915004217	HGS	HGSGUN24112018
41	S AKHIL KUMAR REDDY	9915004218	NEEYAMO	NEESAK05072019
42	DHANDU HARI KRISHNA REDDY	9915004219	HGS	HGSARV24112018
43	ARVIND KUMAR	9915004223	LG SOFT	LGSARV30112018
44	AVULA JAYA PAVAN KUMAR	9915004227	HGS	HGSAVU24112018
45	MOHAMMED ABDUR RAHMAN	9915004229	GLOBAL HEALTH CARE	GLOMOH2032019
46	CHITHAMBARANAT HAN C K	9915004231	IGENIUS	IGECHI02032019
47	CHEEKARLA BALACHANDRA REDDY	9915004233	EDUVIRTUOSO	EDUCHE30042019
48	JAAVEETH H	9915004234	IGENIUS	IGEJAA02032019
49	GURUPRIYA R V	9915004238	IBM	IBMGUR29112018
50	MONIKA SUNDARI G	9515004201	HGS	HGSMON24112018
51	AATHIL F	9915004001	HGS	HGSAAT24112018
52	AKSHAYA S	9915004003	GLOBAL HEALTH CARE	GLOAKS02032019
53	JAYASHEELA S	9915004025	GLOBAL HEALTH CARE	GLOJAY02032019

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54	MAHENDRAN R	9915004038	GLOBAL HEALTH CARE	GLOMAH02032019
55	REVATHI C	9915004055	IGENIUS	IGEREV02032019
56	SATHISH KUMAR S	9915004060	IGENIUS	IGESAT02032019
57	SRIRAM G	9915004068	CTS	CTSSR07042019
58	SUBHA M	9915004071	TECH MAHINDRA	TECSUB27042019
59	SURUTHI R	9915004076	EDUVIRTUOSO	EDUSUR30042019
60	SURYA NARAYANAN N	9915004077	EDUVIRTUOSO	EDUNSU30042019
61	VAISHNAVI M	9915004080	INDIAN HEALTH CARE	INDVAI11032019
62	VEERABAHU MURUGAN A	9915004083	KOTAK	KOTVEE2412019
63	VENKADESH R	9915004085	KOTAK	KOTVEN2412019
64	VENKATESH P	9915004086	HGS	HGSPVEN24112018
65	VINISH W	9915004091	HGS	HGSVIN24112018
66	SAVITA SHRIYA CHITIRALA	9915004096	GLOBAL HEALTH CARE	GLOSAV02032019
67	APPIREDDIGARI SREEKANTH REDDY	9915004098	GLOBAL HEALTH CARE	GLOAPI02032019
68	UMA ANANTHAM D	9915004104	GLOBAL HEALTH CARE	GLOUMA02032019
69	KALLURI HARI KRISHNA	9915004109	IGENIUS	IGEKAL02032019
70	RAZIA KHAN	9915004127	IGENIUS	IGRKAL02032019
71	P MANOJKUMAR	9915004131	HGS	HGSPMA24112018
72	KUKUTI VEERA RAGHAVA YADAV	9915004136	EDUVIRTUOSO	EDUKUK30042019
73	NANDHINI M A	9915004138	EDUVIRTUOSO	EDUNAN30042019
74	SELVAMANI R	9915004139	EDUVIRTUOSO	EDUSEL30042019
75	KAKKARUVALAPPI L SRIKRISHNA	9915004140	VINS INFOTECH	VINKAK09082019
76	CALVINGNANASUN DAR E	9915004147	KOTAK	KOTCAL2412019
77	KRISHNAN T	9915004149	HGS	HGSKRI24112018
78	CHINTHALAPALLI GAYATHRI	9915004168	HGS	HGSCHG24112018
79	MARISAMY I	9915004175	GLOBAL HEALTH CARE	GLOMAR02032019
80	SARAVANAKUMAR M	9915004179	GLOBAL HEALTH CARE	GLOSAR02032019
81	MANIKANDAN P	9915004188	GLOBAL HEALTH CARE	GLOMAN02032019
82	POLARATHI MANOJ KUMAR	9915004206	IGENIUS	IGEPOL02032019
83	PRIYANSHU PRIYADARSHI	9915004225	IGENIUS	IGESOD02032019

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84	SODABATHINA NANDA KOTESWARA RAO	9915004236	HGS	HGSSOD24112018
85	VISWESWARAN N	9915004240	AI BEING	ALJVIS377015
86	RAJESH JOSHUA J	9816004002	EDUVIRTUOSO	EDURAJ30042019
87	BATHULA VISHNU SURYA TEJA	9915004241	EDUVIRTUOSO	EDUBAT30042019
88	EDUPUGANTI DOONDI ABHIRAM SAI	9915004242	EDUVIRTUOSO	EDUEDU30042019
89	GADDAM SAICHAND	9915004243	KOTAK	KOTGAD2412019
90	NIRUN XAVIER A	9915004245	KOTAK	KOTNIR2412019
91	SRIPAD PRAKASH	9915004246	KOTAK	KOTSRI2412019
92	VARSHA .B.K	9915004247	GLOBAL HEALTH CARE	GLOVAR02032019
93	YADAVALLI KISHORE KUMAR	9915004248	GLOBAL HEALTH CARE	GLOYAD02032019
94	E L MANIKANTAN	9915004249	GLOBAL HEALTH CARE	GLOELM02032019
95	BALAJI N	9915004250	EDUVIRTUOSO	EDUELM30042019
96	MITHLAJ.P	9915004251	EDUVIRTUOSO	EDUMIT30042019
97	MD HUSAIN ASHRAF	9915004252	IGENIUS	IGEMDH02032019
98	BIJOY.V	9915004253	IGENIUS	IGEBIJ02032019
99	ASWATHI.K	9915004254	GLOBAL HEALTH CARE	GLOASH02032019
100	NALLA PERUMAL ARUN P	9915004046	EDUVIRTUOSO	EDUNAL30042019
101	KISHAN B	9915004235	EDUVIRTUOSO	EDUKIS30042019
102	VENKAT PRASAT V S	9915004239	EDUVIRTUOSO	EDUVEN30042019
103	BHARATH S	9915004009	KOTAK	KOTBHA2412019
104	GANESH ANAND E	9915004016	KOTAK	KOTGAE2412019
105	GANESHKUMAR S	9915004017	HGS	HGSGAN24112018
106	GOWTHAM SRINIVASAN S	9915004019	HGS	HGSGOW24112018
107	HARSHINI P	9915004021	GLOBAL HEALTH CARE	GLOGOW02032019
108	KIRUTHIKA.S	9915004031	GLOBAL HEALTH CARE	GLOKIR02032019
109	RAJASEKAR D	9915004051	GLOBAL HEALTH CARE	GLORAJ02032019
110	SATHYANARAYAN AN R	9915004061	IGENIUS	IGE0SAT02032019
111	VIGNESH S KUMAR	9915004087	EDUVIRTUOSO	EDUVIG24112018
112	VILSON J	9915004090	EDUVIRTUOSO	EDUVIL30042019
113	SRUTHI.R	9915004095	EDUVIRTUOSO	EDUSRU30042019

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114	AMBARAPU NAGA THEJESWARA GOUD	9915004105	KOTAK	KOTAMB2412019
115	CHINTHAKUNTLA SRIKANTH REDDY	9915004232	DEAKIN UNIVERSITY	DEACHI219405461
116	DONTHIREDDY KAMAL REDDY	9915004195	NORTH WEST MISSOURI STATE UNIVERSITY	NORDON919583428
117	GALIGUTTA CHAITHANYA	9915004143	VELLORE INSTITUTE OF TECHNOLOGY	VELGAL19MA10007
118	BODDULURI KAILASH CHOWDARY	9915004201	HOGSKOLAN DALARNA	HGOBOD81456
119	B PRABHAKAR REDDY	9915004169	DEAKIN UNIVERSITY	DEABPA219257313
120	KAVIYA DEVI V	9915004102	NATIONAL ENGINEERING COLLEGE	NATKAV1953001
121	JENCY A JEBAMANI B	9915004028	KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION	KALJEN9919104007
122	ALLAM RAMI REDDY	9915004141	KL UNIVERSITY	KLUALA195034012
123	KALANJIYAM B	9915004244	KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION	KALKAL9919104004
124	KAVITHA R	9915004097	INDIAN INSTITUTE OF JOURNALISM & NEW MEDIA,BANGALOR E	INDKAVIINJM2022
125	KUNALA MANOJ KUMAR	9915004224	UNIVERSITY OF HERTFORDSHIRE	UNIKUN19019144
126	SARANYA M	9816004003	HGS	HGSSAR24112018
127	SIVAKUMAR R	9816004005	THINKSYNQ	THISIV21012019
128	S KARAN KUMAR	9816004006	THINKSYNQ	THISKA21012019
129	AHAMED BAZEER A	9915004002	HGS	HGSAHA24112018
130	ANJANA DEVI K	9915004004	HGS	HGSANJ24112018
131	ANUSHIYA S	9915004005	HGS	HGSANU24112018
132	ARUMUGASELVAM S	9915004006	THINKSYNQ	THIARU21012019
133	BALAJI V	9915004007	HGS	HGSBAL24112018
134	BALAKUMARAN M	9915004008	GLOBAL HEALTH CARE	GLOBAL02032019
135	BREMI C R	9915004010	TCS	TCSLCT20182555503
136	CHANDHRU V	9915004011	SWIFTERZ	SWICHAN01112018
137	DARWIN SUBASH S	9915004012	HGS	HGSDAR24112018

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138	DINESH KUMAR M	9915004013	HGS	HGSDIN24112018
139	DINESH KUMAR K	9915004014	KOTAK	KOTDIN24012019
140	ESWARAN S	9915004015	HGS	HGSESW24112018
141	HARISH VIJAY M	9915004020	THINKSYNQ	THIHAR21012019
142	HAUMSHINI R	9915004022	HGS	HGSHAU24112018
143	JASPER JERALD R	9915004024	GLOBAL HEALTH CARE	GLOJAS02032019
144	JEBIN IMMANUEL G	9915004026	HGS	HGSJEB24112018
145	JEEVANANTHAM S	9915004027	AI BEING	ALJJEE377015
146	KAJOLINI S	9915004030	HGS	HGSKAJ24112018
147	KODIESWARI G	9915004032	HGS	HGSKOD24112018
148	LAKSHMI NARAYANI S	9915004033	EDUVIRTUOSO	EDULAK30042019
149	LAKSHMI PRIYA J	9915004034	HGS	HGSLAK24112018
150	LAXI C	9915004035	CTS	CTS13062986
151	MAHESHVARAN J	9915004039	HGS	HGSMAH24112018
152	MAREESVARAN S	9915004041	HGS	HGSMAR24112018
153	MUKESH M	9915004043	HGS	HGSMUK24112018
154	MUKESH PRAKASPATHY S T	9915004044	HGS	HGSTMU24112018
155	MUTHU BALAJI N	9915004045	THINKSYNQ	THIMUT21012019
156	NANDHINI B	9915004047	HGS	HGSNAN24112018
157	PON DHARANI T	9915004048	HGS	HGSPON24112018
158	PRATHEEP R	9915004049	EDUVIRTUOSO	EDUPPRA30042019
159	PRINCE PRIYATHARSAN S	9915004050	CTS	CTSPRI27042019
160	RAMKUMAR R	9915004053	THINKSYNQ	THIRAM21012019
161	SACHIN G	9915004056	EDUVIRTUOSO	EDUSAC30042019
162	SANTHOSH KUMAR P	9915004057	EDUVIRTUOSO	EDUSAN30042019
163	SAPNAJALIL N	9915004058	HGS	HGSSAP24112018
164	SATHIA DEV T M	9915004059	HGS	HGSSAT24112018
165	SHANMUGAM S	9915004062	HGS	HGSSHA24112018
166	SHUNMUGA PRABHA.S	9915004063	HGS	HGSSHU24112018
167	SHYAM SUNDAR M	9915004064	HGS	HGSSHY24112018
168	SIVA PRASATH R	9915004065	HGS	HGSSIV24112018
169	SIVASANKAR G	9915004066	HGS	HGSGSI24112018
170	SUDARSAN B	9915004072	EDUVIRTUOSO	EDUSUD30042019
171	SUNIL SINGH K	9915004074	THINKSYNQ	THISUN21012018
172	SVENI J	9915004078	HGS	HGSSVE24112018
173	THARUN S R	9915004079	NEEYAMO	NEETHA05072019
174	VANMATHI B	9915004081	IBM	IBMVAN29112018
175	VASAGAR G	9915004082	THINKSYNQ	THIVAS21012019
176	VENGATESH. K	9915004084	HGS	HGSVEN24112018
177	VIGNESHA S	9915004088	KOTAK	KOTVIG01042019
178	VIJAYAKUMAR M	9915004089	HGS	HGSVIJ24112018

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179	VYSHALI S	9915004093	EDUVIRTUOSO	EDUVYS30042019
180	GURUMOORTHY T	9915004094	THINKSYNQ	THICHI21012019
181	CHINNAKOTLA REDDY RANI	9915004099	HGS	HGSCHI24112018
182	KONDALA MANOGNA	9915004100	HGS	HGSKON24112018
183	V HARICHANDANA	9915004103	HGS	HGSVHA24112018
184	RAMALINGAPPAGA RI YASHWANTKRISHN A SAI	9915004107	CTS	CTS13062988
185	NARRA PRAVEEN	9915004110	HGS	HGSNAR24112018
186	HAMEEM SAFIYA JALVA M	9915004111	HCL	HCLHAM09032019
187	KUSUMANCHI RAVI TEJA	9915004112	THINKSYNQ	THIKUS21012019
188	ANANTHU J	9915004113	HGS	HGSANA24112018
189	LAKSHMI PRIYA R	9915004114	HGS	HGSRLA24112018
190	SAJJA SRINIVAS RAKESH	9915004117	THINKSYNQ	THISAJ21012019
191	RAMESH KUMAR KM	9915004118	THINKSYNQ	THIRAK21012019
192	VANAJA GAYATHRI S	9915004121	HGS	HGSVAN24112018
193	ROSHNI B	9915004122	EDUVIRTUOSO	EDUROS30042019
194	C S NAVEEN KUMAR	9915004125	THINKSYNQ	THICSN21012019
195	AMBITI HARIVARDHAN	9915004126	GLOBAL HEALTH	GLOAMB02032019
196	RAVI VENKATA SAI	9915004128	CTS	CTS13062989
197	NAGARAJUGARI SUBRAMANYA SAI ARAVIND	9915004129	CTS	CTS13062990
198	NALLANI VINODSAI	9915004130	NEEYAMO	NEENAL05072019
199	SRIRAM M	9915004132	TCS	TCSLCT20182561125
200	GAYATHRI K	9915004134	HGS	HGSGAY24112018
201	THAMARA KANI C	9915004101	AI BEING	ALJTHA377015

Assessment Year : 2017-18 (CAYm4)

S. No	Student Name	Enrollment no	Employee Name	Appointment No
1	VISHVAK S	9515004301	FINNOVATION TECH SOLUTION	FINVIS20122017
2	KAMALA DHARANI.A	9815004001	BANK ZONE	BANKAM20122017
3	SELVAM.R	9815004003	BEREZIA	BERSEL20122017
4	ANITHA B.	9815004004	BEREZIA	BERANI20122017

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5	AISHWARYA K.	9914004001	MOBIUS	MOBAIS19012018
6	KOTTAPALLI VENKATAGOW THAM	9914004004	WIPRO	WIPKOT16092017
7	DEVISRI S	9914004005	BEREZIA	BERDEV20122017
8	GAJA MANCHI R	9914004007	BANK ZONE	BANGAJ20122017
9	GURUPRASAT H.L	9914004009	LEAD PRO	LEAGUR11062018
10	JESULLA GRACELYN B.	9914004010	NEEYAMO IT ENTERPRISE	NEEJES20112017
11	MAREESWARI M.	9914004013	BEREZIA	BERMAR20122017
12	MUTHU LAKSHMI L.	9914004016	BYJUS	BYJMUT18072018
13	MUTHU PALANIVEL P.B.	9914004017	FINNOVATION	FINMUP20122017
14	MUTHUMARI R.G.	9914004018	FINNOVATION	FINMUT20122017
15	PADRE ALEX J	9914004019	WIPRO	WIPPAD16092017
16	PRAVEEN K L.	9914004020	MAGUS	MAGPRA10032018
17	PRAVEEN KUMAR.M	9914004021	LEAD PRO	LEAPRA20122017
18	PRIYA P.	9914004022	HEXAWARE	HEXPRI11052018
19	PRIYANKA SURANA.P	9914004023	WIPRO	WIPPRI16092017
20	RATHIKA K.	9914004024	LUMINA DATAMATICS	LUMRAT26022018
21	RENUGA DEVI N	9914004025	BEREZIA	BERREN20102017
22	RICHARD AMALRAJ A	9914004026	LUMINA DATAMATICS	LUMRIC26022018
23	SABARISH KUMAR M.	9914004027	BEREZIA	BERSAB20122017
24	SANKARESH C	9914004028	LUMINA	LUMSAN26022018
25	SANTHANABH ARATHI R.	9914004029	MOBIUS	MOBSAR29122017
26	SATHISH K.	9914004030	BOARD INFINITY COMPANY	BOASAT13102018
27	SELVA VIGNESH.M	9914004031	BEREZIA	BERSEL20122017
28	SOMAVIGNESH WAR A	9914004032	BEREZIA TECHNOLOGIES	BERSOM20122017
29	SUBRAMITHA. K.K	9914004034	CTS	CTSSUB05012018
30	SUJI THAMAYANTH I.L.	9914004035	FINNOVATION	FINSUJ20122017



31	SURYA PRAKASH JHA	9914004036	LUMINA DATAMATICS	LUMSUR26022018
32	THAMINI PL.	9914004038	BOARD INFINITY	BOATHA12102018
33	VASANTH KUMAR.V	9914004040	BANK ZONE	BANVAS20122017
34	VENNILA S	9914004041	BOARD INFINITY	BOAVEN12102018
35	VIJAYALAKSH MI M	9914004042	BEREZIA	BERVIJ20122017
36	VISWANATHA N B.	9914004043	BEREZIA	BERVIS20122017
37	SAIRAM S	9914004046	BEREZIA	BERSAI20122017
38	HEMADEVI U	9914004048	RIDSYS	RIDHEM12042018
39	ANANDA KRISHNAN K	9914004050	LEAD PRO	LEANA20042018
40	HARINI S	9914004051	MAGUS	MAGHAR01032018
41	VENKATA SAI BHARGAVA B	9914004052	KALYCITO INTERN	KALVEN24012018
42	JYOTI KISHAN	9914004053	FINNOVATION	FINJYO20122017
43	MAYANK RAJ	9914004054	BANK ZONE	BANMAY20122017
44	AMBATI VINUSHA	9914004055	LUMINA DATAMATICS	LUMAMB26022018
45	GYANESH KUMAR	9914004056	LUMINA DATAMATICS	LUMGYA26022018
46	SAI NAGA SOBHAN	9914004057	BOARD INFINITY	BOASAI12102018
47	BATTU HARITHA	9914004058	TCS	TCSBAT08012018
48	VAKATI SHARA PRIYANKA	9914004059	MOBIUS	MOBVAK19012018
49	SANJAY RAGAVENDRA R	9914004060	DALHOUSIE UNIVERSITY	DALSAN4004060
50	SAI NANDHINI S.	9914004063	BANK ZONE	BANSAI20122017
51	MUNNALURI ROOPESH	9914004061	UNIVERSITY OF NEW HAMPSHIRE	UNIMUN19102018
52	GARIKIMUKKU REETHIKA	9914004062	INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, DESIGN AND MANUFACTURING JABALPUR	INDGAR1811008
53	MOHAN RAJ P	9914004015	GEO EXPLORATION SERVICE	GEOMOH25042018
54	YAVANARANI P	9914004044	DURUVA FINANCE	DURYAV19032018
55	AJITHKUMAR T N	9914004045	MIDDLESEX UNIVERSITY LONDON	MIDAJIM00682348

56	SWATHI S J	9914004037	LUMINA DATAMATICS	LUMSWA26022018
57	PURA RARIYANG	9914004064	MOBIUS	MOBPUR19012018

## 4.5. Professional Activities (20)

### 4.5.1. Professional societies/chapters and organizing engineering events (5)

The department of Computer Science Engineering focuses on conducting quality events for the benefit of the student community. The events are planned in different levels (Institute/State/National/International) to address all batches of the students. 50% of the events are national level, 5% of the events are international events, 25% of the events are state-level and 20% are institutional level events. Eminent speakers distinguished professional software developers, and top university academicians are involved in handling sessions to ensure the basic and recent processes on the topic are discriminated against to the students in the mode of knowledge sharing. The utmost current IT trend will be indulged as the theme of the program which paves the way for better exposure to unknown content in the field of Computer Science and Technology. Encourage the budding scientist and programmers with tech contests.

The following are Society/Chapters

1. CSI Students Chapter
2. ACM students Chapter
3. IEDC (Innovation and Entrepreneurship Development Centre)
4. Indian Society of Technical Education (ISTE)

#### 1. CSI Students Chapter

**Table 4.5.1.1 CSI list of events conducted during 2021-2022**

S.No	Event Name	Duration	Faculty Coordinators	Event title	Participants	Date & Time
1.	Coding contest	1 day	Dr.A.Saravanan, Mr.S.Suresh Kumar	Virtual Code war	449	22.04.2022
2.	Paper / Poster Presentation	1 day	Dr.G.S. Smirthy	Paper / Poster Presentation	105	22.04.2022
3.	Tech Quiz	1 day	Mrs.G.Elizabethrani	Tech Quiz	120	22.04.2022
4.	Project Expo	1 day	Dr.Jane rubel angelina	Project Expo	96	22.04.2022

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5.	Learnathon I	1 day	Dr.C.Balasubramanian	Recent trends in IoT technology	173	22.04.2022
6.	Value Added Course	5 days	Mr.A.Robert singh	RPA Design and Development	82	Oct 10,17, 24, 31 Nov 7, 2021 9 am to 6 pm
7.	Workshop	1 day	Ms.M.Malathi Mr.K.Vignesh	Haskell Programming	60	3 <sup>rd</sup> Saturday of September 2021 9 am to 5 pm
8.	Workshop	1 day	Dr.D.Ganesha Perumal Ms.T.Preethi	Python with Raspberry pi	57	5 <sup>th</sup> Saturday of October 2021 9 am to 5 pm
9.	Workshop	1 day	Dr.P.Muthuvel Mr.M.K.Nagarajan	Media Forensics	115	1 <sup>st</sup> Saturday of November 2021 9 am to 5 pm
10.	Value added course	5 days (40hours)	Mr.Muthuvel	RPA design and development	72	Dec 2021 9 am to 6 pm
11.	One credit	15 hours	Mrs.R.Sumathi	Web application with React Native Beginners	148	Sep 19,15 and 26 of 2021
12.	Webinar	1 hour	Dr. B.Pitchaimanickam	Alumni Webinar Talk Series	948	02.06.2021 04.06.2021 05.06.2021 07.06.2021 08.06.2021 10.06.2021 11.06.2021 12.06.2021 19.06.2021 6.06.2021

**Table 4.5.1.2 CSI list of events conducted during 2020-2021 (Odd Semester)**

S. No	Event Name	No of days	Date	Faculty Incharge	Participants
1	Youtube channel - one topic/student	1	05.08.2020	Dr. Thendral, Dr.R.Murugeswari	247
2	Coding contest	5	15.07.2020, 25.07.2020, 27.07.2020, 28.07.2020	Mr. MuthamilSudar, Ms. G, Elizabeth Rani, Mrs. R. Sumathi	187

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3	Mini-project competition	1	Review - Weekly once (2020-21 Odd Semester)	Mr. M. Raja, Mr. C. Balasubramanian	124
4	Startup Ideas competition	4	02.08.2020, 03.08.20,04.08.20,05.08.20	Dr. N.C. Brintha, Mr.D.Balakrishnan	120
5	Code Debugging	3	21.07.2020, 28.07.2020, 04.08.2020	Mrs. Vidhya, Dr.R.Murugeswari	210
6	Lets Crack It! Career Guidance Program	1	05.08.2020	Mr.P.Velmurugadass	54
7	Technical talk series (by Alumni)	6	19.07.2020, 22.07.2020,23.07.2020, 25 .07.2020, 27.07.2020,28.07.2020,29. 07.2020,30.07.2020,05.08. 2020	Dr. B. Pitchai Manickam, Dr.G.Murugaboopathi	648
8	On spot E-Poster contest	2	24.07.2020, 01.08.2020	Mr.P.Nagaraj, Dr.B.S.Murugan	41
9	Web Application development contest	1	28.07.2020	Mrs. J. Jeyaranjani	48
10	Virtual Symposium	1	08.08.2020	Dr.R.Kanniga Devi and Mrs.J.Jeyaranjani	730
11	Resume building	2	24.07.2020, 31.07.2020	Dr. T. Diliphan Rajkumar, Mr.R.Rajasubramaniam	68
12	Technical workshop on AI and Deep learning-COVID-19-Forecasting	5	03.08.20 to 07.08.20	Dr.A.Saravanan , Mrs.S.Vidya	56
13	Software Testing	5	08.08.2020, 15.08.2020, 22.08.2020, 29.08.2020 and 5.08.2020	Mr.Velmurugadass and Mr M.Raja	53
14	Software Testing Strategies	1	05-08-2020	Dr.S.Dhanasekaran	61
15	Guest lecture on Industry Trends and Technology	1	08-08-2020	Dr.S.Dhanasekaran	63
16	Two days hands on workshop on A dive into Object Oriented Programming (Focusing C++)	2	6.8.2020 & 7.8.2020	Mrs.G.Elizabeth Rani &Mr.R.Raja Subramanian	120
17	Industrial databases and its applications	1	01.11.2020 08.11.2020 Time: 9.00 am to 4.00 pm	Mrs.S.Vidya Dr.R.Murugeswari	72
18	Machine Learning and its applications	1	22.11.2020 28.11.2020 29.11.2020 9.00 am to 4.00 pm	Dr.P.Thendral Dr.Robert Singh	66

19	Computer Vision	1	24.10.2020 and 30.10.2020	Dr.A.Saravanan	110
20	One credit on “Neural Network Architectures in Computer Vision”	5	20.07.2020 to 24.07.2020	Mr.R.Raja Subramaniam	157
21	Full Stack Management	4	05.06.2020- 12.05.2020 (online)	Mrs.R.Sumathi	21
22	R with Data Analytics	4	06.06.2020 to 24.06.2020 (Online)	Mrs.R.Sumathi	22
23	Predictive Modeling	4	08.07.2020- 21.07.2020	Mrs.R.Sumathi	24

**Table 4.5.1.3 CSI list of events conducted during 2020-2021 (Even Semester)**

S. No	Name of the Event	Duration	Faculty Coordinators	Event title	Participants	Date & Time
1.	Workshop	2 days	Mr.P.Velmurugadass	Website development	60	March 2021
2.	Guest Lecture	1 day	Dr.S.Dhanasekaran	Virtual Reality (CSI Sponsored)	126	20.02.2021
3.	Programming contest	1 day	Dr.C.Balasubramanian Mr.M.Raja Mr.Rajasubramanian	Chase the Solution	275	06.03. 2021
4.	Problem solving	1 day	Dr.A.Saravanan Mr.P.Nagaraj Mr.Rajasubramanian	Virtual Code war	360	20.03.2021
5.	Summer course	30 hours	Mrs.J.Jeyaranjani	Android Application Development	41	07.06.2021
6.	Coding contest	1 day	Dr.R.Ramalakshmi	Coderscrew Coding contest	310	19.06.2021
7.	One credit	5 days	Mrs.R.Sumathi	Web application using Django	194	07,14,21,27,18/02/2021
8	Webinar	1 hour	Dr B.Pitchaimanickam	Alumni Webinar Talk Series	293	7.06.2021 08.06.2021,10.06.2021 11.06.2021,12.06.2021 19.06.2021,26.06.2021

**Table 4.5.1.4 CSI list of events conducted during 2019-2020 (Odd Semester)**

S. No	Event	Duration	Faculty Incharge	Event title	Date	Participants
1	CSE- Association and CSI students chapter inauguration	1 day	Association and CSI incharges	Inauguration	17.08.2019	690
2	Workshop	1 day	Dr.S.Karkuzhali	Artificial Intelligence	07.09.2019	63
3	Workshop	1 day	Mr.C.Balasubramanian	Internet of Things	21.09.2019	68
4	Guest Lecture - Joint participation with IT department	1 day	Dr.G.Murugaboopathi	Block chain technology	03.08.2019	73
5	Guest Lecture	1 day	Dr.R.Murugeswari	Machine Learning	21.09.2019	64
6	Guest Lecture	1 day	Mr.M.Raja	Augmented Reality	21.09.2019	71
7	Guest Lecture	1 day	Mrs.J.Jeyaranjani	Python Programming	19.10.2019	88
8	One credit course	5 days	Mrs.R.Sumathi	R Programming	10.09.19 15.09.2019	44
9	National Seminar	1 day	Dr.K.Murugeswari	Emerging IT technologies	19.10.2019	310
10	International Certification	1 month	Dr.P.Thendral	SAP-ABAP	24.06.2019 - 20.07.2019	218
11	Value added course	5 days	Mr. P.Nagaraj	Machine learning and Internet of Things ( ACM Hackathon 2k19)	10/8/19- 14/8/19	198

**Table 4.5.1.5 CSI list of events conducted during 2019-2020 (Even Semester)**

S. No	Event Name	Duration	Faculty Incharge	Event title	Participants	Date
1	Workshop	1 day	Mr.C.Bala Subramanian	Internet of Things	50	2/22/2020 (8601 Lab)
2	Guest Lecture - Joint participation with IT department	1 day	Dr.G.Murugaboopathi	Block chain technology	76	03.02.2020 (8th Block Seminar Hall)
3	Workshop	1 day	Dr.R.Murugeswari & Dr.P.Thendral	Machine Learning	56	01.02.20 (8601 lab)
4	Guest Lecture	1 day	Mr.M.Raja	Augmented Reality	112	25.01.2020 9th block Seminar hall
5	Workshop	2 days	Mrs.J.Jeyaranjani	Python Programming	66	09.01.20 and 10.1.20 8401 Lab
6	National Seminar	1 day	Dr.K.Murugeswari	Emerging IT technologies	256	01.02.2020 8501
7	Symposium	2 days	Dr.R.Kanniga Devi Mrs.J.Jeyaranjani	National Level Symposium	750	13.03.2020 and 14.03.2020 K.S.Krishnan Auditorium
8	Value added course	5 days	Mrs.R.Sumathi	Mule soft development	63	25.01.2020 to 27.01.2020 and 08.02.2020, 09.02.2020

**Table 4.5.2 ACM Events Summary**

<b>S. No</b>	<b>Date</b>	<b>Title</b>
1.	28-Jul-2018	Privacy and Security in Online Social Media
2.	08-08-2018 to 12-Aug-2018	Disfrutar2K18
3.	10-Aug-2019 to 14-Aug-2019	Disfrutar 2k19
4.	23-01-2020	Algorithm Thinking and Problem Solving
5.	24-02-2020	ACM Eminent Speaker Programme: Security and Trust
6.	27-04-2020	Entrepreneurship and Innovation
7.	25-05-2020	Application of ML in Real Problem Statements
8.	05-06-2020 to 24-06-2020	R for Data Analytics
9.	05-06-2020 to 18-06-2020	Full Stack Development
10.	05-06-2020 to 18-06-2020	Pywarriors
11.	08-07-2020 to 25-07-2020	Predictive Modelling
12.	23-07-2020	A Novel Way To Teach Operating Systems
13.	25-07-2020	Machine Learning Taxonomy (Online)
14.	27-07-2020	How To Write A Good Research Paper (Online)
15.	29-07-2020	Uncle Sam Boulevard: Road to USA
16.	31-07-2020	Choosing your next step and shaping your carrer in IT
17.	03-08- 2020	Block Chain Technology
18.	12-08-2021	RPA Design and Development
19.	27-08-2021	Machine Learning Using Python
20.	23-04-2022	Cyber Security Tools and Techniques
21.	24-05-2022 to 28-05-2022	Blue Prism
22.	24-02-2022 & 25-02-2022	IoT Using Arduino



## ENTREPRENEURSHIP AND INNOVATION

**Resource Person: Mr. S. Kirubakaran, Founder and CEO of Experts Hub**

The webinar under the topic Entrepreneurship and Innovation was conducted on 27-April-2020 at 2pm to 3pm organised by KARE/ ACM and KARE/ACM-W student chapter. Around 50 members attended this webinar. Mr. S. Kirubakaran.(Founder & CEO Experts Hub).He taught how Innovation relies on how entrepreneurs position themselves, get funding and manage ventures to become successful.

The poster is for a webinar titled "ENTREPRENEURSHIP AND INNOVATION". At the top, it features the Kalasalingam University logo and name, along with a portrait of Mr. S. Kirubakaran. Below this, it identifies the organizing departments: "DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING" and "SCHOOL OF COMPUTING". It also mentions "KARE ACM & KARE ACM-W STUDENT CHAPTERS" with their respective logos and chapter IDs (170084 & 180857). The webinar is hosted on "ExpertsHub". The session is presented by "Mr.S.Kirubakaran, Founder & CEO - ExpertsHub", with a small photo of him. The mode of session is "Cisco Webex Meeting". The date and time are "27-04-2020 (2pm to 3pm)" and the meeting ID is "581 011 432". A QR code is provided for scanning, with a "SCAN ME" button below it. The meeting information link is <https://meetingsapac10.webex.com/meetingsapac10/j.php?MTID=me1cdf53a9f63e4fe51cb7493026014aa>.

Fig. 4.5.2.1. Webinar- Entrepreneurship and Innovation

## APPLICATION OF ML IN REAL PROBLEM STATEMENTS

**Resource person: Mr. Krishnakumar (Technology leder at Honeywell) and G. Lok Sundar**

Webinar under the topic “Application of ML in Real Problem Statements. It was held on 25-05-2020 from 1:30 pm to 2:30 pm. The total number of participants was 130. In these programs learned to enable computers and computing machines to search for and identify hidden sights, without being programmed for where to look for, when exposed to new data sets has been explained in this webinar.

The poster is for a webinar titled "Industry Examples - Application of ML in Real Problem Statements". It is organized by the School of Computing at Kalasalingam University, specifically by the KARE ACM and KARE ACM-W Student Chapters. The webinar is scheduled for May 25, 2020, from 1:30 PM to 2:30 PM. The session is led by Mr. Krishnakumar, a technology leader at Honeywell, and co-chaired by G. Lok Sundar, a 3rd-year CSE student at KARE. The poster includes logos for Kalasalingam University, KARE ACM, and KARE ACM-W, along with a meeting ID and a link to the webinar.

**KALASALINGAM**  
ACADEMY OF RESEARCH & EDUCATION  
(DEEMED TO BE UNIVERSITY)  
SCHOOL OF COMPUTING  
KARE ACM & KARE ACM-W STUDENT CHAPTERS  
(Chapter ID : 170084 & 180857)  
WEBINAR ON :  
**Industry Examples - Application of ML in Real Problem Statements**  
Session By :  
**Mr. Krishnakumar**  
Technology leader at Honeywell  
(Industry Expert, Software Architect & Former SAP chief Architect)  
Date&Time : 25-05-2020(1.30 P'M to 2.30P'M)  
Meeting ID : 587394468  
Meeting Information Link :  
<https://meetingsapac4.webex.com/meetingsapac4/j.php?MTID=m0a3e5da79409481036ef950c8c173edd>  
Co-Speaker :  
**G.Lok Sundar**  
3rd Year CSE  
KARE

Fig. 4.5.2.2. Webinar -Application of ML in Real Problem Statements

## R FOR DATA ANALYTICS

Resource person: Dr. S. Sampath, Professor, Department of CS/IT, KARE

The event was organized by Kare /ACM under the topic “ R for Data Analytics “ was conducted from 05-06-2020 to 24-06-2020 at 9:30Am to 11:30 Am and Attendance was 30 in number. The course is free of cost. It is an online event conducted through WebEx meetings by Dr. S. Sampath. Faculty Sponsors KARE/ACM, Dean of Computer Science and Engineering Dr.P.Deepalakshmi, HOD/CSE Dr. Francis Saviour Devaraj and the faculty coordinator Mr. P. Nagaraj. In these event students learnt a programming language, open-source software for heavy statistical computing called R-Programming language. The techniques and processes of Data Analytics have been automated into mechanical processes and algorithms that work over raw data for human consumption have been taught clearly and how Data Analytics is applied to R programming language.

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Under sec. 3 of UGC Act, 1956 Accredited by NAAC with 'A' Grade  
Acad Regn. No:KARE/001/2018, Sivakasi (TN), India. Email: info@kalasalingam.ac.in / www.kalasalingam.ac.in

Date: 05.06.2020 to 24.06.2020

Time: 2 Hrs 9:30am - 11:30am

**KARE ACM Organize Value Added Course on  
R for Data Analytics**

**Resource Person**  
Dr. S. Sampath, Professor, Department of CS/IT  
Kalasalingam Academy of Research and Education

Dr. P. Deepalakshmi  
Dean/Soc & Faculty Mentor, KARE-ACM

Mr. P. Nagaraj  
Co-ordinator

Dr. A. Francis Saviour Devaraj  
HOD/CSE

Fig. 4.5.2.3. Valued Added Course R for Data Analytics

**FULL STACK DEVELOPMENT (ONLINE)**

**Resource person: Mr.Kirubakaran (Founder & CEO-Experts Hub)**

The event under the topic “FULL STACK DEVELOPMENT “It is an event conducted through online mode from 05-06-2020 to 18-06-2020 by Mr. Harsh Sharma (Associative Deep learning Engineer) and Mr.Kirubakaran (Founder & CEO-Experts Hub). Faculty Sponsors KARE/ACM, Dean of computer science and Engineering Dr.P.Deepalakshmi, HOD/CSE Dr. Francis Saviour Devaraj and the faculty coordinator Mrs.R.Sumathi. Here the resource persons taught Front-end and Back-end Technologies. In Front-end they taught HTML 5, CSS, JavaScript, Bootstrap and in Back-end they taught Django, PostgreSQL, deployment, Hosting the Website, SSL Certificate creation. Number in attendees in the event was 25. The event ended successfully.

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Grand Nagar, Krishnankottai - 626119. Srilalitha (D), Vairamangudi (D), Tamil Nadu | info@kalasalingam.ac.in | www.kalasalingam.ac.in

**KARE-ACM Organizes Value Added Course on Full Stack Development (online)**

**Resource Person**  
**Mr. Harsh Sharma,**  
Associate Deep Learning Engineer,  
360 DT, New Delhi.  
&  
**Mr. Kirubakaran,**  
Founder & CEO, Expertshub

**Front Technology :**  
HTML 5,  
CSS,  
JavaScript,  
Bootstrap.

**Back End Technology :**  
Django,  
PostgreSQL,  
deployment,  
Hosting the Website,  
SSL Certificate creation

**Date: 05.06.2020 - 18.06.2020**

**Time: 3 hours Per Day**

**Registration Amount ₹2500/-**

**Dr. P. Deepalakshmi**  
Dean, Soc & Faculty Mentor, KARE-ACM

**Mrs. R. Sumathi**  
Co-ordinator

**Dr. Francis Saviour Devaraj**  
HOD CSE

**Fig. 4.5.2.4. Value Added Course-Full Stack Development**

## PYWARRIORS

It was a 14 days program held from 05-06-2020 to 18-06-2020. The number of participants attended the event was 216. It is a three-phase level competition. In level-1 participants have to acquire a certificate in python through online websites. In level-2 is a Quiz completely based on python which participants have learnt through websites. This quiz was conducted from Smart bridge platform. Next level is the final level, in this level all the participants have been assigned with a challenge. They have to develop the code for this challenge. Finally, there was prizes for winners in the event, third prize with worth of 1500/- and second prize worth of 2000/- finally first prize win worth of 3000/-. The event ended successfully.

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**SCHOOL OF COMPUTING**

**KARE ACM** & **KARE ACM - W** STUDENT CHAPTER'S

**SMARTBRIDGE**  
Let's Bridge the Gap  
Proudly Presents

**PYWARRIORS**  
Learn - Code - Challenge

LEVEL - 1 (05.06.2020)	LEVEL - 2 (10.06.2020)	LEVEL - 3 (15.06.2020 - 17.06.2020)
Learning Activity - All Participants Must Complete Online Python Certification from the below Website. <a href="http://www.sololearn.com">www.sololearn.com</a>	Online Quiz - will be organized through SmartInternz platform <a href="http://www.smartinternz.com">www.smartinternz.com</a>	Challenge - Participants Should Develop Code for Given Challenge.

**PRIZES**  
1<sup>st</sup> - 3000/-  
2<sup>nd</sup> - 2000/-  
3<sup>rd</sup> - 1500/-

**ENTRY FEE : RS. 200/-**  
Note: Entry fee is only for Level 3

**CONTACT**  
+91 91825 79319, +91 89783 45367

Register @ <https://smartinternz.com/pywarriors>

Fig. 4.5.2.5. Code Challenge-Pywarriors

## PREDICTIVE MODELING

**Resource person: Dr. S. Sampath Kumar, Department of CS/IT/ KARE.**

KARE ACM Organized 17 days program for Training Program on Predictive Modeling. Faculty Sponsors KARE/ACM, Dean of computer science and Engineering/mentor/Kare-ACM Dr.P.Deepalakshmi and the faculty coordinator Mrs. S. Vidya and Dr. A. Francis Saviour Devaraj. It was held from 08-07-2020 to 25-07-2020 from 9:30 am to 11:30 am. This Webinar teaches how Predictive models use known results to develop (or train) a model that can be used to predict values for different or new models.

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**DATE**  
08.07.2020 to 25.07.2020

**Time:**  
9:30am - 11:00am

**KARE ACM**

**KARE ACM Organizes Training Program on**  
**PREDICTIVE MODELLING**

**Entry Fee**  
Free for  
**KARE Students**  
Rs.500(Externals)

**Resource Person**  
**Dr.S.Sampath, Professor, Department of CS/IT**  
**Kalasalingam Academy of Research and Education**

**Registration**  
<http://rs-gz/17x1v8>

**Dr.P. Deepalakshmi**  
Dean/SOC & Faculty Mentor/KARE-ACM

**Mrs. S. Vidya**  
Co-ordinator

**Dr.A. Francis Saviour Devaraj**  
HOD/CSE

**PREDICTIVE ANALYTICS**

Fig. 4.5.2.6. Training Program- Predictive Modelling

## A NOVEL WAY TO TEACH OPERATING SYSTEMS

**Resources person: Dr. Abhijat M. Vichare-ACM Eminent Speaker Consultant at Persistent Systems Ltd.**

The webinar under the topic “A Novel Way to Teach Operating Systems” was held on 23-July-2020. Faculty Sponsors KARE/ACM, Dean of computer science and Engineering Dr.P.Deepalakshmi, and the faculty coordinator Mr.K.Muthamil Sudar. In the webinar, the resource person is given the basic way for teaching Operating Systems, as Operating Systems is a basic requirement for computer science students.

The poster is for a webinar titled "A Novel Way To Teach Operating Systems". At the top, it features the Kalasalingam University logo and name, along with a portrait of an elderly man in sunglasses. Below this, it identifies the School of Computing and the ACM-India Eminent Speaker Programme. The main title of the webinar is prominently displayed. On the left, there is a portrait of Dr. Abhijat M. Vichare, the session speaker. To his right, the session details are provided: "Session by: Dr. Abhijat M. Vichare, ACM Eminent Speaker, Consultant at Persistent Systems Ltd., Pune". Further right, the date and time are listed as "23<sup>rd</sup> JULY 2020, 11:00 AM to 12:30PM". A QR code is provided for registration, with the URL <https://rb.gy/olvsig>. At the bottom, the names and roles of the faculty members are listed: Dr. P. Deepalakshmi, Dean/SoC & Faculty Mentor/KARE-ACM, and Mr. K. Muthamil Sudar, Co-Ordinator.

**Fig. 4.5.2.7. Webinar-A Novel Way to Teach Operating Systems**

**MACHINE LEARNING TAXONOMY (ONLINE)**

**Resources Person: Dr. P. Kayal-ACM Distinguished Speaker, Associate professor, Department of Information Technology, BVRITH, Hyderabad, India.**

The webinar under the topic “Machine Learning Taxonomy was conducted on 25-July-2020 at 11:00 am – 12: 30 pm. Faculty Sponsors KARE/ACM , Dean of computer science and Engineering Dr.P.Deepalakshmi, Faculty coordinator is Mr. K. Muthamilsudar and student coordinator chair/KARE/ACM, Y. Chanikya Chowdary. In this online session, Speaker taught how Taxonomies and ontologies provide machines powerful tools to make sense of data. The purpose of machine learning is to teach computers to execute tasks without human intervention. An increasing number of applications such as genomics, social networking, advertising, or risk analysis generate a very large amount of data that can be analyzed or mined to extract knowledge or insight into a process, customer, or organization. Ultimately, machine learning algorithms consist of identifying and validating models to optimize a performance criterion using historical, present, and future data.

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**KARE ACM** **SCHOOL OF COMPUTING**

**ACM Distinguished Speaker Program**  
Webinar on  
**Machine Learning Taxonomy**

**25th July, 2020**  
Saturday

**11 AM - 12:30 PM**

Registration Link :  
<https://forms.gle/GsZtNsKrfriASb8n6>

**Scan Me!**

**Dr.P.KAYAL**  
ACM Distinguished Speaker  
Associate Professor  
Department of Information Technology  
BVRITH | Hyderabad | India

Faculty Sponsor/KARE ACM  
**Dr.P.Deepalakshmi**

Coordinator  
**Mr.K.Muthamil Sudar**

**Y.Chanikya Chowdary**  
Chair, KARE ACM

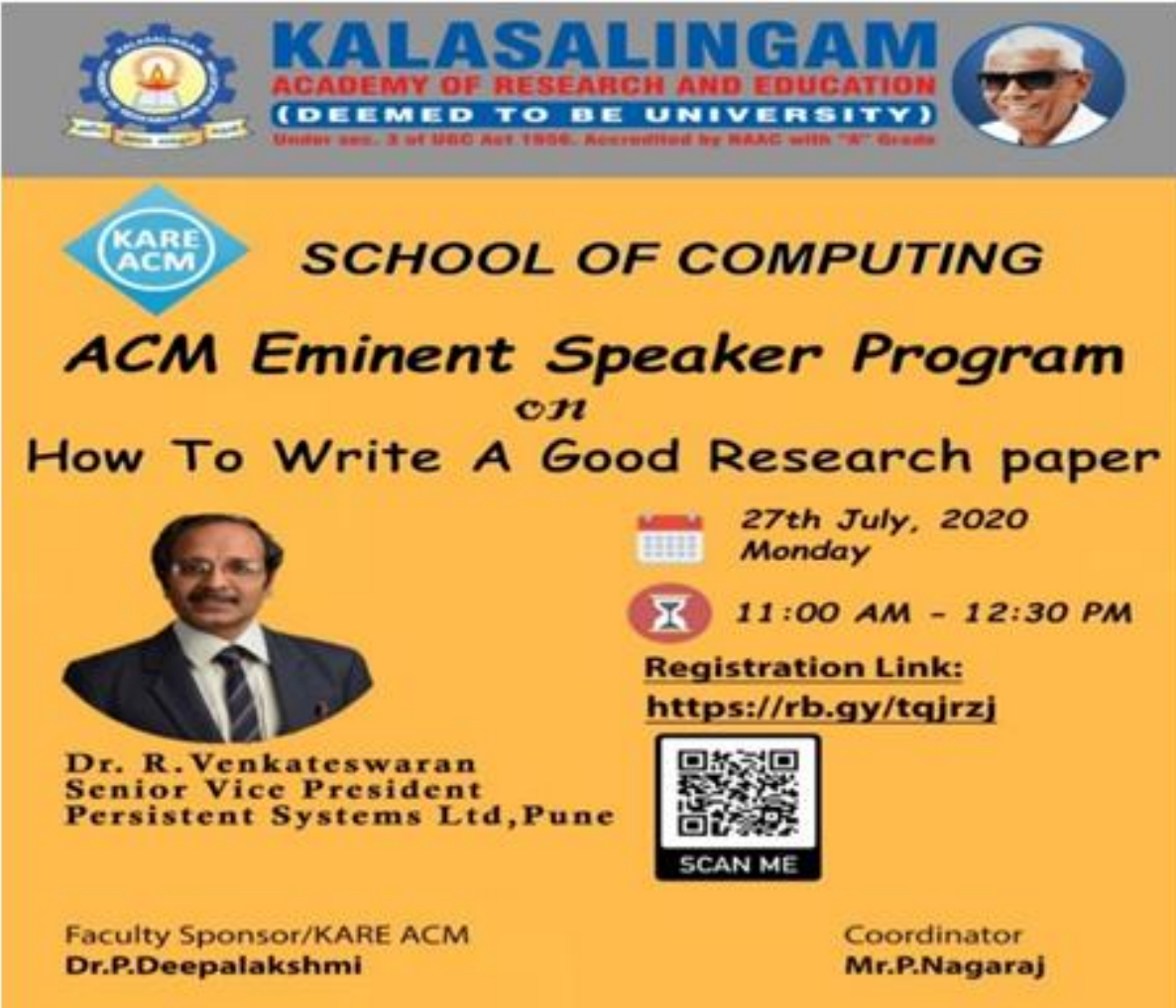
**Fig. 4.5.2.8. Webinar- Machine Learning Taxonomy**



## HOW TO WRITE A GOOD RESEARCH PAPER (ONLINE)

**Resources person: Dr. R. Venkateswaran senior vice president persistent system Ltd, Pune.**

The ACM eminent speaker program under the topic “How To Write A Good Research Paper (Online)” was conducted on 27-July-2020 at 11:00 Am – 12: 30 Pm. Faculty Sponsors KARE/ACM, Dean of Computer Science and Engineering Dr.P.Deepalakshmi and Faculty coordinator is Mr. P. Nagaraj. In this online session the Speaker taught how to write a good Research paper which will become an add on to their resume. Most of the final year students attended the session.



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**KARE ACM**

**SCHOOL OF COMPUTING**

**ACM Eminent Speaker Program**  
ON  
**How To Write A Good Research paper**

**Dr. R. Venkateswaran**  
Senior Vice President  
Persistent Systems Ltd, Pune

27th July, 2020  
Monday

11:00 AM - 12:30 PM

**Registration Link:**  
<https://rb.gy/tqjrzej>

SCAN ME

Faculty Sponsor/KARE ACM  
**Dr.P.Deepalakshmi**

Coordinator  
**Mr.P.Nagaraj**

Fig. 4.5.2.9. Webinar-How to Write a Good Research Paper

## UNCLE SAM BOULEVARD: ROAD TO USA

**Resources person: Pratheep Kumar Reddy Yaddala, Lead Data Scientist, Target Corporation, Minneapolis USA**

The Alumni Talk Programme under the topic “Uncle Sam Boulevard: Road to USA” was conducted on 29-July-2020. Faculty Sponsors KARE/ACM, Dean of computer science and Engineering Dr.P.Deepalakshmi and Faculty coordinator is Dr.T.Dhiliphan Rajkumar and Mr. K. Muthamilsudar and student coordinator vice chair/KARE/ACM Ch. Mahendranath. As many of the students aim for higher studies one should know the job opportunities at present. Our alumni Pratheep Kumar Reddy Yaddala, Lead Data Scientist, Target Corporation, Minneapolis has taught the students about the situations in the US.

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**SCHOOL OF COMPUTING**

**KARE ACM Alumni Talk Programme**  
**Uncle Sam Boulevard : Road to USA**

**29 July 2020/ 8 AM**

Registration link:  
<https://bit.ly/3j5RywR>

**Alumini:**  
Pratheep Kumar Reddy Yaddala  
Lead Data Scientist,  
Target Corporation,  
Minneapolis  
USA

**Coordinator**  
Dr.T.Dhiliphan Rajkumar  
Mr.K.Muthamil Sudar

**Vice Chair/KARE ACM**  
Ch.Mahendranath

**Faculty Sponsor/KARE ACM**  
Dr.P.Deepalakshmi

SCAN ME

Fig. 4.5.2.10. Webinar -Uncle Sam Boulevard :Road to USA

## CHOOSING YOUR NEXT STEP AND SHAPING YOUR CAREER IN IT

**Resource person: Harinath Gandhi, Technology and Strategy Leader, Integration Services & SLDC Cummine Inc, Indianapolia.**

The webinar on the topic “Choosing your next step and Shaping your career in IT”. The event was held on 31<sup>st</sup> July 2020, at 9:00 Am to 11:00 Am. The faculty sponsor/KARE ACM / Dean school of computing of computer science and Engineering Dr.P.Deepalakshmi and faculty coordinators Dr.T.Dhiliphan Rajkumar, Mr. Muthamil Sudar. Student coordinator M.A kif hussain. The resource person has given a clear idea of choosing the career path for the students. The event was completed successfully.

Fig. 4.5.2.11.Choosing your next step and Shaping your career in IT

**Resource person: Dr. Ch. ASwani Kumar, Professor, School of IT & Engineering, Vellore Institute of Technology**

The webinar under the topic “Block chain Technology. Faculty sponsors/KARE/ACM Dr.P.Deepalakshmi and Mrs. Jeyaranjani along with student coordinator S. Vasavi. The event was held on 3rd August 2020 at 11:00 Am to 12:30 Pm. The resource person explained about block chain technology. Block chain is the backbone technology of digital crypto currency Bitcoin. The block chain is a distributed database of records of all transactions or digital events that have been executed and shared among participating parties. Each transaction is verified with the majority of the participants of the systems. It contains every single record of each transaction. Bitcoin is the most popular cryptocurrency which is an example of the block chain. Block chain technology records transactions in a digital ledger which is distributed over the network thus making it incorruptible. Anything of value like land assets, cars, etc., can be recorded on the block chain as a transaction technology successfully.

The poster is for a webinar titled "BLOCK CHAIN TECHNOLOGY" organized by the School of Computing at Kalasalingam University. It features the university's logo and a portrait of the resource person, Dr. Ch. Aswani Kumar. The event is part of the ACM Distinguished Speaker Program and is scheduled for August 3rd, 2020, from 11:00 AM to 12:30 PM. A registration link and a QR code are provided for attendees. Faculty sponsors and coordinators are also listed at the bottom.

**KALASALINGAM**  
ACADEMY OF RESEARCH AND EDUCATION  
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**SCHOOL OF COMPUTING**

ACM DISTINGUISHED SPEAKER PROGRAM

**ON**

**BLOCK CHAIN TECHNOLOGY**

**Resource Person:**  
**Dr.Ch.Aswani Kumar**  
**Professor**  
**School of IT & Engineering**  
**Vellore Institute of**  
**Technology**

**3<sup>rd</sup> August, 2020**  
**11:00 AM - 12:30 PM**

**Registration Link:**  
<https://bit.ly/20n4NLE>

**SCAN ME**

Faculty Sponsor/KARE ACM  
**Dr.P.Deepalakshmi**

Coordinator  
**Mrs.J.Jeyaranjani**

Student Coordinator  
**S.Vasavi**

Fig. 4.5.2.12. Webinar-Block Chain Technology

**3.IEDC (Innovation and Entrepreneurship Development Centre)**

IEDC in KLU is functioning with an aim to develop an institutional mechanism to create entrepreneurial culture in academic institutions to foster the growth of innovation and entrepreneurship among the faculty and students

**Table 4.5.3 List of events organized by the IEDC**

S. No.	Date	Event Title	Name of the expert
1	04.08.2017 to 06.08.2017	Entrepreneurship Awareness Camp	Dr.R.Chandrasekhar, Dean-MBA/KLU Mr.Sivakumar, Corporate Trainer, Chennai. Mr.I.Ramachandran, Rtd-Director, Indian overseas Bank, Virudhunagar
2	31.08.2017	Entrepreneurship Orientation Camp	K.R.Ganasambandhan, CEO, AthmaAcadamy
3	08.03.2019	Women Entrepreneurship	Dr.Dhanalakshmi, CED Madurai
4	08.01.2019	India First Leadership Talk 1st Episode	Shri. Anand Mahindra, Chairman, Mahindra Group
5	24.01.2019	2nd Episode of India First Leadership Talk	Dr. Anand Deshpande, Founder, Chairman & Managing Director Persistent Systems Ltd
6	19.03.2019	3rd Episode of India First Leadership Talk	Dr. AjitDoval, NSA, Govt. of India
7	10.05.2019	Episode 04 of India First Leadership Talk	Prof. Anil D. Sahasrabudhe, Chairman, AICTE
8	10.01.2019	Workshop on IPR for Students and Faculty Members	Ms. Shwetasree, Principal, Fidus Law Chamber Dr.J.Deny, President, KARE-IIC
9	14.06.2019	Proof of Concept Exhibition	Mr.RagupathiMuthu, Director, MinniyalPvt.Ltd
10	05.08.2019	Dr.N.Seshagiri memorial Lecture 2019	Shri Narayana Murthy, Founder
11	09.11.2019	Demo Day	Dr.J.Deny, President-IIC, KARE, Mr.RagupathiMuthu, Director, MinniyalPvt.Ltd
12	15.10.2019	Innovation Day Campaign	Mr.RagupathiMuthu, Director, MinniyalPvt.Ltd Mr.Pothirasan, Director, Raj Bioelectronics and Intelligent Pvt.Ltd
13	24.01.2019	MSME Demo Day	Mr.Thirupatthi& Mr. Govindaraj Assistant Directors, MSME

14	08.02.2020	Internal Smart India Hackathon 2020	Mr.RagupathiMuthu, Director,MinniyalPvt.Ltd Dr.J.Deny, President-IIC, KARE,
15	28.02.2020	Science Day	Dr.J.Deny, President-IIC, KARE, DrB.Peruaml Convener-IIC, KARE,
16	29.02.2020	IIC-ISTE Innovation Contest	Mr.PrabhuSwaminathan Founder Director Lafors Talent Solutions India Pvt.Ltd Chennai

#### 4.Indian Society of Technical Education (ISTE)

The ISTE in KLU is the leading Professional non-profit making society for the Technical education system with the motto of Career Development of Teachers and Personality Development of Students and Overall development of our Technical Education System. Food Technology students participated in different events organized by the ISTE and it is shown in the Table 4.5.4

**Table 4.5.4 List of events organized by the ISTE**

S. No	Name of the Guest Lecture	Date/Duration	Name of the Resource person
1	ISO Auditing- Practice	15/10/2016	Mr. S.Swaminathan Managing Director Aries NDT Ltd, Chennai.
2	ISO Practice: Current scenario in Industries	03/03/2018	Mr.S.Swaminathan Dynamic Tech, Chennai.
3	Import and Export Activities: Challenges and Opportunities	14/9/2018	Dr.G.Rajamurthy Director Global Institute of Foreign Trade, Madurai.
4	National education policy	22/04/2021	B. Venkat Director, Faculty Development Cell, AICTE.
6	The Indian Space odyssey	17/09/2021	Dr.P. Venkitakrishnan Prof Saishshawan, scientist Indian Space Research Organization, Bangalore.

#### **4.5.2. Publication of technical magazines, newsletters, etc. (5)**

##### **Magazines:**

The Department of Computer Science and Engineering regularly conduct national level technical symposium. The magazine is released on the day of symposium which summarises the entire year department activities. Summarise the participation of students in quality activities inter and intra sessions organised by reputed professional bodies, universities, colleges and companies. It list out the highlights of the students skills. It also disseminates notable achievements of the faculty members to rise student community and excel in the field of research. The awards and special participation of the students in prominent events are presented. The students Placement Records shows the placement progress report of the year. It also includes space to encourage the article writer, artist and innovators of student's community through technical/non-technical section.

##### **Newsletter:**

The Department of Computer Science and Engineering regularly release newsletter that shows the highlights of the department for the period of time. The progress in research, innovation, notable achievements will be the part of the newsletter. All the chapters/societies plan and progress are represented. It conveys the department success key indicator in brief.

##### **Conference:**

The Department of Computer Science and Engineering conducted virtual symposium during the pandemic period. This conference proceeding is published with ISSN number (9789390082247) by Shanlax publisher. The conference proceedings showcase the project excellence of our students that serves different societal community. All the presented papers are published with ISSN number.

	2017 - 2018		2018 - 2019		2019 - 2020		2020 - 2021			2021-2022	
	Magazine	Newsletter	Magazine	Newsletter	Magazine	Newsletter	Magazine	Newsletter	Conference	Magazine	National level Symposium
<b>Released on</b>	2.3.2018	5.8.2017	16.03.2019	17.8.2018	6.3.2020	22-08-2019	8.8.2020	20.5.2020	20.5.2020	23.4.2022	23.4.2022
<b>Released by</b>	Mr.Pradeep Kumar, Tech lead, Honeywell Technology, Madurai	Mr.Prabhuram Ramamoorthy, Chief Engineer, Ramar Tech, Chennai	Mrs.N.Manjula Devi, Maitree lead, TCS, Chennai	Mr.Rajadurai, Technical Lead, HCL, Chennai	Mrs.P.Vanitha, Project Manager, IBM Chennai	Dr.S.Swamyathan, Professor, Anna University	Mr.Rammanoj Ramachandran, Delivery Manager, CTS, Chennai	Dr.Karthick Seshadri, Head – Dept. of CSE, NIT,AP	Dr.Chinaharan Nagamalai, VP- Wireilla, Sydney, Australia	Mr.Venkatesh Subramanian, IBM	Mr.Viqaruddin Surki, IBM
<b>Editorial Members</b>	Dr.R.Ramalakshmi Dr.S.Dhanasekaran	Dr.P Deepalakshmi Ms.J.Pamina	Dr.P Deepalakshmi Dr.R.Ramalakshmi Dr.S.Hariharasitaraman Dr.S.Dhanasekaran Ms.J.Jeyaranjani Ms.J.Pamina	Dr.P Deepalakshmi Mr.K.Muthamil sudar	Dr.A.Francis Saviour Devaraj Dr.R.Kanniga Devi Mrs.J.Jeyaranjani	Dr.A.Francis Saviour Devaraj Dr.R.Kanniga Devi	Dr.A.Francis Saviour Devaraj Dr.R.Kanniga Devi	Dr.A.Francis Saviour Devaraj Dr.R.Kanniga Devi	Dr.A.Francis Saviour Devaraj Dr.K.Kartheeban Mrs.J.Jeyaranjani	Dr.P Deepalakshmi	Dr.P Deepalakshmi



<b>Content</b>	Patron messages Editorial board members Department vision, mission Chapters/society office bearers Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos	Student Events conducted Students participation FDP organized Notable students achievements Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos	Patron messages Editorial board members Department vision, mission Chapters/society office bearers Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos	Student Events conducted Students participation FDP organized Notable students achievements	Patron messages Editorial board members Department vision, mission Chapters/society office bearers Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos	Student Events conducted Students participation FDP organized Notable students achievements	Patron messages Editorial board members Department vision, mission Chapters/society office bearers Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos	Student Events conducted Students participation FDP organized Notable students achievements	Patron messages Editorial board members Department vision, mission Chapters/society office bearers Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos	Patron messages Editorial board members Department vision, mission Chapters/society office bearers Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos	Patron messages Editorial board members Department vision, mission Chapters/society office bearers Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos	Patron messages Editorial board members Department vision, mission Chapters/society office bearers Activities conducted Students Achievements Faculty Achievements Student technical contribution Student's non-technical contribution Group photos
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Fig. 4.4.2.1. Magazine (2017 – 2018)

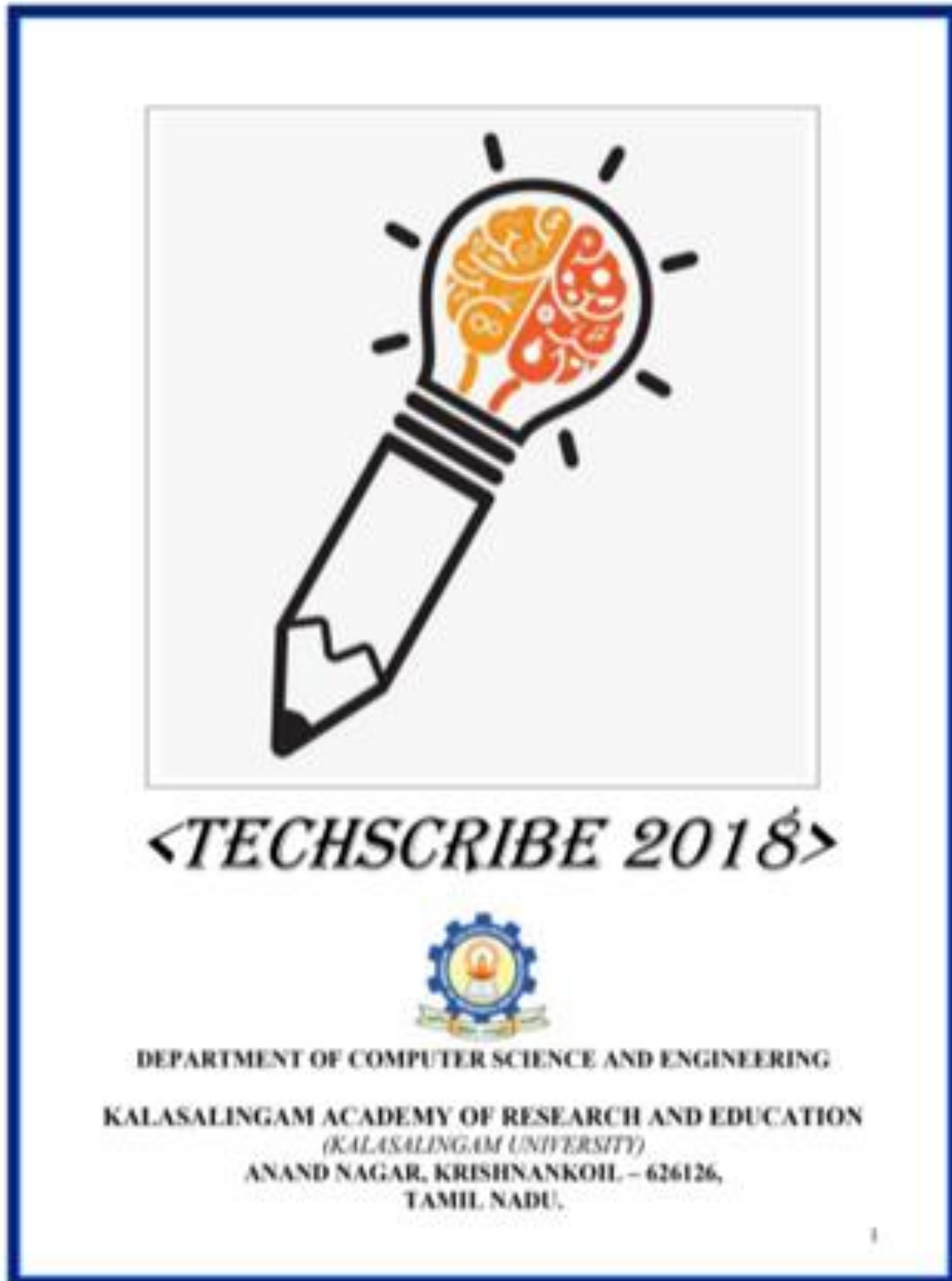


Fig. 4.4.2.2. Magazine (2018 – 2019)



Fig. 4.4.2.3. Magazine (2019 – 2020)



Fig. 4.4.2.4. Conference Proceeding



Fig. 4.4.2.5. National Level Technical Symposium

### 4.5.3 Participation in inter-institute events by students of the program of study (10)

#### A. Events within the state:

##### (i) List of students presented in a national and international conference

S. No	Authors	Title	Publication	No of Students
1.	R Raja Subramanian, <b>Manchala Yaswanth, Bala Venkata Rajkumar TS, Kota Rama Sai Vamsi, Devisetty Mahidhar, R Raja Sudharsan</b>	Musical Instrument Identification using Supervised Learning	6th International Conference on Intelligent Computing and Control Systems (ICICCS) 2022	3
2.	R Raja Subramanian, Marisetty <b>Sai Murali, B Deepak, P Deepak, Hamsinipally Nikhil Reddy, R Raja Sudharsan</b>	Airline Fare Prediction Using Machine Learning Algorithms	4th International Conference on Smart Systems and Inventive Technology (ICSSIT) 2022	3
3.	Saravanan Alagarsamy, <b>Thippareddy Tarun Kumar Reddy, Bandi Praveen Kumar, Penugonda Sai Vineeth</b>	A Novel Technique for Prophecy of Brain Strokes	2022 6th International Conference on Intelligent Computing and Control Systems (ICICCS)	3
4.	Saravanan Alagarsamy, <b>Bendela Kusuma, Cheedella Venkata Naga Mohan, Malleboina Venkata Sukumar, Dora Veera Venkata Sai Sri Sujan, Musalappagari Devendrareddy</b>	Smart System for Reading the Bar Code using Bayesian Deformable Algorithm for Blind People	2022 6th International Conference on Trends in Electronics and Informatics (ICOEI)	4
5.	S. Alagarsamy, D. Bhargava and B. D. <b>Hemanth, K. V. Sudheer Kumar, P. Vamsi</b>	Identifying the Missing People using Deep Learning Method	2022 7th International Conference on Communication and Electronics Systems (ICCES)	3
6.	Saravanan Alagarsamy, <b>Dubba Sreshta, Dondapati Usha Rani, Dudda Sai Yashwanth Reddy, Pasapula Nidita, Boddapu Niteesh Satya Sai</b>	Pattern Recognition based Smart Billing System for Water Consumption	2022 7th International Conference on Communication and Electronics Systems (ICCES)	5
7.	J.Jayanthi, <b>Dhanekula Giri Venkata Manohar, Pamulapati Vamsi Krishna, Mirza Adnan</b>	Titanic Survival Analysis Using Logistic Regression	National Conference on Current & Emerging Technologies, 2022	4

	<b>Biag,Maraka Rajesh Kumar</b>			
8.	<b>J.Jayanthi nanditha alagusundar, M.hari chandra prasad, s.jashvitha</b>	Cardiovascular Disease Prediction Using machine learning	International Conference on Advanced Communication Control & Computing Technology” (ICACCCT’ 22)	3
9.	<b>Gudi sai Bharath, Iragamreddy siva prasad syed nakhi ali J jayanthi, pallapu sasi kumar</b>	Real estate price prediction	3rd International Conference on Engineering and Advancement in Technology -2022	3
10.	<b>J.Jayanthi, mekala suresh Vutthunoori yagnesh, Lakhimsetty eswar kumar, Udayagiri likhith</b>	Cricket(Ipl) Prediction Based On Previous Data	3rd International Conference on Engineering and Advancement in Technology -2022	3
11.	<b>J.jayanthi manchanapalli pavan charan, Narla dinath reddy, Sana sreenivasa rao, Chalmuri sai hemanth</b>	Customer churn analysis and prediction using auttml	3rd International Conference on Engineering and Advancement in Technology -2022	4
12.	<b>J.Jayanthi T.venkat sai prathap Rayala nithin S pradeep P.Ram bhupal reddy</b>	Impact of Youtube Advertisements on Sales	3rd International Conference on Engineering and Advancement in Technology -2022	4
13.	<b>R.sumathi, Manyam sanjay kumar reddy, N.vinay kumar reddy , N.revanth, S.bhavani</b>	Analysis regression for Stock Data Prediction	Third International Conference on Instrumentation, MEMS and Biosensing Technology(ICIMBT-2022)	3
14.	<b>J.Jayanthi, Manyam sanjay kumar reddy, Nimmakayala vinay kumar reddy</b>	Crop Recommendation System using Machine Learning Algorithms	International Conference on Advanced Communication Control & Computing Technology" (ICACCCT' 22)	3
15.	<b>J.Jayanthi, Narayanan prudhvish, Uppala Bharath, Lakkireddy tharun kumar reddy N krithiga</b>	Mall customer segmentation using K-Means clustering	3rd International Conference on Engineering and Advancement in Technology -2022	3

16.	J. Jayanthi, <b>Boggarapu rama sai Santosh,</b> <b>Koya srikanth Boggarapu, jala venkata jathin krishna</b>	Bigmart Sales Prediction	International Conference on Advanced Communication Control & Computing Technology" (ICACCCT' 22)	3
17.	J.jayanthi <b>mannealli praveena voggu, jahnavi sai sree parimi sunayana, a.abi Lakshmi, t.kalyani</b>	Market Basket Analysis Using Apriori Algorithm	ICEAT 2022 3rd International Conference on Engineering and Advancement in Technology -2022	4
18.	J.jayanthi, <b>Samba bhavani, Lakku amulya, Mooli chandra mounika</b>	Bitcoin price prediction using Machine learning	International Conference on Advanced Communication Control & Computing Technology" (ICACCCT' 22)	3
19.	Dr. E. Sudheer Kumar, <b>Kandregula Jai Surya, Konduru Yaswanth Varma, Kurapati Nithish Reddy and Adepudi Akash</b>	Noise Reduction in Audio File Using Spectral Gating and FFT with Python Modules	1st International Conference on Recent Developments in Electronics and Communication Systems,2022	4
20.	R Murugeswari, <b>D Patan, H Ravella, D Sanikireddy</b>	Club: A web based operating system	6th International Conference on Intelligent Computing and Control Systems,2022	2
21.	R Murugeswari, <b>Z Sharik Anwar, V Raja Dhananjeyan, C Naveen Karthik</b>	Automated Sugarcane Disease Detection Using Faster RCNN with an Android Application	6th International Conference on Trends in Electronics and Informatics (ICOEI)	3
22.	R Murugeswari, <b>Kasi Vishwanath Nila, V Raja Dhananjeyan, Kumbham Bhanu Sai Teja, Kurivelu Venkata Prabhas</b>	Flower perception using Convolution Neural Networks based Escalation of Transfer learning	4th International Conference on Smart Systems and Inventive Technology (ICSSIT)	4
23.	B. Pitchaimanickam, <b>R.Gayathri, G Jyoshna, P Prema sai</b>	Digital Dermatology classification using deep learning technique	6th IEEE international conference on Intelligent Computing and Control Systems (ICICCS 2022), 2022	2
24.	NC Brintha, P Nagaraj, <b>Arige Tejasri, Bhavanam Vijaya Durga, Mederametla Tarun Teja,</b>	A Food Recommendation System for Predictive Diabetic Patients using ANN and CNN	2022 7th International Conference on Communication and Electronics Systems (ICCES)	4



	<b>Maguluri Navi Venkata Pavan Kumar</b>			
25.	<b>NC Brintha, Kunal Vasudevan, Vikrant V Joliya, Lagishetty Aashry</b>	Intelligent SoS Application with GPS Tracking and Hidden Camera Detection	2022 6th International Conference on Trends in Electronics and Informatics (ICOEI)	3
26.	<b>N.C. Brintha, T. Veera Venkata Sai, B. Niteesh Satya Sai, Vikram K, Yk. Induvarshini and P. Nidita</b>	Synchronization of Diesel Generator using Micro-Controller	IEEE-International Conference on Innovative Computing, Intelligent Communication and Smart Electrical systems (ICES -2022)	4
27.	<b>N.C. Brintha, T. Veera Venkata Sai, B. Niteesh Satya Sai, Vikram K, Yk. Induvarshini and P. Nidita</b>	Synchronization of Diesel Generator using Micro-Controller	IEEE-International Conference on Innovative Computing, Intelligent Communication and Smart Electrical systems (ICES -2022)	4
28.	<b>N. C. Brintha, Janjanam Adi Narayana, G.L.V.Sai Jaswanth, Gandla Jaya Chandrapal and Darapuneni Venkat</b>	Realtime Facial Emotion Detection Using Machine Learning	IEEE-International Conference on Innovative Computing, Intelligent Communication and Smart Electrical systems (ICES -2022)	4
29.	<b>N. C. Brintha, Chakka Venkata Pavan Tarun, Lingisetty Abhishikth, Bitra Purna Koteswara Rao, Maddika Taruneshwar Reddy</b>	Smart Railway Crossing Surveillance System	IEEE-International Conference on Computing, Communication, Security & Intelligent Systems, 2022	4
30.	<b>R Raja Subramanian, TM DheenaDayalan, T Badhrirajan, C Dhinakaran, C Glory Devakirubai, R Raja Sudharsan</b>	An Automated House Plan Generator leveraging Genetic Algorithms	International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA) 2021.	3
31.	<b>R Raja Subramanian, Mahesh Kancharla, Suraj Hussain Duddekula, AVN Harshith, Govinda Sai Kamisetty, R Raja Sudharsan</b>	Assessing and Monitoring Dietary Intake	International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA) 2021.	3

32.	Elizabeth Rani, <b>G, Reddy, G.S., Obulareddy, P., Harshith, S.S.R., Sakthimohan, M.</b>	Web Application for Community Question Answering 2021	International Conference on Advanced Computing and Innovative Technologies in Engineering, ICACITE, April 2021, pp. 670–673, 9404605, DOI: 10.1109/ICACITE5122.2.2021.9404605	3
33.	Sakthimohan. M; Elizabeth Rani. G; <b>Busireddy Gnaneswr Reddy; Sadhu Lokaan Reddy; Vangam Chennareddy</b>	Wireless Power Transmission Science Model	Proceedings of the 2nd International Conference on Electronics and Sustainable Communication Systems, ICESC 2021, September 2021, pp. 577–581 DOI: 10.1109/ICESC51422.2.2021.9532606	3
34.	G Elizabeth Rani.; <b>Harini Mohan; Bendela Kusuma; P Shiridi Kumar; Ardhala Mounika Jenny; Nukala Akshith</b>	Automatic Evaluations of Human Blood Using Deep Learning Concepts November 2021	6th International Conference on Signal Processing, Computing and Control (ISPCC), 2643-8615, DOI: 10.1109/ISPCC53510.2021.9609519	5
35.	Muthamil Sudar.K, <b>D.Lakshmi Lokesh, Chanikya,</b> Nagaraj.P (2021 February)	Gas Level Detection and Automatic Booking Notification Using IOT	International Conference on Computer Communication And Informatics, IEEE 2021 (SCOPUS)	2
36.	<b>Varma, C. G.,</b> Nagaraj, P., Muneeswaran, V., <b>Mokshagni, M., &amp; Jaswanth, M.</b> (2021, May).	Astute Segmentation and Classification of leucocytes in blood microscopic smear images using titivated K-means clustering and robust SVM techniques.	In 2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS) (pp. 818-824). IEEE. MAY 2021	3
37.	Nagaraj, P., Muneeswaran, V., Sudar, K. <b>M., Ali, R. S., Someshwara, A. L., &amp; Kumar, T. S.</b> (2021, May).	Internet of Things Based Smart Hospital Saline Monitoring System.	In 2021 5th International Conference on Computer, Communication and Signal Processing (ICCCSP) (pp. 53-58). IEEE.JUNE 2021	4

38.	Nagaraj, P., Muneeswaran, V., <b>Ali, R. S., Kumar, T. S., Someshwara, A. L., &amp; Pranav, J.</b> (2020, September).	Flexible Bolus Insulin Intelligent Recommender System for Diabetes Mellitus Using Mutated Kalman Filtering Techniques.	In Conference on Intelligent Systems (pp. 565-574). Springer, Singapore. JUNE 2021.	4
39.	Muneeswaran, V., Nagaraj, P., <b>Dhannushree, U., Lakshmi, S. I., Aishwarya, R., &amp; Sunethra, B.</b> (2021).	A Framework for Data Analytics-Based Healthcare Systems.	In Innovative Data Communication Technologies and Application (pp. 83-96). Springer, Singapore. FEB 2021	4
40.	<b>Sharan, E. S., Kumar, K. S., &amp; Madhuri, G.</b> Nagaraj, P., (2021, July).	Conceal face mask recognition using convolutional neural networks.	In 2021 6th International Conference on Communication and Electronics Systems (ICCES) (pp. 1787-1793). IEEE. AUG 2021.	3
41.	Nagaraj, P., Muneeswaran, V., Muthamil Sudar, K., <b>Hammed, S., Lokesh, D. L., &amp; Samara Simha Reddy, V.</b> (2021, May).	An Exemplary Template Matching Techniques for Counterfeit Currency Detection.	In International Conference on Image Processing and Capsule Networks (pp. 370-378). Springer, Cham. SEP 2021	3
42.	<b>Harinath Reddy, C., Koushik Kumar, B. V., Sai Teja Varma, N., Vidya, S.,</b> Nagaraj, P., & Muthamil Sudar, K. (2021, May).	Risk Prediction of Lung Disease Using Deep Learning Approach	In International Conference on Image Processing and Capsule Networks (pp. 462-471). Springer, Cham. SEP 2021	3
43.	R. R. Subramanian, C. S. <b>Niharika, D. U. Rani, P. Pavani and K. P. L. Syamala,</b>	Design and Evaluation of a Deep Learning Algorithm for Emotion Recognition	2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS), 2021, pp. 984-988, May 2021	4
44.	D. Tanouz, R. R. Subramanian, <b>D. Eswar, G. V. P. Reddy, A. R. Kumar and C. V. N. M. Praneeth</b>	Credit Card Fraud Detection Using Machine Learning	2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS), 2021, pp. 967-972, May 2021	4
45.	R. R. Subramanian, <b>R. Avula, P. S. Surya and B. Pranay</b>	Modeling and Predicting Cyber Hacking Breaches	2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS), 2021, pp. 288-293, May 2021	3

46.	R. R. Subramanian, <b>K. Y. Varma, K. Balaji, M. D. Reddy, A. Akash and K. N. Reddy</b>	Multiplayer Online Car Racing with BCI In VR	2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS), 2021, pp. 1835-1839, May 2021.	4
47.	R. Raja Subramanian, <b>H. Mohan, A. Mounika Jenny, D. Sreshta, M. Lakshmi Prasanna and P. Mohan</b>	PSO Based Fuzzy-Genetic Optimization Technique for Face Recognition	2021 11th International Conference on Cloud Computing, Data Science & Engineering (Confluence), pp. 374-379, March 2021	5
48.	R. R. Subramanian, <b>N. Akshith, G. N. Murthy, M. Vikas, S. Amara and K. Balaji</b>	A Survey on Sentiment Analysis	2021 11th International Conference on Cloud Computing, Data Science & Engineering (Confluence), 2021, pp. 70-75, March 2021	5
49.	R. R. Subramanian, <b>D. Achuth, P. S. Kumar, K. Naveen kumar Reddy, S. Amara and A. S. Chowdary</b>	Skin cancer classification using Convolutional neural networks.	2021 11th International Conference on Cloud Computing, Data Science & Engineering (Confluence), 2021, pp. 13-19, March 2021	5
50.	R. Raja Subramanian, <b>Mahesh Kancharla, Suraj Hussain Duddekula, A.V.N. Harshith, Govinda Sai Kamisetty, R. Raja Sudharsan,</b>	Assessing and Monitoring Dietary Intake	International Conference on Advancements in Electrical Electronics Communication Computing and Automation, October 2021	4
51.	R. Raja Subramanian, <b>T.M.Dheena Dayalan, T.Badhrirajan, C.Dhinakaran, C.Glory Devakirubai, R. Raja Sudharsan,</b>	An Automated House Plan Generator leveraging Genetic Algorithms.	International Conference on Advancements in Electrical Electronics Communication Computing and Automation, October 2021	5
52.	R. Raja Subramanian, <b>Dora Veera Venkata Sai Sri Sujan Babu, Dondapati Usha Rani, Musalappagari Devendrareddy, Bendele Kusuma, R. Raja Sudharsan,</b>	Detecting Bias in the Grading System using Machine Learning.	International Conference on Advancements in Electrical Electronics Communication Computing and Automation, October 2021	6
53.	R. Raja Subramanian, <b>Yalla</b>	Audio Emotion Recognition by Deep	International Conference on	6

	<b>Sireesha, Yalla Satya Praveen Kumar Reddy, Tavva Bindamrutha, Mekala Harika, R. Raja Sudharsan</b>	Neural Networks and Machine Learning Algorithm.	Advancements in Electrical Electronics Communication Computing and Automation, October 2021	
54.	R Raja Subramanian, <b>Harini Mohan, Ketepalli Poojita Lakshmi Syamala, Chunduri Sandya Niharika, Ede Venkatesh, R Raja Sudharsan,</b>	Forensic Verification of Handwritten Documents using Secure Multi Party Computation.	International Conference on Advancements in Electrical Electronics Communication Computing and Automation, October 2021	5
55.	Saravanan Alagarsamy, Kailasam Selvaraj, Vishnuvarthanan Govindaraj, <b>A. Ajith Kumar, S. Hari Shankar, G. Lakshmi Narasimman,</b>	Automated Data analytics approach for examining the background economy of Cybercrime	Third International Conference on Inventive Research in Computing Applications (ICIRCA), pp. 332-336, September 2021.	3
56.	Saravanan Alagarsamy, Vishnuvarthanan Govindaraj, <b>T. TarunKumar Reddy, B. Praveen Kumar, P. Sai Vineeth,</b>	An automated assistance system for detecting the stupor of drivers using vision-based technique	Second International Conference on Electronics and Sustainable Communication Systems (ICESC), pp. 1203-1207, August 2021.	3
57.	<b>Harshitha Naidu Ravuvar, Haritha Goda, R.Sumathi</b>	Smart Health Predicting System Using K-Means Algorithm	2020 International Conference on Computer Communication and Informatics (ICCCI - 2020), Jan. 22 – 24, 2020, Coimbatore	2
58.	<b>G. Bharath, K. J. Manikanta, G. B. Prakash, R. Sumathi ,</b>	Detecting Fake News Using Machine Learning Algorithms	2021 International Conference on Computer Communication and informatics (ICCCI), Jan 2021, pp. 1-5, DOI: 10.1109/ICCCI50826.2021.9402470.	3
59.	Elizabeth Rani, <b>G., Deetshana, S., Naidu, K.Y., Sakthimohan, M., Sarmili, T.</b>	Automated Interactive Irrigation System – IoT Based Approach	IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing, INCOS 2019, Jan 2020, 8951382, DOI:	3

			10.1109/INCOS45849.2 019.8951382	
60.	Elizabeth Rani, <b>G Reddy, A.T.V., Vardhan, V.K., Harsha, A.S.S., Sakthimohan, M.</b>	Machine learning based Cibil verification system	Proceedings of the 3rd International Conference on Smart Systems and Inventive Technology, ICSSIT 2020, October 2020, pp. 780–782, 9214195, DOI: 10.1109/ICSSIT48917.2020.9214195	2
61.	Nagaraj P, Muthamilsudar K, <b>Naga Nehanth S, Mohammed Shahid R, Sujith Kumar V</b> (2020).	Perceptual Image Super Resolution Using Deep Learning and Super Resolution Convolution Neural Networks (SRCNN).	Intelligent Systems and Computer Technology, 37, 3. June – 2020.	3
62.	Nagaraj, P., <b>Aakash M., Arun Kumar M., Dharanitharan A., A Rajkumar.</b>	Analysis of Data Mining Techniques in Diagonalizing Heart Disease.	Intelligent Systems and Computer Technology, 37, 257. June – 2020	4
63.	<b>S. Amara</b> and R. R. Subramanian,	Collaborating personalized recommender system and content-based recommender system using Text Corpus	2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS), Coimbatore, India, pp. 105-109, April 2020.	1
64.	Saravanan Alagarsamy, <b>T. Abitha, S. Ajitha, S. Sangeetha,</b> and Vishnuvarthanan Govindaraj	Identification of high grade and low-grade tumors in MR Brain Image using Modified Monkey Search Algorithm,	IOP Conference Series: Materials Science and Engineering, vol.993,pp. 1-5.December 2020.	3
65.	<b>Harshitha Naidu Ravuvar, Haritha Goda,</b> R.Sumathi	Smart Health Predicting System Using K-Means Algorithm	2020 International Conference on Computer Communication and Informatics (ICCCI - 2020), Jan. 22 – 24, 2020, Coimbatore,	2
66.	<b>Akash Awasthi, A.Madhu Vamsi, Vibhuti Duggal,</b> P.Deepalakshmi, <b>Surendra Rao,</b>	3D Visualization and Localization of Radiation Source in External Radiotherapy Using Inverse linear Boltzmann Transport Equation	International Conference on Advanced Computing & Communication Systems (ICACCS 2019), Sri Eshwar College of Engineering, Coimbatore, March 2019 (Available in IEEE	4

			Explorer, SCOPUS Indexed)	
67.	<b>B.Vishnu vardhan,</b> <b>D.Lokesh Babu,</b> K.Muthamil Sudar -	Pro Guard: Detecting Malicious accounts in Social Network-Based Online Promotions	International Conference on Research Techniques in Engineering and Technology (11 <sup>th</sup> November 2018), held at Ramee Guestline, Tirupati	2
68.	<b>J.Mahesh Varian ,</b> <b>A.Harivardhan,</b> M.Raja,	Surveillance using humanoid robot	International Conference On Research Techniques In Engineering & Technology – April 2018, ISBN-13: 978-1729728116	2
69.	M.BalaKumaran, R.Sumathi, <b>V.Chandru,</b> <b>S.Jeevanatham,</b>	Online Blood Bank using Mobile Apps	National Conference on Data Computing, Communication, Security and Internet of Things (NCDCCSIT 2018), organized by Department of CSE, KARE, May 2018	3
70.	<b>S.Arumugaselvam,</b> R.Sumathi, <b>J.Maheswaran</b> <b>,M.Mukesh,S.Loganathan</b>	Energy Calculation for Gentyre-piez electro crystal	National Conference on Data Computing, Communication, Security and Internet of Things (NCDCCSIT2018), organized by Department of CSE, KARE, May 2018	3

## (ii) List of students participated in workshop/training program

S. No	Name	Event	Venue	Date
1.	SHRUTHI R	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
2.	SWEDA PREETHY	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
3.	SOUNDARYA K	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
4.	SUNDARI V,	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
5.	SRIRAM M	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
6.	CHANDRU R	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
7.	KRISHNAN T	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
8.	SUNIL KUMAR J ROHIT	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
9.	UTKARSH KAPOOR	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
10.	ANUP RAJ	Android App Development	IIT Madras	03.02.2018 and 04.02.2018
11.	BELLAM RAMYASRUTHI	Cyber Security Workshop	Vellore Institute of technology	17.03.2018 to 20.03.2018
12.	CHALUVADI MAHENDRANATH	Cyber Security Workshop	Vellore Institute of technology	17.03.2018 to 20.03.2018
13.	TAVVA MOHIT VENKATA NAGASAI	Cyber Security Workshop	Vellore Institute of technology	17.03.2018 to 20.03.2018
14.	KODALI SUDHEER KUMAR	Cyber Security Workshop	Vellore Institute of technology	17.03.2018 to 20.03.2018
15.	CHINIMILLI BHANU MOHAN KUMAR	Cyber Security Workshop	Vellore Institute of technology	17.03.2018 to 20.03.2018
16.	NIRAIMATHI R C	Big data analytics workshop	Thiagarajar college of engineering	18.10.2018 to 19.10.2018
17.	POOJA N	Big data analytics workshop	Thiagarajar college of engineering	18.10.2018 to 19.10.2018
18.	SABERA S J	Big data analytics workshop	Thiagarajar college of engineering	18.10.2018 to 19.10.2018
19.	MAHESHWARI S	Big data analytics workshop	Thiagarajar college of engineering	18.10.2018 to 19.10.2018



20.	PRIYADHARA K	Big data analytics workshop	Thiagarajar college of engineering	18.10.2018 to 19.10.2018
21.	MEENAKUMARI K	Big data analytics workshop	Thiagarajar college of engineering	18.10.2018 to 19.10.2018
22.	PANDEESWARI J	Big data analytics workshop	Thiagarajar college of engineering	18.10.2018 to 19.10.2018
23.	ALLA NAGA SAHITHI	Big data analytics workshop	Thiagarajar college of engineering	18.10.2018 to 19.10.2018
24.	GANESH KRISHNA	Embedded System Workshop	IIT Madras	4.8.2018

**iii. List of students participated in internship/training program**

S.No	Register Number	Name of the Student	Nature of event	Industry Name
1.	9916004074	M. SAI DINESH	Internship	Shiash Info Solution Pvt Ltd
2.	9916004085	M. HEMANTH	Internship	Shiash Info Solution Pvt Ltd
3.	9916004142	SANA VENKATESWARA RAO	Internship	Soft Suave Technologies (P) Ltd.
4.	9916004169	PRUDHVI KRISHNA THANDRA	Internship	Avancer Software Solutions Pvt. Ltd
5.	9916004160	SIRIGIRI SIRI CHANDANA	Internship	Avancer Software Solutions Pvt. Ltd
6.	9916004019	BANDARI VAMSHIKRISHNA	Internship	Avancer Software Solutions Pvt. Ltd
7.	9916004162	K.SOUNDARYA	Internship	Janus Technologied, chennai
8.	9914004052	B VENKATA SAI BHARGHAVA	Internship	Kalycito Intern
9.	9914004057	GABBTTA VENKATA SAI NAGA SOBHAN	Internship	Mazework
10.	9914004040	VASANTH KUMAR.V	Internship	Mazework
11.	9918004210	V DEEPAK NITHIN GUPTA	Industrial Training	Enthu Technology Solutions
12.	9918004172	CH VENKAT GOPI	Industrial Training	Enthu Technology Solutions
13.	9918004231	K KARTHIK	Industrial Training	Enthu Technology Solutions

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14.	9918004008	B RAMCHARAN REDDY	Industrial Training	Enthu Technology Solutions
15.	9918004187	G.DESHIK	Industrial Training	Eminent Technology Solutions
16.	9918004191	A.NAGA VARDHAN REDDY	Industrial Training	Eminent Technology Solutions
17.	9918004194	J.VENKATA VARADARAJU	Industrial Training	Eminent Technology Solutions
18.	9918004201	P.SATEESH REDDY	Industrial Training	Eminent Technology Solutions
19.	9918004031	G.KOWSHIK	Industrial Training	Smart Web Technologies
20.	9918004056	S.LAKSHMAYYA	Industrial Training	Smart Web Technologies
21.	9918004166	M.K.BHASKAR	Industrial Training	Smart Web Technologies
22.	9918004131	B.TEJESH	Industrial Training	Smart Web Technologies
23.	9918004228	P.SATHISH KUMAR REDDY	Industrial Training	Eminent technology solutions
24.	9918004230	B.MURALI KRISHNA	Industrial Training	Eminent technology solutions
25.	9918004227	D.SANJAY	Industrial Training	Eminent technology solutions
26.	9918004226	UPPALAPATI NAVEEN	Industrial Training	Nandha Infotech
27.	9918004188	UMMITI SAI UMA SANDEEP	Industrial Training	Nandha Infotech
28.	9918004190	KESARI BHARGAVA REDDY	Industrial Training	Nandha Infotech
29.	9918004019	DADIREDDY SHARATHKUMAR REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd,Chennai
30.	9918004092	PODARALLA SREEKANTH REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd,Chennai
31.	9918004141	GADDAMIDA HARI PRASAD	Industrial Training	SmartX Connected Products Pvt. Ltd,Chennai
32.	9918004099	RAMASWAMY PRAKASH	Industrial Training	SmartX Connected Products Pvt. Ltd,Chennai
33.	9918004091	P.LEELANATHREDDY	Industrial Training	SmartX Connected Products Pvt. Ltd,Chennai
34.	9918004079	NARAHARI SURYA PRAKASH	Industrial Training	SmartX Connected Products Pvt. Ltd,Chennai
35.	9918004089	P MUKESH SAI	Industrial Training	SmartX Connected Products Pvt. Ltd,Chennai
36.	9918004109	M.SHAILESH	Industrial Training	Pofi Technologies,Coimbatore

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37.	9918004104	T.SANATHANI	Industrial Training	Pofi Technologies,Coimbatore
38.	9918004096	V.PRIYA DHARSHINI	Industrial Training	Pofi Technologies,Coimbatore
39.	9918004068	MARREDDY VAMSIDHAR REDDY	Industrial Training	Reality radssoon,Coimbatore
40.	9918004069	M.NAGA SAI	Industrial Training	Reality radssoon,Coimbatore
41.	9918004094	P.VINAY	Industrial Training	Reality radssoon,Coimbatore
42.	9918004192	M.CHINNAKARUPPU	Industrial Training	Zealsoft Technology Solutions ,Madurai
43.	9918004195	J.R.KARTHIKEYAN	Industrial Training	Zealsoft Technology Solutions ,Madurai
44.	9918004232	P.SANJAYPANDIAN	Industrial Training	Zealsoft Technology Solutions ,Madurai
45.	9918004024	DHEENADAYALAN T M	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
46.	9918004025	DHINAKARAN C	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
47.	9918004080	NAVEEN KARTHIK C	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
48.	9918004179	DUDELLA SHARATH	Industrial Training	Smart web Technologies, Coimbatore
49.	9918004233	MAKKENA SUBRAMANYA SOMASEKHAR	Industrial Training	Smart web Technologies, Coimbatore
50.	9519004301	HEMANTH KUMAR	Industrial Training	Smart web Technologies, Coimbatore
51.	9918004213	DOMMARAJU BHANU VARMA	Industrial Training	Smart Web Technologies, Coimbatore
52.	9918004182	AEKASI VISHNU BHARATH REDDY	Industrial Training	Smart Web Technologies, Coimbatore
53.	9918004140	SAMBAREDDY SAI KUMAR	Industrial Training	Smart Web Technologies, Coimbatore
54.	9918004198	KUNKU SAI KRISHNA	Industrial Training	Smart Web Technologies, Coimbatore
55.	9918004047	S.KASIRAMAN	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
56.	9918004014	S.R.BHARATHWAJ	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai

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57.	9918004001	M.AJITHLAKSHMNAN	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
58.	9918004007	P.ARAVINDRAJ	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
59.	9819004002	NIKHIL SAI SHANKAR KOTHARU	Industrial Training	Falcon Square, Coimbatore
60.	9918004005	ANKIT KAG	Industrial Training	Falcon Square, Coimbatore
61.	9918004044	REDDAPPA REDDY KALAVAPALLI	Industrial Training	Falcon Square, Coimbatore
62.	9918004055	BHARGAV REDDY KUMMETHA	Industrial Training	Falcon Square, Coimbatore
63.	9918004045	K GOVINDA SAI	Industrial Training	Phoenix Softech, Madurai
64.	9918004057	L ANJANI NANDAN REDDY	Industrial Training	Phoenix Softech, Madurai
65.	9918004026	D SURAJ HUSSAIN	Industrial Training	Phoenix Softech, Madurai
66.	9918004022	DASI LIKHITESWAR REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
67.	9918004040	JEEREDDY HARSHAVARDHAN REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
68.	9918004142	YERRA ANIL KUMAR	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
69.	9918004050	KESABOYINA PRABHU KUMAR	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
70.	9918004015	BUCHUPALLE BAVESH REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
71.	9918004013	B.RAGHUNATH REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
72.	9918004036	GUVVALA VISHNU VARDHAN REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
73.	9918004193	G.CHARAN KUMAR REDDY	Industrial Training	Web walk infosys, Madurai
74.	9918004199	M.GIRIDHAR SAI REDDY	Industrial Training	Web walk infosys, Madurai
75.	9918004223	N.KARTHIK	Industrial Training	Web walk infosys, Madurai

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76.	9918004123	Y.PRAVEEN REDDY	Industrial Training	Web walk infosys, Madurai
77.	9918004004	ANANTHABOTLA VENKATA NAGA HARSHITH	Industrial Training	Web walk infosys, Madurai
78.	9918004021	DASARI BHARATH CHANDRA	Industrial Training	Web walk infosys, Madurai
79.	9918004054	KOTHAPALLI MADANAMOHAN REDDY	Industrial Training	Web walk infosys, Madurai
80.	9918004085	NUNE VEERA VENKATA SATYA NARAYANA SWAMY	Industrial Training	BOLT IOT, Bangalore
81.	9918004009	T BADHRIRAJAN	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
82.	9918004098	RAJA DHANANJEYAN V	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
83.	9918004110	Z SHARIK ANWAR	Industrial Training	National Small Industries Corporation(A Govt of India Enterprise), Chennai
84.	9918004137	KETHAM SAMARA SIMHA REDDY	Industrial Training	Falcon Square, Coimbatore
85.	9918004053	KOTHA PRADEEP REDDY	Industrial Training	Falcon Square, Coimbatore
86.	9918004115	TANGELLA SHASHIPREETHAM REDDY	Industrial Training	Web walk infosys, Madurai
87.	9918004113	SOLIPURAM SAI GNANESHWAR REDDY	Industrial Training	Web walk infosys, Madurai
88.	9918004088	PATAPANCHULA GOWTHAM	Industrial Training	Web walk infosys, Madurai
89.	9918004030	C. GLORY DEVAKIRUBAI	Industrial Training	Icore Software Technologies, Coimbatore
90.	9918004061	M. MALATHY	Industrial Training	Icore Software Technologies, Coimbatore
91.	9918004067	M. MANONMANI	Industrial Training	Icore Software Technologies, Coimbatore
92.	9918004146	TARUNKUMAR REDDY T	Industrial Training	Phoenix Softech, Madurai
93.	9918004147	CH . BHARGAV	Industrial Training	Phoenix Softech, Madurai
94.	9918004149	P. SAI VINEETH	Industrial Training	Phoenix Softech, Madurai
95.	9918004168	G. MAHESH	Industrial Training	Phoenix Softech, Madurai

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96.	9918004100	RAVELLA HARINI	Industrial Training	Falcon Square, Coimbatore
97.	9918004029	GANJI POOJITHA SREE VANDANA	Industrial Training	Falcon Square, Coimbatore
98.	9918004087	PATAN DILSHAD	Industrial Training	Falcon Square, Coimbatore
99.	9918004033	GUDDANTI RAVINDRA BABU	Industrial Training	Falcon Square, Coimbatore
100.	9918004121	VENKATESH C	Industrial Training	Kaashiv InfoTech, Chennai
101.	99180004035	GURRAM VAMSI	Industrial Training	Shiash Info Solutions Private limited, Chennai
102.	9918004059	M. VENKATA NAVEEN	Industrial Training	Shiash Info Solutions Private limited, Chennai
103.	9918004133	T.MANOJ KUMAR	Industrial Training	Shiash Info Solutions Private limited, Chennai
104	9918004158	K.SAI YUGANDAR	Industrial Training	Shiash Info Solutions Private limited, Chennai
105	9918004091	PEREDDY LEELANATH REDDY	Industrial Training	Shashi info solutions private limited, Chennai
106	9918004079	NARAHARI SURYA PRAKASH	Industrial Training	Shashi info solutions private limited, Chennai
107	9918004089	PATCHIPULUSU MUKESH SAI	Industrial Training	Shashi info solutions private limited, Chennai
108	9918004102	N.SAI VISHAL	Industrial Training	Phoenix Softech ,Madurai
109	9918004074	M.SASI CHANDRA	Industrial Training	Phoenix Softech ,Madurai
110	9918004064	M.HEMANTH	Industrial Training	Phoenix Softech ,Madurai
111	9918004073	MUNAGA RAKESH	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
112	9918004108	SHAIK MAHABUB SHAARIEF	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
113	9918004062	MALLEPALLI RAKESH REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai
114	9918004086	PAGADALA VENKATA SAI RAMANJENEYA REDDY	Industrial Training	SmartX Connected Products Pvt. Ltd, Chennai

**B. Events outside the state:****(i) List of students presented in an international conference/Journal**

S. No	Authors	Title	Publication	No of Students
1.	Saravanan Alagarsamy; C <b>Jayakkan Allan Tilak;</b> <b>Midigesi Rakesh</b> <b>Kumar; Mandala</b> <b>Vishnu Vardhan; R.</b> Sumathi	Smart System Using Back Propagation Networks for Detection of Fire and Alert to the Users	2022 International Conference on Computational Intelligence and Sustainable Engineering Solutions (CISES)	3
2.	<b>K. Aashish Dubey, K.</b> <b>Bharath Ganesh , V.</b> <b>Gowtham , Mr. D.</b> Balakrishnan	Phishing email detection	International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353 Volume 28 Issue 4 – April 2021, pp 5-8.	3
3.	Deepalakshmi P, <b>Prudhvi Krishna T, Siri</b> <b>Chandana S, Lavanya</b> <b>K, Parvathaneni Naga</b> <b>Srinivasu</b>	Plant Leaf Disease Detection Using CNN Algorithm	International Journal of Information System Modeling and Design, IGI Global. Vol.12, No.1, pp.1- 12, Jan-2021.	4
4.	<b>Lok Sundar Ganthi,</b> <b>Nallapaneni Yaswanthi,</b> <b>Perumalsamy Deepalaks</b> hmi and Mahalingam Krishna Kumar,	Employee Attrition Prediction using Machine Learning Algorithms	International Conference on Data Science and Applications - ICDSA 2021, April 10-11, 2021. (Presented, Proceedings to be published in Springer LNNS).	3
5.	Elizabeth Rani, G., <b>Ajay</b> <b>Sukumar, G.V., Umesh</b> <b>Chandra, T., Anki</b> <b>Reddy, K., Sakthimohan,</b> M.	Load Allocation as Quality and secured in Mobile Cloud Networking Location	Journal of Physics: Conference Series, August 2021, 1979(1), 012045. DOI:10.1088/1742- 6596/1979/1/012045	3
6.	Jeyaranjani, J., <b>Kapoor,</b> <b>U.</b>	Machine Learning based Fitness application using BMI value,	Journal of Physics: Conference Series, August 2021, 1979(1),DOI: 10.1088/1742- 6596/1979/1/012033.	1
7.	K.Muthamil Sudar, <b>E.S.</b> <b>Vishnuvardhan, N.</b> <b>Yogesh, M. Yogesh</b> <b>Kumar, Nagaraj. P,</b>	Driver drowsiness detection using shape predictor algorithm	Journal of Chengdu University of Technology, Vol. 26, No. 7,2021	3
8.	Muneeswaran, V., Nagaraj, P., <b>Dhannushree, U.,</b> <b>Lakshmi, S. I.,</b>	A Framework for Data Analytics-Based Healthcare Systems.	In Innovative Data Communication Technologies and Application (pp. 83-96).	4

	<b>Aishwarya, R., &amp; Sunethra, B. (2021).</b>		Springer, Singapore. FEB 2021	
9.	<b>SP.Venkata Sudheer, K.Sudheer, R.Madhan Mohan Reddy and M.K.Nagarajan</b>	Urban Street Cleanliness Assessment Using Mobile Edge Computing and Deep Learning	The journal of "International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE)", Volume 28, Issues 5, (Pg.No: 34-37) May, 2021	3
10.	<b>B.Pitchaimanickam, P Neshma Vaishnavi, Ch.Keerthana, P.Akhila</b>	News webpage classification using URL content and structure attributes	International Journal of Emerging Technology in Computer Science and Engineering(IJETCSE), Vol. 27, no 1, pp 1-5, May 2021.	3
11.	<b>B.Pitchaimanickam, K.Sa si kiran Reddy, S.V.S.C Harshith, S.V Surendra Reddy</b>	Sentiment Analysis of Polarity in Product reviews in Amazon product media using multi model classification	International Research Journal of Engineering and Technology (IRJET), Vol 8, no 5, pp 945- 949, May 2021.	3
12.	<b>B.Pitchaimanickam, M.U daya sree, P Meghana, E Sowjanya</b>	Plant Disease classification using image segmentation and support vector machine	International Research Journal of Engineering and Technology (IRJET), Vol 8, no 5 , pp 775- 781, May 2021.	3
13.	<b>Saravanan Alagarsamy, R Raja Subramanian, Theepika Shree, Mounika Balasubramanian, Vishnuvarthanan Govindaraj,</b>	Prediction of Lung Cancer using Meta-Heuristic based Optimization Technique: Crow Search Technique,	International Conference on Computing, Communication, and Intelligent Systems (ICCCIS), pp. 186-191, April 2021.	3
14.	<b>Saravanan Alagarsamy, R Raja Subramanian, Praveen Kumar Bobba, Pradeep Jonnadula, Sanath Reddy Devarapalli,</b>	Designing a Smart Speaking System for Voiceless Community	Expert Clouds and Applications, Springer, July 2021.	3
15.	<b>C Bala Subramanian, Etlam Jaswanth and Ch Pushyanth Reddy</b>	Secured Patient Record in Cloud Environment	International Journal of Advanced Science and Technology, ISSN: 2005-4238, Volume-28, Issue-7, June 2020. Page No. 105666-105684.	2
16.	<b>D. Balakrishnan R.C. Niraimathi, S.J. Sabera</b>	Fog centric secure cloud storage scheme	International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE) ISSN: 0976-1353 Volume	2



			27 Issue 1 – APRIL 2020, pp. 1-4.	
17.	<b>Mounika, Rajeswari Pichika, Brintha, N.C.,</b>	Glaucoma Detection Using Fundus Image of Eye	International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE), Vol. 27, No.1, pp.1-6, April. 2020.	2
18.	<b>Akash Awasthi, P.Deepakshmi, P.Nagraj, Madhu Vamsi, Anup Raj</b>	Mobile barcode scanning system using IOT smart glass technology	Inderscience International Journal of Intelligent Enterprise, Vol.7, Issue.1-3, pp.219-318, Jan-2020.	3
19.	<b>Vamsi A.M., Deepalakshmi P., Nagaraj P., Awasthi A., Raj A.</b>	IOT Based Autonomous Inventory Management for Warehouses	EAI/Springer Innovations in Communication and Computing edited by Haldorai A., Ramu A., Mohanram S., Onn C. (eds), Springer, Cham, August -2020. (SCOPUS)	3
20.	<b>T.Dhiliphan Rajkumar , L. Manish Kumar , N. Akhila , P. Sai Keerthana,</b>	Performance Analysis of Machine Learning Techniques to Predict Diabetes Mellitus	International Journal of Advanced Science and Technology, Vol. 29, No. 9s,(May 2020), pp. 6366-6373	3
21.	<b>Muthamil Sudar.K., Mounika Kodela, Pranathi Sivva,</b>	Scrutinize the Utility of Preserved Data	International Journal of Future Generation Communication and Networking Vol. 13, No. 2, 2020 pp.1228-1237.	2
22.	<b>Muthamil Sudar.K., Stanley G, Sharun T, Satheesh Kumar B,</b>	Intelligent Healthcare System using a Machine learning model to Predict Diseases	(Published in International Journal of Advanced Science and Technology Vol. 29, No. 8s, (2020), pp. 3148-3154)	3
23.	<b>R. R. Subramanian, R. Nikhil Mourya, V. Prudhvi Teja Reddy, B. Narendra Reddy, Srikar Amara,</b>	Lung Cancer Prediction using Deep Learning Framework	International Journal of Control and Automation, vol. 13, no. 3, pp. 154-160, May 2020.	4
24.	<b>M. Raja, A. Naga sahithi, P. Rishika, G. Prasanthi</b>	Advanced vehicle tracking system using raspberry pi	Journal of Critical review ISSN- 2394-5125 VOL 7, ISSUE 3, March 2020 doi: 10.31838/jcr.07.03.210	3
25.	<b>Ramar, Ramalakshmi, Swashi Muthammal, Tamilselvi Dhamodharan, and Gopi Krishnan Rajendran.</b>	Modelling Alzheimer's Peoples Brain Using Augmented Reality for Medical Diagnosis Analysis.	In International Conference on Intelligent Human Systems Integration, pp. 524-531. Springer, Cham, 2020.	4

26.	Saravanan Alagarsamy, Vishnuvarthanan Govindaraj, <b>Mahammed Irfan, Ragavendra Swami, Nikhil Mani Kumar</b>	Smart Recognition of Real-Time Face using Convolution Neural Network (CNN) Technique	Test engineering and management, 83, 23406-23411, April 2020.	4
27.	Saravanan Alagarsamy, S. Ramkumar, Kartheeban Kamatchi, <b>Hari Shankar, Ajith Kumar, Sanjeev Karthick, Praveen Kumar</b>	Designing a Advanced Technique for Detection and Violation of Traffic Control System	Journal of Critical Reviews,7(8), 2874-2879, April 2020.	4
28.	Saravanan Alagarsamy, Vishnuvarthanan Govindaraj, <b>Kumarasamy Meenakumari, Kumaran Priyadhara</b>	Identification of Various Diseases in Guava Fruit using Spiral Optimization (SPO) Technique	Test engineering and management,83, 9561-9566, April 2020.	2
29.	Saravanan Alagarsamy, Kartheeban Kamatchi, <b>Mehta Maharshi, Nilesh Nirav, Moksh Kaushal</b>	Association of Identical Pairs Using Natural Language Processing,	International Journal of Psychosocial Rehabilitation,24(6), 7320-7327, April 2020.	3
30.	<b>M. Saravanan, J. Karthik, V. Rahul, T. Dhiliphan Raj Kumar,</b>	Secure Health Care System Based on Mobile Computing	International Journal of Research in Engineering, Science and Management, Volume-2, Issue-11, November-2019, ISSN (Online): 2581-5792	2
31.	<b>J. Ashok Lawrence , L. Alagappan , K. Vignesh Varadhan , K. Muthamil Sudar,</b>	Detection of Distributed Denial of Service Attacks using Machine Learning Techniques	International Journal of Research in Engineering, Science and Management Vol. 2, No.11 2019, pp. 310-314	3
32.	<b>T. Raghupathi , M. Sivabalan , S. S. Jeganath , K. Muthamil Sudar,</b>	Preventing Man in the Middle Attack Using Machine Learning,	International Journal of Research in Engineering, Science and Management Vol. 2, No. 11 2019, pp. 327-331	3
33.	J. Jeyaranjani <b>K. Aishwarya, B. Anitha, P. Yavanarani</b>	Dynamic Task Scheduling using Genetic Algorithm in Private Cloud Environment,	International Journal for Research in Applied Science & Engineering Technology (IJRASET), pp. 2300 - 2304, April 2018, DOI: 10.22214/ijraset.2018.4392	3
34.	<b>D.Yaswanth, K.Raviteja, Y.Harish kumar, M. Raja,</b>	Key Management Protocol In Ciphertext Policy For Cloud Data Sharing.	International Journal of Research, ISSN NO:2236-6124 Volume 7, Issue XI, November/2018 pp: 565-573	3

35.	A.Saravanan, S.Sairam, A.Soma Vigneshwar, T.N.Ajith Kumar	Lesion Identification and Tissue Segmentation in Magnetic Resonance (MR) Image using Interval type based Clustering	International Journal of Digital Communication and Networks (IJDCN), vol.4,no.5, pp. 4501-4504, April 2018.	4
36.	S.Lakshmi Narayani, A.Saravanan, S.Anushiya, G.Kodieswari,	Identifying various type of Pathologies in Magnetic Resonance (MR) Image using Jaya algorithm	International Journal of Innovative Research in Applied Sciences and Engineering (IJIRASE), vol.2,no.5, pp. 298-310, November 2018.	3

(ii) List of students participated in workshop/training program

S. No	Name	Event	Venue	Date
1.	Monika Sree Velampudi	Tech Fest	IIT Bombay	31.12.2017
2.	Siddi Mahesh	Tech Fest	IIT Bombay	31.12.2017
3.	Mandi Akif Hussain	Tech Fest	IIT Bombay	31.12.2017
4.	Thota gopichand	Tech Fest	IIT Bombay	31.12.2017
5.	Iyer Karthik	Tech Fest	IIT Bombay	31.12.2017
6.	Revoori Veeharika Redd	Tech Fest	IIT Bombay	31.12.2017
7.	Vankadari Harsha	Artificial Intelligence and Machine learning workshop	Hydrolus technology private limited,Pune	23.03.2018 to 24.03.2018
8.	Praneetha Reddy	Artificial Intelligence and Machine learning workshop	Hydrolus technology private limited,Pune	23.03.2018 to 24.03.2018
9.	Nallani Vinodsai	Artificial Intelligence and Machine learning workshop	Hydrolus technology private limited,Pune	23.03.2018 to 24.03.2018
10.	Ramalingappagari Yashwantkrishna Sai	Artificial Intelligence and Machine learning workshop	Hydrolus technology private limited,Pune	23.03.2018 to 24.03.2018
11.	Ramalingappagari yashwantkrishna sai,	Technical symposium	Jawarharlal Nehru Technological university	23.03.2018 to 24.03.2018
12.	Nallani vinodsai	Technical symposium	Jawarharlal Nehru Technological university	23.03.2018 to 24.03.2018

13.	Vankadari Harsha Praneetha Reddy	Technical symposium	Jawarharlal Nehru Technological university	23.03.2018 to 24.03.2018
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**(iii) List of students participated in tech event/Internship**

S. No	Register Number	Name of the Student	Nature of event	Event/Industry Name
1	9919004340	Tejesh	Whiz Googler expert in whiz googler weekly challenge	Whiz Googler expert
2	9917004036	Sasi kumar	IUCEE annual student forum 2020, Anurag group of Institute, Hyderabad, Winner	IUCEE Hyderabad, Winner
3	9917004001	K Aashish Dubey	Certified ethical hacker, EC council,	Certified ethical hacker
4	9916004229	Akash Awasthi	Research Intern at Bhabha atomic research centre (BARC), Mumbai.	Research Intern at Bhabha atomic research centre (BARC), Mumbai.
			Research Fellowship at IIT Gandhinagar	Research Fellowship at IIT Gandhinagar
			KVPY fellowship sponsored by DST and Indian Institute of Science, Bangalore	DST and Indian Institute of Science, Bangalore
			“Smart India Hackathon” conducted by AICTE, MHRD and Dept of Atomic Energy, Runner	Smart India Hackathon” conducted by AICTE
			IEEE SS12 , National Green University, Colombo, 5 <sup>th</sup> place	IEEE SS12 , National Green University, Colombo
			Best project awarded by IIT, Kanpur at intelligent systems laboratory, 2018	IIT, Kanpur

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			Best paper award in IEEE International Conference,2019	IEEE International Conference,2019
5	9916004248	Madhu Vamsi	Research Intern at Bhabha atomic research centre (BARC), Mumbai.	Research Intern at Bhabha atomic research centre (BARC), Mumbai.
			Research Fellowship at IIT Gandhinagar	IIT Gandhinagar
			Research Intern at university of California, Berkeley in collaboration with Microsoft research.	Research Intern at university of California
			“Smart India Hackathon” conducted by AICTE, MHRD and Dept of Atomic Energy.	Smart India Hackathon” conducted by AICTE
			Research Intern at Bhabha atomic research centre (BARC), Mumbai.	Research Intern at Bhabha atomic research centre (BARC), Mumbai
6	9916004009	Etlam Jaswanth	Semester abroad program in soongsil university in south korea,2018	Soongsil university in south korea,
			Hackathon which is on cyber security 2019,Runner	Hackathon which is on cyber security 2019,
			One month winter internship on php technology in phoenix softech dec 2017	Phoenix softech dec 2017
7	9915004056	SACHIN G	Internship	ISRO, Bangalore
8	9915004127	RAZIA KHAN		
9	9916004176	T. BALA MANIDEEP	Internship	Grepthor Software Solutions Pvt Ltd
10	9916004091	M. BHARATH KUMAR	Internship	Grepthor Software Solutions Pvt Ltd
11	9916004077	M. HARI KRISHNA	Internship	Grepthor Software Solutions Pvt Ltd

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12	9916004027	DEVARAPALLI KARTHIK	Internship	VNC Digital Services Pvt Ltd
13	9916004141	SAI RAVI TEJA GARLAPATI	Internship	EC & G/DIT/SDD, Defence Research Development Lab (DRDL)
14	9916004040	GUNDLAPALLI SAHANA	Internship	Young Minds Technology Solutions Pvt Ltd
15	9916004066	KOLISSETTY THARUNI	Internship	Young Minds Technology Solutions Pvt Ltd
16	9916004202	MANYAM VISHNU VARDHAN REDDY	Internship	Young Minds Technology Solutions Pvt Ltd
17	9916004217	A.TIRUMALA VIKAS REDDY	Internship	KESTE IT Solutions
18	9916004247	V.KEERTHI VARDHAN		
19	9916004011	A.SAI SRI HARSHA		
20	9916004068	K VISHNU VARDHAN	Internship	KESTE IT Solutions
21	9916004210	G PRIYANKA		
22	9916004203	P BHANU PRAKASH		
23	9916004208	VASANTHU JEYAPRAKASH REDDY	Internship	VNC Digital Services Pvt Ltd
24	9916004027	KARTHICK DEVARPALLI		
25	9916004250	TARUN RAMAGIRI		
26	9916004248	A. MADHU VAMSI	Internship	Zoho Corp
27	9915004184	VENNA NAGA THRINADH REDDY	Internship	Zoho Corp
28	9915004215	N V SAI TEJA	Internship	Zoho Corp
29	9915004196	LAVESH KARNANI	Internship	Amazon
30	9915004135	EGUVAPALLI VAMSIDHAR REDDY	Internship	Lean Pitch
31	9915004151	R GOPI KRISHNAN	Internship	Lean Pitch
32	9915004211	GANDE VARUN KUMAR	Internship	Lean Pitch
33	9816004003	SARANYA M	Internship	Global Health Care
34	9915004008	BALAKUMARAN M	Internship	Global Health Care
35	9915004024	JASPER JERALD R	Internship	Global Health Care

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36	9915004126	AMBITI HARIVARDHAN	Internship	Global Health Care
37	9915004162	GABBURI NIKHIL	Internship	Global Health Care
38	9915004177	BARAM RAMESH BABU	Internship	ThinGKs Informatic
39	9918004043	KALAVALA NAGA SAI ANIL	Industrial Training	VI Solutions
40	9918004101	REPANA DEVANANDA	Industrial Training	VI Solutions
41	9918004107	SEGU DHANUSH KUMAR	Industrial Training	VI Solutions
42	9918004041	JINKA LAKSHMI PATHI	Industrial Training	VI Solutions
43	9918004173	V.PAVAN KUMAR REDDY	Industrial Training	Bharath Sanchar Nigam Limited
44	9918004160	S.ARSHAD ALI	Industrial Training	Bharath Sanchar Nigam Limited
45	9918004139	I.RAMACHARAN REDDY	Industrial Training	Bharath Sanchar Nigam Limited
46	9918004171	B.HEMANTH	Industrial Training	Bharath Sanchar Nigam Limited
47	9918004119	V.SRIJITH	Industrial Training	Bharath Sanchar Nigam Limited
48	9918004125	M.HANUMANTHARA O	Industrial Training	Bharath Sanchar Nigam Limited
49	9918004135	N.MOHAN KALYAN	Industrial Training	Bharath Sanchar Nigam Limited
50	9918004235	CH.YASWANTH	Industrial Training	Innovent technology
51	9918004077	N SAIVIVEK	Industrial Training	VI Solutions, Banglore
52	9918004093	P GNANESWAR	Industrial Training	VI Solutions, Banglore
53	9918004065	M VENKATA MITHILESH	Industrial Training	VI Solutions, Banglore
54	9918004046	KANCHARLA MAHESH	Industrial Training	Clinivantage Healthcare Technologies Pvt. Ltd,Maharashtra.
55	9918004077	N SAIVIVEK	Industrial Training	Alphatac Technologies,Bang alore.
56	9918004069	M NAGASAI	Industrial Training	Alphatac Technologies, Bangalore.

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57	9918004093	P GNANESWAR	Industrial Training	Alphatac Technologies, Bangalore.
58	9918004201	P.SATEESH REDDY	Industrial Training	Alphatac Technologies, Bangalore.
59	9918004037	IMMADISETTY.GOKUL VAMSI	Industrial Training	Bolt iot, Bengaluru
60	9918004032	GONTLA.CHANDRAS HEKAR	Industrial Training	Bolt iot, Bengaluru



CRITERIA 5											
FACULTY INFORMATION AND CONTRIBUTIONS											200

## 5.1.1. Faculty Details (CAR 2021 -2022)

S.No	Name	PAN No.	University Degree	Date of Receiving Highest Degree	Area of Specialization	Current Designation	Date (Designated as Prof/ Assoc. Prof.).	Initial Date of Joining	Association Type	Currently Associated with (Yes/No)	In case of No, Date of Leaving	IS HO D?
1	Dr.V.Vasudevan	AFJPV8049L	M.Sc. and Ph.D.	4/5/1992	Cloud Computing	Professor	1/8/2007	19/8/1992	Regular	Yes		No
2	Dr. K. Karuppasamy	AISPK7377A	MCA and Ph.D.	11/6/2010	Graph Theory	Professor	1/7/2015	5/7/1999	Regular	Yes		No
3	Dr. Koteswara Rao Anne	ASNPA9400B	MS and Ph.D.	11/6/2010	Network & Security	Professor	17/8/2020	17/8/2020	Regular	Yes		No
4	Dr. P. Sarasu	BBHPS8086B	ME/M.Tech and Ph.D.	13/7/2012	Artificial Intelligence	Professor	17/8/2020	17/8/2020	Regular	Yes		No
5	Dr. P. Deepalakshmi	ANRPD7277Q	ME/M.Tech and Ph.D.	17/8/2013	Machine Learning	Professor	1/7/2017	8/12/2004	Regular	Yes		Yes
6	Dr.A.Francis Saviour Devaraj	AAFPP5070Q	ME/M.Tech and Ph.D.	10/6/2011	Network & Security	Professor	2/5/2018	2/5/2018	Regular	No	25/05/2022	No
7	Dr. R. Ramalakshmi	AQAPR9195D	ME/M.Tech and Ph.D.	13/11/2015	Machine Learning	Professor	5/7/2019	4/6/2001	Regular	Yes		No
8	Dr. N. Dhinaharan	BEQPD3401M	ME/M.Tech and Ph.D.	9/6/2006	Network & Security	Professor	2/7/2018	2/7/2018	Regular	Yes		No
9	Dr. K. Kartheeban	AZIPK4803C	ME/M.Tech and Ph.D.	11/7/2014	Cloud Computing	Professor	1/8/2018	2/6/1999	Regular	Yes		No

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S.No	Name	PAN No.	University Degree	Date of Receiving Highest Degree	Area of Specialization	Current Designation	Date (Designated as Prof/ Assoc. Prof.).	Initial Date of Joining	Association Type	Currently Associated with (Yes/ No)	In case of No, Date of Leaving	IS HO D?
10	Dr. R. Murugeswari	AJCPM2123K	ME/M.Tech and Ph.D.	2/6/2017	Soft Computing	Associate Professor	1/7/2017	28/6/2000	Regular	Yes		No
11	Dr. R. Kanniga Devi	AYFPK7030F	ME/M.Tech and Ph.D.	8/7/2016	Graph Theory	Associate Professor	1/12/2017	15/2/2005	Regular	Yes		No
12	Dr. G. Murugaboopathi	AMKPM8267H	ME/M. Tech and PhD	08-07-2011	Network & Security	Associate Professor	22/12/2014	22/12/2014	Regular	No	30/11/2021	No
13	Dr. S. Dhanasekaran	AQTPD6286E	ME/M. Tech and PhD	09-06-2017	Big Data Analytics	Associate Professor	07/07/2017	13/08/2008	Regular	No	10/05/2022	No
14	Dr. B. S. Murugan	BAJPM8594B	ME/M.Tech and Ph.D.	9/6/2017	Cloud Computing	Associate Professor	1/7/2017	5/6/2009	Regular	Yes		No
15	Dr. K. Murugeswari	ALWPK7686B	ME/M.Tech and Ph.D.	4/6/2012	Machine Learning	Associate Professor	19/6/2018	19/6/2018	Regular	No	27/05/2022	No
16	Dr.B.Pitchai Manickam	AUFPP5465R	ME/M.Tech and Ph.D.	2/11/2020	Wireless Sensor Networks	Associate Professor	16/4/2014	13/6/2007	Regular	Yes		No
17	Dr. T. Dhiliphan Rajkumar	BDEPD8419A	ME/M.Tech and Ph.D.	1/5/2017	Big Data Analytics	Associate Professor	3/5/2019	17/6/2016	Regular	Yes		No
18	Dr. N. C. Brintha	ASRPB5292N	ME/M.Tech and Ph.D.	2/5/2018	Image Processing	Associate Professor	3/5/2018	3/5/2018	Regular	Yes		No
19	Dr. P. Thendral	AONPP8851R	ME/M.Tech and Ph.D.	04/06/2012	Machine Learning	Associate Professor	19/06/2018	19/06/2018	Regular	No	25/05/2022	No
20	Dr. A. Saravanan	CNLPS1667P	ME/M.Tech and Ph.D.	16/9/2019	Image Processing	Associate Professor	2/1/2020	30/6/2009	Regular	Yes		No
21	Dr. A. Robert Singh	AUFPA4406R	ME/M.Tech and Ph.D.	15/6/2019	Internet of Things	Associate Professor	2/1/2020	4/7/2011	Regular	No	27/05/2022	No

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S.No	Name	PAN No.	University Degree	Date of Receiving Highest Degree	Area of Specialization	Current Designation	Date (Designated as Prof/ Assoc. Prof.).	Initial Date of Joining	Association Type	Currently Associated with (Yes/ No)	In case of No, Date of Leaving	IS HO D?
22	Dr. J. Jane Rubel Angelina	AJLPJ7771M	ME/M.Tech and Ph.D.	03/09/2019	Networks & Security	Associate Professor	2/8/2021	2/8/2021	Regular	Yes		No
23	Dr. C. Bala Subramanian	ASOPB4640B	ME/M.Tech and Ph.D.	2/11/2020	Internet of Things	Associate Professor	26/08/2021	22/12/2008	Regular	Yes		No
24	Dr. R. Sumathi	BRYPS8737E	ME/M.Tech and Ph.D.	19/11/2021	Image Processing	Assistant Professor		1/8/2007	Regular	Yes		No
25	Mrs. V. Manoranjithem	AVTPM5559J	M.E/M.Tech	4/6/2007	Big Data Analytics	Assistant Professor		31/12/2007	Regular	Yes		No
26	Mr. M. Raja	AQPPR5851F	M.E/M.Tech	5/5/2008	Network & Security	Assistant Professor		2/6/2008	Regular	Yes		No
27	Mr. D. Balakrishnan	AWUPB1917B	M.E/M.Tech	4/5/2009	Internet of Things	Assistant Professor		1/6/2009	Regular	Yes		No
28	Dr. B. Balakiruthiga	ARZPB8749D	ME/M.Tech and Ph.D.	7/12/2021	Network & Security	Assistant Professor		1/7/2011	Regular	Yes		No
29	Mrs. J. Jeyaranjani	AREPJ8067B	M.E/M.Tech	6/6/2011	Distributed computing	Assistant Professor		1/7/2011	Regular	Yes		No
30	Mrs. B.Thevahi	AMYPT4960E	M.E/M.Tech	2/6/2014	Internet of Things	Assistant Professor		18/6/2015	Regular	No	31/05/2022	No
31	Mr. Chittaranjan swain	EOVPS2359M	M.E/M.Tech	1/6/2015	Fog Computing	Assistant Professor		12/5/2016	Regular	No	25/05/2022	No
32	Mrs. G. Elizabeth Rani	ACBPE3224D	M.E/M.Tech	5/11/2012	Image Processing	Assistant Professor		17/6/2016	Regular	No	27/05/2022	No
33	Dr. K. Muthamil Sudar	BSKPM2992J	ME/M.Tech and Ph.D.	1/11/2021	Software-Defined networks	Assistant Professor		6/7/2016	Regular	No	27/05/2022	No

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S.No	Name	PAN No.	University Degree	Date of Receiving Highest Degree	Area of Specialization	Current Designation	Date (Designated as Prof/ Assoc. Prof.).	Initial Date of Joining	Association Type	Currently Associated with (Yes/ No)	In case of No, Date of Leaving	IS HO D?
34	Mr. P. Velmurugadass	ALHPV3773D	M.E/M.Tech	3/6/2013	Blockchain Technology	Assistant Professor		1/6/2017	Regular	Yes	-	No
35	Mr. P. Nagaraj	AXHPN7775P	M.E/M.Tech	3/6/2013	Big Data Analytics	Assistant Professor		12/6/2017	Regular	Yes	-	No
36	Mr. K. Vijaykumar	ATNPV5488M	M.E/M.Tech	8/6/2015	Big Data Analytics	Assistant Professor		29/6/2017	Regular	Yes	-	No
37	Ms. K. Sivapriya	FKUPS0350C	M.E/M.Tech	8/5/2017	Wireless Sensor Networks	Assistant Professor		1/12/2017	Regular	No	24/06/2022	No
38	Mr. S. Prabhu	DYLPS7535G	M.E/M.Tech	1/6/2015	Cloud Computing	Assistant Professor		1/12/2017	Regular	Yes	-	No
39	Mr. L. Karuppasamy	DRMPK6500D	M.E/M.Tech	2/6/2014	Cloud Computing	Assistant Professor		1/12/2017	Regular	Yes	-	No
40	Mr.S.Kannudurai	CJCPK5871J	M.E/M.Tech	10/6/2011	Big Data Analytics	Assistant Professor		18/6/2018	Regular	Yes	-	No
41	Ms. S. Manochitra	CYVPM8076M	M.E/M.Tech	3/6/2013	Network & Security	Assistant Professor		18/6/2018	Regular	Yes	-	No
42	Mr. M. Sankara Mahalingam	CTJPS8156B	M.E/M.Tech	2/6/2014	Wireless Sensor Networks	Assistant Professor		18/6/2018	Regular	Yes	-	No
43	Mrs. P. Packiya Lakshmi	BFTPP0975E	M.E/M.Tech	5/6/2006	Big Data Analytics	Assistant Professor		18/6/2018	Regular	No	24/06/2022	No
44	Mr. R. Anantha Kumar	AVQPA0619Q	M.E/M.Tech	6/6/2011	Cloud Computing	Assistant Professor		18/6/2018	Regular	No	24/06/2022	No
45	Mrs. M. Malathi	BFUPM5645D	M.E/M.Tech	1/11/2010	Artificial Intelligence	Assistant Professor		18/6/2018	Regular	No	24/06/2022	No

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S.No	Name	PAN No.	University Degree	Date of Receiving Highest Degree	Area of Specialization	Current Designation	Date (Designated as Prof/ Assoc. Prof.).	Initial Date of Joining	Association Type	Currently Associated with (Yes/No)	In case of No, Date of Leaving	IS HO D?
46	Mr. M. K. Nagarajan	AKLPN5900D	M.E/M.Tech	1/6/2009	Network & Security	Assistant Professor		18/6/2018	Regular	Yes	-	No
47	Ms. A. M.Gurusigaamani	BKFPG6144R	M.E/M.Tech	4/11/2013	Big Data Analytics	Assistant Professor		18/6/2018	Regular	Yes	-	No
48	Ms. S. Jeevitha	AOVPJ0025P	M.E/M.Tech	1/11/2010	Cloud Computing	Assistant Professor		18/6/2018	Regular	Yes	-	No
49	Mr. R. Raja Subramanian	BIJPR7559D	M.E/M.Tech	4/6/2018	Artificial Intelligence	Assistant Professor		27/6/2018	Regular	Yes	-	No
50	Ms. K. Sowndaryia	GJHPS3032J	M.E/M.Tech	4/6/2018	Network & Security	Assistant Professor		2/7/2018	Regular	Yes	-	No
51	Ms. D. Kavitha	BGFPG4190M	M.E/M.Tech	2/6/2008	Wireless Sensor Networks	Assistant Professor		2/7/2018	Regular	Yes	-	No
52	Ms. S. Shanmugapriya	CULPS8038M	M.E/M.Tech	6/6/2011	Internet of Things	Assistant Professor		2/7/2018	Regular	Yes	-	No
53	Ms. Jenifa	BVCPJ4348A	M.E/M.Tech	3/6/2019	Internet of Things	Assistant Professor		1/7/2019	Regular	Yes	-	No
54	Mr. K. Vignesh	ASVPV1617P	M.E/M.Tech	1/6/2012	Image Processing	Assistant Professor		11/4/2020	Regular	Yes	-	No
55	Ms. G. Vidhya Shree	BELPV7085L	M.E/M.Tech	5/6/2020	Big Data Analytics	Assistant Professor		18/6/2020	Regular	No	24/06/2022	No
56	Ms.M. Umashree	ACEPU6777G	M.E/M.Tech	3/11/2014	Internet of Things	Assistant Professor		1/7/2020	Regular	Yes	-	No
57	Mr. A. Karthic	CPHPK4298G	M.E/M.Tech	10/7/2014	Big Data Analytics	Assistant Professor		1/7/2020	Regular	Yes	-	No
58	Ms. Rubathi Saranya J	BLAPR7128G	M.E/M.Tech	3/11/2014	Machine Learning	Assistant Professor		1/7/2020	Regular	No	24/06/2022	No

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S.No	Name	PAN No.	University Degree	Date of Receiving Highest Degree	Area of Specialization	Current Designation	Date (Designated as Prof/ Assoc. Prof.).	Initial Date of Joining	Association Type	Currently Associated with (Yes/ No)	In case of No, Date of Leaving	IS HO D?
59	Mr. Cibi Castro	BFHPC4192L	M.E/M.Tech	3/6/2013	Big Data Analytics	Assistant Professor		1/7/2020	Regular	Yes	-	No
60	Ms. Vijayalakshmi	AYRPV5287H	M.E/M.Tech	3/6/2013	Internet of Things	Assistant Professor		2/7/2020	Regular	No	24/06/2022	No
61	Ms. Jayanthi	BCKPJ7256C	M.E/M.Tech	31/05/2012	Machine Learning	Assistant Professor		06/07/2021	Regular	Yes	-	No
62	Dr.S.Surya	GZZPS9383G	ME/M.Tech and Ph.D.	30/06/2020	Wireless Sensor Networks	Assistant Professor		20/7/2021	Regular	No	30/05/2022	No
63	Mr. R. Raja Sekar	BIQPR1395N	M.E/M.Tech	30/06/2013	Machine Learning	Assistant Professor		12/8/2021	Regular	Yes	-	No
64	Dr. Wilson Prakash S	ADTPW2748R	ME/M.Tech and Ph.D.	03/04/2021	Machine Learning	Assistant Professor		06/07/2021	Regular	Yes	-	No
65	Mr. Nirmalan R	AVSPN4815F	M.E/M.Tech	30/06/2014	Machine Learning	Assistant Professor		06/07/2021	Regular	Yes	-	No
66	Mr. Sudheer Kumar E	COUPS9920K	M.E/M.Tech	16/12/2013	Software Development	Assistant Professor		06/07/2021	Regular	Yes	-	No
67	Dr. Muthuvel. P	BAZPM0873K	ME/M.Tech and Ph.D.	31/07/2018	Soft Computing	Assistant Professor		14/3/2018	Regular	Yes	-	No
68	Dr. Saranya Devi S	CSGPS1886N	ME/M.Tech and Ph.D.	09/08/2021	Soft Computing	Assistant Professor		06/07/2021	Regular	Yes	-	No
69	Ms. Devisurya	BEBPD5611N	M.E/M.Tech	09/06/2016	Deep learning	Assistant Professor		09/06/2017	Regular	No	30/05/2022	No
70	Ms. M. Sowmya	IFLPS7086Q	M.E/M.Tech	08/05/2017	Machine Learning	Assistant Professor		09/06/2017	Regular	No	30/05/2022	No
71	Ms. S. Vidya	ALGPV8841B	M.E/M.Tech	03/12/2018	Big Data Analytics	Assistant Professor		18/06/2018	Regular	No	30/05/2022	No

**5.1. Student-Faculty Ratio (SFR) (20)***(To be calculated at Department Level)*

No. of UG Programs in the Department (n)	: 5
No. of PG Programs in the Department (m)	: 2
No. of Students in UG1 2 <sup>nd</sup> Year= <b>u1</b>	: <b>240</b> (240+0)
No. of Students in UG1 3 <sup>rd</sup> Year= <b>u2</b>	: <b>242</b> (240+2)
No. of Students in UG1 4 <sup>th</sup> Year= <b>u3</b>	: <b>243</b> (240+3)
No. of Students in UG2 2 <sup>nd</sup> Year= <b>u2</b>	: <b>60</b> (60+0)
No. of Students in UG3 2 <sup>nd</sup> Year= <b>u2</b>	: <b>60</b> (60+0)
No. of Students in UG4 2 <sup>nd</sup> Year= <b>u2</b>	: <b>60</b> (60+0)
No. of Students in UG5 2 <sup>nd</sup> Year= <b>u2</b>	: <b>60</b> (60+0)
No. of Students in PG1 1 <sup>st</sup> Year= <b>p1.1</b>	: 12
No. of Students in PG1 2 <sup>nd</sup> Year= <b>p1.2</b>	: 12
No. of Students in PG2 1 <sup>st</sup> Year= <b>p2.1</b>	: 0
No. of Students in PG2 2 <sup>nd</sup> Year= <b>p2.2</b>	: 12

No. of Students = Sanctioned Intake + Actual admitted lateral entry students

*(The above data to be provided considering all the UG and PG programs of the department)*

**S**=Number of Students in the Department =  $UG1+UG2+UG3+PG1+PG2$

**F** = Total Number of Faculty Members in the Department (excluding first year faculty)

**Student Faculty Ratio (SFR) = S / F**

*Table B.5.1 SFR Calculation*

Year	CAY (2021-22)	CAYm1 (2020-21)	CAYm2 (2019-20)
UG1	240+242+243 (725)	242+243+247 (732)	243+247+243 (733)
UG2	60+0+0	0	0
UG3	60+0+0	0	0
UG4	60+0+0	0	0
UG5	60+0+0	0	0
<b>Computer Science and Engineering</b>	<b>965</b>	<b>732</b>	<b>733</b>
<b>M.Tech Computer Science and Engineering</b>	24	24	24
<b>M.Tech Network Engineering</b>	12	24	24
<b>PG1</b>	<b>36</b>	<b>48</b>	<b>48</b>
<b>Total No. of Students in the Department (S)</b>	<b>1001</b>	<b>780</b>	<b>781</b>
<b>No. of Faculty in the Department (F)</b>	<b>70</b>	<b>62</b>	<b>58</b>
<b>Student Faculty Ratio (SFR)</b>	<b>SFR2= 14.3</b>	<b>SFR2= 12.58</b>	<b>SFR3= 13.46</b>
<b>Average SFR</b>	<b>13.44</b>		



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

*Table 5.1.1 Details of Regular and contract Faculty*

	The total number of regular faculty in the department	Total number of contractual faculty in the department
<b>CAYm1(2021-22)</b>	70	-
<b>CAYm1(2020-21)</b>	62	-
<b>CAYm2(2019-20)</b>	58	-

## 5.2. Faculty Cadre Proportion (20)

*Table B.5.2 Faculty Cadre Ratio*

Year	Professors		Associate Professors		Assistant Professors	
	Required F1	Available	Required F2	Available	Required F3	Available
<b>CAY (2021-22)</b>	5	9	11	13	33	48
<b>CAYm1 (2020-21)</b>	4	9	8	12	26	41
<b>CAYm2 (2019-20)</b>	4	7	8	15	26	36
<b>Average (2019-20, 2020-21, 2021-22)</b>	4.33	8.33	9	13.3	28.3	41.6

$$\text{Cadre Ratio} = (1.92 + 1.47 \times 0.6 + 1.46 \times 0.4) \times 10 = \mathbf{33.86}$$

**Marks = 20**

## 5.3. Faculty Qualification (20)

FQ =  $2.0 \times [(10X + 4Y)/F]$  where x is no. of regular faculty with Ph.D., Y is no. of regular faculty with M. Tech., F is no. of regular faculty required to comply 20:1 Faculty Student ratio (no. of faculty and no. of students required are to be calculated as per 5.1)

**Table B.5.3 Faculty Qualification**

	X	Y	F	$FQ = 2.0 \times [(10X + 4Y)/F]$
CAY (2021-22)	30	40	50	18.44
CAY (2020-21)	22	40	39	19.48
CAYm1 (2019-20)	19	39	39	17.74
Average Assessment (19-20, 20-21, 21-22)				<b>18.55</b>

**5.4. Faculty Retention (10)**

No. of regular faculty members in CAYm2= 58 CAYm1= 62 CAY= 70

S. No	Name of the Faculty	Date of Joining	CAY 2021-22	CAYm1 2020-21	CAYm2 2019-20
1	Dr.V. Vasudevan	04-05-92	Y	Y	Y
2	Dr. K. Karuppasamy	05-07-99	Y	Y	Y
3	Dr. Koteswara Rao Anne	17-08-20	Y	Y	-
4	Dr. P. Sarasu	17-08-20	Y	Y	-
5	Dr. P. Deepalakshmi	08-12-04	Y	Y	Y
6	Dr.A.Francis Saviour Devaraj	02-05-18	Y	Y	Y
7	Dr. R. Ramalakshmi	04-06-01	Y	Y	Y
8	Dr. N. Dhinakaran	02-07-18	Y	Y	Y
9	Dr. K. Kartheeban	02-06-99	Y	Y	Y
10	Dr. R. Murugeswari	28-06-00	Y	Y	Y
11	Dr. R. Kanniga Devi	15-02-05	Y	Y	Y
12	Dr. G.Murugaboopathi	22-12-14	-	Y	Y
13	Dr. S. Dhanasekaran	13-08-08	Y	Y	Y
14	Dr. B. S. Murugan	05-06-09	Y	Y	Y
15	Dr. K. Murugeswari	19-06-18	Y	Y	Y
16	Dr. B. Pitchai Manickam	13-06-07	Y	Y	Y
17	Dr. T. Dhiliphan Rajkumar	17-06-16	Y	Y	Y
18	Dr. N. C. Brintha	03-05-18	Y	Y	Y
19	Dr. P. Thendral	19-06-18	Y	Y	Y

20	Dr. T. Veeramakali	12-06-18	-	-	Y
21	Dr. A. Saravanan	30-06-09	Y	Y	Y
22	Dr. A. Robert singh	04-07-11	Y	Y	Y
23.	Dr. S. Karkuzhali	12-06-18	-	-	Y
24.	Dr.R.Velumani	27-06-18	-	-	Y
25	Dr. J. Jane Rubel Angelina	02-08-21	Y	-	-
26	Dr. C. Bala Subramanian	22-12-08	Y	Y	Y
27	Dr. R. Sumathi	01-08-07	Y	Y	Y
28	Mrs. V. Manoranjithem	31-12-07	Y	Y	Y
29	Mr. M. Raja	02-06-08	Y	Y	Y
30	Mr. D. Balakrishnan	01-06-09	Y	Y	Y
31	Dr. B. Balakiruthiga	01-07-11	Y	Y	Y
32	Mrs. J. Jeyaranjani	01-07-11	Y	Y	Y
33	Mrs. B.Thevahi	18-06-15	Y	Y	Y
34	Mr. Chittaranjan swain	12-05-16	Y	Y	Y
35	Mrs. G. Elizabeth Rani	17-06-16	Y	Y	Y
36	Dr. K. Muthamil sudar	06-07-16	Y	Y	Y
37	Mr. P. Velmuruga dass	01-06-17	Y	Y	Y
38	Ms. Devisurya	09-06-17	Y	Y	Y
39	Ms. M. Sowmya	09-06-17	Y	Y	Y
40	Mr. P. Nagaraj	12-06-17	Y	Y	Y
41	Mr. R. Raja Subramanian	27-06-18	Y	Y	Y
42	Mr. K. Vijaykumar	29-06-17	Y	Y	Y
43	Ms. K. Sivapriya	01-12-17	Y	Y	Y
44	Mr. S. Prabhu	01-12-17	Y	Y	Y
45	Mr. L. Karuppasamy	01-12-17	Y	Y	Y
46	Mr.S.Kannudurai	18-06-18	Y	Y	Y
47	Ms. S. Manochitra	18-06-18	Y	Y	Y
48	Mr. M. Sankara Mahalingam	18-06-18	Y	Y	Y
49	Mrs. P. Packiya Lakshmi	18-06-18	Y	Y	Y
50	Mr. R. Anantha Kumar	18-06-18	Y	Y	Y
51	Ms. S. Vidya	18-06-18	Y	Y	Y
52	Mrs. M. Malathi	18-06-18	Y	Y	Y
53	Mr. M. K. Nagarajan	18-06-18	Y	Y	Y
54	Ms. A. Gurusigaamani	18-06-18	Y	Y	Y

55	Ms. S. Jeevitha	18-06-18	Y	Y	Y
56	Ms. K. Sowndaryia	02-07-18	Y	Y	Y
57	Ms. D. Kavitha	02-07-18	Y	Y	Y
58	Ms. S. Shanmugapriya	02-07-18	Y	Y	Y
59	Ms. Jenifa	01-07-19	Y	Y	Y
60	Mr. K. Vignesh	11-04-20	Y	Y	-
61	Mr.A.Bhuvaneshwaran	02-07-18	-	-	Y
62	Ms. G. Vidhya Shree	18-06-20	Y	Y	-
63	Ms. Balasubbulakshmi	03-06-19	-	-	Y
64	Ms.M. Umashree	01-07-20	Y	Y	-
65	Mr. A. Karthic	01-07-20	Y	Y	-
66	Ms. Rubathi SaranyaJ	01-07-20	Y	Y	-
67	Mr. Cibi Castro	01-07-20	Y	Y	-
68	Ms. Vijayalakshmi	02-07-20	Y	Y	-
69	Ms. Jayanthi	06-07-21	Y		
70	Dr.S.Surya	20-07-21	Y		
71	Mr. R. Raja Sekar	12-08-21	Y		
72	Dr. Wilson Prakash S	06-07-21	Y		
73	Mr. Nirmalan R	06-07-21	Y		
74	Mr. Sudheer Kumar E	06-07-21	Y		
75	Dr. Muthuvel. P	14-03-18	Y		
76	Dr. Saranya Devi S	06-07-21	Y		

**Table B 5.4b Faculty Retention**

<i>Description</i>	<i>CAY (2021-22)</i>	<i>CAY m1 (2020 -21)</i>	<i>CAYm12 (2019-20)</i>
<b>Total Number of Regular Faculty</b>	<b>70</b>	<b>62</b>	<b>58</b>
<b>Number of Regular Faculty Retained</b>	<b>52 out of 70 keeping 2019-20 as base</b>	<b>53 out 58 keeping 2019-20 as base</b>	
<b>% of Faculty Retained</b>	<b>89.65%</b>	<b>91.3%</b>	
<b>Average</b>	<b>90.45%</b>		

## 5.5 Faculty competencies in correlation to Program Specific Criteria (10)

The competency of faculty members is measured based on their excellence in academic degrees, academic related training, certifications, achievements and research publications. Faculty members articulate their domain specific knowledge to groom the students to excel in academics and prepare them to participate in various events like Smart India Hackathons, Ideathon, Internships, Paper presentation, Project Presentation, etc.

Faculty members show consistent progress in their domain by publishing their research works in renowned Journals and actively contributing their services to the Industries as consultancy works.

Faculty competency is measured based on their excellence in following the key areas / program specific areas referred by the ACM Computing Curricula Recommendations - CC2020 (<https://www.acm.org/binaries/content/assets/education/curricula-recommendations/cc2020.pdf>) as well as by Computing Accreditation Commission and Engineering Accreditation Commission of ABET.

- Algorithm Design and Analysis
- Artificial Intelligence and Machine Learning
- Circuits and Electronics
- Cloud Computing/Distributed Computing
- Computer Architecture and Organisation
- Data Science
- Internet of Things
- Networks and Security
- Programming for problem solving
- Software Engineering

To measure the competency of faculty members, following factors are considered.

- Degree specialization (UG / PG /PhD),
- Research area, Research guidance (UG/PG/PhD),
- Research paper publication,
- Funded Projects Received
- Reviewer / Editor in refereed journals
- Books, Book Chapters Published
- Patents Published, Products developed
- E-content / MOOC content developed
- Online courses / FDP / training programs / workshops / seminars / series of webinars attended in relevance to the academic specialisation.
- Guest lecturers delivered
- Awards received

***Table B.5.5. Summary of Faculty competencies in correlation to Program Specific Criteria***

S.No	Program Specific Criteria	Name of the Faculty	Competency Attained Through
1	Algorithm Design and Analysis	Dr. P. Deepalakshmi	<ul style="list-style-type: none"> <li>● Published a Book Titled “Fundamental Data Structures and Algorithms”</li> <li>● One of the top 5% performers in NPTEL Certification on “Programming, Data Structures and Algorithms using Python”</li> <li>● Developed E-Content for Data Structure Course</li> </ul>
		Ms. R. Sumathi	<ul style="list-style-type: none"> <li>● Completed Honours Code Certification for CS213.3x: Algorithms organised by IITBombayX (IITB)</li> </ul>
		Mr. R. Raja Subramanian	<ul style="list-style-type: none"> <li>● Currently working on two books “Data Structures using Python” and “Algorithm Design Techniques and Analysis”.</li> <li>● Coursera certification on Divide &amp; Conquer, Searching &amp; Sorting, Randomized Algorithms, 100%</li> <li>● Designed various image processing algorithms for handwritten recognition and authorship inference.</li> </ul>

2	Artificial Intelligence and Machine Learning	Mr. R. Raja Subramanian	<ul style="list-style-type: none"> <li>● Guided more than 30 scholars in Undergraduate level and 2 scholars in Postgraduate level in the areas of Predictive Analytics, Machine Learning, Image Processing</li> <li>● Published research papers in SCI/Scopus journals in the area of Machine Learning.</li> <li>● Coursera certification on Neural Networks and Deep Learning, 98.3%</li> <li>● Published a Patent based on Deep Learning and IoT Technology</li> <li>● Resource person for FDPs/Workshops on Machine Learning and Deep Learning</li> <li>● Completed ATAL FDP on Artificial Intelligence</li> <li>● Completed IBM Training Program on Introduction to Artificial Intelligence and Machine Learning</li> <li>● Completed IBM Training Program on Predictive Analytics</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing</li> </ul>
		Dr. N. C. Brintha	<ul style="list-style-type: none"> <li>● Published patent on medical image analysis using machine learning in the area of Artificial Intelligence and Machine Learning.</li> <li>● Guiding Ph.D research scholars on Machine Defect Detection, Medical Image analysis, Quality Control and published papers in journals.</li> <li>● Completed ATAL FDPs in the thrust areas like Deep Learning, Artificial Intelligence and Machine Learning Techniques.</li> <li>● Completed IBM Training Program on Predictive Analytics</li> </ul>
		Dr. R. Murugeswari	<ul style="list-style-type: none"> <li>● Attended FDP on Introduction to AIML, Machine Learning Techniques, Predictive Analytics</li> <li>● Guiding UG/PG and Ph.D. in the area of Machine learning</li> <li>● Published 4 papers in IEEE conference in the area of machine learning</li> <li>● Completed IBM Training Program on Introduction to Artificial Intelligence and Machine Learning</li> <li>● Completed IBM Training Program on Predictive Analytics</li> </ul>



		Dr. P. Deepalakshmi	<ul style="list-style-type: none"> <li>● Published a patent titled “Dynamically Understanding 3d Visual Scenes Using Deep Learning”</li> <li>● Guiding many PhD research scholars by applying various AIML techniques in health care, cyber security, legal, social network domains and published papers related to the same in many SCI, SCOPUS level journals, book chapters and conferences.</li> <li>● Published an article in related to cloud security in a high impact factored Journal - Journal of Ambient Intelligence and Humanized Computing, Springer, (IF=7.104)</li> <li>● Attended IBM sponsored Training programs on Machine Learning and Artificial Intelligence, Predictive Analytics, Deep Learning.</li> <li>● Delivered a lecture on “Deep Learning Techniques for Health Informatics” as part of AICTE Sponsored Virtual STTP on Predictive Modelling and Data Analysis Using Python based Machine Learning Technique.</li> <li>● Delivered a lecture on “Application of Deep Learning Techniques for Health Informatics”</li> <li>● Delivered a lecture on “Blockchain for 5G and beyond networks”.</li> <li>● Completed IBM Training Program on Introduction to Artificial Intelligence and Machine Learning</li> <li>● Completed IBM Training Program on Predictive Analytics</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing</li> </ul>
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		Dr.R. Ramalakshmi	<ul style="list-style-type: none"> <li>● Published a book chapter titled “Prediction of COVID-19 Outbreak with Current Substantiation Using Machine Learning Algorithms”</li> <li>● Guided Ph.D and PG Students to develop machine learning models for classification.</li> <li>● Published an article in in related to Machine Learning in High impact factor Journal - Environmental Technology &amp; Innovation, Elsevier (IF=5.263)</li> <li>● Published an article in in related to Machine Learning in High impact factor Journal - Environmental Science and</li> <li>● Pollution Research, Springer, Q1 (IF=4.223)</li> <li>● Completed IBM Training Program on Introduction to Artificial Intelligence and Machine Learning.</li> <li>● Completed IBM Training Program on Predictive Analytics</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing</li> </ul>
		Dr B.Pitchaimanic kam	<ul style="list-style-type: none"> <li>● Completed ATAL online FDP on Artificial Intelligence.</li> <li>● Attended FDP on Introduction to AIML, Predictive Analytics, Machine learning, Deep learning.</li> <li>● Journal Reviewer - Journal of Experimental and Theoretical Artificial Intelligence,</li> <li>● Journal Reviewer - Journal of Ambient Intelligence and Humanised Computing.</li> <li>● Completed IBM Training Program on Introduction to Artificial Intelligence and Machine Learning</li> <li>● Completed IBM Training Program on Predictive Analytics</li> </ul>

		Mrs. G. Elizabeth Rani	<ul style="list-style-type: none"> <li>● Pursuing Ph.D. in the area of Image Processing by using machine learning algorithms titled “Development of an automated microstructural analysis in SEM images”.</li> <li>● Published 4 papers in IEEE conference in the area of machine learning</li> <li>● Guiding UG projects in the area of machine learning various algorithms i.e., SVM, K-means, Logistic Regression etc.</li> <li>● Attended FDP on Introduction to AIML, Predictive Analytics.</li> <li>● Attended Workshop on Introduction to Machine Learning at IIT Kharagpur.</li> <li>● Completed IBM Training Program on Predictive Analytics</li> <li>● Completed IBM Training Program on Introduction to Machine Learning</li> </ul>
		Dr T.Dhiliphan Rajkumar	<ul style="list-style-type: none"> <li>● Attended FDP on Introduction to AIML, Predictive Analytics, Machine learning, Deep learning.</li> <li>● Published an article in High impact factored Journal - International Journal of Intelligent Systems (IF=8.709)</li> <li>● Completed IBM Training Program on Predictive Analytics</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing</li> </ul>
		Dr. R. Kanniga Devi	<ul style="list-style-type: none"> <li>● Guiding Research Scholars in the area of Artificial intelligence and Machine learning</li> <li>● Published research papers in the area of AIML</li> <li>● Completed IBM Training Program on Introduction to Machine Learning</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing</li> </ul>

		<p>Ms. J. Jeyaranjani</p>	<ul style="list-style-type: none"> <li>● Journal Reviewer - Journal of Machine Learning and its application”</li> <li>● Resource Person for IEEE Tech Talk series “Machine Learning using Python” – IEEE madras section</li> <li>● Resource Person for Hands on training program on “Machine learning for Research Application” - Kamaraj college of engineering, Virudhunagar</li> <li>● Attended ATAL FDP on “Microsoft and SAP Tech Saksham FDP on Artificial Intelligence (Batch 5) Artificial Intelligence Thrust Areas”</li> <li>● Attended ATAL FDP on “Data Science with Statistical Methods using R Programming- Basic Course Data Sciences Thrust Areas”</li> <li>● Attended 2 weeks AICTE FDP on “Machine Learning for Computer vision”</li> <li>● Completed IIT Bombay - Spoken tutorial project on “SCILAB – open source substitution for MATLAB”</li> <li>● Attended TEQIP sponsored FDP on “Free and open source software tool for AI and ML”</li> <li>● Published 3 Scopus indexed papers by applying machine learning concepts.</li> <li>● Completed IBM Training Program on Introduction to Artificial Intelligence and Machine Learning</li> <li>● Completed IBM Training Program on Predictive Analytics</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing</li> </ul>
		<p>Dr.A. Robert Singh</p>	<ul style="list-style-type: none"> <li>● Published a book on “Computer Vision”</li> <li>● Attended FDP on Introduction to AIML, Machine Learning Techniques</li> <li>● Published an article in High impact factored Journal - Journal of Ambient Intelligence and Humanised Computing, Springer, (IF=7.104)</li> <li>● Guiding UG/PG and Ph.D. in the area of Machine learning.</li> <li>● Completed IBM Training Program on Introduction to Artificial Intelligence and Machine Learning.</li> <li>● Completed IBM Training Program on Predictive Analytics.</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing</li> </ul>

		Dr. A. Saravanan	<ul style="list-style-type: none"> <li>● Attended ATAL National Workshop on Artificial Intelligence</li> <li>● Attended IBM Training Program FDP on Introduction to AIML, Predictive Analytics, Machine Learning Techniques</li> </ul>
		Mr. K.Vignesh	<ul style="list-style-type: none"> <li>● Pursuing Ph.D. in the domain of Machine Learning and Deep Learning titled “Optimized Deep Learning Methods for Crop Yield Prediction”</li> <li>● Guiding UG students project based on ML</li> <li>● Attended FDP on Introduction to AIML.</li> <li>● Completed IBM Training Program on Introduction to Machine Learning</li> </ul>
		Dr. K. Muthamil Sudar	<ul style="list-style-type: none"> <li>● Attended FDP on Machine Learning and Deep Learning using Python.</li> <li>● NPTEL Certification on Introduction to Machine Learning. Guiding the UG Projects in the area of machine learning and Deep learning.</li> <li>● Completed IBM Training Program on Predictive Analytics.</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing.</li> </ul>
		Mr. P.Nagaraj	<ul style="list-style-type: none"> <li>● Completed IBM Training Program on Introduction to Artificial Intelligence and Machine Learning</li> <li>● Completed IBM Training Program on Predictive Analytics.</li> <li>● Completed IBM Training Program on Computational Linguistics and Natural Language Processing.</li> </ul>
3	Circuits and Electronics	Dr. C. Bala Subramanian	<ul style="list-style-type: none"> <li>● Degree Specialisation</li> <li>● B.Tech – Electronics and Communication Engineering</li> <li>● M.Tech – Applied Electronics</li> <li>● E-Content developed for Analog Electronic Circuit Course.</li> </ul>

		Mr. M. Raja	<ul style="list-style-type: none"> <li>● Degree Specialisation - B.Tech – Electronics and Communication Engineering</li> <li>● E-Content developed for Analog Electronic Circuit Course.</li> </ul>
		Dr. A. Robert Singh	<ul style="list-style-type: none"> <li>● Degree Specialisation</li> <li>● B.E EEE</li> <li>● M.E. (Embedded Systems)</li> <li>● Published a patent titled “Temporary Speed-Breaker Early Warning Device”</li> </ul>
		Mrs. G. Elizabeth Rani	<ul style="list-style-type: none"> <li>● Cleared CLAD International Certification with LabVIEW Associate Developer</li> <li>● Attended Webinar on Digital Circuit Design Using SCILAB</li> </ul>
4	Cloud Computing/Distributed computing	Dr. B. S. Murugan	<ul style="list-style-type: none"> <li>● Completed Ph.D in Cloud computing titled “An Intelligent and Energy Efficient Resource Allocation in Cloud Environment”</li> <li>● Received Rs 27,000 for Consultancy work on cloud computing.</li> <li>● Published more than 30 research articles in reputed journals and conferences in the area of Cloud Computing, Data Science.</li> <li>● Completed IBM Training Program on Cloud Architecture and Deployment Models</li> </ul>
		Dr. S. Dhanasekaran	<ul style="list-style-type: none"> <li>● Completed Ph.D in Cloud Computing titled “An Intelligent Agent System for Developing Efficient Cloud Service Search Engine.”</li> <li>● Completed Juniper Networks Certified Associate (JNCIA) - Cloud</li> <li>● Elite Awardee in IIT-NPTEL Course entitled “Cloud Computing”</li> <li>● Published an article in High impact factored Journal - Journal of Computers, Materials &amp; Continua, (IF=3.772)</li> <li>● Published an article in High impact factored Journal - Journal of Parallel and Distributed Computing, (IF=3.734)</li> <li>● Completed IBM Training Program on Cloud Architecture and Deployment Models</li> </ul>

		Dr. N. C. Brintha	<ul style="list-style-type: none"> <li>● Completed Ph.D. in the area of Cloud Computing titled “Resource scheduling and analysis of computational problems in cloud manufacturing”</li> <li>● Mentor of the Incubation Centre of the Indian Institute of Information Technology Kottayam (IIIT Kottayam) on IoT Cloud Societal projects.</li> <li>● Published a Book chapter titled “Integrating SMEs Through Cloud: An Industrial Revolution”.</li> <li>● Currently guiding UG/PG student projects and Ph.D. in the area of resource Management, Scheduling, Security, Edge Computing, Load Balancing, Smart manufacturing using Cloud.</li> <li>● Published more than 40 research publications in Cloud Computing, Distributed computing and interdisciplinary fields.</li> <li>● Completed FDPs in the thrust areas like Predictive Analytics, Cloud Computing.</li> <li>● Reviewer in the journal Information Technology and Control - Kaunas University of Technology.</li> <li>● Completed IBM Training Program on Cloud Architecture and Deployment Models</li> </ul>
		Dr. J. Jane Rubel Angelina	<ul style="list-style-type: none"> <li>● Completed Ph.D. in the area of Cloud Computing titled “Performance Enhancement Hash based Parallel Reduplication Model”</li> <li>● Completed Coursera course ‘Google Cloud Platform Fundamentals: Core Infrastructure’ offered by Google Cloud</li> <li>● Completed Coursera course ‘Programming with Cloud IoT Platforms’ offered by Pohang University of Science and Technology, South Korea</li> <li>● Completed SWAYAM NPTEL course on ‘Cloud Computing’ offered by IIT Kharagpur</li> <li>● Published more than 10 research publications in Cloud Computing</li> </ul>
		Dr. R. Ramalakshmi	<ul style="list-style-type: none"> <li>● Completed certification on EMC2 Academic Associate, Cloud Infrastructure and Services</li> <li>● Completed Certification on Microsoft Technology Associate in Cloud Fundamentals</li> </ul>

		Dr. P. Deepalakshmi	<ul style="list-style-type: none"> <li>● Principal Investigator of DST-IEDC project titled “Point of Sale (An App for small business with storage in Cloud).</li> <li>● Published a Book chapter titled “Access Control Mechanisms for Electronic Healthcare Records in Cloud Environment”.</li> <li>● Certificate on EMC Academic Associate, Cloud Infrastructure and Services from EMC2,</li> <li>● Published an article in High impact factored Journal - Journal of Cognitive System Research, Elsevier, (IF=3.523)</li> <li>● Completed IBM Training Program on Cloud Architecture and Deployment Models</li> <li>● Published an article in related to cloud security in a high impact factored Journal - Journal of Ambient Intelligence and Humanized Computing, Springer, (IF=7.104)</li> </ul>
		Dr. R. Kanniga Devi	<ul style="list-style-type: none"> <li>● Completed Ph.D in the area of Cloud Computing titled “Application of Graph theory concepts to address resource provisioning issues in cloud computing”</li> <li>● Certificate on EMC Academic Associate Cloud Infrastructure and Services from EMC2, Bangalore</li> </ul>
		Mr. C. Bala Subramanian	<ul style="list-style-type: none"> <li>● Certified AWS Academy Cloud Foundations - Trainer</li> <li>● Completed Microsoft certification on Cloud.</li> <li>● Attended various IBM faculty training programs, Workshops and Seminar.</li> <li>● Published an article in High impact factored Journal - Journal of Computers, Materials &amp; Continua, (IF=3.772)</li> <li>● Completed IBM Training Program on Cloud Architecture and Deployment Models</li> </ul>
		Dr. R. Murugeswari	<ul style="list-style-type: none"> <li>● Certificate on EMC Academic Associate, Cloud Infrastructure and service</li> <li>● Completed IBM Training Program on Cloud Architecture and Deployment Models</li> </ul>
		Dr.A. Robert Singh	<ul style="list-style-type: none"> <li>● Certificate on EMC Academic Associate</li> <li>● Published an article in High impact factored Journal - IEEE Access, IEEE, (IF=3.367)</li> </ul>



		Dr. A. Saravanan	<ul style="list-style-type: none"> <li>● Certificate on EMC Academic Associate, Cloud Infrastructure and Services from EMC2, Bangalore.</li> <li>● Completed NPTEL Course on Cloud Computing and Distributed Systems.</li> </ul>
		Ms. J. Jeyaranjani	<ul style="list-style-type: none"> <li>● Certificate on EMC Academic Associate, Cloud Infrastructure and Services from EMC2, Bangalore.</li> <li>● NPTEL certification on “cloud computing”</li> </ul>
		Mr. D. Balakrishnan	<ul style="list-style-type: none"> <li>● Attended FDP on Cloud Architecture and Deployment Models</li> <li>● Attended Webinar on Cloud Computing</li> </ul>
		Dr. K. Muthamil Sudar	<ul style="list-style-type: none"> <li>● NPTEL certification on Cloud Computing</li> <li>● Attended FDP on Cloud Architecture.</li> <li>● Attended webinar programs on cloud computing models.</li> <li>● Completed IBM Training Program on Cloud Architecture and Deployment Models</li> </ul>
		Mr. R. Anantha Kumar	<ul style="list-style-type: none"> <li>● Pursuing Ph.D in the area of Cloud Computing titled “An Optimal Resource Scheduling and Rearranging Mechanism for User Gratification in Cloud Computing”</li> <li>● Completed EMC Academic Associate, Cloud infrastructure and Services International Certification</li> <li>● Completed “Object Oriented Analysis and design using UML” with Essentials of Rational Software Architect from IBM Software Education.</li> <li>● Completed “AZ-900: Microsoft Azure Fundamentals” Microsoft certification</li> </ul>
5	Data Science	Mr. R. Raja Subramanian	<ul style="list-style-type: none"> <li>● Coursera certification on Hadoop Platform and Application Framework, 100%</li> <li>● Working in Consultancy Project on Price Comparison (Ecommerce) Project, CK Fortunes – IT Ventures</li> <li>● Attended IBM Sponsored Training Programs on Predictive Analysis</li> <li>● Completed IBM Training Program on Data Visualization for Analytics</li> </ul>

		Dr. K. Muthamil Sudar	<ul style="list-style-type: none"> <li>● Certificate on EMC Academic Associate, Data Science and Big Data Analytics from EMC2, Bangalore.</li> <li>● Guiding the UG CSP projects in the area of Data Science using machine learning algorithms.</li> <li>● Completed IBM Training Program on Data Analytics, Descriptive Analytics</li> <li>● Completed IBM Training Program on Data Warehousing and Multidimensional Modeling</li> <li>● Published a patent titled “Sensor Based Blaze Less Smart Iron Box”</li> </ul>
		Dr. P. Deepalakshmi	<ul style="list-style-type: none"> <li>● Published a book chapter titled “Opinion mining analysis of e-commerce sites using fuzzy clustering with whale optimization techniques”</li> <li>● Published a book chapter titled “Optimized Adaptive Kalman Filter for Diabetes Recommendation System- A Bi-Level Performance Improvement Strategy for Health Care Applications”</li> <li>● Guided research scholars in the field data Science</li> <li>● Delivered a tutorial session on “Networking Issues in Big Data Analytics”</li> <li>● Attended IBM Sponsored Training Programs on Predictive Analysis</li> <li>● Completed IBM Training Program on Data Warehousing and Multidimensional Modeling</li> <li>● Completed IBM Training Program on Data Visualization for Analytics</li> </ul>
		Dr. R. Ramalakshmi	<ul style="list-style-type: none"> <li>● Completed ATAL FDP on Data Sciences, Predictive Analytics, AI, Machine Learning and Deep Learning</li> <li>● Published a Book Chapter titled “COVID-19 Epidemic Analysis and Prediction in Virudhunagar District Using Machine Learning”</li> <li>● Guided research scholars in the field of Social Network Analysis, and Price prediction in Agriculture</li> <li>● Received funded project from DST for the study on Firework Industries.</li> <li>● Completed IBM Training Program on Data Warehousing and Multidimensional Modeling</li> <li>● Completed IBM Training Program on Data Visualization for Analytics</li> <li>● Completed IBM Training Program on Descriptive Analysis</li> </ul>

		Dr T.Dhiliphan Rajkumar	<ul style="list-style-type: none"> <li>● Completed Ph.D in the Data mining and the titled “Query Refinement in search engine using web mining“</li> <li>● Published a Book Chapter titled “An Experimental Implementation of Map Reduce on the Hadoop for Analyzing Big Data”</li> <li>● Papers published in reputed Journals/Conferences in this area of Data Science</li> <li>● Guiding UG/PG/PhD projects in the area of Data Science.</li> <li>● Completed IBM Training Program on Data Warehousing and Multidimensional Modeling</li> <li>● Completed IBM Training Program on Data Visualization for Analytics</li> </ul>
		Mr. P. Nagaraj	<ul style="list-style-type: none"> <li>● Pursuing Ph.D in Data Science Domain titled “Development of an e-Healthcare Interpretation and Recommendation System for Diabetes using AI-based techniques “</li> <li>● Published a book chapter titled “Optimized Adaptive Kalman Filter for Diabetes Recommendation System- A Bi-Level Performance Improvement Strategy for Health Care Applications”</li> <li>● Completed ATAL FDP on Data Science</li> <li>● Published a book titled “Elements of Theory of Computation”.</li> <li>● Guiding UG/PG projects in the area of Data Science, Machine Learning, and Deep Learning Techniques.</li> <li>● Published an article in related to Data Analytics in a high impact factored Journal - Diabetes Metabolic Syndrome and Obesity- Targets and Therapy, DOVEPRESS publications, Q3 (IF=3.168)</li> <li>● More than 30 publications in reputed Journals/Conferences in this area.</li> <li>● Completed IBM Training Program on Data Analytics.</li> <li>● Completed IBM Training Program on Data Visualization for Analytics</li> <li>● Completed IBM Training Program on Descriptive Analysis</li> </ul>

6	Image Processing	Dr. A. Saravanan	<ul style="list-style-type: none"> <li>● Completed Ph.D. in the domain of Medical Image Processing titled “Computer Aided Detection of Pathologies in brain images by applying Meta Heuristic Based Clustering Techniques”</li> <li>● Published a patent titled “Biometric and Image Sensing Digital Door”.</li> <li>● Guiding UG/PG and Ph.D. in the area of Medical Image Processing and Machine learning.</li> <li>● More than 20 papers published in reputed journals in the domain of image processing,</li> <li>● Reviewer in IEEE Transaction on Fuzzy Systems.</li> <li>● Reviewer in IEEE Transaction on Circuits and Video Technology.</li> <li>● Reviewer in IEEE Transactions on Industrial Informatics.</li> <li>● Outstanding Contribution for Applied Soft Computing Journal, Elsevier.</li> <li>● Published an article in related to Image Processing in a high impact factored Journal - Biocybernetics and Biomedical Engineering, Elsevier, Q2. (IF=4.314)</li> </ul>
		Dr. R. Ramalakshmi	<ul style="list-style-type: none"> <li>● Published a book chapter in the field of machine learning titled “Modelling Alzheimer’s People Brain Using Augmented Reality for Medical Diagnosis Analysis”</li> </ul>
		Dr. R. Sumathi	<ul style="list-style-type: none"> <li>● Completed Ph.D in the area of Image processing titled “Analysis of Tumor in Multimodal Image using Hybrid Approaches”</li> <li>● Reviewer - Journal of supercomputing</li> <li>● Published an article in related to Image Processing in a high impact factored Journal - Biocybernetics and Biomedical Engineering, Elsevier, Q2. (IF=4.314)</li> </ul>

		Dr. S. Karkuzhali	<ul style="list-style-type: none"> <li>● Completed Ph.D in the area of Image Processing</li> <li>● Awarded Senior research fellowship from ICMR</li> <li>● Completed Internal certifications on Remote sensing and Image Analysis</li> <li>● Journal reviewer on “Elsevier-Clinical Imaging”</li> <li>● Published an article in related to Image Processing in a high impact factored Journal - Journal of Medical Systems, Springer, Q2 (IF=4.460)</li> <li>● Published an article in related to Image Processing in a high impact factored Journal - Biocybernetics and Biomedical Engineering, Elsevier, Q2. (IF=4.314)</li> <li>● Published more than 20 research articles in reputed journals and conferences.</li> </ul>
		Mr. Sudheer Kumar	<ul style="list-style-type: none"> <li>● Completed Ph.D in the area of Image Processing</li> <li>● Received Best Paper Award, for the paper “Medical Image Analysis using Deep Learning: A Systematic Literature Review” in the 2nd International Conference held at SKIT Jaipur during Feb 01-02, 2019.</li> <li>● Published more than 5 research articles in reputed journals and conferences related to Image Processing.</li> </ul>
		Dr. C. Bala Subramanian	<ul style="list-style-type: none"> <li>● Published a Book chapter titled “A comparative note on recent advances of signal/image processing techniques in healthcare”.</li> <li>● Published a patent titled “Biometric and Image Sensing Digital Door”</li> </ul>
7	Internet of Things	Mr. R. Raja Subramanian	<ul style="list-style-type: none"> <li>● Attended ATAL FDP on IoT &amp; Cyber Security.</li> <li>● Published a book chapter titled “Paradigms of Intelligent IoT Architecture”</li> <li>● Published book chapters and papers on Fog Computing frameworks</li> <li>● NPTEL certification on Introduction to Internet of Things – Elite + Silver &amp; Topper</li> </ul>

		Dr. C. Bala Subramanian	<ul style="list-style-type: none"> <li>● Delivered Guest Lectures/Invited Talks.</li> <li>● Published a patent titled “Perceptible Handbag for Visually Impaired”</li> <li>● Completed four online courses.</li> <li>● Attended various IBM faculty training programs on IoT.</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> <li>● Completed IBM Training Program on Wireless Sensor Network and IOT Standards</li> </ul>
		Dr.T.Dhiliphan Rajkumar	<ul style="list-style-type: none"> <li>● Academy ATAL online FDP on “Internet of Things</li> <li>● Attended online workshop on “Artificial Intelligence with Internet of Things</li> <li>● Applied a patent Covid-19 Patient Healthcare Monitoring System using IOT and Wearable sensor</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> </ul>
		Dr. R. Ramalakshmi	<ul style="list-style-type: none"> <li>● Published a book chapter - Self Regulating Power Saving System for Home Automation</li> <li>● Published a patent titled “A system and method of Internet of Things based Intelligence Greenhouse Surviving System with Cloud Computing”</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> <li>● Completed IBM Training Program on Introduction to Sensor Technology and Instrumentation</li> </ul>
		Dr B.Pitchaimanickam	<ul style="list-style-type: none"> <li>● NPTEL Elite certification on Internet of Things(IoT) – [Topper 5%], Introduction to industry 4.0 and Industrial Internet of Things.</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> <li>● Completed IBM Training Program on Introduction to Sensor Technology and Instrumentation</li> </ul>

		Mrs. G. Elizabeth Rani	<ul style="list-style-type: none"> <li>● Attended ATAL FDP on Internet of things</li> <li>● Guided UG Projects in the area of Internet of things concepts</li> <li>● Published one IEEE paper by using the concepts of IOT.</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> </ul>
		Dr. N. C. Brintha	<ul style="list-style-type: none"> <li>● Attended FDPs on IOT, Wearable devices, Precision Health Technology</li> <li>● Reviewer - Journal of Internet of Things –Elsevier</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> <li>● Completed IBM Training Program on Introduction to Sensor Technology and Instrumentation</li> </ul>
		Dr. S. Dhanasekaran	<ul style="list-style-type: none"> <li>● Published a book chapter titled “Metaheuristic-Based Kernel Extreme Learning Machine Model for Disease Diagnosis in Industrial Internet of Things Sensor Networks”</li> <li>● Published an article related to Internet of Things in High impact factored Journal - Sustainable Computing: Informatics and Systems, Elsevier, (IF=4.028)</li> <li>● Published an article related to Cloud Centric Internet of Things in High impact factored Journal - Computers, Materials &amp;</li> <li>● Continua, Tech Science Press, Q1 (IF= 3.772)</li> </ul>
		Dr.A. Robert Singh	<ul style="list-style-type: none"> <li>● Completed NPTEL Course on Introduction to IoT</li> <li>● Guiding UG/PG and Ph.D. in the area of Internet of Things</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> <li>● Completed IBM Training Program on Introduction to Sensor Technology and Instrumentation</li> <li>● Completed IBM Training Program on Wireless Sensor Network and IOT Standards</li> </ul>
		Dr. A. Saravanan	<ul style="list-style-type: none"> <li>● Completed NPTEL Course on Introduction to IoT (Secured Elite).</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> </ul>

		Dr. B. S. Murugan	<ul style="list-style-type: none"> <li>● Published a book chapter titled “Metaheuristic-Based Kernel Extreme Learning Machine Model for Disease Diagnosis in Industrial Internet of Things Sensor Networks”</li> </ul>
		Ms. J. Jeyaranjani	<ul style="list-style-type: none"> <li>● Attended ATAL FDP on “Internet of Things (IoT) Engineering”</li> <li>● Published 2 Scopus indexed paper using IoT technology</li> <li>● Attended Webinar on IoT for Smart World, Internet of Things</li> </ul>
		Mr. D. Balakrishnan	<ul style="list-style-type: none"> <li>● Pursuing Ph.D in the area of Internet of Things titled “An Intelligent and Heart rate monitoring using IoT”</li> <li>● 8 papers published in journals for the domain of Internet of Things</li> <li>● Attended FDP on Wireless Sensor Networks (WSN) &amp; IoT Standards.</li> <li>● Guiding UG Project in the area of Internet of Things.</li> <li>● Completed NPTEL Course on Introduction to IoT (Elite)</li> <li>● Completed IBM Training Program on Introduction to Internet of Things</li> <li>● Completed IBM Training Program on Wireless Sensor Network and IOT Standards</li> </ul>
		Dr. A. Nesarani	<ul style="list-style-type: none"> <li>● Completed Ph.D in the field of Internet of Things titled “Secure Device Management for Energy Efficient Data Transmission in Internet of Things”.</li> <li>● Published a Book Chapter - Self Regulating Power Saving System for Home Automation</li> <li>● Attended Workshop, FDPs on Internet of Things.</li> </ul>
		Dr.A.Francis Saviour Devaraj	<ul style="list-style-type: none"> <li>● Published a patent titled “A system and method of Internet of Things based Intelligence Greenhouse Surviving System with Cloud Computing”</li> <li>● Completed IBM Training Program on Introduction to Sensor Technology and Instrumentation</li> </ul>
		Mr. K.Vignesh	<ul style="list-style-type: none"> <li>● Attended ATAL -FDP on IOT and smart city.</li> <li>● Completed IBM Training Program on Wireless Sensor Network and IOT Standards</li> </ul>



		Mr. M. K. Nagarajan	<ul style="list-style-type: none"> <li>● Attended FDP on IoT &amp; Cyber Security</li> <li>● Completed IBM Training Program on Wireless Sensor Network and IOT Standards</li> </ul>
		Mr. M. Raja	<ul style="list-style-type: none"> <li>● Attended FDP on IoT &amp; Cyber Security</li> <li>● Completed IBM Training Program on Introduction to Sensor Technology and Instrumentation</li> <li>● Completed IBM Training Program on Wireless Sensor Network and IOT Standards</li> </ul>
8	Networks and Security	Dr. B. S. Murugan	<ul style="list-style-type: none"> <li>● Published a Book titled “Information Security – A Practical Approach.</li> <li>● Published an article related to Anomaly Detection in High impact factored Journal - Computers and Electrical Engineering, Elsevier. (IF=3.818)</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> <li>● Completed IBM Training Program on IT Application Security</li> </ul>
		Dr. S. Dhanasekaran	<ul style="list-style-type: none"> <li>● Published a Book titled “Information Security – A Practical Approach</li> <li>● Published a Book Chapter titled “Intelligent Abnormality Detection Method in Cyber Physical Systems Using Machine Learning”.</li> <li>● Published an article related to Optimized Network Model in High impact factored Journal - Artificial intelligence in medicine, Elsevier, Q1. (IF=4.028)</li> <li>● Published an article in High impact factored Journal - Multimedia Tools and Applications, Springer (IF=2.757)</li> <li>● Completed IBM Training Program on IT Physical Security and System Security and IBM Training Program on IT Application Security</li> </ul>
		Dr. N. C. Brintha	<ul style="list-style-type: none"> <li>● Attended 5 days FDP on Network Security from National Institute of Technology, Nagaland</li> <li>● Guiding Ph.D research work on Blockchain technology.</li> <li>● Completed IBM Training Program on IT Infrastructure Landscape.</li> <li>● Completed IBM Training Program on Information Security Fundamentals</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> <li>● Completed IBM Training Program on IT Application Security</li> </ul>

		Dr. P. Deepalakshmi	<ul style="list-style-type: none"> <li>● Completed Consultancy project titled “Pen Testing of KLU Web domain and Sub Domains” and “Web Security Testing” (completed)</li> <li>● Published a book chapter titled “Threshold Based Energy Efficient Routing Protocol for Critical Data Transmission to Increase Lifetime in Heterogeneous Wireless Body Area Sensor Network”</li> <li>● Published a book chapter titled “Hash Function Based Optimal Block Chain Model for the Internet of Things (IoT)”.</li> <li>● Published a book chapter titled “Improved Key Generation Scheme of RSA (IKGSR) Algorithm Based an Offline Storage for Cloud ”.</li> <li>● Published a book chapter titled “Personalised Smart Diabetes System Using Hybrid Models of Neural Network Algorithms”.</li> <li>● Published a patent titled “Automated Security Threat Analysis and Executing Optimal Response for Wireless Sensor Networks”.</li> <li>● Delivered a lecture on “The role of cryptography in cybersecurity”, as part of ATAL sponsored Five Days Online Faculty development Programme - CYBER SECURITY.</li> <li>● Journal Reviewer - International Journal of Network Management, Wiley</li> <li>● Published an article related to SDN Routing in High impact factored Journal - Cognitive System Research, Elsevier, Q3. (IF=3.523)</li> <li>● Published an article related to WSN Routing in High impact factored Journal - Mobile Networks and Applications, springer, Q2. (IF=3.426)</li> <li>● Published an article in High impact factored Journal - Computers and Electrical Engineering, Elsevier. (IF=3.818)</li> <li>● Published an article in High impact factored Journal - Mobile Networks and Applications, Springer (IF=3.426)</li> <li>● Published an article related to Energy Efficient Routing in High impact factored Journal - Computers and Electrical Engineering, Elsevier Ltd, Q2 (IF=3.818)</li> </ul>
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		Mr. C. Bala Subramanian	<ul style="list-style-type: none"> <li>● Published a patent titled “System and Method for Selecting Base Station In A Worldwide Interoperability For Microwave Access Network”.</li> <li>● Published a patent titled “Next Generation Framework for Smart Building Monitoring using 6LoWPAN”.</li> <li>● Published an article in related to WSN in a High impact factored Journal - Journal of Ambient Intelligence and Humanized Computing, Springer, (IF=7.104)</li> <li>● Published an article in related to Data Hiding in a High impact factored Journal - Computers, Materials &amp; Continua, Tech Science Press, Q1 (IF=3.772)</li> <li>● Attended various IBM faculty training programs, Workshops and Seminar.</li> <li>● Completed IBM Training Program on IT Infrastructure Landscape.</li> <li>● Completed IBM Training Program on Information Security Fundamentals</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> <li>● Completed IBM Training Program on IT Application Security</li> </ul>
		Dr B.Pitchaimanic kam	<ul style="list-style-type: none"> <li>● Completed Ph.D in the area of Wireless Sensor Networks titled “Biologically Inspired Algorithms for the Optimization of Wireless Sensor Networks Lifetime and Energy Consumption”</li> <li>● Completed Academy ATAL online FDP on Cyber Security Vulnerabilities and Safeguards.</li> <li>● Guiding UG/PG projects in the area of wireless sensor networks, Detection of DDoS Attacks.</li> <li>● Completed certificate - Juniper Networks Certified Associate (JNCIA) - Security</li> <li>● Published an article related to WSN in High impact factored Journal - Neural Computation &amp; Applications, Springer, (IF=5.606)</li> <li>● Reviewer in the journal: International Journal of Sensor, Wireless Communications and Control (IJSWCC)</li> <li>● Attended online workshop on “Cyber Hygiene using Virtual Labs.</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> <li>● Completed IBM Training Program on IT Application Security</li> </ul>

		<p>Dr.A.Francis Saviour Devaraj</p>	<ul style="list-style-type: none"> <li>● Completed Ph.D in Network &amp; Security titled “Prevention of message modification in WSN by authentication using ECC Digital Signature”</li> <li>● Published a Books Titled “Cryptography &amp; Network Security Concepts, Design &amp; Applications”</li> <li>● Published a Book titled “Ad-Hoc Networks, Implementation &amp; Study Guide”.</li> <li>● Published a patent titled “Unlock Pattern to Remove Subscriber Identity Module (Sim) From A Mobile Phone”</li> <li>● Journal Reviewer - Journal of Wireless personal communication, Springer, Journal of Wireless networks, Springer</li> <li>● Published patents</li> <li>● Published an article related to Reliable Route Selection in High impact factored Journal - Journal of Ambient Intelligence and Humanized Computing, Springer, Q1 (IF=4.028)</li> <li>● Published an article related to Pervasive WSN in High impact factored Journal - Sustainable Computing: Informatics and Systems, Elsevier, (IF=4.028)</li> <li>● Published an article related Secure Image Archival in High impact factored Journal - IEEE Access, IEEE, Q1 (IF=3.367)</li> <li>● Developed E-Content for Computer Networks</li> <li>● Completed IBM Training Program on IT Infrastructure Landscape.</li> <li>● Completed IBM Training Program on Information Security Fundamentals</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> <li>● Completed IBM Training Program on IT Application Security</li> </ul>
		<p>Dr. R. Ramalakshmi</p>	<ul style="list-style-type: none"> <li>● Completed Ph.D. in the field of Ad Hoc and Wireless Sensor Networks titled “Application of Connected Dominating Set for Routing in Ad Hoc and Wireless Sensor Networks”</li> <li>● Guided research scholars in the field of Opportunistic Networks, Software defined Networks, and Mitigating DDoS Attacks</li> <li>● Published an article in High impact factor Journal - Environmental Technology &amp; Innovation, Elsevier (IF=5.263)</li> <li>● Completed IBM Training Program on IT Application Security</li> </ul>

		Dr. R. Murugeswari	<ul style="list-style-type: none"> <li>● Completed Ph.D. in the domain of Wireless Mesh Networks titled “Development of Improved Evolutionary Algorithms for QoS Routing in Wireless Mesh Network”</li> <li>● Completed - Juniper Networks Certified Associate (JNCIA) - JUNOS (R &amp; S)</li> <li>● More than 5 papers published in reputed journals in the domain of networks</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> <li>● Completed IBM Training Program on IT Application Security</li> </ul>
		Dr. A. Robert Singh	<ul style="list-style-type: none"> <li>● Completed Ph.D. in the domain of Smart Grid network titled “Optimal routing algorithms for wireless mesh network based Advanced metering infrastructure (AMI) in smart grid”</li> <li>● Published a book chapter titled “An Intelligent Algorithm for Joint Routing and Link Scheduling in AMI with a Wireless Mesh Network”.</li> <li>● More than 5 papers published in reputed journals in the domain of networks.</li> <li>● Published an article related Cyber Physical System in High impact factored Journal - IEEE Access, IEEE, Q1 (IF=3.367)</li> <li>● Published an article related to WSN in High impact factored Journal - Journal of Applied Soft Computing, Elsevier (IF=6.725)</li> <li>● Completed IBM Training Program on IT Infrastructure Landscape.</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> </ul>
		Dr.B. Balakiruthiga	<ul style="list-style-type: none"> <li>● Completed Ph.D in the area of SDN titled “ Design of Efficient Routing Mechanisms for Software Defined Data Centre (SDDC)</li> <li>● Completed Software Testing, Cloud Infrastructure services, CCNA certifications</li> <li>● Completed IBM Training Program on Information Security Fundamentals.</li> <li>● Completed IBM Training Program on IT Infrastructure Landscape.</li> <li>● Completed IBM Training Program on IT Application Security</li> </ul>

		Dr. K. Muthamil Sudar	<ul style="list-style-type: none"> <li>● Completed Ph.D in the area of Security in Software-Defined Networking titled “ IDS using Machine Learning techniques in SDN”</li> <li>● Published a patent titled “Automated Security Threat Analysis and Executing Optimal Response for Wireless Sensor Networks”.</li> <li>● More than 10 publications in the area of Network Security.</li> <li>● Attended FDP on Cybersecurity, Digital Forensics and Hardware Security.</li> <li>● NPTEL certification on Introduction to Wireless Sensor Networks</li> <li>● Completed CCNA Cybersecurity Operations- Trainer Level</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> </ul>
		Mr. M. Raja	<ul style="list-style-type: none"> <li>● Degree Specialisation – M.E. Network Engineering</li> <li>● Pursuing Ph.D in the area of Networks and Security titled “An Optimal Encryption Techniques for Enhancing Data Security in Lightweight Cryptography”</li> <li>● Completed CCNA CyberOps - Trainer Level</li> <li>● Certificate on Palo Alto Networks – PCCET</li> </ul>
		Dr. S. Wilson Prakash	<ul style="list-style-type: none"> <li>● Completed Ph.D in the area of Security in Software-Defined Networking titled “Design of Dynamic Load Balancing for Software Defined Networking”</li> <li>● More than 5 publications in the area of Software Defined Networking.</li> <li>● Attended FDP on Networks and Security</li> <li>● Completed Ethical Hacking Cyber Security Course from HackingFlix Academy</li> <li>● Completed Computer Forensics Investigation using Open Source Tools from HackingFlix Academy</li> <li>● Completed Introduction to SDN and OpenFlow from Udemy</li> <li>● Completed Certified WhiteHat Hacker Level 1 from Udemy</li> </ul>

		Mr. M. K. Nagarajan	<ul style="list-style-type: none"> <li>● Pursuing Ph.D in Wireless Sensor Networks titled “Energy Efficient Routing and Effective Key Management in Dynamic Wireless Sensor Networks”</li> <li>● Guiding UG projects in the area of Network Security.</li> <li>● Currently 4 papers published in reputed journals/conferences in the domain of Network Security.</li> <li>● Certificate on Palo Alto Networks – Cyber Security Entry Level Technicians.</li> <li>● Attended FDP on IT Application Security, Digital Forensics</li> <li>● Completed IBM Training Program on IT Physical Security and System Security</li> <li>● Completed IBM Training Program on Digital Forensics</li> </ul>
9	Programm ing for problem solving	Dr T. Dhiliphan Rajkumar	<ul style="list-style-type: none"> <li>● Published book on “Programming in JAVA”</li> <li>● NPTEL Elite certification on Data Structure and algorithms using python.</li> <li>● Attended the Wipro Certified Faculty training program and got trained on Wipro’s Project Based Learning framework in Java-J2EE and Python</li> </ul>
		Dr. B.S Murugan	<ul style="list-style-type: none"> <li>● Received Rs. 35 lakhs fund from DST for the project entitled “Development of Science and Technology Software for school children through skill building activities”.</li> </ul>
		Mr. P. Nagaraj	<ul style="list-style-type: none"> <li>● Published a book titled “Operating Systems- Overview”</li> <li>● E-Content developed for Operating Systems</li> </ul>
		Dr B.Pitchaimanic kam	<ul style="list-style-type: none"> <li>● NPTEL Elite certification on Programming in C++, Data Structure and algorithms using python.</li> <li>● Attended the Wipro Certified Faculty training program and got trained on Wipro’s Project Based Learning framework in Java-J2EE and Python.</li> </ul>
		Mrs. G. Elizabeth Rani	<ul style="list-style-type: none"> <li>● NPTEL Elite certification on Programming in C++,</li> <li>● Attended Workshop on Python at IIT Bombay</li> <li>● Completed ATAL FDP on Inculcating Creativity: Tools for Effective Thinking.</li> </ul>

		Dr. R. Ramalakshmi	<ul style="list-style-type: none"> <li>● Developed MOOC Content for Java and C++ Programming</li> <li>● Developed a MOOC portal for the University (mooc.kalasalingam.ac.in)</li> <li>● Developed a virtual lab for the university (itvlab.kalasalingam.ac.in)</li> <li>● Sun Certified Java Programmer.</li> <li>● One of the top 5% performers in NPTEL Certification on “Programming, Data Structures and Algorithms in Python”</li> <li>● Completed NPTEL online Elite certification on “Programming in C++”</li> <li>● Completed IBM Training Program on Introduction to Python Programming</li> </ul>
		Dr. R. Kanniga Devi	<ul style="list-style-type: none"> <li>● E-Content developed for Python programming, Department of CSE, KARE</li> <li>● Attended IBM-ICE FDP on Python Programming, Dept. of CSE, KARE, 25-28th June 2019.</li> <li>● Certificate on Udemy " Learn Graphs and Social Network Analytics using Python "</li> <li>● Certificate on Python, GUVI Geek Networks, IITM Research Park, April 2021</li> <li>● Certificate on Build a Face recognition Application using Python, AI-For-India event, GUVI Geek Networks, IITM Research Park,</li> <li>● Completed IBM Training Program on Introduction to Python Programming</li> </ul>
		Dr. R. Murugeswari	<ul style="list-style-type: none"> <li>● NPTEL Elite certification on Programming in C++, Compiler Design</li> <li>● Completed IBM Training Program on Introduction to Python Programming</li> </ul>
		Ms. J. Jeyaranjani	<ul style="list-style-type: none"> <li>● Resource Person for IEEE Tech Talk series “Machine Learning using Python” – IEEE madras section</li> <li>● NPTEL Certification – Joy of computing</li> </ul>
10	Software Engineering	Dr. S. Dhanasekaran	<ul style="list-style-type: none"> <li>● IBM certified Professional Rational Software Architect (RSA) Technology</li> <li>● Software Testing Certification (Instructor Level)</li> <li>● Elite Awarder in IIT-NPTEL Online Course entitled “Software Testing”</li> </ul>



		Mrs. G. Elizabeth Rani	<ul style="list-style-type: none"><li>● Attended ATAL FDP in Recent Trends in Software Testing</li></ul>
		Ms. J. Jeyaranjani	<ul style="list-style-type: none"><li>● Attended ATAL FDP on “Software Testing”</li></ul>
		Ms. S. Shanmuga Priya	<ul style="list-style-type: none"><li>● Degree Specialisation - M.E-Software Engineering.</li><li>● 6 months of industry experience.</li><li>● IBM certificate on rational software architecture.</li></ul>

## 5.6. Innovations by the Faculty in Teaching and Learning (10)

In the Department of Computer Science and Engineering, much importance is given for incorporating innovative techniques in teaching. During the beginning of every semester, a refresher program is conducted to share the innovative practices followed by other faculties pertaining to a new/enriched course offered in the semester. Such brainstorming sessions help transfer the best practices amongst faculties in the department. Pedagogies, Innovative Assessments, Assignments, Content-out-of-Syllabus are typically discussed in the sessions. A snip of one of the meetings conducted for one of the courses “Problem Solving using Computer Programming” is depicted in fig. Faculty members use the LCD Projectors for their presentations. The faculty members use these aids to take the teaching learning process to the next level.

Lectures are presented by faculty members using a variety of teaching tools such as chalk and board, PowerPoint presentation, video lectures, models, charts, animation, and other teaching techniques such as lecture, group discussion, seminar, tutorials, guest lectures, and demonstration. Apart from this, the following are the various innovative practices followed at CSE department to enhance Teaching-Learning.

- X-Component Activity
- Flipped Learning
- Virtual lab
- Industry Based Evaluation
- Research Article Based Learning
- Case Study Based Learning
- Community Service Project

### (i) X-Component Activity:

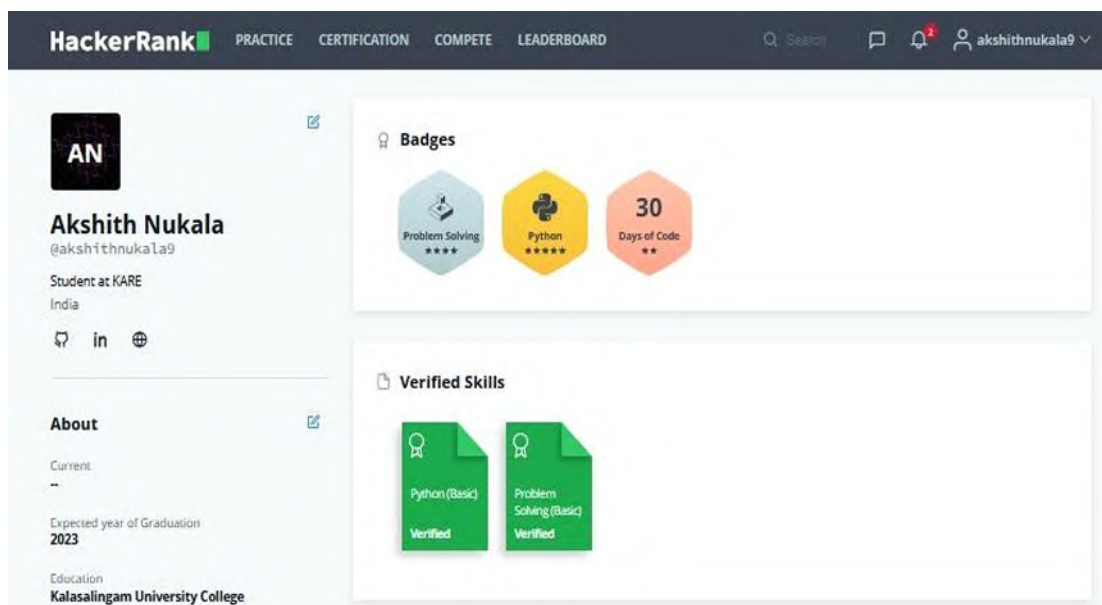
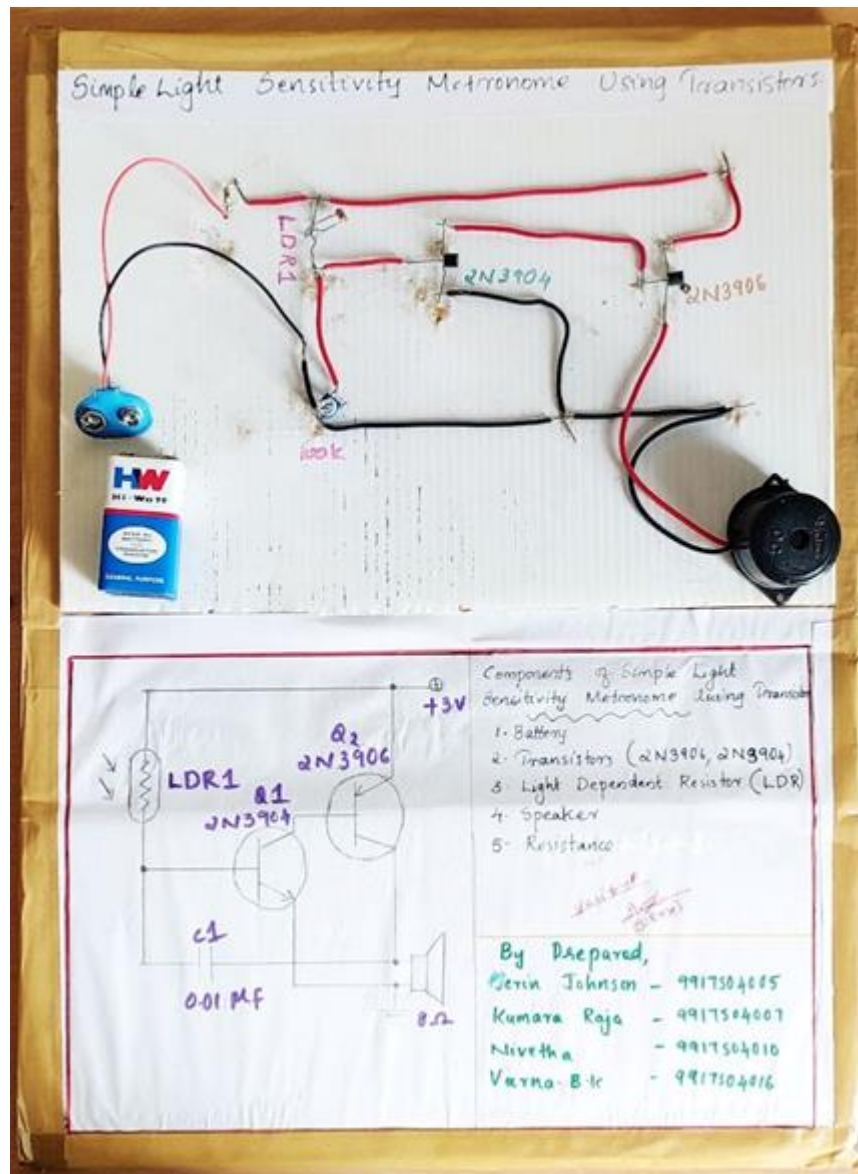


Fig.5.6a. X-Activity coding challenge (Sample Copy)

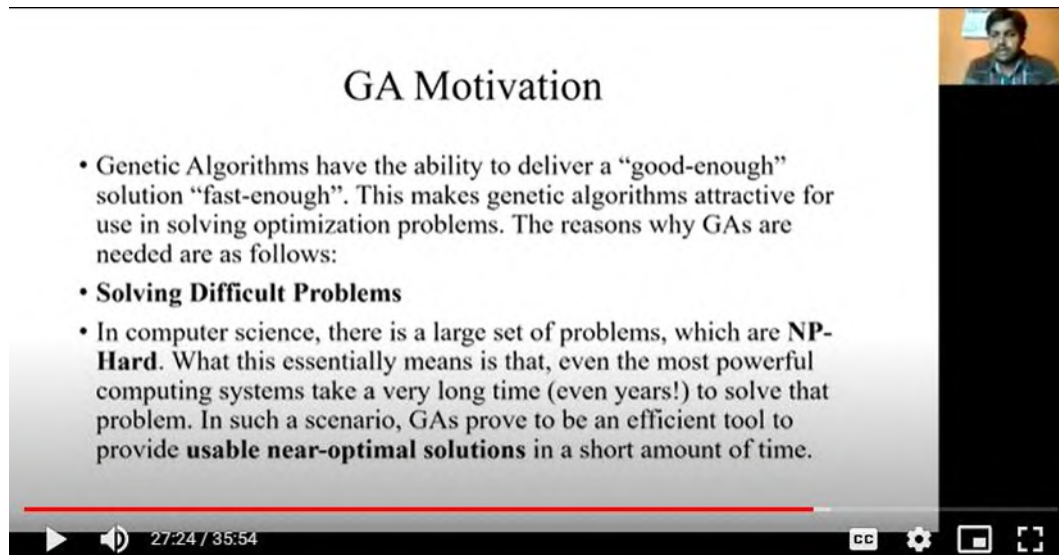


**Fig. 5.6b. Mini Project done by students for the Course (Analog Electronics)  
as part of X Plan Activity (Sample Copy)**

KARE Curriculum inculcates a special component called X-Activity in various courses. The courses to be offered with X-Activity are decided before the commencement of a semester. Maximum of two courses per semester can compose this X-Activity per program (one at second year level and another at third year level) since X-Activity requires the increase in number of contact hours for the concerned course. As part of X-Activity, the courses will be embedded with recent content out-of-syllabus with innovative pedagogy schemes. Such components are inculcated with the envision to enhance students' depth knowledge in the course. The X-Activity also results in enhancing students' achievements in terms of qualifying in coding challenges (Hackerrank), mini project developments, paper publications, among others. This makes the student comprehend the topics outside the book/syllabus and be prepared for public examinations/ certifications/ competitions/ viva voce. The sample copy of the X-Activity coding challenge result is depicted in Fig.5.6a and a sample mini project for the course “Analog Electronics” is depicted in Fig. 5.6b.

## (ii) Flipped Learning

Flipped Learning aims to increase student engagement and learning by having students complete the necessary readings at home and work on live problem-solving during class time. With a flipped classroom, students watch online lectures, collaborate in online discussions, or carry out research at home, while actively engaging concepts in the classroom, with the course teacher's guidance. Fig. 5.6b is an example screenshot of implementation of the flipped learning strategy. The videos from reputed online sites or own recordings will be shared to the students through the Google Classroom/ Drive/ other common communication mediums.



**Fig. 5.6b. Flipped Classroom Video – Genetic Algorithms in CSE18R112: Introduction to Artificial Intelligence and Machine Learning**

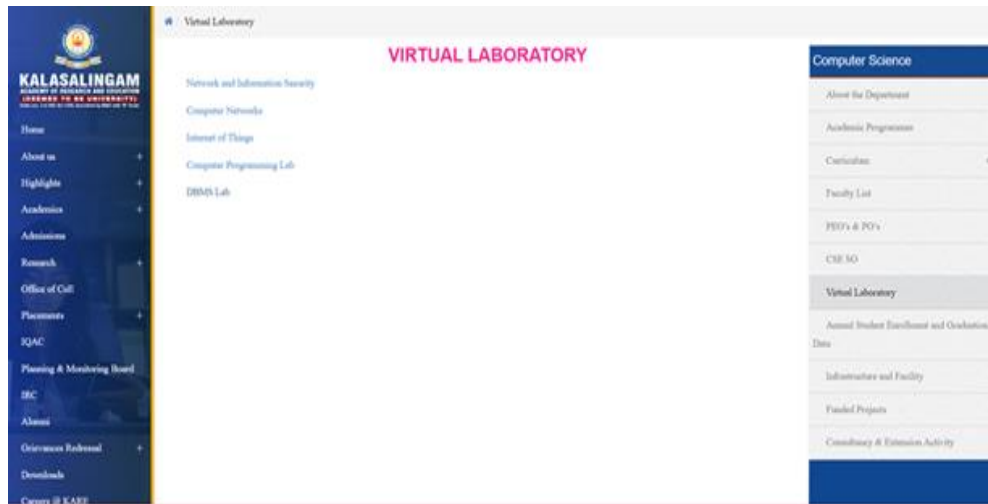
## (iii) Virtual Laboratories

**Table 5.6 Virtual lab and Package details**

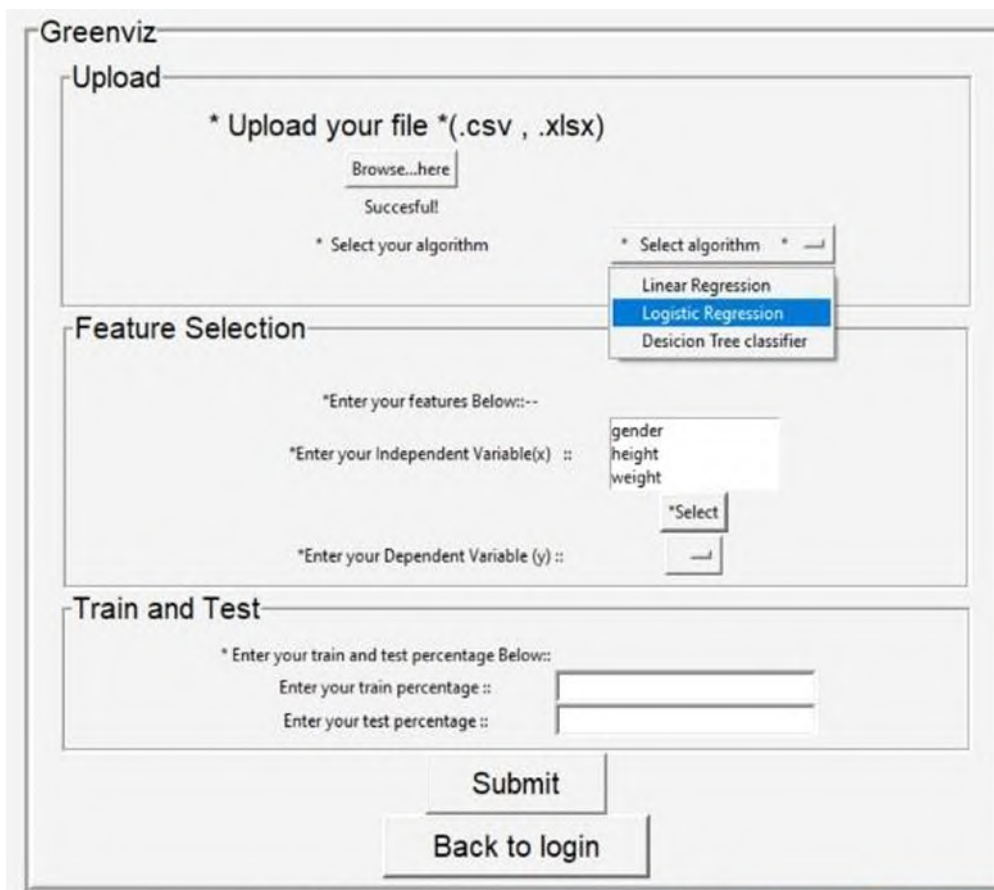
Virtual Lab	Domain	Faculty	Link
ITVlab	Programming - C, C++, Java, Python(3)	<b>Dr. R. Ramalakshmi</b> <b>Mr. B. Pitchai</b> <b>Manicakam</b> Dr. S. Suprakash	<a href="https://itvlab.kalasalingam.ac.in/">https://itvlab.kalasalingam.ac.in/</a>
Greenviz	Machine Learning Package	<b>Mr. Raja</b> <b>Subramanian</b> <b>Mr. P. Nagaraj</b>	<a href="https://pypi.org/project/greenviz/">https://pypi.org/project/greenviz/</a>

Virtual laboratories can be combined with display technologies such as interactive projectors or smartboards for an all-inclusive class, as opposed to the limited area afforded by physical workstations. They can be used to supplement existing ones or stand alone. The Virtual laboratories aid students to practice laboratory experiments at home and it is an effective tool to teach/learn practical courses

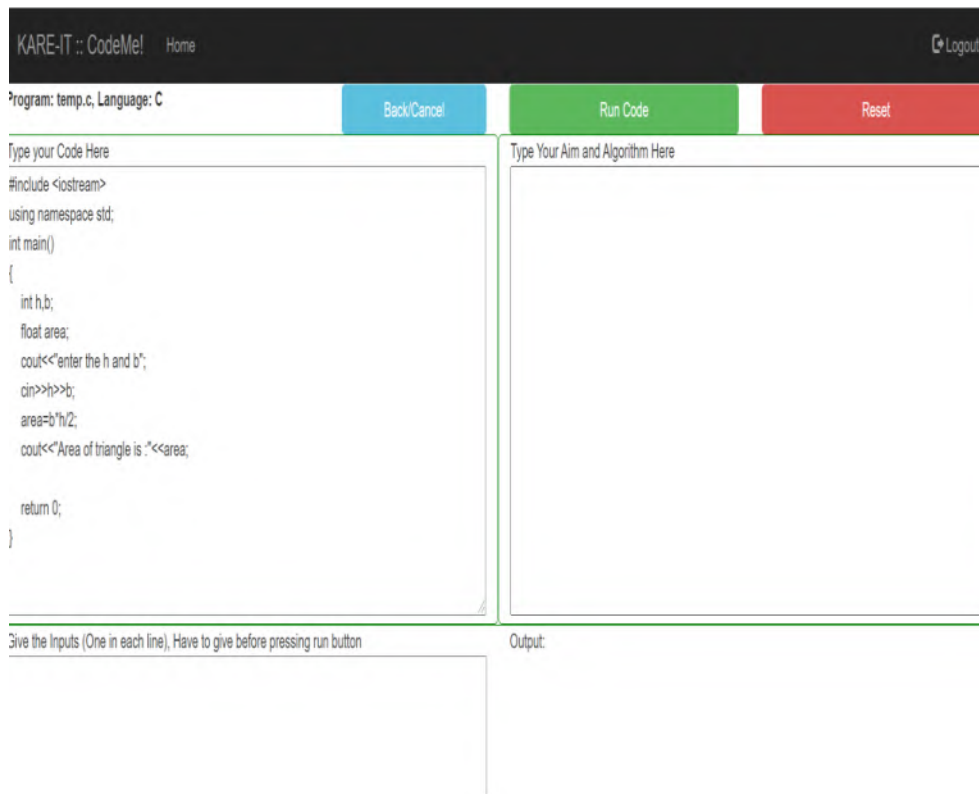
online during pandemic situations. The list of virtual laboratories available in the department is made visible publicly in the University website, as shown in Fig.5.6c.



**Fig. 5.6c. Virtual Laboratory details.**



**Fig. 5.6d. Greenviz for Machine Learning**

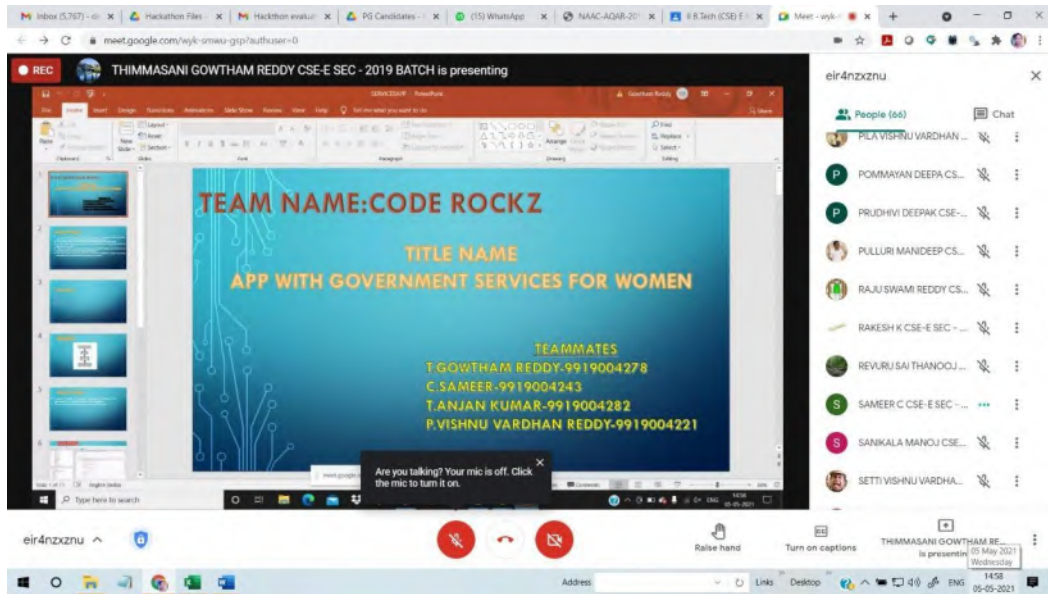


**Fig. 5.6e. Programming Virtual Lab**

Fig. 5.6(d) and Fig.5.6(e) show the virtual lab created by the faculty members of the CSE department for the courses related to programming and machine learning respectively.

#### **(iv) Industry based Evaluation**

The B.Tech (CSE) curriculum composes various industry oriented courses across different streams. For effective delivery and evaluation in such courses, one of the assessment methods is fixed as 'Evaluation by Industry Person'. The weightage of this assessment is typically fixed by the Course Coordinator with the suggestions of Course Mentor and duly approved by Director IQAC. The typical assessment carried out by Industry Experts in this evaluation includes Mini Hackathon, Case Study Development, Mini Projects, Industrial Quizzes, among others. Through such direct evaluations by industry experts, students get experienced with industrial standards and technologies. Evaluation of students' projects by Industry Experts is shown in Fig. 5.6f.



**Fig. 5.6f. Machine Learning course project Evaluation done by Industry Expert (Sample Copy)**

#### **(v). Research articles-based evaluation**

Research Article Based Evaluation is a unique evaluation method carried out in specific elective courses at KARE. The course which comprises learning the state-of-the-art technology and modern tools are typically delivered in Project Based Learning mode. With such pedagogies, faculties tend to carry out classes in Student Centric Learning mode. The student will be choosing a problem statement in alignment with the course, upon necessary scaffolding of the course teacher. The student learns the course with the development/implementation of the problem statement leveraging the technologies learned from the course. In addition to the concepts to be learned from a course, the student is also learning the concepts beyond the syllabus which are needed to solve his problem statements. Projects developed through such courses upon appropriate references from research articles will be presented by the students with appropriate surveys and findings. Students will be evaluated based on their presentations and solutions. Fast learners will be motivated to extend the project to paper publications. Fig. 5.6g depicts the sample copy of a paper published in Journals and conferences.

The screenshot shows a web browser displaying an IEEE Xplore article. The article title is "Credit Card Fraud Detection Using Machine Learning". The publisher is IEEE. The authors listed are D. Tanouz, R Raja Subramanian, D. Eswar, G V Parameswara Reddy, A. Ranjith Kumar, and CH V N M Praneeth. The article has 601 full-text views. The abstract discusses the increasing number of fraud cases and the need for machine learning-based algorithms like logistic regression, random forest, and Naive Bayes to handle imbalanced datasets. The article is part of the 2021 5th International Conference on Systems and Informatics Engineering Design Symposium.

**Fig.5.6g. Sample copy of a Machine Learning article published in Journal.**

### (vi) Case Study based Learning

Case study based learning is an established approach used across various computer science related disciplines where students apply their knowledge to real-world scenarios, promoting higher levels of cognition. Here, students typically work in groups on case studies. The cases present a problem for which students devise solutions under the guidance of the instructor. The following screenshots shown in Fig. 5.6h. illustrate the case study-based learning outputs achieved by our student in a specific course.

**Encryption & Decryption  
Using Diffie Hellman Algorithm**

**INDUSTRIAL BASED PROJECT REPORT**

*Submitted by*


**VIKRANT V JOLIYA (9919004368)**  
**KUNAL VASUDEVAN (9919004153)**

*In partial fulfillment for the award of the degree  
of*

**BACHELOR OF TECHNOLOGY**

**IN**

**Computer Science And Engineering**





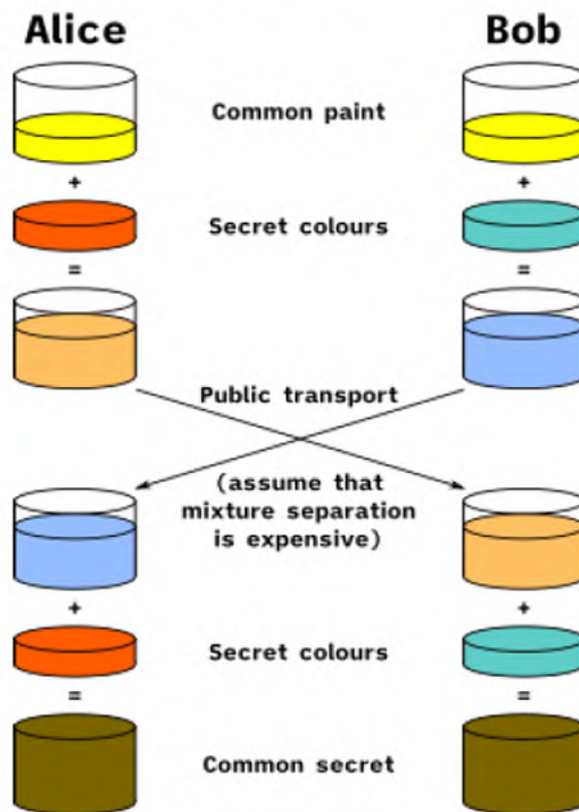
CHAPTER 3

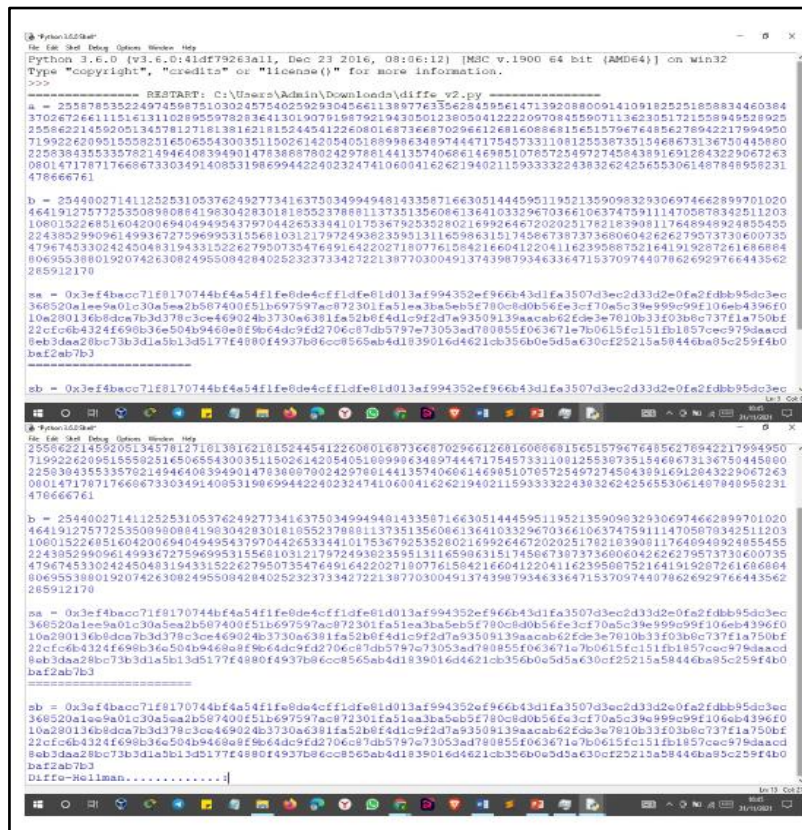
Secrecy Chat Report

Alice		Bob		Eve	
Known	Unknown	Known	Unknown	Known	Unknown
$p = 23$		$p = 23$		$p = 23$	
$g = 5$		$g = 5$		$g = 5$	
$a = 6$	$b$	$b = 15$	$a$		$a, b$
$A = 5^a \text{ mod } 23$		$B = 5^b \text{ mod } 23$			
$A = 5^6 \text{ mod } 23 = 8$		$B = 5^{15} \text{ mod } 23 = 19$			
$B = 19$		$A = 8$		$A = 8, B = 19$	
$s = B^a \text{ mod } 23$		$s = A^b \text{ mod } 23$			
$s = 19^6 \text{ mod } 23 = 2$		$s = 8^{15} \text{ mod } 23 = 2$			$s$

CHAPTER 4

Project Design





**Fig.5.6h. Case Study Based Learning: Computer Networks**

**(vii). Community Service Project (CSP)**

Community service projects are the new experience for students to interpret their academic knowledge with real-time problems. This project gives them the exposure of how to identify new problems which require computing solutions by interacting with people at various levels. They can obtain more knowledge on deriving and designing new projects based on a real circumstance. Based on the requirements gathered, they can make a detailed analysis with the support of an internal supervisor and arrive at deciding the feasibility of taking the real time work. Community service projects are the pathway for a real time product development out of the need of a community. On successful completion of the project, the students will have a higher chance to get career opportunities as Project developer, Project designer and Project tester based on executing a real time project during the student lifetime. Few samples of students' interaction with community people is shown in Fig.5.6i.



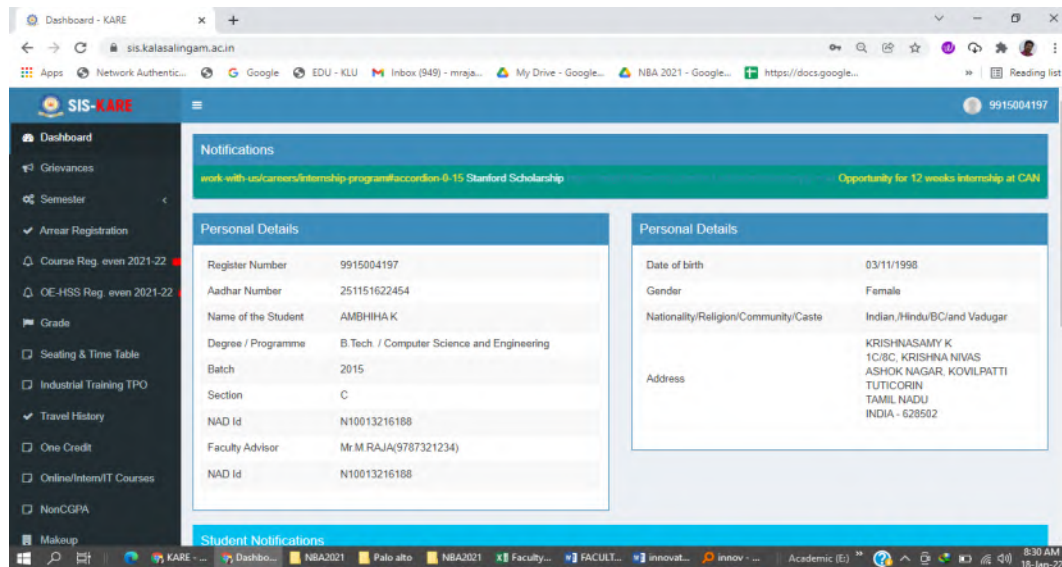
**Fig.5.6i. Students visiting and interacting with community people (sample copy)**

## **B. Availability of work on the Institute Website**

The following are the website links for EASY (EDU-KLU), SIS, AR respectively in which all the details about faculty, students and faculty event participation and publications is made available.

1. <https://sis.kalasalingam.ac.in/login> - SIS login for student access

SIS (SIS-KARE) Portal at KARE enables students to register course registration, viewing their attendance, grades, etc. Along with student details and registration, this portal also allows students to make tuition fee payments. Fig. 5.6j. shows the SIS Portal.



**Fig. 5.6j. SIS login for student access.**

2. <https://edu.kalasalingam.ac.in/login> - EASY (EDU-KARE)

EASY (EDU-KARE) Portal at KARE enables staff to record, manage & compile daily student attendance data. Along with student attendance, this portal also allows faculties to generate 100% accurate student attendance and mark reports. Fig.5.6k. shows the EDU-KARE Attendance Portal.

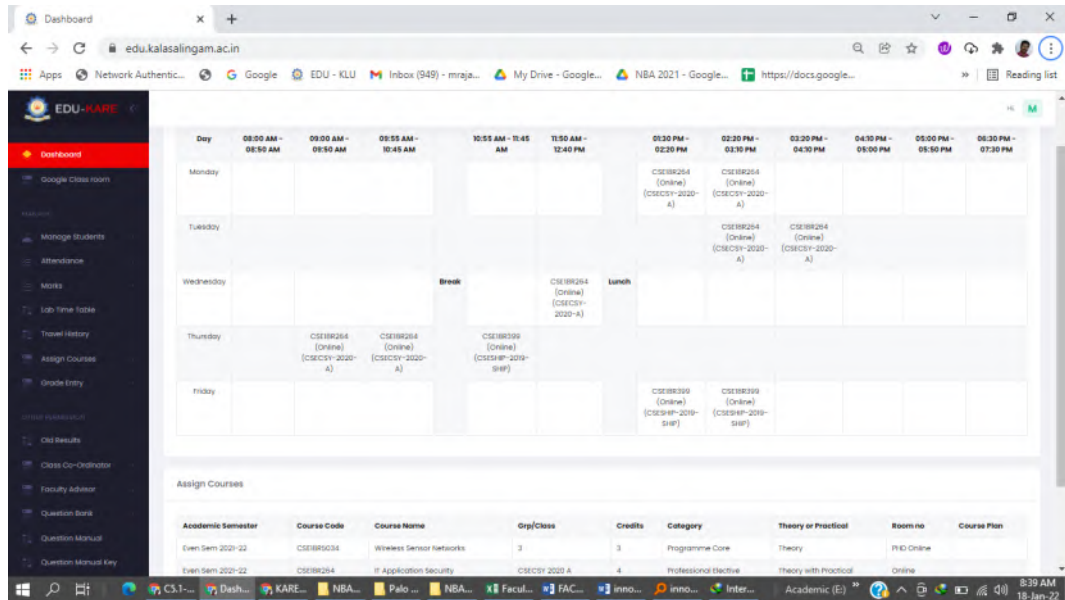


Fig.5.6k. EDU-KARE Attendance Portal.

3. <http://ar.kalasalingam.ac.in/> - AR-KARE Portal at KARE enables staff to record, manage & compile faculty participation/achievements, publications details. Fig.5.6l shows the AR-KARE Faculty Portal.

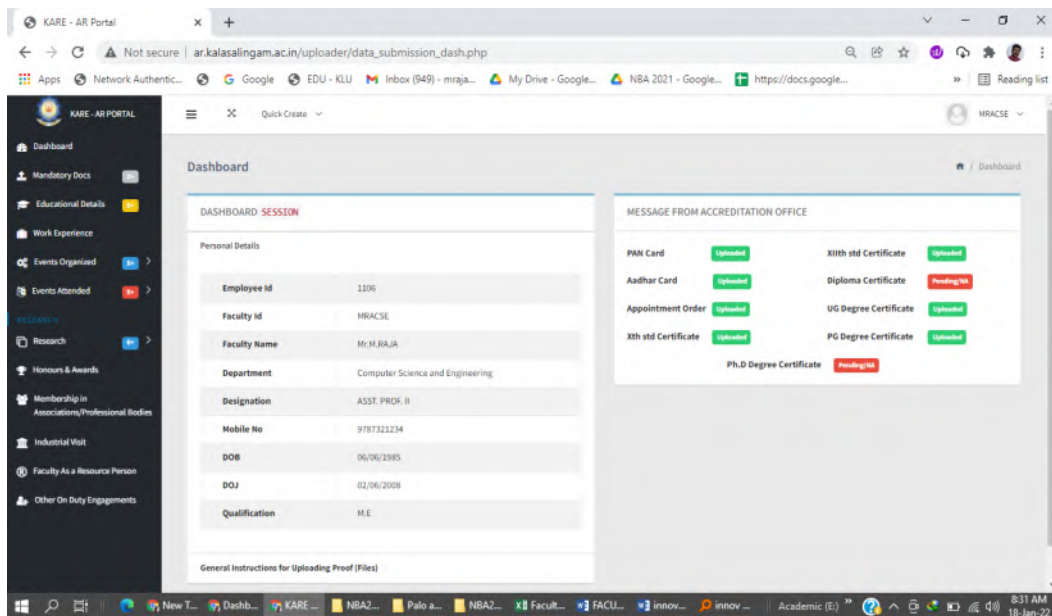
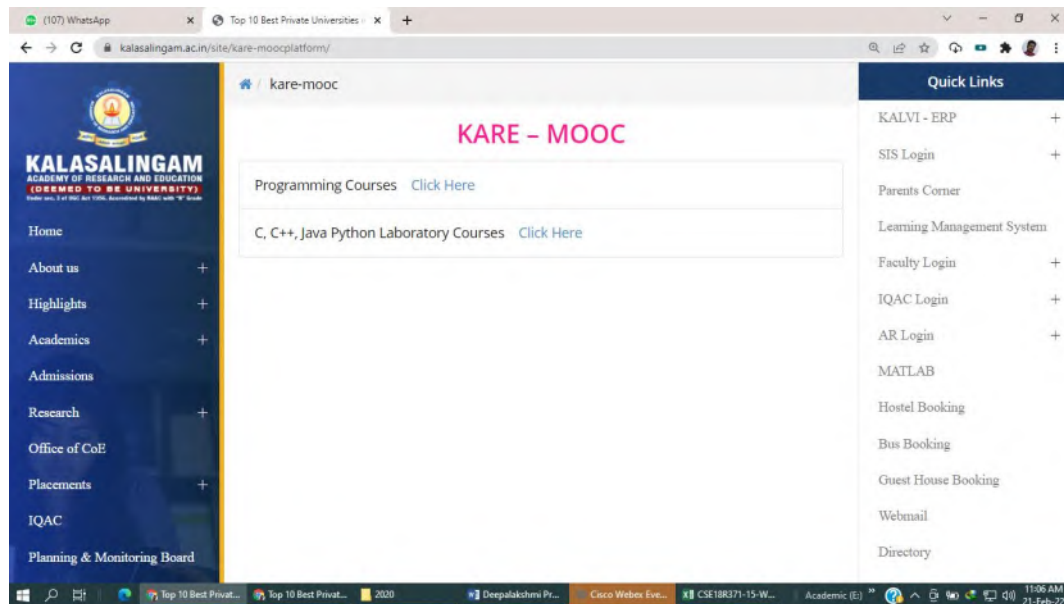


Fig.5.6l. AR-KARE Faculty Portal.

4. <https://kalasalingam.ac.in/site/kare-moocplatform/> - KARE-MOOC Portal at KARE enables students to use the virtual laboratory platform for their laboratory purposes. Fig.5.6m depicts the KARE-MOOC Portal.



**Fig.5.6m. KARE-MOOC Portal for virtual laboratory courses.**

### **C. Availability of work for peer review and critique**

As all the contents are available for peer review and critique by the course expert and course coordinator of the particular course and program in google sites and other domains like youtube.com, wordpress.com, blogger.com., etc. These sites provide the platform to provide peer review and critique.

All the innovative practices were assessed through the director office of University Faculty Affairs and Learning Technology (FALT) by means of specific rubrics for each innovative practice.

At the beginning of the semester, autonomy course evaluation methods are finalised with all the course handling faculty members with proper justification. The same is forwarded to FALT for acceptance. After the end of the semester, the evaluated methods for the particular course is evaluated based on FALT rubrics.

For every semester students are asked to give feedback for each course teacher. They are asked to give the ratings for a list of questions which is used for enhancing teaching - learning process. The same thing is evaluated based on FALT rubrics. Fig. 5.6(n-p). shows the faculty work available publicly for peer review and critique.

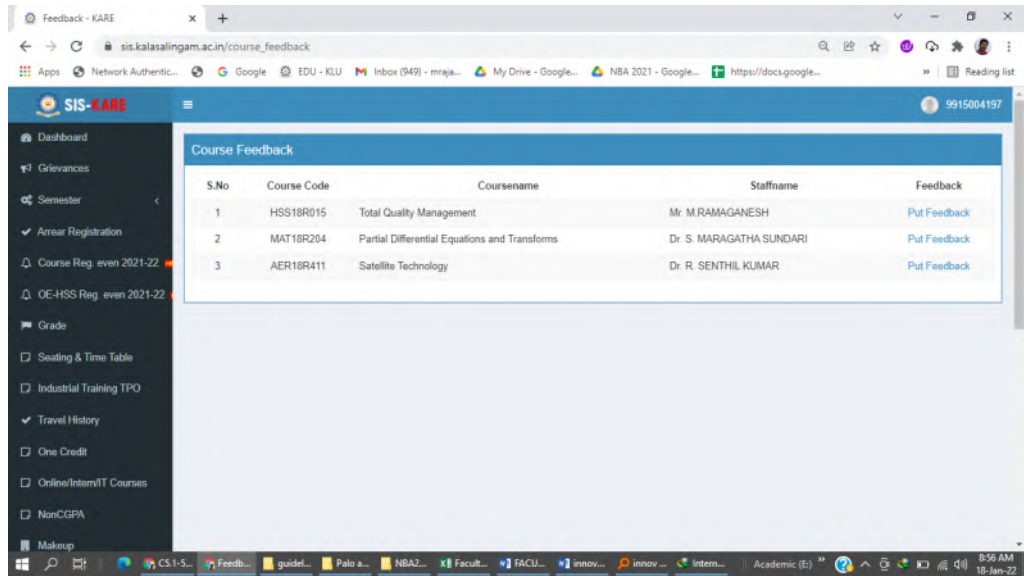


Fig.5.6n Course Feedback through SIS login.

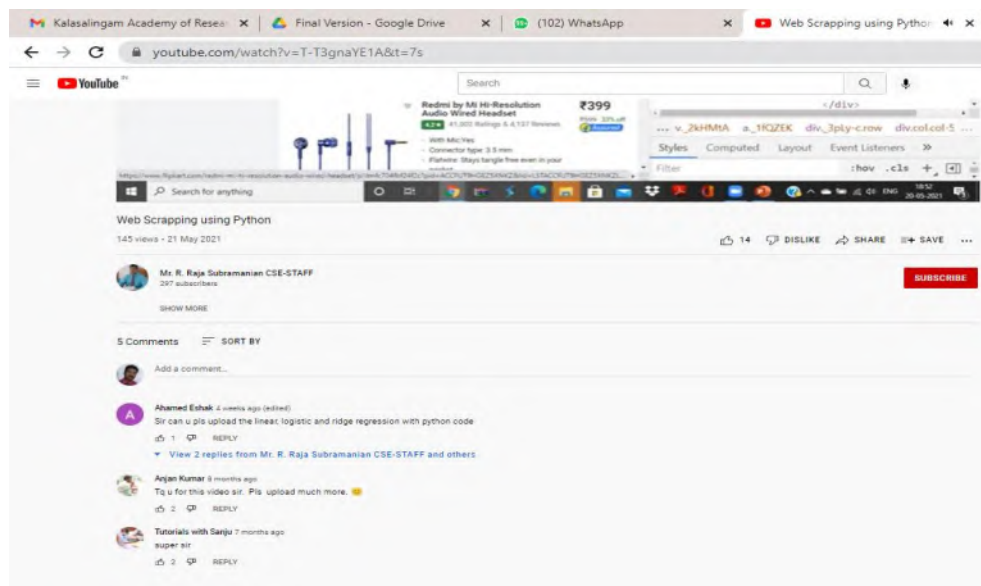


Fig.5.6o. Faculty Youtube Channel for Peer review and critiques (Sample copy)

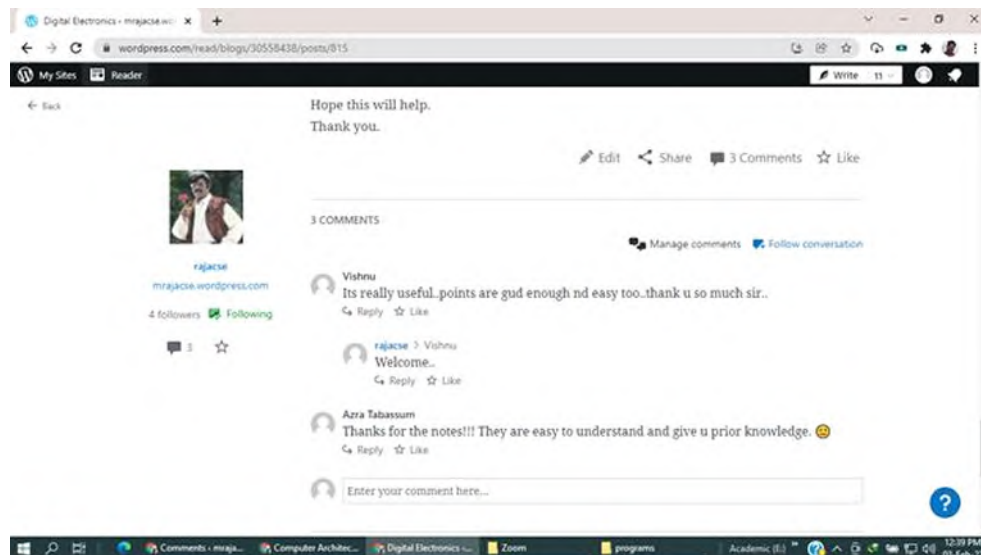


Fig.5.6p. Faculty Wordpress Website for Peer review and critiques (Sample copy)

### **D. Reproducibility and Reusability by other scholars for further development**

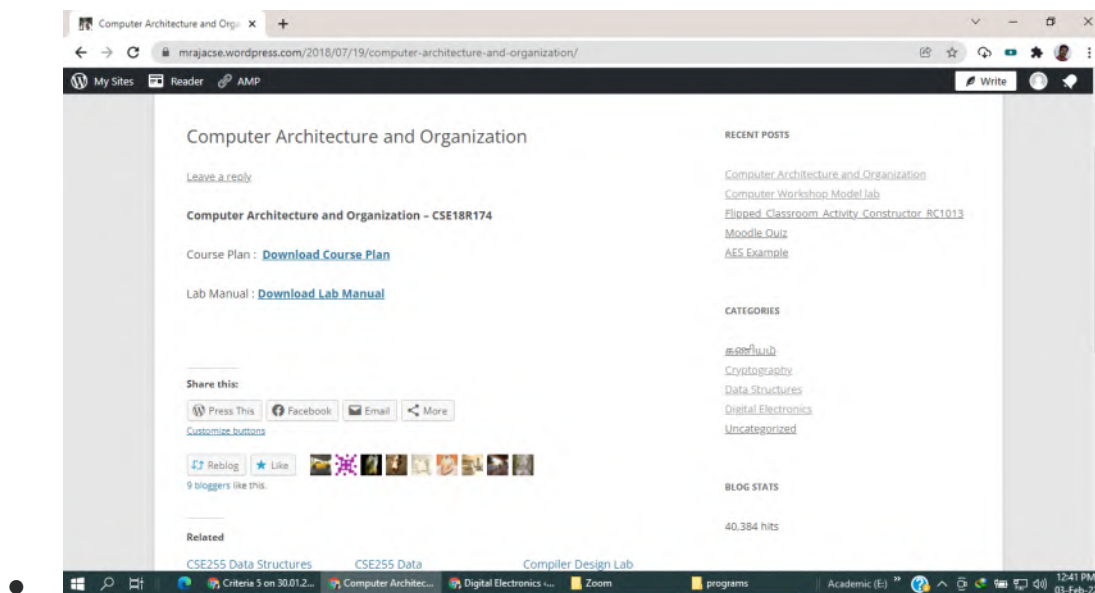
E-content materials prepared by faculty can be accessed by all the students and faculty members which enable faculty members and students to even recapitulate the engineering ideas.

Those E-learning materials are basically the open course ware, lecture videos and the journals, these resources help the scholar, faculty and students to stick towards the subject knowledge.

As the learning materials uploaded under creative commons in google sites, wordpress, it will be available for anyone to reproduce it and reuse it by others scholars for further development.

The citation of the scholar in their research paper shows the real time reproducibility and reusability of the available resources.

The virtual laboratories developed by the faculty ensure the reusability of data and the technological availability in the university as a whole. Fig. 5.6n. shows the sample copy of reproducibility and reusability by other scholars for further development.



**Fig. 5.6q. Reproducibility and Reusability by other scholars for further development  
(Sample Copy)**

The department faculties are regularly involved in Consultancy projects, preparation of content delivery schemes and documentation, open source projects for societal development. As an illustration, one of the department faculties, Mr. R. Raja Subramanian has developed software for Automatic Time Table generation. The software is leveraged by the University department as well as other Colleges for the purpose of Time Table generation. The software is available under creative common licence.

Year	Course Teachers	Section	Course Name	theory	lab	labavl	x.com	labtype	CIBCS	
I Mtech CSE	Mr.S.Kailasam	A	Advance Algorithms	4	0	0	0	0	0	Edit Save
I Mtech CSE	Central Faculty	A	Audit Course	0	2	0	0	0	0	Edit Save
I Mtech CSE	Dr.V.Baby shalini	A	Data Science	4	0	0	0	0	0	Edit Save
I Mtech CSE	Dr.V.Baby shalini	A	Data Science lab	0	3	0	0	0	0	Edit Save
I Mtech CSE	Dr.B.S.Murugan	A	Mini Project with Seminar	0	2	0	0	0	0	Edit Save
I Mtech CSE	Central Faculty	A	Research Methodology	3	0	0	0	0	0	Edit Save
I Year	Dr.N.C.Brindha	A	Computer Architecture and Organization	4	2	0	0	1	0	Edit Save
I Year	Dr. A. Robert Singh	B	Computer Architecture and Organization	4	2	0	0	1	0	Edit Save
I Year	Mrs.G.Elizabeth rani	C	Computer Architecture and Organization	4	0	0	0	1	0	Edit Save
I Year	Mr.S.Krishna Narayanan/Mrs.G.Elizabeth rani	C	Computer Architecture and Organization	0	2	0	0	1	0	Edit Save
I Year	Dr.A.Muthu kumar	D	Computer Architecture	4	2	0	0	1	0	Edit Save

**Fig. 5.6r Time Table Generation Software developed by faculty under Creative Commons.**

Faculties are also involved in content development and the same is available publicly in LMS, Websites and YouTube, for the reference of Students, researchers and faculties from other Universities and Colleges.

### **5.7. Faculty as participants in Faculty development/training activities/STTPs (15)**

- A Faculty scores a maximum of five points for participation
- Participation in 2 to 5 days Faculty/ Faculty development program: 3 Points
- Participation >5 days Faculty/ Faculty development program: 5 points



Name of the Faculty	Max. 5 per Faculty		
	CAYm1 (2020-21)	CAYm2 (2019-20)	CAYm3 (2018-19)
Dr. K. Karuppasamy	3	5	-
Dr. Koteswar Anne	3	5	-
Dr. P. Sarasu	-	5	-
Dr. P. Deepalakshmi	-	5	5
Dr. A. Francis Saviour Devaraj	3	5	5
Dr. K. Kartheeban	3	5	5
Dr. R. Ramalakshmi	3	5	5
Dr. R. Murugeswari	3	5	3
Dr. R. Kanniga Devi	5	5	5
Dr. G. Murugaboopathi	3	-	3
Dr. B. S. Murugan	5	5	3
Dr. S. Dhanasekaran	5	5	3
Dr. K. Murugeswari	-	5	3
Dr. N. C. Brintha	3	5	5
Dr. B. Pitchai Manickam	3	5	5
Dr. T. Dhiliphan Rajkumar	3	5	5
Dr. T. Veeramakali	-	-	3
Mr.S. Sankaranarayanan	-	-	3
Dr. A. Saravanan	3	5	5
Dr. A. Robert singh	3	5	5
Dr. S. Karkuzhali	-	-	-
Dr. B. Bensujitha	-	-	-
Dr. C. Balasubramanian	3	5	5
Dr. R. Sumathi	5	5	5
Mrs. V. Manoranjithem	3	-	3
Mr. M. Raja	5	5	5
Mr. D. Balakrishnan	5	5	5
Mrs. J. Jeyaranjani	5	5	5
Dr. B. Balakiruthiga	3	5	-
Mrs. B.Thevahi	-	5	3
Mr. Chittaranjan swain	3	-	3
Mrs.A.Nesarani	-	-	3
Mrs. G. Elizabeth Rani	3	5	5
Dr. K. Muthamil sudar	3	5	5
Mr. P. Velmuruga dass	3	5	3
Ms. Devisurya	3	-	-
Mr. P. Nagaraj	5	5	5
Mr. R. Raja Subramanian	5	5	5
Mr. K. Vijaykumar	3	5	3
Ms. K. Sivapriya	3	3	3
Mr. S. Prabhu	-	-	3
Mr. L. Karuppasamy	-	3	3
Mr. S. Kannudurai	3	-	3
Ms. S. Manochitra	5	3	-
Mr. M. Sankara Mahalingam	3	5	-
Mrs. P. Packiya Lakshmi	3	3	3

Mr. R. Anantha Kumar	3	3	3
Ms. S. Vidya	3	3	-
Mrs. M. Malathi	3	-	3
Ms. A. Gurusigaamani	3	3	-
Mr. M. K. Nagarajan	5	5	5
Ms. S. Jeevitha	3	5	5
Ms. K. Sowndaryia	-	3	3
Ms. D. Kavitha	3	3	-
Ms. Jenifa	-	3	-
Ms. S. Shanmugapriya	5	5	5
Mr. K. Vignesh	5	3	-
Ms. G. Vidhya Shree	-	3	-
Ms. Balasubbulakshmi	-	5	-
Ms. Umasree M	3	5	3
Mr. A. Kartic	3	5	-
Mr. Cibi Castro	3	-	3
Ms. Rubathi Saranya.J	3	-	3
Ms. Vijayalakshmi	3	-	3
Dr. J. Jane Rubel Angelina	3		
Dr.S.Surya	3		
Mr. R. Raja Sekar	3		
Dr. Wilson Prakash S	3		
Mr. Nirmalan R	3		
Mr. Sudheer Kumar E	3		
Dr. Muthuvel. P	3		
Dr. Saranya Devi S	3		
Mr.M.S.Vignesh	3		
<b>Sum</b>	203	123	122
<b>RF= Number of Faculty required to comply with 20:1 Student-Faculty ratio as per 5.1</b>	50	39	39
<b>Assessment = <math>3 \times (\text{Sum}/0.5 \text{ RF})</math> (Marks limited to 15)</b>	24.36	18.92	18.77
<b>Average assessment over last three years (Marks limited to 15) =</b>	<b>20.68</b>		

Table B.5.7

## Research and Development (75)

### 5.8.1. Academic Research (20)

**Number of quality publications in refereed/SCI Journals, citations, Books/Book Chapters etc.**

The summary of contributions in research publications done by the departmental faculty/researchers are mentioned in Table 5.8.1 and Table 5.8.2.

**Summary:**

Year	SCI	Scopus	UGC-CARE/ Others	Books	Book Chapters
2021-22	41	107	18	1	16
2020-21	33	94	10	1	17
2019-20	18	32	58	3	11

**Publication Details for CAY (2021-22)**

<b>No. of SCI Indexed Publications</b>	41
<b>No. of Scopus Indexed Publications</b>	107
<b>No. of other Publications</b>	18

## SCI Indexed Publications CAY (2021-22)

S. No	Authors	Publication Details	Journal Details	Impact Factor/ Scopus/ Others	Scopus Citation	Google Scholar Citation
1	Mahesh Babu, <b>Kanniga Devi</b> , Samuel Fosso Wamba	A Large-scale real-world comparative study using pre-COVID-lockdown and post-COVID-lockdown data on predicting shipment times of therapeutics in e-Pharmacy supply chains, <b>July 2022</b> . DOI: <a href="https://doi.org/10.1108/IJPDLM-05-2021-0192">https://doi.org/10.1108/IJPDLM-05-2021-0192</a>	International Journal of Physical Distribution & Logistics Management, <b>Emerald Group Publishing Ltd., Q1.</b>	<b>5.212</b>	0	0
2	Mahesh Babu Mariappan, <b>Kanniga Devi</b> , Yegnanarayanan Venkataraman, Ming K. Lim, Panneerselvam Theivendren	Using AI and ML to predict shipment times of therapeutics, diagnostics and vaccines in e-pharmacy supply chains during COVID-19 pandemic, DOI: <a href="https://doi.org/10.1108/IJLM-05-2021-0300">https://doi.org/10.1108/IJLM-05-2021-0300</a> .	The International Journal of Logistics Management, <b>Emerald Publisher. Q1.</b>	<b>5.212</b>	4	4
3	Ramachandran Veerachamy & <b>Ramalakshmi Ramar</b>	Agricultural Irrigation Recommendation and Alert (AIRA) system using optimization and machine learning in Hadoop for sustainable agriculture, Vol. 29, No. 14, <b>March 2022</b> . DOI: <a href="https://doi.org/10.1007/s11356-021-13248-3">https://doi.org/10.1007/s11356-021-13248-3</a>	Environmental Science and Pollution Research, <b>Springer Berlin Heidelberg, Q2.</b>	<b>5.19</b>	2	6

4	Scaria Alex, T <b>Dhiliphan Rajkumar</b>	Spider bird swarm algorithm with deep belief network for malicious JavaScript detection, Vol. 107, pp. 102301, <b>Aug 2021</b> . DOI: <a href="https://doi.org/10.1016/j.cose.2021.102301">https://doi.org/10.1016/j.cose.2021.102301</a>	Computers & Security, <b>Elsevier Ltd., Q1.</b>	<b>5.105</b>		2
5	A Senthilkumar, A Anderson, <b>Saravanan Alagarsamy</b>	Performance enhancement and ANN prediction of R600a vapour compression refrigeration system using CuO/Sio2 hybrid nanolubricants: an energy conservation approach, Vol. 34 Issue. 6, pp. 4923–4935, <b>Nov 2021</b> . DOI: <a href="https://doi.org/10.1007/s00521-021-06681-5">https://doi.org/10.1007/s00521-021-06681-5</a>	Neural Computing and Applications, <b>Springer London, Q2.</b>	<b>5.102</b>	0	
6	<b>G Elizabeth Rani, R Murugeswari</b> , Suchart Siengchin, N Rajini, M Arul Kumar	Quantitative assessment of particle dispersion in polymeric composites and its effect on mechanical properties, Vol 19, pp. 1836-1845, <b>July 2022</b> , <a href="https://doi.org/10.1016/j.jmrt.2022.05.147">https://doi.org/10.1016/j.jmrt.2022.05.147</a>	Journal of Materials Research and Technology, <b>Elsevier, Q1.</b>	<b>5.039</b>	0	0
7	<b>Balakiruthiga B., Deepalakshmi P.</b>	(ITMP) “ Intelligent Traffic Management Prototype using Reinforcement Learning approach for Software Defined Data Center (SDDC), Vol. 32No. pp. - 12 <b>2021</b> . DOI: <a href="https://doi.org/10.1016/j.suscom.2021.100610">https://doi.org/10.1016/j.suscom.2021.100610</a>	Sustainable Computing: Informatics and Systems, <b>Elsevier USA, Q1</b>	<b>4.92</b>	0	0
8	K Meena, <b>R Raja sekar</b> , AVR Mayuri, V Preetha and NN Krishna Veni	5G Narrow Band-IoT Based Air Contamination Prediction Using Recurrent Neural Network, Vol. 33 No. pp. - 1 <b>2022</b> . DOI: <a href="https://doi.org/10.1016/j.suscom.2021.100619">https://doi.org/10.1016/j.suscom.2021.100619</a>	Sustainable Computing: Informatics and Systems, <b>Elsevier USA, Q1</b>	<b>4.92</b>	0	0

9	Ramachandran Veerachamy, <b>Ramalakshmi Ramar,</b> S Balaji, L Sharmila	Autonomous Application Controls on Smart Irrigation, Vol 100, pp. 107855, <b>May 2022</b> , <a href="https://doi.org/10.1016/j.compeleceng.2022.107855">https://doi.org/10.1016/j.compeleceng.2022.107855</a>	Computers and Electrical Engineering – <b>Elsevier, Q1.</b>	<b>4.89</b>	0	1
10	Anantha Kumar R., <b>Kartheeban K.</b>	Resource allocation using Dynamic Pricing Auction Mechanism for supporting emergency demands in Cloud Computing, Vol. 158, pp. 213-226, <b>Dec 2021.</b> DOI: <a href="https://doi.org/10.1016/j.jpdc.2021.07.016">https://doi.org/10.1016/j.jpdc.2021.07.016</a>	Journal of Parallel and Distributed Computing, <b>Academic Press Inc., Q1.</b>	<b>4.54</b>	0	1
11	Sulaiman, S. M.; Jeyanthi, P. Aruna; Devaraj, D.; Shihabudheen, K., V	A novel hybrid short-term electricity forecasting technique for residential loads using Empirical Mode Decomposition and Extreme Learning Machines, Vol. 98 No. pp. - 3 <b>2022.</b> DOI: <a href="https://doi.org/10.1016/j.compeleceng.2021.107663">https://doi.org/10.1016/j.compeleceng.2021.107663</a>	Computers & Electrical Engineering, <b>Elsevier Ltd., Q1.</b>	<b>4.15</b>	3	
12	Murthy M.Y.B., <b>Koteswararao A.,</b> Babu M.S.	Adaptive fuzzy deformable fusion and optimized CNN with ensemble classification for automated brain tumor diagnosis, Vol.12 No.1 pp. 37-58 <b>Nov 2021.</b> DOI: <a href="https://doi.org/10.1007/s13534-021-00209-5">https://doi.org/10.1007/s13534-021-00209-5</a>	Biomedical Engineering Letters, <b>Springer Verlag, Q2.</b>	<b>3.92</b>	10	0
13	Mohammed, Sheik S.; Titus, Femin; Thanikanti, Sudhakar Babu; Sulaiman, S. M.; Deb, Sanchari; Kumar, Nallapaneni Manoj	Charge Scheduling Optimization of Plug-In Electric Vehicle in a PV Powered Grid-Connected Charging Station Based on Day-Ahead Solar Energy Forecasting in Australia, Vol. 14No. 6 pp. - 3 <b>2022.</b> DOI: <a href="https://doi.org/10.3390/su14063498">https://doi.org/10.3390/su14063498</a>	SUSTAINABILITY, <b>MDPI AG, Q2.</b>	<b>3.89</b>	2	

14	Prabakaran, Senthil; <b>Ramar, Ramalakshmi;</b> Hussain, Irshad; Kavin, Balasubramanian Prabhu; Alshamrani, AlGhamdi, Ahmed Saeed; Alshehri, Abdullah	Predicting Attack Pattern via Machine Learning by Exploiting Stateful Firewall as Virtual Network Function in an SDN Network, Vol. 22 No. 3 pp. 1-24 <b>Feb 2022</b> . DOI: <a href="https://doi.org/10.3390/s22030709">https://doi.org/10.3390/s22030709</a>	SENSORS, <b>Multidisciplinary Digital Publishing Institute (MDPI), Q1.</b>	<b>3.847</b>	10	
15	Ramachandran, Veerachamy; <b>Ramalakshmi, Ramar;</b> Kavin, Balasubramanian Prabhu; Hussain, Irshad; Almaliki, Abdulrazak H.; Almaliki, Ashraf Y.; Abdulrhman A.; Elnaggar, Hussein, Enas E.	Exploiting IoT and Its Enabled Technologies for Irrigation Needs in Agriculture, Vol. 14 No. 5 pp. 1-20 <b>March 2022</b> . DOI: <a href="https://doi.org/10.3390/w14050719">https://doi.org/10.3390/w14050719</a>	WATER, <b>Multidisciplinary Digital Publishing Institute (MDPI), Q1.</b>	<b>3.53</b>	8	
16	Arivendan, Ajithram; Thangiah, Winowlin Jappes Jebas; Irulappasamy, Siva; <b>Chrish, Brintha N.</b>	Study on characterization of water hyacinth (Eichhornia crassipes) novel natural fiber as reinforcement with epoxy polymer matrix material for lightweight applications, <b>Feb 2022</b> . DOI: <a href="https://doi.org/10.1177/15280837211067281">https://doi.org/10.1177/15280837211067281</a>	Journal of Industrial Textiles, <b>SAGE Publications Ltd, Q2.</b>	<b>2.93</b>	0	0

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39	Subhashini, Sottallu Janakiram; Alli, Periya Karappan; Ganesan, Vinoth Chakkaravarthy; Stalin, Balasubramaniam; Vairamuthu, Jayarajan; Jeyaraj <b>Jane Rubel Angelina</b>	Fault Tolerant cross layer scheme using virtual cluster head for Heterogeneous sensor networks, Tome 74, No 11, <b>Feb 2021</b> , DOI: <a href="https://doi.org/10.7546/CRABS.2021.11.11">10.7546/CRABS.2021.11.11</a>	Comptes rendus de l'Acad'emie bulgare des Sciences, <b>Bulgarian Academy of Sciences, Q3</b> .	<b>0.378</b>	0	0

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41	<b>Pallath Mohanakrishnan, Kannan Suthendran,</b> Anish Pon Yamini	Design of a novel polarization insensitive pentaband THz metamaterial, Sep 2021, doi: 10.1002/mop.33060	Microwave and Optical Technology Letters, <b>John Wiley &amp; Sons Inc, Q3</b>	<b>1.311</b>	1	1

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S.No	Authors	Publication Details	Journal Details	Impact Factor / SCOPUS / Others	SCOP US citations	Google Scholar Citation
1	<b>Nagaraj, P., &amp; Deepalakshmi P.</b>	Diabetes Prediction Using Enhanced SVM and Deep Neural Network Learning Techniques: An Algorithmic Approach for Early Screening of Diabetes. Volume 16, Issue 4, Pages 1-20. DOI: 10.4018/IJHISI.20211001.0a25	International Journal of Healthcare Information Systems and Informatics (IJHISI), <b>IGI Publisher. Q3</b>	Scopus Journal	6	9
2	<b>V. Vaissnave, P. Deepalakshmi</b>	Comparative Analysis: Sentiment Analysis for Legal Judgment Text in India's Supreme Court Based on GloVe Pretrained Word Embedding and Deep Learning Models. volume 425, (pp. 33-44). <b>June 2022.</b>	In Soft Computing: Theories and Applications, Lecture Notes in Networks and Systems, <b>Springer, Singapore.</b>	Scopus Conference	0	0

		<a href="https://doi.org/10.1007/978-981-19-0707-4_4">https://doi.org/10.1007/978-981-19-0707-4_4</a> .				
3	<b>V. Vaissnave &amp; P. Deepalakshmi</b>	Analysis on Hybrid Deep Neural Networks for Legal Domain Multitasks: Categorization, Extraction, and Prediction. 18(1), 1-22. <b>June 2022</b> . DOI: 10.4018/IJeC.301257	International Journal of e-Collaboration (IJeC), <b>IGI Publisher, Q2</b> .	Scopus Journal	0	0
4	<b>Abirami, K., &amp; Deepalakshmi, P.</b>	A Comparative Study on Algorithms Applied to the Design of Assistive Technology for Autism and Spectrum Disorder: Far and Beyond. <b>April 2022</b> . (pp. 1-6). DOI: 10.1109/ICOEI53556.2022.9777125	In 2022 6 <sup>th</sup> International Conference on Trends in Electronics and Informatics (ICOEI) <b>IEEE</b> .	Scopus Conference	0	0
5	<b>Susumary, J., &amp; Deepalakshmi, P.</b>	Graph analysis and clustering of proteins linked with COVID-19, vol. 16, no. 1, pp. 145-158, March 2022, DOI: 10.3233/IDT-200185	Intelligent Decision Technologies, <b>ios Press, Q3</b> .	Scopus Journal	0	0
6	<b>Sundararajan, G., &amp; Perumalsamy, D.</b>	Proactive Routing Mechanism for Removing Far Sensor in IoT using A Design of B* Index. Volume 12, Number 2,, pp. 132-141(10), <b>Jan 2022</b> . DOI: <a href="https://doi.org/10.2174/2210327911999210111231213">https://doi.org/10.2174/2210327911999210111231213</a>	International Journal of Sensors Wireless Communications and Control, <b>Bentham Science Publishers B.V., Q4</b>	Scopus Journal	0	0
7	<b>Sudar, K. M., &amp; Deepalakshmi, P.</b>	Flow-Based Detection and Mitigation of Low-Rate DDOS Attack in SDN Environment Using Machine Learning Techniques. vol 244. <a href="https://doi.org/10.1007/978-981-16-2919-8_18">https://doi.org/10.1007/978-981-16-2919-8_18</a>	In IoT and Analytics for Sensor Networks (pp. 193-205). Lecture Notes in Networks and Systems, <b>Springer, Singapore</b> .	Scopus Conference	3	5

8	Ganthi, L. S., Nallapaneni, Y., <b>Perumalsamy, D.,</b> Mahalingam, K. (	Employee Attrition Prediction Using Machine Learning Algorithms. vol 288. (pp.577-596). <a href="https://doi.org/10.1007/978-981-16-5120-5_44">https://doi.org/10.1007/978-981-16-5120-5_44</a>	In Proceedings of International Conference on Data Science and Applications, Lecture Notes in Networks and Systems, <b>Springer, Singapore.</b>		0	1
9	<b>P. Velmurugadass, S. Dhanasekaran</b> and S. Sasikala	The Cloud based Edge Computing with IoT Infrastructure and Security", pp. 030-034, <b>April 2022</b> ,doi: 10.1109/ComPE53109.2021.9751942.	International Conference on Computational Performance Evaluation 2021, <b>IEEE.</b>	Scopus Conference	17	27
10	<b>P. Velmurugadass and S. Dhanasekaran</b>	Enhancing Security Service of Data Protection Level using Machine Learning,pp. 1-5, <b>nov 2021</b> .doi: 10.1109/GCAT52182.2021.9587730.	2nd Global Conference for Advancement in Technology (GCAT), <b>IEEE</b>	Scopus Conference	17	27
11	<b>S. Manochitra</b> and R. Partheepan	EEG Analysis of Human Perception based on Video-Audio Stimuli.pp. 1-5, <b>Nov 2021</b> .doi: 10.1109/STCR51658.2021.9588981.	2021 Smart Technologies, Communication and Robotics (STCR), <b>IEEE</b>	Scopus Conference	0	0
12	<b>Nagarajan, M.K.,</b> Janakiraman, N., Balasubramanian, C	A Novel Swarm Intelligence Routing Protocol in Wireless Sensor Networks,pg -385-398 vol 116. <b>March 2022</b> . <a href="https://doi.org/10.1007/978-981-16-9605-3_26">https://doi.org/10.1007/978-981-16-9605-3_26</a>	Evolutionary Computing and Mobile Sustainable Networks., Lecture Notes on Data Engineering and Communications Technologies, <b>Springer</b>	Scopus Conference	0	0
13	Satish S. Salunkhe, Vinodkumar Jacob, Aditya Tandon, <b>S. Jeevitha</b> , Rakesh Kumar Arora and Shilpa Laddha	Portable healthcare computing and clinical decision support system enabled by artificial intelligence, Vol.13 No.3, pp 228-233, <b>june 2022</b> 10.1504/IJESMS.2022.123955	International Journal of Engineering Systems Modelling and Simulation, <b>Inderscience, Q4</b>	Scopus Journal	0	0

14	Saini, v., praveen, ., kumar, k. a., thomas, j., selvaganapathi, ., & <b>Jayanthi, j.</b>	Impact of the fly ash, vermicompost and inorganic fertilisers on soil nutrients, carbon pools, growth and yield of sorghum fodder (sorghum bicolor l)., vol .22(49-50), PP:34-48, <b>Aug 2021.</b> <a href="https://www.ikppress.org/index.php/PCBMB/article/view/6928">https://www.ikppress.org/index.php/PCBMB/article/view/6928</a>	Plant Cell Biotechnology and Molecular Biology, <b>Society for Biology and Biotechnology, Q4</b>	Scopus Journal	0	0
15	kumar. A ,Thomas J., Kumar A. <b>Jayanthi</b> , kumar, A., & Bhople, B. S.	Assessing soil health with aid of inactive microbial pool and soil microbial expanding potential. plant cell biotechnology and molecular biology, vol. 22, no. 49-50, pp. 61-66, <b>Aug. 2021,</b> <a href="https://www.ikppress.org/index.php/PCBMB/article/view/6934">https://www.ikppress.org/index.php/PCBMB/article/view/6934.</a>	Plant Cell Biotechnology and Molecular Biology, <b>Society for Biology and Biotechnology, Q4</b>	Scopus Journal	0	0
16	Dr.KrutiJani1, Dr.K.R. Kavitha, A. Suphalakshmi, Mr.B. Reuben, <b>Ms.S. Shanmugapriya</b>	Review on Applications of Robotics and Artificial Intelligence in Marine Industry, ISSN: 0011-9342 , Issue: 7, Pages: 15680-15686,Year 2021,,	Design Engineering, <b>Rogers Media Publishing, Q4.</b>	Scopus Journal	0	0
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18	<b>R. Raja Subramanian , C. Sivapragasam</b>	A Case Study on the Student Centric Course in Engineering Programme leveraging PBL, Volume 35, No. 1, PP:27-41, <b>July 2021</b> ,Doi: 10.16920/jcet/2021/v35i1/22054	Journal of Engineering Education Transformations <b>Rajarambapu Institute Of Technology, Q3</b>	Scopus Journal	0	0



19	<b>R. R. Subramanian</b> , M. Yaswanth, B. V. Rajkumar T S, K. Rama Sai Vamsi, D. Mahidhar and R. R. Sudharsan,	Musical Instrument Identification using Supervised Learning, pp. 1550-1555, <b>July 2021</b> , doi: 10.1109/ICICCS53718.2022.9788116.	6th International Conference on Intelligent Computing and Control Systems (ICICCS), <b>IEEE</b> .	Scopus Conference	0	0
20	<b>R. R. Subramanian</b> , M. S. Murali, B. Deepak, P. Deepak, H. N. Reddy and R. R. Sudharsan,	Airline Fare Prediction Using Machine Learning Algorithms," , pp. 877-884, <b>Jan 2022</b> , doi: 10.1109/ICSSIT53264.2022.9716563.	4th International Conference on Smart Systems and Inventive Technology (ICSSIT), <b>IEEE</b> .	Scopus Conference	0	0
21	<b>R Raja Subramanian</b> , Yalla Sireesha, Yalla Satya Praveen Kumar Reddy, Tavva Bindamrutha, Mekala Harika, R Raja Sudharsan	Audio Emotion Recognition by Deep Neural Networks and Machine Learning Algorithms, pp. 1-6, Oct 2021, doi: 10.1109/ICAECA52838.2021.9675492.	International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA), <b>IEEE</b> .	Scopus Conference	0	1
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23	<b>R. R. Subramanian</b> , D. V. V. S. S. S. Babu, D. U. Rani, M. Devendrareddy, B. Kusuma and R. R. Sudharsan,	Detecting bias in the relative grading system using machine learning, pp. 1-6, <b>Jan 2022</b> , doi: 10.1109/ICAECA52838.2021.9675641.	International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA), <b>IEEE</b>	Scopus Conference	0	0

24	<b>R. R. Subramanian</b> , T. M. DheenaDayalan, T. Badhirirajan, C. Dhinakaran, C. G. Devakirubai and R. R. Sudharsan	An Automated House Plan Generator leveraging Genetic Algorithms, , pp. 1-6, <b>oct 2021</b> doi: 10.1109/ICAECA52838.2021.9675541.	2021 International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA), <b>IEEE</b>	Scopus Conference	0	0
25	<b>R. R. Subramanian</b> , H. Mohan, K. P. L. Syamala, C. S. Niharika, E. Venkatesh and R. R. Sudharsan,	Forensic Verification of Handwritten Documents using Secure Multi Party Computation," pp. 1-6, <b>OCT 2021</b> , doi: 10.1109/ICAECA52838.2021.9675594.	2021 International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA), <b>IEEE</b>	Scopus Conference	0	0
26	<b>R. R. Subramanian</b> , M. Kancharla, S. H. Duddekula, A. V. N. Harshith, G. S. Kamisetty and R. R. Sudharsan	Assessing and Monitoring Dietary Intake, pp. 1-4, <b>OCT 2021</b> , doi: 10.1109/ICAECA52838.2021.9675677.	International Conference on Advancements in Electrical, Electronics, Communication, Computing and Automation (ICAECA), <b>IEEE</b>	Scopus Conference	0	0
27	R. R. Sudharsan, V. Vishnu, R. Bhuvaneshwaran, V. P. Sundaraesh and <b>R. Raja Subramanian</b>	A Novel Approach on Infrared (IR) based Thermal Detection for TSVs, pp. 179-183, <b>June 2022</b> ,doi: 10.1109/ICICCS53718.2022.9788404.	6th International Conference on Intelligent Computing and Control Systems (ICICCS), <b>IEEE</b>	Scopus Conference	0	0

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30	<b>D.Balakrishnan, T.Dhiliphan Rajkumar, S.Dhanasekaran, B.S.Murugan</b>	Energy Aware Fuzzy Data Fusion For Iot Environment, Vol.25, Issue 4, doi: <a href="https://www.annalsofrscb.ro/index.php/journal/article/view/8487">https://www.annalsofrscb.ro/index.php/journal/article/view/8487</a>	Annals of the Romanian Society for Cell Biology, Association of Cell <b>Biology Romania,Q4</b>	Scopus Journal	0	0
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33	<b>G. Elizabeth Rani</b> , G. Narasimha Murthy, M. Abhiram, H. Mohan, T. Singh Naik and M. Sakthimohan	An Automated Airlines Reservation Prediction System Using BlockChain Technology, pp. 224-228, <b>Feb 2022</b> , doi: 10.1109/ICIIP53038.2021.9702587	2021 Sixth International Conference on Image Information Processing (ICIIP), <b>IEEE</b>	Scopus Conference	7	7
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36	Sakthimohan. M; <b>Elizabeth Rani. G</b> ; Busireddy Gnaneswr Reddy; Sadhu Lokaan Reddy, Vangam Chennareddy	Wireless Power Transmission Science Model, pp. 1-5, <b>Sep 2021</b> , doi: 10.1109/ICESC51422.2021.9532606	2021 Second International Conference on Electronics and Sustainable Communication Systems (ICESC), <b>IEEE</b>	Scopus Conference	7	7
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42	<b>Sudar, K. M., Nagaraj, P.,</b> Ganesh, M., Yadav, D. A., Kumar, K. M., & Muneeswaran, V.	Analysis of Seminary Learner Campus Network Behaviour using Machine Learning Techniques. (pp. 1117-1122). <b>June 2022</b> DOI: 10.1109/ICCES54183.2022.9835820	In 2022 7th International Conference on Communication and Electronics Systems (ICCES) (pp. 1117-1122). <b>IEEE</b> .	Scopus Conference	0	0
43	Muneeswaran, V., <b>Nagaraj, P.,</b> Rajasekaran, M. P., Reddy, S. U., Chaithanya, N. S., & Babajan, S.	IoT based Multiple Vital Health Parameter Detection and Analyzer System. (pp. 473-478), <b>June 2022</b> . DOI: 10.1109/ICCES54183.2022.9835814	In 2022 7th International Conference on Communication and Electronics Systems (ICCES) . <b>IEEE</b> .	Scopus Conference	0	0
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47	Sunethra, B., Sreeya, C., Dhannushree, U., <b>Nagaraj, P.,</b> & Muneeswaran, V.	A Systematic Parking System Using bi-class Machine Learning Techniques. (pp. 221-226). <b>April 2022</b> . DOI: 10.1109/ICSCDS53736.2022.9760903	In 2022 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS) <b>IEEE</b> .	Scopus Conference	0	2
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62	Muneeswaran, V., <b>Nagaraj, M. P.</b> , Rajasekaran, M. P., Chaithanya, N. S., Babajan, S., & Reddy, S. U.	Indigenous Health Tracking Analyzer Using IoT. (pp. 530-533). <b>July 2021</b> , DOI: 10.1109/ICCES51350.2021.9489052	In 2021 6th International Conference on Communication and Electronics Systems (ICCES) <b>IEEE</b> .	Scopus Conference	9	13
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65	<b>Nagaraj, P.</b> , Muneeswaran, V., <b>Muthamil Sudar, K.</b> , Hammed, S., Lokesh, D. L., & Samara Simha Reddy, V	An Exemplary Template Matching Techniques for Counterfeit Currency Detection. (pp. 370-378). <b>Sep 2021</b> , <a href="https://doi.org/10.1007/978-3-030-84760-9_32">https://doi.org/10.1007/978-3-030-84760-9_32</a>	In International Conference on Image Processing and Capsule Networks, Lecture Notes in Networks and Systems <b>Springer, Cham.</b>	Scopus Conference	7	10
66	Ho Chi Minh Perumal, <b>Bala Subramanian Chokkalingam</b>	An Efficient Analysis of E-Commerce Site using Big Data Assisted Modified Learning Strategy based on Novel Customer Recommendations, pp. 249-	2022 IEEE International Conference on Signal Processing, Informatics, Communication and	Scopus Conference	0	0

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84	Kadarkarai Arunkumar, Muthiah Muthukannan, Arunachalam Suresh Kumar, Arunasankar Chithambar Ganesh, <b>Rangaswamy Kanniga Devi</b>	Production of Eco-Friendly Geopolymer Concrete by using Waste Wood Ash for a Sustainable Environment, Vol.7 Issue 4, pp. 993-1006, <b>Oct 2021</b> . DOI: <a href="https://doi.org/10.22059/POLL.2021.320857.1039">10.22059/POLL.2021.320857.1039</a>	Pollution, University of Tehran, <b>Q3.</b>	Scopus Journal	0	2
85	Arunachalam Suresh Kumar, Muthiah Muthukannan, Kadarkarai Arunkumar, Arunasankar Chithambar Ganesh, <b>Rangaswamy Kanniga Devi</b>	Utilisation of waste glass powder to improve the performance of hazardous incinerated biomedical waste ash geopolymer concrete, Vol. 7, Issue. 93, <b>Nov 2021</b> . DOI: <a href="https://doi.org/10.1007/s41062-021-00694-8">https://doi.org/10.1007/s41062-021-00694-8</a>	Innovative Infrastructure Solutions, Springer International Publishing AG, <b>Q2.</b>	Scopus Conference	6	7
86	<b>R.Kanniga Devi, M.</b> Muthukannan, J. Dhesinghraj, M. Murali, K. Mayandi, Dinesh Elango	Banana Fibre A golden revolution, Vol. 30, Issue. 9, pp. 51-59, <b>Sep 2021</b> . DOI: <a href="https://doi.org/10.1080/15440478.2021.1993493">10.1080/15440478.2021.1993493</a>	Asian Textile Journal, G P S Kwatra, <b>Q4.</b>	Scopus Journal	0	0
87	Suresh Kumar Arunachalam, Muthukannan Muthiah, <b>Kanniga Devi Rangaswamy,</b> Arunkumar Kadarkarai,	Improving the structural performance of reinforced geopolymer concrete incorporated with hazardous heavy metal waste ash, Vol. 1, Issue. 1, pp. 1-10, <b>July 2021</b> . DOI:	World Journal of Engineering, Emerald Group Publishing Ltd., <b>Q3.</b>	Scopus Journal	1.2	5

	Chithambar Ganesh Arunasankar	<a href="https://doi.org/10.1108/WJE-01-2021-0055">https://doi.org/10.1108/WJE-01-2021-0055</a>				
88	Dr. D. Kalpanadevi <b>Dr. K. Kartheeban</b>	Diagnosis Kidney Function Test Using Machine Learning Algorithm Based on Runge Kutta Method, Vol. 71 Issue. 3s2, pp. 87-98, <b>July 2021.</b>	<b>Mathematics Theory</b> and its Contribution in Robotics and Computer Engineering,	Scopus Journal	0	0
89	N Indumathi, <b>R Ramalakshmi</b> , Ayodeji Olalekan Salau, Tayo Uthman Badrudeen, Chukwunonso Anthony Mmonyi	Predictive Analytics of Human Errors in the Fireworks Industry, pp. 234-238, <b>May 2022</b> , 10.1109/DASA54658.2022.9765179.	IEEE - International Conference on Decision Aid Sciences and Applications (DASA) <b>IEEE</b>	Scopus Conference	0	0
90	R Ramana, <b>BS Murugan</b>	Detection of Multiple Small 3D Objects Using Point Cloud Images by ASP Network 3D Object Detection Model, pp. 1924-1940, <b>Dec 2021.</b> DOI:	Design Engineering <b>Toronto</b>	Scopus Journal	0	0
91	<b>T Dhiliphan Rajkumar S Dhanasekaran, BS Murugan</b>	Machine learning based data fusion scheme for intrusion detection, pp. 7393-7409, <b>Aug 2021.</b>	Design Engineering <b>Toronto</b>	Scopus Journal	0	0
92	Preethi C., <b>Brintha N.C.</b> , Yogesh C.K.	An comprehensive survey on applications of precision agriculture in the context of weed classification, leave disease detection, yield prediction and UAV Image analysis, Vol. 39 pp. 296-306, <b>Nov 2021.</b> DOI: <a href="https://doi.org/10.3233/APC210152">https://doi.org/10.3233/APC210152</a>	Advances in Parallel Computing Technologies and Applications, <b>IOS Press.</b>	Scopus Journal	0	0
93	Haripriya K., <b>Brintha N.C.</b> , Yogesh C.K.	A survey on securing medical data in cloud using blockchain, Vol. 39 Issue. pp. 279-287, 11 <b>2021.</b> DOI: <a href="https://doi.org/10.3233/APC210150">https://doi.org/10.3233/APC210150</a>	Advances in Parallel Computing Technologies and Applications, <b>IOS Press.</b>	Scopus Journal	0	0

94	R Reena Daphne, JT WinowlinJappes, <b>NC Brintha</b>	An Unsupervised Drowsiness Detection Architecture Using Fuzzy Classifier, pp. 1734-1742, <b>June 2022</b> . DOI: doi: 10.1109/ICICCS53718.2022.9788467.	2022 6th International Conference on Intelligent Computing and Control Systems (ICICCS), <b>IEEE</b> .	Scopus onference	0	0
95	<b>NC Brintha</b> , Kunal Vasudevan, Vikrant V Joliya, Lagishetty Aashry	Intelligent SoS Application with GPS Tracking and Hidden Camera Detection, pp. 964-969, April 2022. DOI: 10.1109/ICOEI53556.2022.9777167	2022 6th International Conference on Trends in Electronics and Informatics (ICOEI), <b>IEEE</b>	Scopus Conference	0	0
96	M Maheswari, <b>NC Brintha</b>	Smart Manufacturing Technologies in Industry-4.0, pp. pp. 146-151, <b>Nov 2021</b> . DOI: 10.1109/ICIP53038.2021.9702613.	2021 Sixth International Conference on Image Information Processing (ICIIP), <b>IEEE</b>	Scopus Conference	0	1
97	<b>NC Brintha</b>	A comparative study of various M Jeya Sundari, machine learning methods on ovarian tumor, pp. 314-319, <b>Nov 2011</b> . DOI:10.1109/ICIP53038.2021.9702697..	2021 Sixth International Conference on Image Information Processing (ICIIP), <b>IEEE</b>	Scopus Conference	0	1
98	<b>NC Brintha</b> , JT Winowlin Jappes, S Santhana Lakshmi	Privacy Enabled Dynamic Regimentation of Photo Posting on Online Social Networks, pp. 245-249, <b>Nov 2021</b> . DOI: 10.1109/ICIP53038.2021.9702658.	2021 Sixth International Conference on Image Information Processing (ICIIP), <b>IEEE</b> .	Scopus Conference	0	0
99	<b>Saravanan Alagarsamy</b> , Thippareddy Tarun Kumar Reddy, Bandi Praveen Kumar, Penugonda Sai Vineeth, A. Senthil Kumar	A Novel Technique for Prophecy of Brain Strokes, pp. 1203-1208, <b>June 2022</b> .	2022 6th International Conference on Intelligent Computing and Control Systems (ICICCS), <b>IEEE</b>	Scopus Conference	0	1
100	<b>Saravanan Alagarsamy</b> , Bendela Kusuma, Cheedella Venkata Naga Mohan,	Smart System for Reading the Bar Code using Bayesian Deformable Algorithm for Blind People, pp. 424-429, <b>April</b>	2022 6th International Conference on Trends in Electronics and	Scopus onference	0	1

	Malleboina Venkata Sukumar, Dora Veera Venkata Sai Sri Sujan, Musalappagari Devendrareddy	<b>2022.</b> DOI: 10.1109/ICOEI53556.2022.9776881.	Informatics (ICOEI), <b>IEEE</b>			
101	<b>Saravanan Alagarsamy, M</b> Malathi, M Manonmani, T Sanathani, A Senthil Kumar	Prediction of Road Accidents Using Machine Learning Technique, pp. 1695-1701, <b>Dec 2021.</b> DOI: 10.1109/ICECA52323.2021.9675852	5th International Conference on Electronics, Communication and Aerospace Technology (ICECA), <b>IEEE</b>	Scopus onference	0	4
102	<b>Saravanan Alagarsamy,</b> Kailasam Selvaraj, Vishnuvarthanan Govindaraj, A. Ajith Kumar, S. HariShankar, G. Lakshmi Narasimman	Automated Data analytics approach for examining the background economy of Cybercrime, pp. 332-336, <b>Oct 2021.</b> DOI: 10.1109/ICIRCA51532.2021.9544845	Third International Conference on Inventive Research in Computing Applications (ICIRCA), <b>IEEE</b>	Scopus onference	3	6
103	<b>Saravanan Alagarsamy,</b> Vishnuvarthanan Govindaraj, T. TarunKumar Reddy, B. Praveen Kumar, P. Sai Vineeth	An automated assistance system for detecting the stupor of drivers using vision-based technique, pp. 1203-1207, <b>Sep 2021.</b> DOI: 10.1109/ICESC51422.2021.9532786.	2021 Second International Conference on Electronics and Sustainable Communication Systems (ICESC), <b>IEEE</b>	Scopus Conference	3	5
104	S Sankara Narayanan, D Vinod, Suganya Athisayamani, <b>A Robert Singh</b>	Combination of Local Feature Extraction for Image Retrieval, vol 1404, pp 319–328, <b>Jan 2022.</b> DOI	Proceedings of Third International Conference on Sustainable Computing, <b>Springer</b>	Scopus Conference	0	0
105	Thiruwieddhi Hanumann, Nune Veera Venkata Satya Narayana Swamy, Patapanchula Gowtham, <b>R Sumathi,</b> P Chinnasamy, A Kalaiarasi	Plant Monitoring System Cum Smart Irrigation using Bolt IOT, pp. 1-3, <b>Jan 2022.</b> DOI: 10.1109/ICCCI54379.2022.9741003	2022 International Conference on Computer Communication and Informatics (ICCCI), <b>IEEE</b>	Scopus Conference	1	2



106	<b>R Sumathi</b> , M Venkatesulu	An Automated Hybrid Approach for Multimodal Tumor Segmentation, Vol. 1979, Issue. 1, pp. 012047, <b>Aug 2021</b> . DOI: <a href="https://doi.org/10.1088/1742-6596/1979/1/012047">https://doi.org/10.1088/1742-6596/1979/1/012047</a>	Journal of Physics: Conference Series, <b>IOP Publishing</b> .	Scopus	0	0
107	Zhang Huizhong, Meng Fanrong, Wang Gui, Beenu Mago and <b>Thendral Puyalnithi</b>	Research on the Automation Integration Terminal of the Education Management Platform Based on Big Data Analysis, Vol. 14, No. 01n02, p 2250003, <b>March 2022</b> . DOI: <a href="https://doi.org/10.1142/S2424922X22500036">https://doi.org/10.1142/S2424922X22500036</a>	Advances in Data Science and Adaptive Analysis, <b>World Scientific Publishing Company, Q4</b> .	Scopus	0	0

#### Other Publications (2021-22)

S.No	Authors	Publication Details	Journal Details	Impact Factor/ Scopus/ Others
1	Arun Kumar, Sanjat Kumar Sahu, Jayanthi J	Developing nation's soil microbial community shifts and diversity loss: leading towards major ecological threat,	Environment Conservation Journal	others
2	K. Vignesh, M. Chinna Karuppu, J. R. Karthikeyan, T. Saikiran, P. Sanjay Pandian	Student Hive, Volume 5, Issue 5, May 2022	International Journal of Research in Engineering, Research India Publications	Others
3	Raja, M.; Dhanasekaran, S.; Vasudevan, V.	Light Weight Cryptography based Medical Data and Image Encryption Scheme, Vol. 18 Issue 2, p88-104. 17p., Dec2021,	Webology	others

4	S Krishna Narayanan, S Dhanasekaran, V Vasudevan	Minimizing Overloads of Critical Tasks Using Machine Learning in CPS by Extending Resources, Vol. 18 Issue 2, p413-424. 12p., Dec2021,	Webology	others
5	Chezhiyan, P., Deepalakshmi, P., Maheswari, K., & Sriramakrishnan, P. (2022).	Gaming application for assistive training to improve cognitive and motor skills of children with dyspraxia. (pp. 359-372).	In Sustainable development in engineering and technology 3ciencias.	others
6	D.Balakrishnan, T.Dhiliphan Rajkumar, S.Dhanasekaran, B.S.Murugan	Energy Aware Fuzzy Data Fusion For Iot Environment, Vol.25, Issue 4, doi: <a href="https://www.annalsofrscb.ro/index.php/journal/article/view/8487">https://www.annalsofrscb.ro/index.php/journal/article/view/8487</a>	Annals of the Romanian Society for Cell Biology, Association of Cell Biology Romania, Q4	others
7	J. Jeyaranjani, V. Priyadharshini, M. Shailesh, S. Shreekanth	Android Battery Saving System, Vol: 29, NO: 4, May 2022, Doi: <a href="https://www.ijetcse.com/admin/uploads/Android%20Battery%20Saving%20System_1651851698.pdf">https://www.ijetcse.com/admin/uploads/Android%20Battery%20Saving%20System_1651851698.pdf</a>	International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE), IJETCSE	others
8	S. Ganesamurthy, J. Jeyaranjan, R. Srimathi	Connected power domination number of product graphs, pp: 1-12, doi:10.48550/arXiv.2205.05274	arXiv, Cornell University	others
9	M. Sakthimohan, G. Elizabeth Ran, J. Deny, S. N. Susmitha, S. Sobiya	Low-cost non-invasive smart bed system using medical devices embedded with IoT, pp.41-51, <b>Nov 2021</b> , doi: 10.17993/3ctecno.2021.specialissue8.41-51	3C Tecnología. Glosas de innovación aplicadas a la pyme, Edición Especial	others
10	M Divyapushpalakshmi, R Ramalakshmi, V Ramachandran	Improved Overlapping Community Detection in Weighted Complex Social Network Using Hybrid Agglomerative Hierarchical Clustering for optical networks, <b>Apr 2022</b> , <a href="https://doi.org/10.21203/rs.3.rs-1537014/v1">https://doi.org/10.21203/rs.3.rs-1537014/v1</a>	Research Square	others
11	M Syed Rabiya, R Ramalakshmi	Partial connectivity aware routing for opportunistic networks, ISBN 978-84-124943-4-1, pp.125-136, <b>Mar 2022</b>	3ciencias - Sustainable development in engineering and technology - Book Chapter	others

12	D Balakrishnan, T Dhiliphan Rajkumar	Survey on IOT applications & security issues, pp. 529-538, 2022. DOI:	Sustainable development in engineering and technology, 3ciencias.	others
13	D Balakrishnan, T Dhiliphan Rajkumar	Issues & challenges in IoT, pp. 79-90, 2022.	Sustainable development in engineering and technology, 3ciencias.	others
14	Senthilkumar Senthilkumar, Murugan Murugan	Improving the security of the organization from the shadow IoT using Blow-fish encryption algorithm, Vol. 14, Issue. 1, pp. 29-35, <b>March 2022</b> . DOI: DOI: <a href="https://doi.org/10.31098/ihsatec.v14i1.483">https://doi.org/10.31098/ihsatec.v14i1.483</a>	Proceedings of The International Halal Science and Technology Conference	others
15	Zhang Huizhong, Meng Fanrong, Wang Gui, Beenu Mago and Thendral Puyalnithi	Research on the Automation Integration Terminal of the Education Management Platform Based on Big Data Analysis, Vol. 14, No. 01n02, p 2250003, <b>March 2022</b> . DOI: <a href="https://doi.org/10.1142/S2424922X22500036">https://doi.org/10.1142/S2424922X22500036</a>	Advances in Data Science and Adaptive Analysis, World Scientific Publishing Company.	others
16	<b>Senthilkumar Senthilkumar, Murugan Murugan</b>	Improving the security of the organization from the shadow IoT using Blow-fish encryption algorithm, Vol. 14, Issue. 1, pp. 29-35, <b>March 2022</b> . DOI: DOI: <a href="https://doi.org/10.31098/ihsatec.v14i1.483">https://doi.org/10.31098/ihsatec.v14i1.483</a>	Proceedings of The International Halal Science and Technology Conference	others
17	<b>D Balakrishnan, T Dhiliphan Rajkumar</b>	Survey on IOT applications & security issues, pp. 529-538, <b>2022</b> . DOI:	Sustainable development in engineering and technology, 3ciencias.	others

18	<b>D Balakrishnan, T Dhilliphan Rajkumar</b>	Issues & challenges in IoT, pp. 79-90, <b>2022.</b>	Sustainable development in engineering and technology, 3ciencias.	others
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**Publication Details for CAYm1 (2020-21)**

<b>No. of SCI Indexed Publications</b>	<b>33</b>
<b>No. of Scopus Indexed Publications</b>	<b>94</b>
<b>No. of other Publications</b>	<b>10</b>

**SCI Indexed Publications CAY m1(2020-21)**

<b>S.No</b>	<b>Authors</b>	<b>Publication Details</b>	<b>Journal Details</b>	<b>Impact Factor/ Scopus/ Others</b>	<b>Scopus Citation</b>	<b>Google Scholar Citation</b>
1	<b>Scaria Alex, Dhilliphan Rajkumar. T</b>	Taylor-HHO algorithm: A hybrid optimization algorithm with deep long short-term for malicious Javascript detection”, SCI - Volume 36, Number 12, 1 <b>Dec-2021</b> , pp. 7153-7176(24), <a href="https://doi.org/10.1002/int.22584">https://doi.org/10.1002/int.22584</a>	International Journal of Intelligent Systems, <b>Wiley, Q1</b>	<b>8.709</b>	-	-
2	<b>P.Chinnasamy, P. Deepalakshmi</b>	HCAC-EHR: Hybrid Cryptographic Access Control for Secure EHR Retrieval in Healthcare Cloud, <b>Feb-2021.</b> <a href="https://doi.org/10.1007/s12652-021-02942-2">https://doi.org/10.1007/s12652-021-02942-2</a>	Journal of Ambient Intelligence and Humanized Computing, <b>Springer, Q1</b>	<b>7.104</b>	<b>2</b>	<b>3</b>

3	Sherly Alphonse, K. Shankar, R. Gobi M. J. JeyasheelaRakkin i, S. Ananthakrishnan, SuganyaAthisaya mani, <b>A. Robert Singh,</b>	A multi-scale and rotation - invariant phase pattern (MRIPP) and a stack of restricted Boltzmann machine (RBM) with pre-processing for facial expression classification., Vol. 12, PP. 3447–3463. <b>Mar-2021.</b> <a href="https://doi.org/10.1007/s12652-020-02517-7">https://doi.org/10.1007/s12652-020-02517-7</a>	Journal of Ambient Intelligence and Humanized Computing, <b>Springer, Q1</b>	<b>7.104</b>	-	<b>14</b>
4	A.Manimuthu, <b>G.Murugaboopa thi</b>	An enhanced approach on distributed accountability for shared data in cloud, Vol. 12, PP. 5421–5425, <b>May-2020,</b> <a href="https://doi.org/10.1007/s12652-020-02029-4">https://doi.org/10.1007/s12652-020-02029-4</a>	Journal of Ambient Intelligence and Humanized Computing, <b>Springer, Q1</b>	<b>7.104</b>	-	-
5	U. Udhayakumar, <b>G.Murugaboopa thi</b>	To improve user key security and cloud user region-based resource scheduler using rail fence region-based load balancing algorithm, Vol. 12, Issue. 6, PP. 1 - 8, <b>June-2021.,</b> <a href="https://doi.org/10.1007/s12652-020-02152-2">https://doi.org/10.1007/s12652-020-02152-2</a>	Journal of Ambient Intelligence and Humanized Computing, <b>Springer, Q1</b>	<b>7.104</b>	-	<b>1</b>
6	Abraham Nesarani, <b>RamalakshmiRa mar,</b> Sivakumar Pandian	An efficient approach for rice prediction from authenticated Block chain node using machine learning technique, Volume 20, <b>Nov-2020.</b> <a href="https://doi.org/10.1016/j.eti.2020.101064">https://doi.org/10.1016/j.eti.2020.101064</a>	Environmental Technology & Innovation, <b>Elsevier, Q1</b>	<b>5.263</b>	<b>8</b>	<b>10</b>
7	Scaria Alex, <b>T Dhiliphan Rajkumar</b>	Spider bird swarm algorithm with deep belief network for malicious JavaScript detection, Vol. 107, <b>Apr-2021,</b> <a href="https://doi.org/10.1016/j.cose.2021.102301">https://doi.org/10.1016/j.cose.2021.102301</a>	Computers & Security, <b>Elsevier, Q1</b>	<b>4.438</b>	-	-
8	V. Ramachandran, <b>R .Ramalakshmi</b>	Agricultural Irrigation Recommendation and Alert (AIRA) system using optimization and machine learning in Hadoop for sustainable agriculture, <b>Mar-2021,</b> <a href="https://doi.org/10.1007/s11356-021-13248-3">https://doi.org/10.1007/s11356-021-13248-3</a>	Environmental Science and Pollution Research, <b>Springer, Q1</b>	<b>4.223</b>	-	-

9	R. Bharathi, T. Abirami, <b>S. Dhanasekaran</b> , Deepak Gupta, Ashish Khanna, Mohamed Elhoseny, K. Shankar	Energy efficient clustering with disease diagnosis model for IoT based sustainable healthcare systems, Vol. 28, Iuuse.11, <b>Dec-2020</b> , <a href="https://doi.org/10.1016/j.suscom.2020.100453">https://doi.org/10.1016/j.suscom.2020.100453</a>	Sustainable Computing: Informatics and Systems, <b>Elsevier, Q1</b>	<b>4.028</b>	<b>17</b>	<b>33</b>
10	Gia Nhu Nguyen, Nin Ho Le Viet, <b>A Francis Saviour Devaraj</b> , R Gopi, K shankar	Blockchain enabled energy efficient red deer algorithm based clustering protocol for pervasive wireless sensor networks, Vol. 28, <b>Dec-2020</b> , <a href="https://doi.org/10.1016/j.suscom.2020.100464">https://doi.org/10.1016/j.suscom.2020.100464</a>	Sustainable Computing: Informatics and Systems, <b>Elsevier, Q1</b>	<b>4.028</b>	<b>6</b>	<b>5</b>
11	Sathiyamoorthi V, Ilavarasi A K, Murali K <b>Murugeswari K</b> , Syed Thouheed Ahmed, Aruna Devi B,	A Deep Convolutional Neural Network based Computer Aided Diagnosis System Volume 171, <b>February 2021</b> , <a href="https://doi.org/10.1016/j.measurement.2020.108838">https://doi.org/10.1016/j.measurement.2020.108838</a>	Measurement, <b>Elsevier, Q1</b>	<b>3.927</b>	-	<b>7</b>
12	K. V. Praveen, P. M. Joe Prathap, <b>S. Dhanasekaran</b> , Denis A. Pustokhin, I.S. Hephzi Punithavathi, P. Duraipandy, Irina V. Pustokhina,	Deep Learning Based Intelligent and Sustainable Smart Healthcare Application in Cloud-Centric IoT, Vol. 66, Issue. 2, PP. 1987-2003, <b>Nov-2020</b> ., <a href="https://doi.org/10.32604/cmc.2020.012398">doi:10.32604/cmc.2020.012398</a>	Computers, Materials & Continua, <b>Tech Science Press, Q1</b>	<b>3.772</b>	<b>4</b>	<b>4</b>
13	J. Banumathi, A. Muthumari, <b>S. Dhanasekaran</b> , S. Rajasekaran, Irina V.	An Intelligent Deep Learning Based Xception Model for Hyperspectral Image Analysis and Classification, Vol. 67, Issue. 2, PP. 2394-2407, <b>Jan-2021</b> . <a href="https://doi.org/10.32604/cmc.2021.015605">doi:10.32604/cmc.2021.015605</a>	Computers, Materials & Continua, <b>Tech Science Press, Q1</b>	<b>3.772</b>	<b>2</b>	<b>1</b>

	Pustokhina, Denis A. Pustokhin, K. Shankar					
14	J Hemalatha, S Geetha, R Geetha, <b>C.Bala Subramanian,</b> Daniela Elena Popescu, D Jude Hemanth	Reversible Data Hiding Based on Varying Radix Numeral System, Vol. 69, Issue. 1, PP. 283-300, <b>June-2021,</b> <i>doi:10.32604/cmc.2021.017203</i>	Computers, Materials & Continua, <b>Tech Science Press,</b> <b>Q1</b>	<b>3.772</b>	-	-
15	<b>S. Vidya,</b> E. Srie Vidhya Janani	Wind speed multistep forecasting model using a hybrid decomposition technique and a selfish herd optimizer-based deep neural network, Vol. 25, Issue. 8, PP. 6237-6270, <b>Mar-2021,</b> <i>https://doi.org/10.1007/s00500- 021-05608-5</i>	Soft computing, <b>Springer, Q2</b>	<b>3.643</b>	-	<b>3</b>
16	B Balakiruthiga, <b>P Deepalakshmi,</b> Sa chi Nandan Mohanty, Deepak Gupta, P Pavan Kumar,K Shankar	Segment routing-based energy aware routing for software defined data center, pp.146- 163, Vol.64, <b>Dec-2020,</b> <i>https://doi.org/10.1016/j.cogsys.2020.08.009</i>	<b>Cognitive System Research,</b> <b>Elsevier, Q3.</b>	<b>3.523</b>	<b>3</b>	<b>16</b>
17	<b>A. Francis Saviour Devaraj, G. MurugaBoopath i,</b> Mohamed Elhoseny, K. Shankar, Kyungbok, MinhyeonjoonMo ongyanendra Prasad Joshi	An Efficient Framework for Secure Image Archival and Retrieval System Using Multiple Secret Share Creation Scheme, vol. 8, pp. 144310-144320, <b>Aug-2020,</b> <i>doi:10.1109/ACCESS.2020.3014346.</i>	IEEE Access, <b>IEEE, Q1</b>	<b>3.367</b>	<b>5</b>	<b>18</b>

18	Porkodi, V, <b>A. Robert Singh,</b> Sait, Abdul Rahaman Wahab, Yang, EunmokSeo, Changho Joshi, Gyanendra Prasad	Resource Provisioning for Cyber-Physical-Social System in Cloud-Fog-Edge Computing Using Optimal Flower Pollination Algorithm, vol. 8, pp. 105311-105319, <b>June-2020</b> , <a href="https://doi.org/10.1109/ACCESS.2020.2999734">https://doi.org/10.1109/ACCESS.2020.2999734</a>	IEEE Access, <b>IEEE, Q1</b>	<b>3.367</b>	<b>13</b>	<b>25</b>
19	<b>Nagaraj P,</b> <b>Deepalakshmi P,</b> Romany F, Mansour Ahmed Almazroa	Artificial Flora Based Feature Selection with Gradient Boosting Tree for Diabetes Diagnosis, Vol.14, pp.2786-2806. <b>June-2021</b> . <a href="https://doi.org/10.2147/DMSO.S312787">https://doi.org/10.2147/DMSO.S312787</a>	Diabetes Metabolic Syndrome and Obesity-Targets and Therapy, <b>DOVEPRESS publications, Q3</b>	<b>3.168</b>	-	-
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## Scopus Indexed Publications CAYm1 (2020-21)

S.No	Authors	Publication Details	Journal Details	Impact Factor/ Scopus/ Others	Scopus Citation	Google Scholar Citation
1	<b>M. Raja, S. Dhanasekaran, V. Vasudevan</b>	Attribute-based encryption for ciphertext in advanced encryption standard, Volume 37, Part 2, <b>November 2020</b> 10.1016/j.matpr.2020.09.288	Materials Today: Proceedings, Elsevier, <b>Q2</b>	Scopus	-	1
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43	Ajithram, A., Jappes, J.T.W., <b>Brintha, N.C.</b>	Water hyacinth (Eichhornia crassipes) natural composite extraction methods and properties - A review, Vol. 45, pp. 1626-1632, <b>Jan. 2021</b> <i>https://doi.org/10.1016/j.matpr.2020.08.472</i>	Materials Today: Proceedings, <b>Elsevier, Q2</b>	Scopus	-	4
44	<b>Brintha, N.C.</b> , WinowlinJappes, J.T., Adam Khan, M., Johnny Christo, N	Application of data computing for resource scheduling in manufacturing industries, Vol 46, No.20, pp. 7251-7257, <b>Feb 2021</b> . <i>DOI:10.1016/j.matpr.2020.12.784</i>	Materials Today: Proceedings - <b>Elsevier, Q2</b>	Scopus	-	1

45	Jappes, J.T.W., <b>Brintha, N.C.,</b> Khan, M.A. Christo, N.J.	Effect of modified method of coating on particle incorporation and wear resistance of nickel - phosphorus - Diamond composite coatings, Vol.45, No. 1, pp. 1509-1513, <b>Jan. 2021</b> <a href="https://doi.org/10.1016/j.matpr.2020.07.673">https://doi.org/10.1016/j.matpr.2020.07.673</a>	Materials Today: Proceedings, <b>Elsevier, Q2</b>	Scopus	-	1
46	WinowlinJappes, J.T., <b>Brintha, N.C.,</b> Adam Khan, M.	Influence of heat treatment over electroless crystallinity of electroless nickel deposition, Vol. 46, No. 7, pp. 7230-7235, <b>Feb 2021</b> <a href="https://doi.org/10.1016/j.matpr.2020.12.411">DOI:10.1016/j.matpr.2020.12.411</a>	Materials Today: Proceedings, <b>Elsevier, Q2</b>	Scopus	-	-
47	Anushraj, B., Winowlin Jappes, J.T., Khan, <b>N C, Brintha</b>	Solid particle erosion studies on heat treated SU718 alloy developed through DMLS processed additive manufacturing, <b>June 2021</b> <a href="https://doi.org/10.1080/2374068X.2021.1939550">https://doi.org/10.1080/2374068X.2021.1939550</a> , 15	Advances in Materials and Processing Technologies, <b>Taylor and Francis Ltd, Q3</b>	Scopus	-	-
48	Suganya Athisayamani, <b>A. Robert Singh, T.</b> Athithan	Recognition of Ancient Tamil Palm Leaf Vowel Characters in Historical Documents using B-spline Curve Recognition, Vol. 171, Pages 2302-2309, <b>June 2020.</b> <a href="https://doi.org/10.1016/j.procs.2020.04.249">https://doi.org/10.1016/j.procs.2020.04.249</a>	Procedia Computer Science, <b>AGH University of Science and Technology, Q3</b>	Scopus	2	5
49	<b>R.Sumathi ,</b> M.Venkatesulu	Towards Better Segmentation of Abnormal Part in Multimodal Images Using Kernel Possibilistic C Means Particle Swarm Optimization with Morphological Reconstruction Filters, Vol.12, No. 3, <b>Feb 2021</b> <a href="https://doi.org/10.4018/IJEHMC.20210501.0a4">DOI:10.4018/IJEHMC.20210501.0a4</a>	International Journal of E-Health and Medical Communications, <b>IGI Global Publishing, Q4</b>	Scopus	1	1

50	<b>R.Sumathi</b> , M.Venkatesulu	An Automated Hybrid Approach for Multimodal Tumor Segmentation, Vol. 1, <b>May-2021</b> <i>doi:10.1088/1742-6596/1979/1/012047</i>	Journal of Physics: Conference Series, <b>IOP Publishing Ltd., Q4</b>	Scopus	0	-
51	<b>M.Raja</b> , A. Naga sahithi, P. Rishika, G. Prasanthi	Advanced Vehicle Tracking System Using Raspberry PI, Vol. 7, Issue. 3, PP. 1330-1334, <b>Aug-2020</b> <i>http://www.jcreview.com/issue.php?volume=Volume%207%20&amp;issue=Issue-3&amp;year=2020</i>	Journal of Critical Reviews, <b>Innovare AcademicsSciences Pvt. Ltd, Q4</b>	Scopus	-	-
52	V.Arunprasad, K.S.Gowthaman, S.Palaniyappan, <b>C.Bala Subramanian</b> , B. Aruna Devi	Advanced Analysis Scheme in Thermal Power Plant for Failure Risk and Complex Repairable System, Vol. 7, Issue. 11, PP. 4081-4089, <b>Aug-2020</b> <i>DOI:10.31838/jcr.07.14.465</i>	Journal of Critical Reviews, <b>Innovare Academics Sciences Pvt. Ltd, Q4</b>	Scopus	-	-
53	Dr. Shafali Jain, Dr.A.Gnanasekar, Dr S Hasan Hussain, <b>Dr.C.Bala Subramanian</b> , S. Stewart Kirubakaran	IoT Enabled Privacy Preserving in Federated Hybrid Smart Grid Cloud Environment Using SparkVol. 7, Issue. 7, PP. 195-202, <b>Nov 2020</b> <i>https://ejmcm.com/article2829.html</i>	European Journal of Molecular & Clinical Medicine, <b>Ubiquity Press, -</b>	Scopus	-	-
54	<b>D. Balakrishnan</b>	Resource Efficient Multi-Feature Based CBIR System Using SVM Classifier, Volume-10, Issue-10, pp 8701-8711, <b>Oct 2020</b> . <i>http://www.jgenng.com/wp-content/uploads/2020/12/volume10-issue10-96.pdf</i>	Journal of Green Engineering, <b>Alpha Publishers, Q4</b>	Scopus	-	-
55	<b>J.Jeyaranjani</b> , Utkarsh Kapoor	Machine Learning based Fitness application using BMI value, <b>May 2021</b> <i>https://doi.org/10.1088/1742-6596/1979/1/012033</i>	Journal of Physics: Conference Series, <b>IOP Publishing Ltd., Q4</b>	Scopus	-	1

56	Revoori Veeharika Reddy, Nagella Kedharnath, Mandi Akif Hussain, <b>S. Vidya</b>	Software Defect Estimation using Machine Learning Algorithms 101204-208, <b>May2021</b> <i>DOI:10.35940/ijrte.A5898.0510121</i>	International Journal of Recent Technology and Engineering (IJRTE)	Scopus	-	3
57	K. Rajeshkumar, <b>S. Dhanasekaran</b> , Dr. <b>V. Vasudevan</b>	Evaluation of risk analysis process in medical big data using Machine Learning, pp. 1-4, <b>21 April 2021</b> . <i>doi:10.1109/ICCCI50826.2021.9402607</i>	2021 International Conference on Computer Communication and Informatics (ICCCI)	Scopus Conference	-	-
58	<b>K MuthamilSudar</b> , <b>P Deepalakshmi</b> , <b>P Nagaraj</b> , V Muneeswaran	Analysis of Cyber Attacks and its Detection Mechanisms, pp. 12-16, <b>21 Dec 2020</b> <i>doi:10.1109/ICRCICN50933.2020.9296178</i>	2020 Fifth International Conference on Research in Computational Intelligence and Communication Networks (ICRCICN)	Scopus Conference	3	3
59	Raja Gopal Kesiraju, <b>P.Deepalakshmi</b>	Dynamic Churn Prediction using Machine Learning Algorithms, <b>21 April 2021</b> . <i>DOI:10.1109/ICCCI50826.2021.9402369</i>	2021 International Conference on Computer Communication and Informatics (ICCCI)	Scopus Conference	-	1
60	<b>Sudar, K. M., Nagaraj, P., Deepalakshmi, P., &amp;Chinnasamy, P.</b>	Analysis of Intruder Detection in Big Data Analytics, pp. 1-5, <b>21 Apr 2021</b> . <i>doi:10.1109/ICCCI50826.2021.9402402</i>	2021 International Conference on Computer Communication and Informatics (ICCCI)	Scopus Conference	2	1
61	<b>Sudar, K. M.</b> , Beulah, M., <b>Deepalakshmi, P., Nagaraj, P.,</b> Chinnasamy, P.	Detection of Distributed Denial of Service Attacks in SDN using Machine learning techniques, pp. 1-5, <b>21 Apr 2021</b> . <i>doi:10.1109/ICCCI50826.2021.9402517</i>	2021 International Conference on Computer Communication and Informatics (ICCCI)	Scopus Conference	3	3

62	<b>K Muthamil Sudar, P Deepalakshmi</b>	Flow-based Detection and Mitigation of Low-rate DDoS attack in SDN Environment using Machine Learning Techniques, vol 244. Springer, Singapore. <b>12 Sep 2021.</b> <a href="https://doi.org/10.1007/978-981-16-2919-8_18">https://doi.org/10.1007/978-981-16-2919-8_18</a>	International Conference on IoT and Analytics for Sensor Networks (ICWSNUCA 2021)	Scopus Conference	-	-
63	<b>J Jeyaranjani, D Devaraj</b>	Genetic Algorithm-Based Resident Load Scheduling for Electricity Cost Reduction. <b>11 Nov 2021.</b> <a href="https://doi.org/10.1007/978-981-16-5078-9_46">https://doi.org/10.1007/978-981-16-5078-9_46</a>	Machine Vision and Augmented Intelligence—Theory and Applications (MAI 2021)	Scopus Conference	-	-
64	<b>Saravanan Alagarsamy, Kartheeban Kamatchi, Vishnuvarthanan Govindaraj</b>	A Novel Technique based on Artificial Bee Colony for MR Brain Image Segmentation, <b>17 Aug 2020.</b> 10.1109/INCCES47820.2019.9167720	IEEE International Conference on Clean Energy and Energy Efficient Electronics Circuit for Sustainable Development (INCCES)	Scopus Conference	7	7
65	<b>K. Kartheeban, J. Hemalatha, C. Priya, M. Venkatesulu</b>	Secure Multicast Group Communications for IoT Applications using WSN, <b>06 Oct 2020.</b> DOI:10.1109/ICSSIT48917.2020.9214238	2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT)	Scopus Conference	-	-

66	Indumathi, N., <b>Ramalakshmi, R.,</b> & Ajith, V	Analysis of risk factors in the Firework Industries: Using Decision Tree Classifier. (pp. 811-814). <b>March 2021.</b> 10.1109/ICACITE51222.2021.9404726	2021 International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE)	Scopus Conference	-	1
67	<b>Elizabeth Rani, G.,</b> <b>Murugeswari, R.,</b> Rajini, N	Edge Detection in Scanning Electron Microscope (SEM) Images using Various Algorithms, pp. 401–405, <b>June 2020</b> 10.1109/ICICCS48265.2020.9121110	International Conference on Intelligent Computing and Control Systems, ICICCS	Scopus Conference	-	2
68	Jency, <b>R.Murugeswari,</b> <b>P.Nagaraj</b>	Online Appointment Management System in Hospitals using Distributed Resource Allocation Algorithm, <b>26 Oct 2021.</b> <a href="https://doi.org/10.1007/978-981-16-5157-1_23">https://doi.org/10.1007/978-981-16-5157-1_23</a>	International conference on Sentimental Analysis and Deep Learning. Advances in Intelligent Systems and Computing	Scopus Conference	-	-
69	<b>R. Kanniga Devi,</b> M.Muthukannan	An Internet of Things-based Economical Agricultural Integrated System for Farmers: A Review, <b>June 2020.</b> DOI:10.1109/ICICCS48265.2020.9121006	International Conference on Intelligent Computing and Control Systems (ICICCS 2020)	Scopus Conference	2	2
70	<b>Dr. R. Kanniga Devi,</b> Dr.M.Muthukannan	Self-healing Fault Tolerance Technique in Cloud Datacenter, <b>26 Feb 2021</b> DOI:10.1109/ICICT50816.2021.9358476	Sixth International Conference on Inventive Computation Technologies (ICICT 2021)	Scopus Conference	-	-

71	<b>Dr. R. Kanniga Devi,</b> Dr.M.Muthukannan	Novel Authentication Mechanisms for Hash Code, CAPTCHA and OTP in Cyber Security Domain, <b>26 Feb2021.</b> DOI:10.1109/ICICT50816.2021.9358573	Sixth International Conference on Inventive Computation Technologies (ICICT 2021)	Scopus Conference	1	1
72	S. Selva Birunda, <b>R. Kanniga Devi</b>	A Novel Score-Based Multi-Source Fake News Detection using Gradient Boosting Algorithm, <b>12 April 2021.</b> DOI:10.1109/ICAIS50930.2021.9395896, 11406 – 414	2021 International Conference on Artificial Intelligence and Smart Systems (ICAIS)	Scopus Conference	-	-
73	<b>B. Pitchaimanickam</b>	Bat Inspired Technique for Effective clustering in Wireless Sensor Networks, pp. 79-84, <b>8-10 April 2021</b> DOI:10.1109/ICCMC51019.2021.9418315	IEEE 5 <sup>th</sup> International Conference on Computing Methodologies and Communication (ICCMC'21)	Scopus Conference	-	-
74	<b>B. Pitchaimanickam</b>	Dragonfly Algorithm for Hierarchical Clustering in Wireless Sensor Networks, pp. 192-197, <b>6-8 May 2021</b> DOI:10.1109/ICICCS51141.2021.9432337	5 <sup>th</sup> International Conference on Intelligent Computing and Control Systems (ICICCS2021)	Scopus Conference	1	1
75	<b>Brintha N C,</b> J.T. WinowlinJappes; M.S. Vignesh	Managing & Detecting Fishy Nodes in MANET using Cloud Concepts, pp. 166 - 169, <b>Oct 2020</b> DOI:10.1109/ICSSIT48917.2020.9214093	IEEE Explore - International Conference on Smart Systems & Inventive Technology (ICSSIT)	Scopus Conference	-	-
76	<b>Brintha, N.C.,</b> Preethi, C., WinowlinJappes, J.T	Exploring malicious webpages using machine learning concept, <b>May 2021.</b>	IEEE Explore - 2021 2nd International Conference for Emerging Technology, INCET	Scopus Conference	-	-



		DOI:10.1109/INCET51464.2021.9456222				
77	<b>Saravanan Alagarsamy,</b> T. Abitha, S. Ajitha, S. Sangeetha, Vishnuvarthanan G	Identification of high grade and low grade tumors in MR Brain Image using Modified Monkey Search Algorithm, vol.993, pp.1-5. <b>Dec 2020.</b> DOI:10.1088/1757-899X/993/1/012052	IOP Conference Series: Materials Science and Engineering	Scopus Conference	1	1
78	<b>Saravanan Alagarsamy,</b> <b>R Raja Subramanian,</b> Theepika Shree, Mounika Balasubramanian, Vishnuvarthanan G,	Prediction of Lung Cancer using Meta-Heuristic based Optimization Technique: Crow Search Technique, pp. 186-191, <b>Apr 2021.</b> 10.1109/ICCCIS51004.2021.9397199	International Conference on Computing, Communication, and Intelligent Systems (ICCCIS)	Scopus Conference	2	2
79	G. Bharath, K. J. Manikanta, G. B. Prakash, <b>R. Sumathi</b>	Detecting Fake News Using Machine Learning Algorithms, pp. 1-5, <b>21 April 2021.</b> DOI:10.1109/ICCCI50826.2021.9402470	International Conference on Computer Communication and informatics (ICCCI)	Scopus Conference	1	1
80	Devi, R.K., <b>Elizabeth Rani, G</b>	A Comparative Study on Handwritten Digit Recognizer using Machine Learning Technique, Development, <b>Aug 2020.</b> DOI:10.1109/INCCES47820.2019.9167748	International Conference on Clean Energy and Energy Efficient Electronics Circuit for Sustainable INCCES	Scopus Conference	-	4
81	<b>Elizabeth Rani, G</b> Reddy, A.T.V., Vardhan, V.K., Harsha, A.S.S., Sakthimohan, M.	Machine learning based Cibil verification system, pp. 780–782, <b>Oct 2020,</b> 10.1109/ICSSIT48917.2020.9214195	Proceedings of the 3rd International Conference on Smart Systems and Inventive Technology, ICSSIT	Scopus Conference	-	-

82	<b>Elizabeth Rani, G,</b> Reddy, G.S., Obulareddy, P., Harshith, S.S.R., Sakthimohan, M.	Web Application for Community Question Answering, pp. 670–673, <b>April 2021.</b> 10.1109/ICACITE51222.2021.9404605	International Conference on Advance Computing and Innovative Technologies in Engineering, ICACITE	Scopus Conference	-	-
83	<b>Nagaraj, P.,</b> Rajasekaran, M. P., Muneeswaran, V., Sudar, K. M., Gokul, K.	VLSI Implementation of Image Compression using TSA Optimized Discrete Wavelet Transform Techniques, pp. 667-670, <b>Oct 2020.</b> 10.1109/ICSSIT48917.2020.9214220	2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT) in IEEE	Scopus Conference	8	8
84	Varma, C. G., <b>Nagaraj, P.,</b> Muneeswaran, V., Mokshagni, M., Jaswanth, M.	Astute Segmentation and Classification of leucocytes in blood microscopic smear images using titivated K-means clustering and robust SVM techniques, (pp. 818-824). IEEE. <b>May 2021</b> DOI:10.1109/ICICCS51141.2021.9432309	2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS)	Scopus Conference	2	1
85	Muneeswaran, V., <b>Nagaraj, P.,</b> Godwin, S, Vasundhara, M, Kalyan, G.	Codification of Dental codes for the Cogent Recognition of an Individual, (pp. 1387-1390). IEEE. <b>May 2021.</b> 10.1109/ICICCS51141.2021.9432141	2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS)	Scopus Conference	2	2
86	<b>Sudar, K. M,</b> Lokesh,D. L, Chowdary, Y. C., <b>Nagaraj, P,</b> Chinnasamy,P.	Region based Skull Eviction Techniques: An Experimental Review., (pp. 629-634). IEEE. <b>May 2021.</b> DOI:10.1109/ICICCS51141.2021.9432253	2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS)	Scopus Conference	2	1

87	<b>R. R. Subramanian,</b> K. Seshadri	Randomized Gossip Algorithm based RSU Distribution for VANETs leveraging Fog Computing, pp. 1-5, <b>Aug 2020.</b> DOI:10.1109/INCCES47820.2019.9167694	IEEE International Conference on Clean Energy and Energy Efficient Electronics Circuit for Sustainable Development (INCCES), India	Scopus Conference	0	1
88	<b>R. R. Subramanian,</b> C. S. Niharika, D. U. Rani, P. Pavani and K. P. L. Syamala	Design and Evaluation of a Deep Learning Algorithm for Emotion Recognition, pp. 984-988, <b>May 2021</b> DOI:10.1109/ICICCS51141.2021.9432336	5 <sup>th</sup> International Conference on Intelligent Computing and Control Systems (ICICCS)	Scopus Conference	0	-
89	D. Tanouz, <b>R. R. Subramanian,</b> D. Eswar, G. V. P. Reddy, A. R. Kumar, C. V. N. M. Praneeth,	Credit Card Fraud Detection Using Machine Learning, pp. 967-972, <b>May 2021</b> DOI:10.1109/ICICCS51141.2021.9432308	5 <sup>th</sup> International Conference on Intelligent Computing and Control Systems (ICICCS)	Scopus Conference	-	2
90	<b>R. R. Subramanian,</b> R. Avula, P. S. Surya and B. Pranay	Modeling and Predicting Cyber Hacking Breaches, pp. 288-293, <b>May 2021.</b> DOI:10.1109/ICICCS51141.2021.9432175	5 <sup>th</sup> International Conference on Intelligent Computing and Control Systems (ICICCS)	Scopus Conference	-	-
91	<b>R. R. Subramanian,</b> K. Y. Varma, K. Balaji, M. D. Reddy, A. Akash and K. N. Reddy	Multiplayer Online Car Racing with BCI in VR, pp. 1835-1839, <b>May 2021</b> DOI:10.1109/ICICCS51141.2021.9432154	5 <sup>th</sup> International Conference on Intelligent Computing and Control Systems (ICICCS)	Scopus Conference	1	1
92	<b>R. Raja Subramanian,</b> H. Mohan, A. Mounika Jenny, D. Sreshta, M. Lakshmi Prasanna and P. Mohan	PSO Based Fuzzy-Genetic Optimization Technique for Face Recognition, pp. 374-379, <b>March 2021.</b> DOI:10.1109/Confluence51648.2021.9377028	11 <sup>th</sup> International Conference on Cloud Computing, Data Science & Engineering (Confluence)	Scopus Conference	-	-

93	<b>R. R. Subramanian</b> , N. Akshith, G. N. Murthy, M. Vikas, S. Amara and K. Balaji	A Survey on Sentiment Analysis, pp. 70-75, <b>Mar 2021</b> DOI:10.1109/Confluence51648.2021.9377136	11 <sup>th</sup> International Conference on Cloud Computing, Data Science & Engineering (Confluence)	Scopus Conference	-	-
94	<b>R. R. Subramanian</b> , D. Achuth, P. S. Kumar, K. Naveen kumar Reddy, S. Amara and A. S. Chowdary	Skin cancer classification using Convolutional neural networks, pp. 13-19, <b>Mar 2021</b> DOI:10.1109/Confluence51648.2021.9377155	11 <sup>th</sup> International Conference on Cloud Computing, Data Science & Engineering (Confluence)	Scopus Conference	-	-

#### Other Publications CAYm1 (2020-21)

S.No	Authors	Publication Details	Journal Details	Impact Factor/ Scopus/ Others	Google scholar citation
1	<b>C Bala Subramanian</b> , Etlam Jaswanth, Ch Pushyanth Reddy	Secured Patent Record in Cloud Environment, Volume-29, Issue-7, <b>June 2020</b> . <a href="http://sersc.org/journals/index.php/IJAST/article/view/27263">http://sersc.org/journals/index.php/IJAST/article/view/27263</a>	International Journal of Advanced Science and Technology	Others	-
2	V. Arunprasad, K.S. Gowthaman, S. Palaniyappan, <b>C. Bala Subramanian</b> , B. Aruna Devi Baseera	Advanced Analysis Scheme in Thermal Power Plant for Failure Risk and Complex Repairable System, Volume-7, Issue-11, Page No. 4081-4089, <b>August 2020</b> . doi: <a href="https://doi.org/10.31838/jcr.07.14.465">10.31838/jcr.07.14.465</a>	Journal of Critical Reviews	Others	-
3	<b>B. Pitchaimanickam</b> , P Neshma Vaishnavi, Ch. Keerthana, P. Akhila	News webpage classification using URL content and structure attributes, Vol. 27, no 1, pp 1-5, <b>May 2021</b> .	International Journal of Emerging Technology in Computer Science and Engineering (IJETCSE)	Others	11
4	<b>B. Pitchaimanickam</b> ,	Sentiment Analysis of Polarity in Product reviews in Amazon product media using multi	International Research Journal of Engineering and Technology (IRJET)	Others	-

	K.Sasi kiran Reddy, S.V.S.C Harshith, S.V Surendra Reddy	model classification, Vol 8, no 5, pp 945- 949, <b>May 2021.</b> <a href="https://www.irjet.net/archives/V8/i5/IRJET-V8I5188.pdf">https://www.irjet.net/archives/V8/i5/IRJET-V8I5188.pdf</a>			
5	<b>B.Pitchaimanickam,</b> M.Udaya sree, P Meghana, E Sowjanya	Plant Disease classification using image segmentation and support vector machine, Vol 8, no 5, pp 775- 781, <b>May 2021.</b> <a href="https://www.irjet.net/archives/V8/i5/IRJET-V8I5156.pdf">https://www.irjet.net/archives/V8/i5/IRJET-V8I5156.pdf</a>	International Research Journal of Engineering and Technology (IRJET)	Others	-
6	<b>D. Balakrishnan,</b> <b>T. Dhiliphan</b> <b>Rajkumar,</b> <b>S. Dhanasekaran,</b> <b>B. S. Murugan</b>	Cloud Integrated Vehicle Pollution Detection and Monitoring Using IOT, Volume-11, Issue- 3, <b>March 2021.</b> <a href="http://www.jgenng.com/wp-content/uploads/2021/3/volume11-issue3-61.pdf">http://www.jgenng.com/wp-content/uploads/2021/3/volume11-issue3-61.pdf</a>	Journal of Green Engineering	Others	-
7	<b>R. Sumathi,</b> M.Venkatesulu	An Automated Framework to segment the tumor part of Multimodal images using Cuckoo search with Kernel Fuzzy C Means Clustering, Vol. 29, No. 7, pp. 105685-105697, <b>June 2020</b> <a href="http://sersec.org/journals/index.php/IJAST/article/view/27264">http://sersec.org/journals/index.php/IJAST/article/view/27264</a>	International Journal of Advanced Science and Technology	Others	-
8	K. Aashish Dubey, K. Bharath Ganesh , V. Gowtham , <b>D. Balakrishnan</b>	Phishing Email Detection, Volume 28 Issue 4, pp 5-8, <b>April 2021,</b> <a href="https://www.ijetcse.com/view_paper.php?id=101&amp;iid=101">https://www.ijetcse.com/view_paper.php?id=101&amp;iid=101</a>	International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE)	Others	-
9	<b>J. Jeyaranjani ,</b> <b>T. Dhiliphan</b> <b>Rajkumar,</b> Ananth Kumar	Coronary heart disease diagnosis using the efficient ANN model, Volume 47, Part 19, <b>March 2021.</b> 10.1016/j.matpr.2021.01.257	Materials Today: Proceedings	Others	3
10	M.Prakash,S. T.Kailash S. M. Hruishikesh srikumar <b>Dr.A.Robert Singh</b>	Smart Village: IoT Based Solar Powered Smart Agriculture System for Monitoring Climatic Change and Soil Fertilization, pp 1-4, <b>April</b> <b>2021,</b> <a href="http://www.enggjournals.com/ijcse/doc/IJCSE20-12-01-020.pdf">http://www.enggjournals.com/ijcse/doc/IJCSE20-12-01-020.pdf</a>	International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE)	Others	-

**Publication Details (CAYm2 (2019-20))**

<b>No. of SCI Indexed Publications</b>	<b>18</b>
<b>No. of Scopus Indexed Publications</b>	<b>32</b>
<b>No. of other Publications</b>	<b>58</b>

**SCI Indexed Publications CAYm2 (2019-20))**

<b>S.No.</b>	<b>Authors</b>	<b>Publication Details</b>	<b>Journal Details</b>	<b>Impact Factor/ Scopus/ Others</b>	<b>Scopus Citation</b>	<b>Google Scholar Citation</b>
1	Prajoona Valsalan P Sriramakrishnan, Sridhar S, Ramkumar S Charlyn Pushpa Latha Priya A, <b>Robert Singh A,</b> T. Rajendran	Knowledge based fuzzy c-means method for rapid brain tissues segmentation of magnetic resonance imaging scans with CUDA enabled GPU machine. <a href="https://doi.org/10.1007/s12652-020-02132-6">https://doi.org/10.1007/s12652-020-02132-6</a> , <b>May 2020.</b>	Journal of Ambient Intelligence and Humanized Computing, <b>Springer, Q1</b>	<b>7.104</b>	<b>14</b>	<b>16</b>
2	<b>Francis Saviour Devaraj A</b>	Energy aware reliable route selection scheme with clustered RP model for wireless sensor networks to promote interaction between human and sensors, Volume 11, Issue 5. <b>August 2020.</b> <a href="https://doi.org/10.1007/s12652-020-02147-z">https://doi.org/10.1007/s12652-020-02147-z</a>	Journal of Ambient Intelligence and Humanized Computing <b>Springer, Q1</b>	<b>7.104</b>	<b>01</b>	<b>01</b>
3	<b>Pitchaimanickam B</b> Murugaboopathi G	A hybrid firefly algorithm with particle swarm optimization for energy efficient optimal cluster head selection in wireless sensor networks, Vol.32, pp.7709–7723, <b>August 2019.</b> <a href="https://doi.org/10.1007/s00521-019-04441-0">https://doi.org/10.1007/s00521-019-04441-0</a>	Neural Computation & Applications, <b>Springer, Q2.</b>	<b>5.606</b>	<b>28</b>	<b>33</b>

4	Xiaoxiao, X Bin L, Ramkumar S Saravanan S Balaji M. S. P <b>Dhanasekaran S,</b> Thimmiaraja J	Electroencephalogram based communication system for locked in state person using mentally spelled tasks with optimized network model, Volume 102, <a href="https://doi.org/10.1016/j.artmed.2019.101766">https://doi.org/10.1016/j.artmed.2019.101766</a> <b>January 2020</b>	Artificial intelligence in medicine, <b>Elsevier, Q1.</b>	<b>5.326</b>	<b>5</b>	<b>6</b>
5	<b>Karkuzhali S.</b> Manimegalai, D	Distinguishing Proof of Diabetic Retinopathy Detection by Hybrid Approaches in Two-Dimensional Retinal Fundus Images, <b>May 2019</b> <a href="https://doi.org/10.1007/s10916-019-1313-6">https://doi.org/10.1007/s10916-019-1313-6</a> ,	Journal of Medical Systems, <b>Springer, Q2</b>	<b>4.460</b>	-	<b>9</b>
6	<b>Karkuzhali S</b> Manimegalai D	Robust intensity variation and inverse surface adaptive thresholding techniques for detection of optic disc and exudates in retinal fundus images. Vol. 39, No. 3, pp. 753-764, <b>July 2019</b> <a href="https://doi.org/10.1016/j.bbe.2019.07.001">https://doi.org/10.1016/j.bbe.2019.07.001</a>	Biocybernetics and Biomedical Engineering, <b>Elsevier, Q2.</b>	<b>4.314</b>	<b>2</b>	<b>3</b>
7	<b>Saravanan Alagarsamy</b> <b>Kartheeban Kamatchi</b>	Multi-Channeled MR brain image segmentation: A new automated approach combining BAT and clustering technique for better identification of heterogeneous tumors, Vol. 39, No. 7, pp. 1005-1035, <a href="https://doi.org/10.1016/j.bbe.2019.05.007">https://doi.org/10.1016/j.bbe.2019.05.007</a> <b>December 2019.</b>	Biocybernetics and Biomedical Engineering, <b>Elsevier, Q2.</b>	<b>4.314</b>	<b>18</b>	<b>27</b>
8	<b>Francis Saviour Devaraj A</b> Mohamed Elhoseny <b>Dhanasekharan S</b> Laxmi Lydia c E Shankar K	Hybridization of firefly and Improved Multi-Objective Particle Swarm Optimization algorithm for energy efficient load balancing in Cloud Computing environments, Vol. 142, Issue:11, <b>Aug 2020</b> <a href="https://doi.org/10.1016/j.jpdc.2020.03.022">https://doi.org/10.1016/j.jpdc.2020.03.022</a>	Journal of Parallel and Distributed Computing <b>Academic Press Inc., Q2</b>	<b>3.734</b>	<b>64</b>	<b>87</b>

9	Mohammed Thaha M Pradeep Mohan Kumar K <b>Murugan, B. S,</b> <b>S.Dhanasekeran,</b> Vijayakarthish, Senthil Selvi A	Brain Tumor Segmentation Using Convolutional Neural Networks in MRI Images, <b>July 2019</b> <a href="https://doi.org/10.1007/s10916-019-1416-0">https://doi.org/10.1007/s10916-019-1416-0</a> ,	Journal of Medical Systems, <b>Springer New York, Q2</b>	<b>2.789</b>	-	<b>53</b>
10	Raj B.A, Jappes J.T.W Khan M.A, Dillibabu V <b>Brintha N.C</b>	Studies on heat treatment and electrochemical behaviour of 3D printed DMLS processed nickel-based superalloy, Vol. 125, No. 10, <a href="https://doi.org/10.1007/s00339-019-3019-5">https://doi.org/10.1007/s00339-019-3019-5</a> , <b>Oct. 2019.</b>	Applied Physics A: Materials Science and Processing, <b>Springer,</b> <b>Q2</b>	<b>2.584</b>	<b>6</b>	<b>11</b>
11	Raj B.A Jappes J.T.W Khan M.A Dillibabu V <b>Brintha N.C.</b>	Direct metal laser sintered (DMLS) process to develop Inconel 718 alloy for turbine engine components, Vol. 202, <b>Feb. 2020.</b> DOI: 10.1016/j.ijleo.2019.163735	Optik, <b>Elsevier, Q2</b>	<b>2.443</b>	-	<b>18</b>
12	Syed Rabiya M. <b>Ramalakshmi R.</b>	Multiattribute based routing for lifetime maximization in opportunistic mobile social networks, Volume 33, Issue 10. <b>May-2020</b> DOI:10.1016/j.ijleo.2019.163735	International Journal of Communication Systems, <b>Wiley Online Library, Q3</b>	<b>2.047</b>	<b>01</b>	<b>01</b>
13	Senthil P <b>Ramalakshmi R</b>	Stateful firewall enabled software defined network with distributed controllers: A network performance study, Volume 32, Issue 17. <b>Oct-2019.</b> <a href="https://doi.org/10.1002/dac.4237">https://doi.org/10.1002/dac.4237</a>	International Journal of Communication Systems, <b>Wiley Online Library, Q3</b>	<b>2.047</b>	<b>03</b>	<b>05</b>
14	Shalini V. B <b>Vasudevan V</b>	Achieving energy efficient wireless sensor network by choosing effective cluster head, <b>Nov-2017.</b> <a href="https://doi.org/10.1007/s10586-017-1375-5">https://doi.org/10.1007/s10586-017-1375-5</a> ,	Cluster Computing, <b>Springer Q3.</b>	<b>1.809</b>	<b>05</b>	<b>10</b>
15	Maragatharajan M, <b>Bala Subramanian M</b> Balakannan S. P	A Secured Manet Using Position-Based Opportunistic Routing and Semi Markov Process, Volume.31, Issue 14, Pages. E5047, <b>July 2019.</b>	Concurrency and Computation: Practice and Experience, <b>Wiley Online Library, Q3</b>	<b>1.536</b>	<b>01</b>	<b>02</b>



		<a href="https://doi.org/10.1002/cpe.5047">https://doi.org/10.1002/cpe.5047</a>				
16	<b>Abinash M.J Vasudevan V</b>	Gene data classification using Map Reduce based linear SVM, <b>Aug 2019.</b> <a href="https://doi.org/10.1002/cpe.5497">https://doi.org/10.1002/cpe.5497</a>	Concurrency and Computation: Practice and Experience, <b>Wiley Online Library, Q3</b>	<b>1.536</b>	-	-
17	<b>PonMozhi K Deepalakshmi P</b>	Joint-Angle based Yoga Posture Recognition for Prevention of Falls among Cognitive Impaired Older People, Vol. 53, No. 4, pp. 528-545, <b>Oct-2019.</b> <a href="https://doi.org/10.1108/DTA-03-2019-0041">https://doi.org/10.1108/DTA-03-2019-0041,</a>	Data Technologies and Publication, <b>Emerald, Q4.</b>	<b>0.704</b>	<b>01</b>	-
18	<b>Brintha N C Shajulin Benedict J.T. WinowlinJappes</b>	Resource allocation in cloud manufacturing using bat algorithm, Vol. 34, No. 3, pp. 296 – 310, <b>April. 2020.</b> DOI: 10.1504/IJMTM.2020.107309	Journal of Manufacturing Technology and Management, <b>Inderscience Publishers, Q4.</b>	<b>0.52</b>	<b>02</b>	<b>02</b>

## Scopus Indexed Publications (CAYm2(2019-20))

S.No	Authors	Publication Details	Journal	Impact Factor/ Scopus/ Others	Scopus citation	Google Scholar Citation
1	Navya V <b>Deepalakshmi P,</b>	Effective Transmission of Critical Parameters in Heterogeneous Wireless Body Area Sensor Networks, Vol.10, No.3-4, pp.350-370, <a href="https://www.inderscienceonline.com/doi/abs/10.1504/IJENM.2019.103161">https://www.inderscienceonline.com/doi/abs/10.1504/IJENM.2019.103161</a> <b>Oct-2019.</b>	International Journal of Enterprise Network Management, <b>Inderscience, Q4.</b>	Scopus	-	-
2	Geetha S, <b>Deepalakshmi P</b>	Rapid Retrieval of Secured Data from the Sensor Cloud using a Relative Record Index and Energy Management of Sensors, Vol.7, Issue.1-3, pp.3-14, <a href="https://www.inderscienceonline.com/doi/abs/10.1504/IJIE.2020.104641">https://www.inderscienceonline.com/doi/abs/10.1504/IJIE.2020.104641</a> <b>Jan-2020.</b>	International Journal of Intelligent Enterprise, <b>Inderscience, Q4.</b>	Scopus	-	02
3	<b>Muthamil Sudar K</b> <b>DeepalakshmiP</b>	Comparative Study on IDS using Machine learning approaches for Software Defined Networks, Vol.7, Issue.1-3, pp.16-27, <a href="https://www.inderscienceonline.com/doi/abs/10.1504/IJIE.2020.104642">https://www.inderscienceonline.com/doi/abs/10.1504/IJIE.2020.104642</a> <b>Jan-2020.</b>	International Journal of Intelligent Enterprise, <b>Inderscience, Q4.</b>	Scopus	04	04
4	Akash Awasthi <b>Deeplakshmi P</b> <b>Nagaraj P</b> Madhu Vamsi Anup Raj	Movable barcode scanning system using IOT smart glass technology, Vol.7, Issue.1-3, pp.219-318, <b>Jan-2020</b> <a href="https://www.inderscience.com/info/ingeneral/forthcoming.php?jcode=ijie">https://www.inderscience.com/info/ingeneral/forthcoming.php?jcode=ijie</a>	International Journal of Intelligent Enterprise, <b>Inderscience, Q4.</b>	Scopus	-	-
5	Wilson Prakash <b>Deepalakshmi P</b>	Flow-based Dynamic Load balancing algorithm for the Cloud networks using Software Defined Networks Vol.8, Issue.4, pp.219-318, <b>Jan-2020.</b> <a href="https://www.inderscienceonline.com/doi/abs/10.1504/IJCC.2019.104495">https://www.inderscienceonline.com/doi/abs/10.1504/IJCC.2019.104495</a>	International Journal of Cloud Computing, <b>Inderscience, Q4.</b>	Scopus	04	04

6	<b>Nagaraj P Deepalakshmi P</b>	A framework for e-Health Care Management service using Recommender System, Vol. 16, No. ½, pp.84-100, <a href="https://www.inderscienceonline.com/doi/abs/10.1504/EG.2020.105256">https://www.inderscienceonline.com/doi/abs/10.1504/EG.2020.105256</a> <b>Feb-2020.</b>	International Journal of Electronic Government, <b>Inderscience, Q4.</b>	Scopus	-	11
7	<b>MuthamilSudar K Deepalakshmi P</b>	Two Level Security Mechanism to Detect DDoS Flooding Attack in Software Defined Networks Using Entropy-based and C4.5 Technique, Vol.26, No.1, pp. 55-76, <b>March-2020.</b> DOI: 10.3233/JHS-200630	Journal of High-Speed Networks, <b>Inderscience, Q4.</b>	Scopus	06	11
8	S. Sivakumar <b>Ramalakshmi R,</b> Siva I	Automotive Drive-Shaft Health Condition Monitoring and Relaying using IoT, <b>February 2020</b> <a href="https://www.stride.gov.my/v3/images/buletin-teknikal/2020_vol_13_num_1.pdf">https://www.stride.gov.my/v3/images/buletin-teknikal/2020_vol_13_num_1.pdf</a>	Defence S and T Technical Bulletin <b>Science &amp; Technology Research Institute for Defence (STRIDE), Q4.</b>	Scopus	-	-
9	Muneeswaran V BenSujitha B Sujin B <b>Nagaraj P</b>	A compendious study on security challenges in big data and approaches of feature selection. 13(3), 23-31. <b>May – 2020</b> <a href="http://serisc.org/journals/index.php/IJCA/article/view/11521">http://serisc.org/journals/index.php/IJCA/article/view/11521</a>	International Journal of Control and Automation, <b>Science and Engineering Research Support Society, Q4</b>	Scopus	03	02
10	<b>Nagaraj P</b> Muthamilsudar K Naga Nehanth S Mohammed Shahid R Sujith Kumar V	Perceptual Image Super Resolution Using Deep Learning and Super Resolution Convolution Neural Networks (SRCNN), 37 (3), <b>June2020.</b> doi:10.3233/APC200112	Intelligent Systems and Computer Technology, <b>IOS Press, Q4</b>	Scopus	02	03
11	<b>Nagaraj P,</b> Aakash M. Arunkumar M., Dharanidharan A. Rajkumar C.	Analysis of Data Mining Techniques in Diagonalising Heart Disease, , 37, 257, doi:10.3233/APC200151 <b>June – 2020</b>	Intelligent Systems and Computer Technology. <b>IOS Press, Q4</b>	Scopus	-	-
12	Saranyadevi S <b>Murugeswari R</b> Bathrinath S	Association Rule Mining for Rainfall Prediction Using Fuzzy Context-free Grammar, Vol. 11, pp, 850-858, <b>August, 2019.</b> <a href="https://www.jardcs.org/abstract.php?id=2082">https://www.jardcs.org/abstract.php?id=2082</a>	Journal of Advanced Research in Dynamical & Control Systems, <b>Institute</b>	Scopus	01	04

			<b>of Advanced Scientific Research, Q4.</b>			
13	Thirukumaran M Jappes J.T.W <b>Brintha N.C.</b>	On the interfacial adhesion of fiber metal laminates using surface modified aluminium 7475 alloy for aviation industries—a study, Vol. 34, No.6, pp. 635-650, <b>March 2020</b> DOI:10.1080/01694243.2019.1680007	Journal of Adhesion Science and Technology, <b>Taylor &amp; Francis, Q3</b>	Scopus	01	02
14	Senthil kumar K Senthil Muthu Kumar T, Chandrasekar M Jiratti Tengsuthiwa, Rajini N Suchart Siengchin Sikiru O Ismail <b>Brintha N C</b>	Effects of stacking sequences on static, dynamic mechanical and thermal properties of completely biodegradable green epoxy hybrid composites, Vol. 6, No. 10, pp.235-246, <b>Sep. 2019</b> DOI:10.1088/2053-1591/ab3ec7	Materials Research Express, <b>IOP Publishing Ltd., Q4</b>	Scopus	05	13
15	<b>Raja Subramanian R</b> Nikhil Mourya R, Prudhvi Teja Reddy V Narendra Reddy B, Srikar Amara	Lung Cancer Prediction using Deep Learning Framework, vol. 13, no. 3, pp. 154-160, <b>May 2020.</b> <a href="http://sersc.org/journals/index.php/IJCA/article/view/24979">http://sersc.org/journals/index.php/IJCA/article/view/24979</a>	International Journal of Control and Automation, <b>Science and Engineering Research Support Society, Q4</b>	Scopus	-	02
16	<b>Deepalakshmi P</b> Visweswarann Jeevananthamm Thamaraikani C Sathiyandra kumar	Automated PE32 Threat Classification Using Import Table and Deep Neural Networks”, IEEE International Conference on Clean energy and Energy efficient electronics circuit for Sustainable development (INCCES), Kalasalingam Academy of Research and Education, on <b>December 18-21, 2019.</b> DOI:10.1109/INCCES47820.2019.9167732	<b>IEEE Xplore</b>	Scopus Conference	-	-
17	Geetha S <b>Deepalakshmi P</b> Shilpapande	Managing Crop for Indian Farming Using IoT, IEEE International Conference on Clean energy and Energy efficient electronics circuit for Sustainable development (INCCES), Kalasalingam Academy of Research and Education, on <b>December 18-21, 2019</b> DOI: 10.1109/INCCES47820.2019.9167699	<b>IEEE Xplore</b>	Scopus Conference	-	02

18	<b>Sumathi R,</b> Venkatesulu M	Segmenting MRI Brain Tumor Images Using Modified Cuckoo Search Optimization with Morphological Reconstruction Filters, <b>April 2019</b> -pp.1- doi:10.1109/INCOS45849.2019.8951331.	2019 <b>IEEE</b> International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS)	Scopus Conference	01	01
19	Harshitha Naidu Ravuvur Haritha Goda, <b>R.Sumathi,</b>	Smart Health Predicting System Using K-Means Algorithm, <b>Jan. 22 – 24, 2020</b> DOI:10.1109/ICCCI48352.2020.9104206	<b>IEEE</b> International Conference on Computer Communication and Informatics (ICCCI -2020)	Scopus Conference	-	02
20	<b>Saravanan Alagarsamy</b> Kartheeban Kamatchi Vishnuvarthanan Govindaraj	A Novel Technique for identification of tumor region in MR Brain Image, <b>DOI: 10.1109/ICECA.2019.8822188, Sep 2019.</b>	3 <sup>rd</sup> International conference on Electronics, Communication and Aerospace Technology (ICECA), <b>IEEE,</b>	Scopus Conference	07	11
21	<b>Saravanan A</b> Kartheeban K Kailasam S Akshyaa S Limsha Ravi Fernando Rajamoorthy Kirthikaa	Identification of Brain Tumor using Deep Learning Neural Networks, <b>Dec.2019.</b> DOI: 10.1109/INCCES47820.2019.9167685,	<b>IEEE</b> International Conference on Clean Energy and Energy Efficient Electronics Circuit for Sustainable Development (INCCES)	Scopus Conference	-	04
22	Rabiya M. S <b>Ramalakshmi R</b>	RIT: Remaining Inter-Contact Time based Routing for Intermittent Connected Networks. (pp. 1-4). <b>December – 2019</b> DOI:10.1109/INCCES47820.2019.9167687	<b>IEEE</b> International Conference on Clean Energy and Energy Efficient Electronics Circuit for Sustainable Development (INCCES)	Scopus Conference	-	-
23	<b>Nagaraj P</b> Rao J. S Muneeswaran V Kumar A. S.	Competent Ultra Data Compression by Enhanced Features Excerption Using Deep Learning Techniques. Pp. (1061-1066). <b>June – 2020</b> DOI:10.1109/ICICCS48265.2020.9121126	4 <sup>th</sup> International Conference on Intelligent Computing and Control Systems (ICICCS) <b>IEEE</b>	Scopus Conference	6	6
24	<b>Nagaraj P,</b> Muneeswaran V Reddy L. V, Upendra P	Programmed Multi-Classification of Brain Tumor Images using Deep Neural Network. <b>June 2020</b>	4 <sup>th</sup> international conference on intelligent computing and control systems	Scopus Conference	11	13

	Reddy, M. V. V.	DOI:10.1109/ICICCS48265.2020.9121016	(ICICCS) (pp. 865-870). <b>IEEE.</b>			
25	Dheepanchakkavarthy Azhagesan <b>Muthuvel P</b> Senthil Kumar Jeyaraj	Proficiency Estimation of Four-Leg DSTATCOM for Compensating Load of Arc Furnace in the Distribution System, <b>Dec 18 – 20,</b> <b>2019.</b> DOI:10.1109/INCCES47820.2019.9167744	<b>IEEE</b> International conference on clean energy and energy efficient electronics circuit for sustainable Development (INCSS)	Scopus Confere nce	-	-
26	Japne A <b>Murugeswari R</b>	Opinion Mining based complex polarity shift pattern handling for improved sentiment classification. <b>Feb. 2020,</b> <b>DOI:10.1109/ICICT48043.2020.9112565,</b> pp 323-329, 26-28),	International Conference on Inventive Computation Technologies (ICICT), <b>IEEE</b>	Scopus Confere nce	01	02
27	Karthiga P <b>R.Murugeswari</b> Manoranjithem R	Sentiment Analysis of Social Media Network Using Random Forest Algorithm. <b>2020(January)</b> <b>DOI: 10.1109/INCOS45849.2019.8951367</b>	<b>IEEE</b> International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS),	Scopus Confere nce	07	15
28	<b>Jeyaranjani J</b> <b>Nesarani A</b>	Internet of Things for Hearing Impaired People, <b>March 2019,</b> pp. 1943–1946, 11, DOI: 10.1109/ICCONS.2018.8663117.	Proceedings of the 2 <sup>nd</sup> International Conference on Intelligent Computing and Control Systems, ICICCS 2018, <b>IEEE</b>	Scopus Confere nce	05	03
29	<b>Jeyaranjani J</b> Devaraj D	Load Profile Generation for DR Program. <b>January 2020.</b> DOI: 10.1109/INCOS45849.2019.8951357	<b>IEEE</b> International Conference on Intelligent Techniques in Control, Optimization and Signal Processing, INCOS 2019,.	Scopus Confere nce	-	-
30	<b>Jeyaranjani J</b> Devaraj D	Deep learning based smart meter data analytics for electricity load prediction, 17 august 2020 doi:10.1109/incces47820.2019.9167704	International conference on clean energy and energy efficient electronics circuit for sustainable development. <b>IEEE</b>	Scopus Confere nce	-	01

31	<b>Elizabeth Rani G</b> Deetshana S Naidu K.Y Sakthimohan M Sarmili T	Automated Interactive Irrigation System – IoT Based Approach. <b>Jan 2020</b> , INCOS 2019, 8951382, DOI: 10.1109/INCOS45849.2019.8951382	<b>IEEE</b> International Conference on Intelligent Techniques in Control, Optimization and Signal Processing,	Scopus Conference	01	02
32	<b>R. Kanniga Devi,</b> <b>G. Elizabeth Rani</b>	A Comparative Study on Handwritten Digit Recognizer using Machine Learning Technique, <b>December 2019</b> 10.1109/INCCES47820.2019.9167748	<b>IEEE</b> International Conference on Clean energy and Energy efficient Electronics Circuit for Sustainable Development (INCCES)	Scopus Conference	-	04

#### Other Journal Publications (CAYm2(2019-20))

S. No	Authors	Publication Details	Journal Details	Impact Factor/ Scopus/ Others
1	Manjunath Kumar T <b>Murugeswari R</b>	Deep Reinforcement Learning based on link prediction approach in Social Network Analysis, <b>July 2019</b> . DOI: 10.35940/ijitee.B1127.1292S219	International Journal of Innovative Technology and Exploring Engineering	Others
2	<b>C Bala Subramanian</b> Balakannan S P	Scan and Z-Curve Trajectory for Mobile Anchor in Localization of Wireless Sensor Network. ISSN: 2277-3878, Volume-8 Issue-3, Page No. 8057-8061, <b>September 2019</b> . <a href="https://www.ijrte.org/wp-content/uploads/papers/v8i3/C6430098319.pdf">https://www.ijrte.org/wp-content/uploads/papers/v8i3/C6430098319.pdf</a>	International Journal of Recent Technology and Engineering	Others
3	Saravanan M Karthik J Rahul V <b>Dhiliphan Raj Kumar T</b>	Secure Health Care System Based on Mobile Computing, Volume-2, Issue-11, ISSN (Online): 2581-5792, <b>November-2019</b> . <a href="https://www.ijresm.com/Vol.2_2019/Vol2_Iss11_November19/IJRESM_V2_I11_16.pdf">https://www.ijresm.com/Vol.2_2019/Vol2_Iss11_November19/IJRESM_V2_I11_16.pdf</a>	International Journal of Research in Engineering, Science and Management	Others

4	Manjunath Kumar T <b>Murugeswari R</b>	Predicting Faculty Performance in Higher Education using Machine Learning, Volume-8 Issue-4, pp. 9472-9478, <a href="https://www.ijrte.org/wp-content/uploads/papers/v8i4/D9750118419.pdf">https://www.ijrte.org/wp-content/uploads/papers/v8i4/D9750118419.pdf</a> November 2019.	International Journal of Recent Technology and Engineering	Others
5	Raghupathi T Sivabalan M Jeganath S. S <b>MuthamilSudar K</b>	Preventing Man in the Middle Attack Using Machine Learning, Vol. 2, No. 11, pp. 327-331, <b>November 2019.</b> <a href="https://www.ijresm.com/Vol.2_2019/Vol2_Iss11_November19/IJRESM_V2_I11_69.pdf">https://www.ijresm.com/Vol.2_2019/Vol2_Iss11_November19/IJRESM_V2_I11_69.pdf</a>	International Journal of Research in Engineering, Science and Management	Others
6	Ashok Lawrence J Alagappan L Vignesh Varadhan L <b>Muthamil Sudar K</b>	Detection of Distributed Denial of Service Attacks using Machine Learning Techniques, Vol. 2, No.11, pp. 310-314, <b>November 2019.</b> <a href="https://www.ijresm.com/Vol.2_2019/Vol2_Iss11_November19/IJRESM_V2_I11_66.pdf">https://www.ijresm.com/Vol.2_2019/Vol2_Iss11_November19/IJRESM_V2_I11_66.pdf</a>	International Journal of Research in Engineering, Science and Management	Others
7	<b>Murugeswari R</b> Manjunath Kumar T Devaraj D Karthika P	Deep Learning based Sentiment Analysis for Social Media Network, Volume-9 Issue-1S4, pp. 93-98, <b>December 2019.</b> <a href="https://www.ijeat.org/wp-content/uploads/papers/v9i1s4/A10981291S419.pdf">https://www.ijeat.org/wp-content/uploads/papers/v9i1s4/A10981291S419.pdf</a>	International Journal of Engineering and Advanced Technology	Others
8	Nagarajan K Sumathi K <b>Deepalakshmi P</b>	Guided Analytics Platform for Southern Region of Tamilnadu Farmer Fraternity, Vol.9, No.1S4, pp.551-559, <b>December 2019.</b> DOI:10.35940/ijeat.a1123.1291s419	International Journal of Engineering and Advanced Technology	Others
9	<b>Deepalakshmi P</b> Jeevanantham M ThamaraiKani C Visweswaran N	Design of Integrated Exploitation Console using Hak5, Vol.9, No.1S4, pp.502 - 506, <b>December 2019.</b> DOI:10.35940/ijeat.a1112.1291s419	International Journal of Engineering and Advanced Technology	Others
10	Sheetal R Geetha S Shilpa Pande <b>Deepalakshmi P</b>	Patient Monitoring System with Miniaturization of Sensors, Vol.9, No.1S4, pp.495 -501, <b>December 2019.</b> DOI:10.35940/ijeat.A1111.1291S419	International Journal of Engineering and Advanced Technology	Others
11	Sathesh Kumar K Shankar K Ilayaraja M <b>Deepalakshmi P</b> Ramkumar S	Effective MKSVM Classifier with LDA Methods for Brain Tumor Detection in MR Images, Vol.8, No.4S2, pp.987-992, <b>December 2019.</b> DOI:10.35940/ijrte.D1097.1284S219	International Journal of Recent Technology and Engineering	Others



12	<b>Sumathi R</b> Venkatesulu M	Segmenting Images like MR Brain, Breast and Scintigraphy Thyroid Gland using Fuzzy C Means Based Morphological Reconstruction Filters, ISSN: 2278-3075, Vol-9, No. 2S2, pp 1011-1016, <b>December 2019</b> <a href="https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11061292S219.pdf">https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11061292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering	Others
13	<b>Deepalakshmi P</b> Vaissnave V	An Artificial Intelligence based Analysis in Legal domain, Vol.9, No.2S2, pp.1046-1051, <b>Dec 2019</b> . DOI:10.35940/ijitee.b1113.1292s219	International Journal of Innovative Technology and Exploring Engineering	Others
14	<b>Sumathi R</b> Venkatesulu M	Automated Framework for Segmenting Skin Lesions using Artificial Bee Colony Optimization with Morphological Reconstruction, ISSN: 2249 – 8958, Vol. 9, No.1S4, pp 144-148, <b>December 2019</b> . DOI:10.35940/ijeat.A1106.1291S419	International Journal of Engineering and Advanced Technology	Others
15	Hamsagayathri P Chinnasamy P <b>Deepalakshmi P</b> Praveena V Rajakumari K	Blockchain Technology: A Step Towards Sustainable Development, Vol.9, No.2S2, pp.1034-1040, <b>December 2019</b> . DOI:10.35940/ijitee.B1109.1292S219	International Journal of Innovative Technology and Exploring Engineering	Others
16	<b>Deepalakshmi P</b> Susymary J	Machine Learning for Epidemiological Analysis in The Industrial Area for a Sustainable Life, Vol.9, No.2S2, pp.1017-1025 <b>December 2019</b> . <a href="https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11071292S219.pdf">https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11071292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering	Others
17	Deepalakshmi P <b>MuthamilSudar K</b>	Flow Based Intrusion Detection System for Software Defined Networking using Hybrid Machine Learning Technique, Vol.9, No.2S2, pp.1026-1033, <b>December 2019</b> . DOI: 10.35940/ijitee.B1108.1292S219	International Journal of Innovative Technology and Exploring Engineering	Others
18	<b>Deepalakshmi P</b> Navya V	Energy Efficient Fuzzy Cost- Effective Routing for Transmission of Critical Physiological Parameters in Wireless Body Area Network under Emergency Scenarios, Vol.9, No.2S2, pp.807-813, <b>Dec 2019</b> . DOI: 10.1016/j.compeleceng.2018.10.011	International Journal of Innovative Technology and Exploring Engineering	Others

19	Ponmozhi K Maheswari K <b>Deepalakshmi P</b>	Classification of Student Performance Dataset using Machine Learning Algorithms, Vol.9, No.2S2, pp. 752-757, <b>December 2019.</b> <a href="http://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11141292S219.pdf">http://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11141292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering	Others
20	<b>Bala Subramanian C</b> Maragatharajan M Balakannan S P	A Range Based and Range Free Localization in Wireless Sensor Network, ISSN: 2277-3878, Volume-8 Issue-4S2, Page No. 669-705. <b>December 2019.</b> DOI: 10.35940/ijrte.D1113.1284S219	International Journal of Recent Technology and Engineering	Others
21	Maragatharajan M <b>Bala Subramanian C</b> Balakannan S P	Node Selection Strategy for Reliable Data Transmission in Manet using Semi Markov Process for Multicast Routing Protocol, ISSN: 2277-3878, Volume-8 Issue-4S2, Page No. 717-722. <b>December 2019.</b> <a href="https://www.ijrte.org/wp-content/uploads/papers/v8i4s2/D11161284S219.pdf">https://www.ijrte.org/wp-content/uploads/papers/v8i4s2/D11161284S219.pdf</a>	International Journal of Recent Technology and Engineering	Others
22	Maragatharajan M <b>Bala Subramanian C</b> Balakannan S P	Reliable Data Delivery in Manet using Adaptive Demand Driven Routing Protocol and Semi Markov Process ISSN: 2278-3075, Volume-9, Issue-2S2, Page No. 781-787. <b>Dec 2019.</b> DOI: 10.35940/ijitee.B1119.1292S219	International Journal of Innovative Technology and Exploring Engineering	Others
23	<b>Bala Subramanian C</b> Hemalatha J Balakannan S P Geetha S	Improving Image Steganalyser Performance using Second Order SPAM Features Extracting through Contourlet Transform, ISSN: 2249 – 8958, Volume-9 Issue-1S4, Page No. 137-143. <b>December 2019</b> DOI: 10.35940/ijeat.a1105.1291s419	International Journal of Engineering and Advanced Technology	Others
24	Raja M Dhanasekaran S <b>Bala Subramanian C</b>	Contactless Detection of Heartbeat and Cardiopulmonary Modeling using Vector Analyzer ISSN: 2278-3075, Volume-9 Issue-2S2, Page No. 419-423. <b>December 2019.</b> DOI: 10.35940/ijitee.B1142.1292S219	International Journal of Innovative Technology and Exploring Engineering	Others
25	Maragatharajan M Aarth N. S. Mahalakshmi K Muthukumar M <b>Bala Subramanian C</b>	A Novel to Project Customer Feelings via Reviews, Volume 9, Issue 1S4, Pages 69-73, <b>December 2019.</b> <a href="https://www.ijeat.org/wp-content/uploads/papers/v9i1s4/A10921291S419.pdf">https://www.ijeat.org/wp-content/uploads/papers/v9i1s4/A10921291S419.pdf</a>	International Journal of Engineering and Advanced Technology	Others

26	Ragul Kumar S Winowlin Jappes J T Siva I, <b>Brintha N C</b>	Acacia Ferrugenia Reinforced Polyester Composites, <b>Dec 2019</b> . <a href="https://www.ijrte.org/wp-content/uploads/papers/v8i4s4/D10631284S419.pdf">https://www.ijrte.org/wp-content/uploads/papers/v8i4s4/D10631284S419.pdf</a>	International Journal of Recent Technology and Engineering	Others
27	Sangilimuthukumar Winowlin Jappes J T Siva I, <b>Brintha N C</b>	The Low-Cost, High-Performance Material for Automotive Application, <b>December 2019</b> . DOI:10.35940/ijitee.B1428.1292S219	International Journal of Innovative Technology and Exploring Engineering	Others
28	<b>Murugeswari R</b> Elizabethrani G Rama Sakthi G Atchैया B	PHISHSTORM: Detection Mechanism for Finding the Phishing and Legitimate Websites by Implementing the Search Engine, Volume-8 Issue-4S2, pp.597-601, <b>December 2019</b> . <a href="https://www.ijrte.org/wp-content/uploads/papers/v8i4s2/D11201284S219.pdf">https://www.ijrte.org/wp-content/uploads/papers/v8i4s2/D11201284S219.pdf</a>	International Journal of Recent Technology and Engineering	Others
29	Deepalakshmi P <b>Nagaraj P</b>	Inclusion of Pre-Processing and Time Series Algorithms in Map Reduce Environment using Big Data Analytics, Vol.9, No.2S2, pp. 798-802, <b>Dec 2019</b> . DOI: 10.35940/ijitee.B1122.1292S219	International Journal of Innovative Technology and Exploring Engineering	Others
30	<b>Pitchaimanickam B</b> Murugaboopathi G	Hybrid Bacteria Foraging Optimization with Cuckoo Search Algorithm for Optimal Cluster head Selection in Wireless Sensor Networks, Volume 9, Issue 1S4, <b>Dec 2019</b> . DOI: 10.35940/ijeat.A1097.1291S419,	International Journal of Engineering and advanced Technology	Others
31	<b>Subramanian R.</b> Ramar R	Design of Offline and Online Writer Inference Technique, vol. 9, no. 2S2, <b>December 2019</b> DOI: 10.35940/ijitee.B1129.1292S219	International Journal of Innovative Technology and Exploring Engineering	Others
32	Karthikeyan P <b>Bala Subramanian. C</b> Arunprasad V Karthik M	Design and Implementation of Solar Powered Tricycle for Physically Challenged Person, ISSN: 2245-4586, Volume-10, Issue-3, Page No.1018-1034, <b>April 2020</b> . <a href="http://www.jgenng.com/wp-content/uploads/2020/04/volume10-issue3-29.pdf">http://www.jgenng.com/wp-content/uploads/2020/04/volume10-issue3-29.pdf</a>	Journal of Green Engineering	Others
33	<b>Balakrishnan D</b> Niraimathi R.C Sabera S.J	Fog Centric Secure Cloud Storage Scheme, ISSN: 0976-1353 Volume 27 Issue 1, pp. 1-4, <b>April 2020</b> .	International Journal of Emerging Technology in Computer Science & Electronics	Others
34	Mounika Rajeswari Pichika <b>Brintha N.C</b>	Glaucoma Detection Using Fundus Image of Eye, Vol. 27, No.1, pp.1-6, <b>April 2020</b> .	International Journal of Emerging Technology in	Others

			Computer Science & Electronics	
35	<b>MuthamilSudar</b> Mounika Kodela <b>K</b> PranathiSivva	Scrutinize The Utility of Preserved Data in Vol. 13, No. 2, pp.1228-1237, <b>April 2020</b> . <a href="https://sersec.org/journals/index.php/IJFGCN/article/view/19710">https://sersec.org/journals/index.php/IJFGCN/article/view/19710</a>	International Journal of Future Generation Communication and Networking	Others
36	<b>MuthamilSudar K</b> Stanley Sharun T Satheesh Kumar B	Intelligent Healthcare System using a Machine learning model to Predict Diseases Vol. 29, No. 8s, pp. 3148-3154, <b>April 2020</b> . <a href="http://sersec.org/journals/index.php/IJAST/article/view/16385">http://sersec.org/journals/index.php/IJAST/article/view/16385</a>	International Journal of Advanced Science and Technology	Others
37	<b>Wilson Prakash S</b> Sri Hari S SanthiyaSree R.M Divya P.G	Human-Computer Interface with Eye Movement, 9 (7), 920-924, <b>April 2020</b> . DOI: 10.35940/ijitee.G5726.059720	International Journal of Innovative Technology and Exploring Engineering	Others
38	<b>Saravanan Alagarsamy</b> S Ramkumar Kartheeban Kamatchi Hari Shankar Ajith Kumar Sanjeev Karthick Praveen Kumar	Designing an Advanced Technique for Detection and Violation of Traffic Control System, 7(8),2874-2879, <b>April 2020</b> . DOI:10.31838/jcr.07.08.473	Journal of Critical Reviews	Others
39	<b>Saravanan Alagarsamy</b> KartheebanKamatchi Mehta Maharshi	Association of Identical Pairs Using Natural Language Processing, 24(6),7320-7327, <b>April 2020</b> . <b>DOI:</b> 10.37200/IJPR/V24I6/PR260737	International Journal of Psychosocial Rehabilitation	Others
40	<b>Saravanan Alagarsamy</b> VishnuvarthanGovinda raj	Identification of Various Diseases in Guava Fruit using Spiral Optimization (SPO) Technique, 83,9561-9566, <b>April 2020</b> . <a href="https://www.testmagzine.biz/index.php/testmagzine/article/view/5341">https://www.testmagzine.biz/index.php/testmagzine/article/view/5341</a>	Test engineering and management	Others
41	<b>Saravanan A,</b> VishnuvarthanGovinda raj Mahammed Irfan, Ragavendra Swami, Nikhil Mani Kumar	Smart Recognition of Real Time Face using Convolution Neural Network (CNN) Technique, 83, 23406-23411, <b>April 2020</b> . <a href="https://www.testmagzine.biz/index.php/testmagzine/article/view/11454">https://www.testmagzine.biz/index.php/testmagzine/article/view/11454</a>	Test engineering and management	Others

42	Thendral Pyualnithi, <b>K Murugeswari</b> Kandavel Rajvardhan Dixit	Lyrics Generation using Recurrent Neural Networks. Vol. 12 No. 01, <b>Jun 2020</b> . <a href="http://www.enggjournals.com/ijcse/abstract.html?file=20-12-01-020">http://www.enggjournals.com/ijcse/abstract.html?file=20-12-01-020</a>	International Journal on Computer Science and Engineering	Others
43	J. Pamina, <b>T. Dhiliphan Rajkumar</b> S. Kiruthika T. Suganya, Femila.F	Exploring Hybrid and Ensemble Models for Customer Churn Prediction in Telecom Sector, ISSN: 2277-3878, Volume-8 Issue-2, <b>July 2019</b> <a href="https://www.ijrte.org/wp-content/uploads/papers/v8i2/A9170058119.pdf">https://www.ijrte.org/wp-content/uploads/papers/v8i2/A9170058119.pdf</a>	International Journal of Recent Technology and Engineering (IJRTE)	Others
44	<b>Dhiliphan Rajkumar. T</b> Deepa.D Jeyaranjani.J	Automatic Diagnosis of Liver Tumor in CT Images, ISSN: 2249 – 8958, Volume-9 Issue-1S4, <b>December 2019</b> <a href="https://www.ijeat.org/wp-content/uploads/papers/v9i1s4/A11161291S419.pdf">https://www.ijeat.org/wp-content/uploads/papers/v9i1s4/A11161291S419.pdf</a>	International Journal of Engineering and Advanced Technology (IJEAT),	Others
45	Scaria Alex <b>Dhiliphan Rajkumar T</b>	Hybrid Optimization Driven Technique for Malicious JavaScript Detection Based on Deep Learning Classifier”, ISSN: 2278-3075, Volume-9, Issue-2S2. <b>December 2019</b> <a href="https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11211292S219.pdf">https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11211292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering (IJITEE),	Others
46	Gul shairabanu.J <b>Dhiliphan Rajkumar.T</b>	An Implementation of Map Reduce on the Hadoop for analyzing big data, ISSN: 2277-3878, Volume-8 Issue-4S2, <b>December 2019</b> . <a href="https://www.ijrte.org/wp-content/uploads/papers/v8i4s2/D11151284S219.pdf">https://www.ijrte.org/wp-content/uploads/papers/v8i4s2/D11151284S219.pdf</a>	International Journal of Recent Technology and Engineering (IJRTE),	Others
47	Scaria Alex <b>Dhiliphan Rajkumar T</b>	Blockchain Technology and Cryptocurrency, ISSN: 2277-3878, Volume-8 Issue-4S2, <b>December 2019</b> . <a href="https://www.ijrte.org/wp-content/uploads/papers/v8i4s2/D11181284S219.pdf">https://www.ijrte.org/wp-content/uploads/papers/v8i4s2/D11181284S219.pdf</a>	International Journal of Recent Technology and Engineering (IJRTE)	Others
48	<b>Dhiliphan Rajkumar T</b> , Manish Kumar L Akhila N SaiKeerthana P	Performance Analysis of Machine Learning Techniques to Predict Diabetes Mellitus, Vol. 29, No. 9s, pp. 6366-6373, <b>May2020</b> <a href="http://sersc.org/journals/index.php/IJAST/article/view/20248">http://sersc.org/journals/index.php/IJAST/article/view/20248</a>	International Journal of Advanced Science and Technology	Others
49	<b>Karuppasamy K</b> Arumugam S	Global Convexity Graph of a Graph., <b>Dec 2019</b> DOI: 10.35940/ijeat.A1203.1291S419	International Journal of Engineering and Advanced Technology (IJEAT)	Others

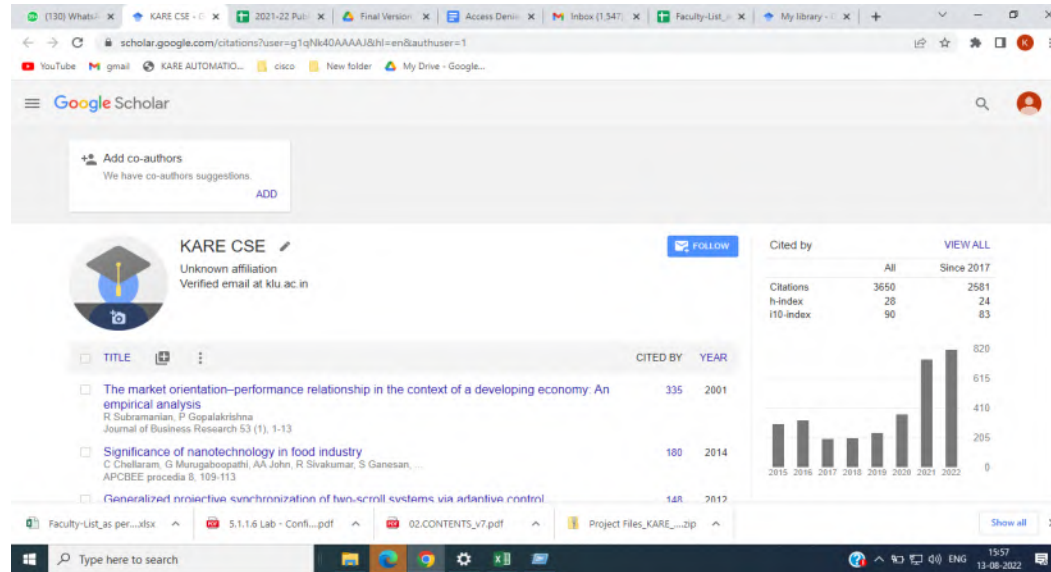
50	<b>Karuppasamy K</b> Arumugam S	Total Mean Labeling Graphs, <b>Dec 2019</b> , DOI:10.35940/ijrte.D1036.1284S419	International Journal of Recent Technology and Engineering (IJRTE)	Others
51	Ananthakumar R <b>Kartheeban K</b>	Effectual Resource Allocation using Auction Mechanism in Cloud Computing ISSN: 2278-3075, Volume-9, Issue-2S2, <b>December 2019</b> <a href="https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11251292S219.pdf">https://www.ijitee.org/wp- content/uploads/papers/v9i2s2/B11251292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	Others
52	SherinMariamJohn <b>Kartheeban K</b>	Spam Detection in Online Comments Based on Feature Weight Breakdown ISSN: 2278-3075, Volume-9, Issue-2S2, <b>December 2019</b> <a href="https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11401292S219.pdf">https://www.ijitee.org/wp- content/uploads/papers/v9i2s2/B11401292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	Others
53	Sherin Mariam John <b>Kartheeban K</b>	Sentiment Scoring and Performance Metrics Examination of Various Supervised Classifiers ISSN: 2278-3075, Volume-9 Issue-2S2, <b>December 2019</b> <a href="https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11111292S219.pdf">https://www.ijitee.org/wp- content/uploads/papers/v9i2s2/B11111292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	Others
54	Diana Arulkumar <b>Kartheeban K</b>	Prediction of Adversary's TTP using Caldera, ISSN: 2278- 3075, Volume-9, Issue-2S2, <b>December 2019</b> <a href="https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11151292S219.pdf">https://www.ijitee.org/wp- content/uploads/papers/v9i2s2/B11151292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	Others
55	Ramachandran V <b>Ramalakshmi R</b> Mathankumar K	Accident Prevention and Traffic Pattern Analysis System for Hilly Regions, ISSN: 2278-3075, Volume-9, Issue-2S2, <b>December 2019</b> <a href="https://www.ijitee.org/wp-content/uploads/papers/v9i2s2/B11281292S219.pdf">https://www.ijitee.org/wp- content/uploads/papers/v9i2s2/B11281292S219.pdf</a>	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	Others
56	Divya Pushpalakshmi M, <b>Ramalakshmi R</b> Ramachandran V	Canny Helmet: A Sustainable Protection for New Generation ISSN: 2249 – 8958, Volume-9 Issue-1S4, <b>December 2019</b> <a href="https://www.ijeat.org/wp-content/uploads/papers/v9i1s4/A11151291S419.pdf">https://www.ijeat.org/wp- content/uploads/papers/v9i1s4/A11151291S419.pdf</a>	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	Others
57	Ramachandran V <b>Ramalakshmi R</b>	Deep Learning based Recommendation System for Profitable Agricultural Plantation ISSN: 3193 – 3203, Volume-29 Issue-9S, <b>Jan 2020</b>	International Journal of Advanced Science and Technology	Others

		<a href="http://sersc.org/journals/index.php/IJAST/article/view/15880">http://sersc.org/journals/index.php/IJAST/article/view/15880</a>		
58	<b>P. Nagaraj</b> , K. Saiteja, D. Abhishek, M. Ganesh, K. Manikanta	Strategies of Analysis for the Improvement of Business Analytics Using Collaborative Data Mechanism, <b>March – April 2020</b> ISSN: 0193-4120 Page No. 9567 - 9571 <a href="https://www.testmagazine.biz/index.php/testmagazine/article/view/5342">https://www.testmagazine.biz/index.php/testmagazine/article/view/5342</a>	Test Engineering and Management	Others

The summary of department citation and h-index is depicted in Table. 5.8.1c.

**Table. 5.8.1c Summary of Department Citation:**

	<b>Overall</b>	<b>Since 2017</b>
<b>Citation</b>	<b>3550</b>	<b>2581</b>
<b>h-index</b>	<b>28</b>	<b>24</b>
<b>i10-index</b>	<b>90</b>	<b>83</b>



**Fig. 5.8.1. Department Citation**

The details of books and book chapters authored by our department faculty members are summarized in Table. 5.8.1d and Table. 5.8.1e which is mentioned below respectively.



Table. 5.8.1d. Summary of books published by faculty members

Books Published				
S. No	Authors	Title of the Book	Publisher	ISBN
1	<b>Vasudevan.V, Dhanasekaran.S Murugan.B.S,</b>	Information Security – A Practical Approach	ISTE (Indian Society for Technical Education) WPLP (Working Professional Learning Projects) Bangalore.	978-81-89731-24-3, <b>2019</b>
2	<b>Dr.P.Deepalakshmi</b>	Fundamental Data Structures and Algorithms	Pearson	978-93-53069-69-8, <b>2019</b>
3	L.Sathish kumar M.Nalini <b>T.Dhiliphan Rajkumar</b>	Programming in JAVA	XPRESS Publishing, Notion Press Media Pvt.Ltd, Chennai-31.	978-1-64760-121-8, <b>2019.</b>
4	Mr. Basavaraj Patil, Prabakaran S, <b>Nagaraj P,</b> Sowmiya Patil	Elements of the Theory of Computation	AGAT Saliha Publications, Tamil Nadu. India	978-81-948141-6-0, <b>Aug 2020.</b>
5	Dr. A. Suganya, <b>Dr. A. Robert Singh</b> Dr. S.Hariharasitaraman	Introduction to Computer Vision	Notion Press.	ISBN: 9798885553490, <b>2022</b>
6	<b>Mr. R. Raja Subramanian</b> <b>Dr. P. Deepalakshmi</b> Dr. R. Raja Sudharsan	A Deep Dive into Python Programming	Pandit Publications	ISBN: 978-93-93769-06-0 <b>2022</b>

**Table. 5.8.1d. Summary of book chapters published by faculty members**

YEAR	Book Chapters Published
CAY (2021-2022)	16
CAY (2020-2021)	17
CAYm1 (2019-2020)	11

**Table. 5.8.1e Book Chapters Published**

S. No	Authors	Title of the Chapter	Name of the Book Published	ISBN
1.	Navya V. <b>Deepalakshmi P</b>	Threshold Based Energy Efficient Routing Protocol for Critical Data Transmission to Increase Lifetime in Heterogeneous Wireless Body Area Sensor Network	Intelligent Pervasive Computing Systems for Smarter Healthcare	978-1-119-43896-0, <b>July 2019</b>
2	<b>A. Robert singh</b> D.Devaraj R.Narmatha Banu	An Intelligent Algorithm for Joint Routing and Link Scheduling in AMI with a Wireless Mesh Network	Studies in Computational Intelligence	978-981-10-8796-7, <b>Sep 2019</b>
3	<b>Saravanan Alagarsamy</b> KartheebanKamatchi VishnuvarthananGovin daraj	An Automated Hybrid Methodology Using Firefly Based Fuzzy Clustering for Demarcation of Tissue and Tumor Region in Magnetic Resonance Brain Images, pp.193-208,	Advances in Computerized Analysis in Clinical and Medical Imaging	9780429446030, <b>November 2019.</b>
4	<b>T. Joshva Devadas</b> <b>R. Raja Subramanian</b>	Paradigms of Intelligent IoT Architecture	Principles of Internet of Things (IoT) Ecosystem: Insight Paradigm	978-3-030-33596-0, <b>Jan 2020</b>

5	<b>R. Ramalakshmi</b> M. Swashi D. Tamilselvi	Modelling Alzheimer's People Brain Using Augmented Reality for Medical Diagnosis Analysis	Intelligent Human Systems Integration 2020	978-3-030-39511-7, <b>Jan 2020</b>
6	<b>K.Murugeswari</b> B.Balamurugan G.Ganesan	Blockchain and Bitcoin Security	Cryptocurrencies and Blockchain Technology Applications	9781119621164, <b>Jan 2020</b>
7	<b>R.Murugeswari</b> S.Saranyadevi S.Bathrinath, M.S.Sabitha	Hybrid Association Rule Miner Using Probabilistic Context-Free Grammar and Ant Colony Optimization for Rainfall Prediction	Thermal Stresses—Advanced Theory and Applications	978-3-030-16656-4, <b>Jan 2020</b>
8	Manjunathkumar T <b>Murugeswari R</b> Devaraj D Hemalatha J	Comparison of Deep Learning and Random Forest for Rumor Identification in Social Network.	Advances in Intelligent Systems and Computing,	978-981-15-1286-5, <b>Jan 2020.</b>
9	<b>P.Chinnasamy,</b> <b>P.Deepalakshmi</b>	An analysis of security access control on healthcare records in the cloud	Intelligent Data Security Solutions for e-Health Applications	978-0-12-819511-6, <b>Jan 2020</b>
10	<b>Deepalakshmi P</b> Shankar K	Role of Ant Colony Optimization in Job Shop Scheduling Problems	Evolutionary Computation in Scheduling	9781119574293, <b>March 2020.</b>
11	<b>Bala Subramanian C,</b> Hemalatha Jeyaprakash Geetha Subbiah	A comparative note on recent advances of signal/image processing techniques in healthcare	Advances in Telemedicine for Health Monitoring Technologies, Design and Applications	9781785619878, <b>Apr 2020</b>
12	Vamsi A.M., <b>Deepalakshmi P.,</b> <b>Nagaraj P.,</b> Awasthi A., Raj A	IOT Based Autonomous Inventory Management for Warehouses	EAI/Springer Innovations in Communication and Computing	978-3-030-19562-5, <b>Aug 2020.</b>
13	Ponmozhi K., <b>Deepalakshmi P</b>	A Posture Recognition System for Assisted Self-Learning of Yoga by Cognitive Impaired Older People for the Prevention of Falls.	EAI/Springer Innovations in Communication and Computing	978-3-030-19562-5, <b>Aug 2020</b>
14	<b>T. Dhiliphan</b> <b>Rajkumar</b> Gul Shaira Banu Jahangeer	An Experimental Implementation of Map Reduce on the Hadoop for Analyzing Big Data	Theory and Practice of Mathematics and Computer Science	978-93-90149-22-3, <b>Sep 2020</b>

15	<b>A. Robert Singh</b> Suganya Athisayamani A. Sherly Alphonse	Enhanced Speeded Up Robust Feature with Bag of Grapheme (ESURF-BoG) for Tamil Palm Leaf Character Recognition	Inventive Communication and Computational Technologies	978-981-15-7345-3, <b>Sep 2020</b>
16	N. Ani Brown Mary <b>A. Robert Singh</b> Suganya Athisayamani	Classification of Banana Leaf Diseases Using Enhanced Gabor Feature Descriptor	Inventive Communication and Computational Technologies	978-981-15-7345-3, <b>Sep 2020</b>
17	Suganya Athisayamani <b>A. Robert Singh</b> A. Sivanesh Kumar	Recurrent Neural Network-Based Character Recognition System for Tamil Palm Leaf Manuscript Using Stroke Zoning	Inventive Communication and Computational Technologies	978-981-15-7345-3, <b>Sep 2020</b>
18	<b>S.Dhanasekaran</b> I. S. Hephzi Punithavathi A. Sivanesh Kumar P. Vijayakarthishik <b>B. S. Murugan</b>	Metaheuristic-Based Kernel Extreme Learning Machine Model for Disease Diagnosis in Industrial Internet of Things Sensor Networks	Artificial Intelligence Techniques in IoT Sensor Networks	9780367439255, <b>Dec 2020</b>
19	<b>A. Francis Saviour Devaraj,</b> P. Vijayakarthishik, <b>S.Dhanasekaran, G. Muruga boopathi,</b> <b>B.S. Murugan</b>	Fuzzy Support Vector Machine with SMOTE for Handling Class Imbalanced Data in IoT Based Cloud Environment	Artificial Intelligence Techniques in IoT-sensor networks	9781003007265, <b>Dec 2020</b>
20	Suganya Athisayamani <b>A. Robert Singh</b> <b>S. Sankara Narayanan</b> <b>S. Dhanasekaran</b>	Fire Detection by Parallel Classification of Fire and Smoke Using Convolutional Neural Network	Computational Vision and Bio-Inspired Computing	978-981-33-6862-0, <b>Jan 2021</b>
21	Perumal, B, Deny, J. Sudharsan, R. Muthukumaran, E. <b>Subramanian, R.</b>	Analysis of Amplify Forward, Decode and Amplify Forward, and Compression Forward Relay for Single and Multi-node Cognitive Radio Networks.	ICASISSET 2020, India,	978-1-63190-286-4, <b>Jan 2021</b>
22	Muneeswaran, V., <b>Nagaraj, P.,</b> Dhannushree, U., Lakshmi, S. I.,	A Framework for Data Analytics-Based Healthcare Systems. (pp. 83-96). Springer, Singapore.	In Innovative Data Communication Technologies and Application,	978-981-15-9651-3, <b>Feb, 2021</b>

23	Indumathi, N., Kalanjiyam, B., & <b>Ramalakshmi, R.</b>	Deep Learning Classification of Retinal Images for the Early Detection of Diabetic Retinopathy Disease.	Computational Intelligence for Information Retrieval	978-0-367-68080-0, <b>March 2021</b>
24	<b>Raja Subramanian R., Vasudevan V</b>	HARfog: An Ensemble Deep Learning Model for Activity Recognition Leveraging IoT and Fog Architectures., vol 956.	Modern Approaches in Machine Learning and Cognitive Science: A Walkthrough. Studies in Computational Intelligence	978-3-030-68291-0, <b>April 2021.</b>
25.	S. Krishna Narayanan <b>S. Dhanasekaran V. Vasudevan</b>	Intelligent Abnormality Detection Method in Cyber Physical Systems Using Machine Learning	Proceedings of International Conference on Machine Intelligence and Data Science Applications	9789813340862, <b>May 2021</b>
26	<b>Nagaraj, P., Muneeswaran, V., Pallikonda Rajasekaran, M., Muthamil Sudar, K., &amp; Sumithra, M.</b>	Implementation of Automatic Soil Moisture Dearth Test and Data Exertion Using Internet of Things. (pp. 511-517). Springer, Singapore.	In Emerging Technologies in Data Mining and Information Security,	978-981-15-9927-9, <b>May 2021.</b>
27	<b>Nagaraj, P., Muneeswaran, V., Ali, R. S., Kumar, T. S., Someshwara, A. L., &amp; Pranav, J.</b>	Flexible Bolus Insulin Intelligent Recommender System for Diabetes Mellitus Using Mutated Kalman Filtering Techniques. (pp. 565-574), Singapore.	In Congress on Intelligent Systems,	978-981-33-6984-9, <b>May 2021.</b>
28	<b>A. Nesarani R. Ramalakshmi</b>	Secure Data Sharing with Interplanetary File System for Pharmaceutical Data	Artificial Intelligence for Cyber Security: Methods, Issues and Possible Horizons or Opportunities	978-3-030-72235-7, <b>June 2021</b>
29	<b>Saravanan Alagarsamy R. Raja Subramanian Praveen Kumar B Pradeep Jonnadula</b>	Designing a Smart Speaking System for Voiceless Community	Expert Clouds and Applications	978-981-16-2126-0, <b>July 2021</b>

	Sanath Reddy D			
30	<b>R. Ramalakshmi</b> M. Shanmugaeswari N. Indumathi	COVID-19 Epidemic Analysis and Prediction in Virudhunagar District Using Machine Learning	Artificial Intelligence for COVID-19	978-3-030-69743-3, <b>July 2021</b>
31	R. Anantha Kumar, <b>K. Kartheeban</b>	Broker Based Collaborative Auction method for Resource Scheduling in cloud computing	Operationalizing Multi-Cloud Environments: Technologies, Tools And Use Cases	978-3-030-74402-1, 18 <b>Sep 2021</b>
32	ShanmugaEswari M Indumathi N <b>Ramalakshmi R</b> Revathy M	Prediction of COVID-19 Outbreak with Current Substantiation Using Machine Learning Algorithms	Intelligent Interactive Multimedia Systems for e-Healthcare Applications	978-981-16-6542-4, <b>Nov 2021</b>
33	<b>P Nagaraj, P Deepalakshmi,</b> Muhammad Fazal Ijaz	Optimized adaptive tree seed Kalman filter for a diabetes recommendation system—bilevel performance improvement strategy for healthcare applications	Cognitive and Soft Computing Techniques for the Analysis of Healthcare Data, Intelligent Data-Centric Systems, Academic Press, Elsevier.	978-0-323-85751-2, <b>Jan 2022</b>
34	Muneeswaran, V., <b>Nagaraj, P.,</b> & Ijaz, M. F. (2022).	An Articulated Learning Method Based on Optimization Approach for Gallbladder Segmentation from MRCP Images and an Effective IoT Based Recommendation Framework	In Connected e-Health. Springer, Cham.	978-3-030-97928-7 <b>May 2022</b>
35	Kumar, S. P., <b>Murugeswari, R.,</b> & <b>Nagaraj, P.</b> (2022)..	Continuous Chain Fibonacci: Knowledge Management System with Chatbot.	In <i>Sentimental Analysis and Deep Learning</i> , Advances in Intelligent Systems and Computing Springer, Singapore.	978-981-16-5156-4 <b>Oct 2021</b>
36	Muneeswaran, V., <b>Nagaraj, P.,</b> Rajasekaran, M. P., Kumar, K. V., Kumar, C., & Reddy, Y.	Programmed Identification of Glaucoma Using Tree Seed Optimized Histogram Manipulation.	In <i>Artificial Intelligence and Evolutionary Computations in Engineering Systems, Advances in Intelligent Systems and Computing</i> Springer, Singapore.	78-981-16-2673-9 <b>Aug 2021</b>
37	R.Kanniga Devi, K. Krishnaraja	Efficient Data retrieval in social IoT with customized relationships, pp. 451-470,	Ingenieria y Tecnologia, 3ciencias.	ISBN 978-84-124943-4-1. <b>March 2022.</b>

38	M. Sakthimohan, <b>G.Elizabeth Rani</b> , Dr.J. Deny, <b>Dr.R.Kanniga Devi</b> , <b>Dr.R. Murugeswari</b>	Smart crop protection system, pp. 287-295,	Ingenieria y Tecnologia, 3ciencias.	978-84-124943-4-1, <b>March 2022.</b>
39	B Anushraj, <b>NC Brintha</b> , D Chella Ganesh, A Ajithram	Electrochemical Corrosion Behavior of Heat Treated Inconel 718 Superalloy Manufactured by Direct Metal Laser Sintering (DMLS) in 3.5% NaCl Solution, pp. 279–296, 2022. DOI: <a href="https://doi.org/10.1007/978-3-030-89401-6_12">https://doi.org/10.1007/978-3-030-89401-6_12</a>	Innovations in Additive Manufacturing, Springer, Cham	978-3-030-89400-9, <b>January 2022</b>
40	JT Winowin Jappes, S Vignesh, K Sankaranarayanan, M Thirukumaran, <b>NC Brintha</b>	Design of Polymer-Based Composites, pp. 41-49, ISBN: 9781003126300.	Polymer-Based Composites, CRC Press	9781003126300, <b>August 2021</b>
41	K.Meena, <b>R.Raja Sekar</b>	IOT and Deep Learning Based prophecy covid-19, PP 83-102, DOI:10.1201/9781003145004-5	Industrial Internet of Things: Technologies and Research Directions, Taylor & Francis Group	ISBN:978-0-367-70207
42	<b>S Dhanasekaran</b> , K Pradeep Mohan Kumar, A Sivanesh Kumar, R Jeya, S Rajasekaran, <b>BS Murugan</b> , <b>R Rajasubramanian</b>	Intelligent metaheuristic cluster-based wearable devices for healthcare monitoring in telemedicine systems,Pages 109-122, <a href="https://doi.org/10.1016/B978-0-323-85854-0.00007-1">https://doi.org/10.1016/B978-0-323-85854-0.00007-1</a>	Wearable Telemedicine Technology for the Healthcare Industry,Academic Press	978032385854000007-1 <b>Jan 2022,</b>
43	N Indumathi, <b>R Ramalakshmi</b> , N Selvapalam, V Ajith	Risk Perception, Risk Management, and Safety Assessments: A Review of an Explosion in the Fireworks Industry,	Computational Intelligence and Data Sciences - Book Chapter	ISBN 9781003224068, <b>March 2022</b>
44	S Sankara Narayanan, D Vinod, Suganya Athisayamani, <b>A Robert Singh</b>	Combination of Local Feature Extraction for Image Retrieval, vol 1404, pp 319–328, DOI	Proceedings of Third International Conference on Sustainable Computing, Advances in Intelligent Systems and Computing, Springer	978-981-16-4537-2 , <b>Jan 2022</b>

## Ph.D. guided /Ph.D. awarded during the assessment period while working in the institute (5)

The list of faculty members and research scholars awarded with Ph.D degree during the assessment period is mentioned in Table. 5.8.1f and Table. 5.8.1g.

**Table. 5.8.1f. List of Faculty members awarded Ph.D. during the assessment period**

S.No	Name of the Faculty	Name of the Supervisor	Title	Univ.	Viva Date
1	<b>Dr. A. Robert Singh</b>	Dr. D. Devaraj	Optimal Routing Algorithms for Wireless Mesh Network Based Advanced Metering Infrastructure (AMI) in Smart Grid	KARE	17.08.2019
2	<b>Dr. A. Saravanan</b>	<b>Dr. K. Kartheeban</b>	Computer Aided Detection of Pathologies in Brain Images by Applying Meta Heuristic Based Clustering Techniques	KARE	16.09.2019
3	<b>Dr. B. Pitchaimanickam</b>	<b>Dr. G. Muruga boopathi</b>	Biologically Inspired Algorithms for the Optimization of Wireless Sensor Networks Lifetime and Energy Consumption	KARE	29.06.2020
4	<b>Dr. S. Hariharasitaraman</b>	Dr. S.P. Balakannan	Analysis of Data Integrity Schemes in Cloud	KARE	30.06.2020
5	<b>Dr. C. Bala Subramanian</b>	Dr. S.P. Balakannan	Effective Localization in Wireless Sensor Network using Trajectory Planning of Mobile Anchors	KARE	22.09.2020
6	<b>Dr. B. Balakiruthiga</b>	Dr. P. Deepalakshmi	Design of Traffic Optimization Schemes for Software Defined Data Center	KARE	07.12.2021
7	<b>Dr. K. Muthamil Sudar</b>	Dr. P. Deepalakshmi	Design of Intrusion Detection System for Software Defined Networking Using Machine Learning Algorithms	KARE	01.11.2021
8	<b>Dr. Saranya Devi</b>	Dr. R. Murugeswari	Analysis of Association Rule Mining using Formal Grammars	KARE	09.08.2021



9	<b>Dr.R. Sumathi</b>	Dr. V. Vasudevan	Analysis of Tumor in Multimodal Images Using Hybrid Techniques	KARE	19.11.2021
10	<b>Dr. M. Muthulakshmi</b>	Dr. G. Murugeswari	Computational Techniques for Gnome Sequence Analysis	MS Univ.	23.03.2022
11	<b>Dr. E. Sudheer Kumar</b>	Dr. C. Shoba Bindu	Deep learning Approaches for Fundus Image Analysis to Identify Retnal Disorders	Jawaharlal Nehru Technical Univ, Ananthpur	26.05.2022

**Table. 5.8.1g. List of Scholars other than regular faculty members awarded Ph. D during the assessment period**

S. No	Faculty Name	Student Name	Research Title	Univ	Viva Date
1	<b>Dr. V. Vasudevan</b>	R. Vijayalakshmi	Efficient Task Scheduling Algorithms for Computing Environment	KARE	29.07.2019
2		Dr. G. Prabu Kanna	Enrichment of Security And Privacy in Cloud Over Outsourced Data	KARE	05.01.2019
3		Dr. M. J. Abinash	Gene Data for Cancer Classification using Hadoop Framework	KARE	03.08.2020
4		Dr. L. Gandhimathi	Intrusion Detection in Wireless Sensor Networks	KARE	09.08.2021
5	<b>Dr. P. Deepalakshmi</b>	Dr. S. Geetha	Design and Implementation of Void Free Routing in Wireless Sensor Networks	KARE	16.08.2019
6		Dr. V. Navya	Design of Energy Efficient Routing Protocols for Critical Data Transmission in Wireless Body Area Networks	KARE	20.06.2019
7		Dr. S. Wilson Prakash	Design of Dynamic Load Balancing for Software Defined Networking	KARE	06.03.2020
8	Dr. D. Devaraj	Dr. M. Jansi Rani	Development of Improved Feature Selection and Classification Algorithms for Microarray Gene Expression Data	KARE	22.06.2020
9		Dr. S.M. Sulaiman	Development of Intelligent Forecasting Techniques for Residential Loads in Smart Grid	KARE	24.06.2022
11	<b>Dr. G. Murugaboopathi</b>	Dr. A. Jainul Fathima	Computer Aided Drug Design Approaches for Developing Dengue Virus Inhibitors	KARE	17.02.2020

12		Dr. S. Subalakshmi	Performance Analysis of Eer Leach Protocol for Body Sensor Network	Bharathiyar University	20.12.2019
13	<b>Dr. R. Ramalakshmi</b>	Dr. P. Senthil	Design of Stateful Firewall With Network Function Virtualisation for Software Defined Network	KARE	24.09.2021
14		Dr. A. Nesarani	Secured Device Management for Energy Efficient Data Transmission in Internet of Things	KARE	22.10.2021
15		Dr. Syed Rabiya	Design of Opportunistic Routing Protocols for Intermittently Connected Mobile Networks	KARE	22.10.2021
16		M. Divyapushpalkshmi	Design of Machine Learning Approaches for Community Detection and Sentiment Analysis in Social Network	KARE	22.04.2022

#### Ph. D. guided during the assessment period while working in the institute (5)

The list of faculty members guiding research scholars along with the scholar details, registration information, title and the completion details is mentioned in Table. 5.8.1h.

**Table. 5.8.1h Ph. D. guiding details as a Supervisor during the assessment period While working in the institute**

S. No	Faculty Name	Student Name	Research Title	Year of Registration	Univ.
1	<b>Dr. V. Vasudevan</b>	Mr. R. Raja Subramanian	A Secure Ambulatory Healthcare Service leveraging Fog Computing	2019	KARE
2		Ms. A.Priya	Smart Teachable cognitive agents for Ambient Assistance	2020	KARE
3		Ms. Abirami B	A Novel Task Scheduling for Dynamically Reconfigurable Computing System	2020	KARE
4		Ms. Vijayaram B	Adaptive Task Offloading in Mobile Edge computing based on Swarm Intelligence Algorithms and Fuzzy Control method	2021	KARE
5		Mr. L Karuppasamy	Efficient Resource Allocation in Cloud Computing	2021	KARE
6		Ms. Veena S Nair	Raga Classification and mental healing using deep learning approach	2021	KARE
7	<b>Dr. Koteswara Rao Anne</b>	Mr. Jithin Jacob	A novel approach for intelligent Distracted Driver Detection Mechanism for Enhancing Automotive Security Using Machine Learning	2021	KARE
8		Mr. Joseph George	Medical Image Analysis and Classification Using Deep Neural Network	2021	KARE

9		Mr. Majjari Sudhakar	Comparative Analysis of Machine Learning Based Algorithms for Detection of Anomalies in Industrial Internet of Things.	2021	KAR E
10		Mr. Raja Sekar R	Biometric Spoofing Detection Using Texture Based Convolutional Neural Network	2021	KAR E
11	<b>Dr. P. Sarasu</b>	Sivadurga K	Health Monitoring of Agri-Soil with the help of Internet of Things	2021	KAR E
12		Venkateswara Reddy. P	Artificial Intelligence-Cloud Based Autonomic System for Delivering Agriculture as a Service	2021	KAR E
13		Sherin M Wilson	A Novel Approach For Developing A Learning Assistance System For Autistic Child Using Machine Learning	2022	KAR E
14	<b>Dr. K. Karuppasamy</b>	Mrs. P. Jeyalakshmi	Domination in Signed Graphs	2016	KAR E
15		Mrs. K. Kasthuri	A study on SD-Divisor Cordial Labeling of Graphs	2018	KAR E
16		Mrs. M. Manjula Devi	Study on Domination in Graphs	2020	KAR E
17		Ms. C. Gayathri	Packing Sets and its Variations in Graphs	2020	KAR E
18		Mrs. P. Vijayalakshmi	Studies in Domination in Graphs	2021	KAR E
19	<b>Dr. P. Deepalakshmi</b>	Mrs. V. Vaissnave	Applying Deep Learning techniques for qualitative and quantitative analysis of massive legal judgment texts to extract information	2019	KAR E
20		Nineesha P	Indian judgmental analysis using deep learning	2021	KAR E
21		Ms. C.Sharon Roji Priya	Sentiment Analysis of Customer Reviews in Online Platform with Deep Learning Techniques	2021	KAR E
22		Ms. Abirami K	Assistive technology for Autism and Spectrum Disorder using Novel Deep Learning Algorithms	2021	KAR E
23		Bavani K	Detection of Distributed Denial of Service attack in a Multi Controller Environment of a Software Defined Network using ENT-PCA Method	2022	KAR E
24	<b>Dr. N. Dhinaharan</b>	Mr. G. Arul Prakash	Data Breach Prevention using Machine Learning Techniques	2020	KAR E
25	<b>Dr. K. Kartheeban</b>	Mr. S. Kailasam	Online Moving Object Detection, Recognition and Tracking in Video Surveillance	2015	KAR E
26		Ms. A. Diana	Resilency in Cyber Security against APT	2015	KAR E
27		Ms. Sherin Mariam John	Sentimental analysis and opinion mining on online review	2016	KAR E
28		Mr. R. Anantha Kumar	An Optimal Resource Scheduling and Rearranging Mechanism for user Gratification in Cloud Computing	2016	KAR E

29		Esakki Muthu S	Blockchain Enabled Agri Goods Tracing and Cryptocurrency Transaction in Supply Chain Management	2021	KAR E
30		Shimja M	A novel method using combined frame based and video based supervision for the detection of Pneumonia using Lung images	2021	KAR E
31		S Asif	Prophecy of Traffic Congestion Extremity using Machine Learning Applications	2021	KAR E
32	<b>Dr. R. Ramalakshmi</b>	Mr. V. Ramachandran	Agricultural Irrigation Automation and Recommendation System using IoT	2016	KAR E
33		Mr. S. Sivakumar	Shaft condition monitoring using IoT	2016	KAR E
34		Ms. A. Malathi	Prediction of Parkinson Disease using Deep Learning	2019	KAR E
35		Ms. D. Kavitha	DDOS Attack Detection and Mitigation in SDN	2016	KAR E
36		Murugavalli K	Experimental investigation of infinity walk on physical and brain functions using EEG	2022	KAR E
37	<b>Dr. R. Murugeswari</b>	Ms. G. Elizabeth Rani	Development of an automated microstructural analysis in SEM images	2017	KAR E
38		Mr. T. Manjunath Kumar	Data Analytics using Machine learning techniques in Higher education	2017	KAR E
39		Keerthiga.S	Performance Analysis in Secured IoT using Optimization Technique	2021	KAR E
40		Thandu Nagaraju	AI moderation of chatbot in the indoor navigation and way finding for visually Impaired people	2021	KAR E
41		Raj D	Multiple Object Detection and Tracking in 3D video	2021	KAR E
42		Ms. V Arthi	Object detection in autonomous vehicles	2021	KAR E
43		Ahamed Nishath S	Comparative Analysis of Fake news Detection Algorithms and to Enhance the Performance to Predict Fake news.	2022	KAR E
44	<b>Dr. R. Kanniga Devi</b>	Ms. S. Selva Birunda	Fake news detection in Online Social Networks using Machine Learning	2019	KAR E
45		Ms. Bejjam Vasundhara Devi	Analyzing Reliability Concepts in Software Engineering : Machine Learning Approach for Software Reliability	2020	KAR E
46		Nithya.D	Decentralized Privacy Secure Digital Data in Land Registry System Using Block chain Technology	2020	KAR E
47		Mahesh Babu M	A Large-Scale Real-World Study On Predicting Processing Times And Shipment Times of Medical Supplies In Indian E-Pharmacy Using Artificial Intelligence And Machine Learning During Pandemic Times	2021	KAR E
48		Divya N J	A privacy-aware Internet of Things based Deep Learning assisted Multi-disease Diagnosis Framework for HealthCare System	2022	KAR E

49		Mr. Sankaramahalingam	A reliable interdomain routing with smart contract using blockchain technology	2022	KAR E
50		Santhosh Kumar A V	Deep Learning Based-Approaches for Spam Bots and Cyberbullying Detection in Online Social Networks	2022	KAR E
51	<b>Dr. B. S. Murugan</b>	Mr. N. Sivabalan	An Adaptive Cryptography Architecture for Highly Secured Data Transmission in IoT	2019	KAR E
52		Mr. M.Senthilkumar	Enhancing the security of an organization from Shadow IoT using Blow-fish encryption standard.	2020	KAR E
53		Ramana R	An Intelligent Method for the Detection of 3D Objects in Computer Vision	2020	KAR E
54		Ms. Prathima Y	Efficient Semantic Clustering Using Deep Autoencoders	2020	KAR E
55		Rajesh P	An Development of Efficient and secure algorithm for Dynamic Load Balancing in Cloud using Convolution neural network Fuzzy data set items	2021	KAR E
56		Shanmugapriya S	Prevent security attacks in IOT using machine learning techniques	2022	KAR E
57		Vinayagavadivu S	Investigation with opinion mining on social media texts by employing machine intelligence approaches	2022	KAR E
58		<b>Dr. S. Dhanasekaran</b>	<b>Ms. V. Manoranjitham</b>	Secure and storage efficient bigdata upload to cloud	2015
59	<b>Mr. M. Raja</b>		An analysis of attribute based encryption in lightweight cryptography	2015	KAR E
60	<b>Mr. P. Velmurugadas</b>		Enhancing Security mechanism to cloud with IOT Environment	2019	KAR E
61	Mr. S. Krishna Narayanan		Security Assessment in Cyber Physical System Using Machine Learning Techniques	2019	KAR E
62	Ms. J. Varalakshmi		A Security Model for preserving the privacy of Data in multicloud	2020	KAR E
63	Mr. K. Rajeshkumar		An Enhanced Medical Big Data Security Framework using Machine Learning	2020	KAR E
64	<b>Mr. Vijay Kumar K</b>		Intelligent Collaboration System for Reducing the Cloud Replication using On-demand Service Level	2021	KAR E
65	Ms. Parvathy Jyothi		An Automatic Method for Segmentation and Classification of MR Brain Images using Deep Learning techniques	2020	KAR E
66	<b>Dr. N. C. Brintha</b>	Ms. K. Haripriya	Securing Medical Data in Cloud Using Blockchain	2020	KAR E
67		Ms. C. Preethi	Deep Learning Based Approach for Precision Agriculture	2020	KAR E
68		Ms. S. Rajalakshmi	Pattern Recognition with Machine Learning using Scanning Electron Microscope	2020	KAR E

69		Ms. Maheswari M	Investigation of effective fault monitoring system through intelligent algorithms	2020	KAR E
70		Dennise Mathew	Empower Smart Manufacturing in Textile Industries using AI & ML Techniques	2021	KAR E
71		M Jeya Sundari	Detection and Classification of Ovarian Tumors in Obstetric Ultrasound Imaging Using Machine Learning	2021	KAR E
72		S.T.Bharathi	Trust in cloud: perspective from access control models and machine learning	2020	KAR E
73	<b>Dr. T. Dhiliphan Rajkumar</b>	Mr. Scaria Alex	Hybrid optimization driven technique for Malicious JavaScript detection based on Deep learning classifier	2018	KAR E
74		Ms. J. Gul Shaira Banu	Prediction and Prognosis of Micro Macro and calcification in Mammogram Images using various Machine Learning Techniques	2018	KAR E
75		<b>Mr. D. Balakrishnan</b>	An Intelligent and Heart rate monitoring using IoT	2018	KAR E
76		Ms. Deepa D	AI based Recommendation Systems for the Medical Practitioners	2021	KAR E
77		M. Ponsuresh	Design of a security mechanism to prevent the attack on Machine Learning Algorithms	2022	KAR E
78	<b>Dr. A. Saravanan</b>	Ms. N. Anu Lavanya	Detection of Cyber Security Threats using Machine Learning and Deep Learning Approaches in IOT	2020	KAR E
79		K. Visalini	Neonatal Seizure Detection, Prediction and Analysis using Deep Learning Techniques	2020	KAR E
80		S Sankili	Cloud Security as a Service by Firewall to Enterprise Customers using SDN/ NFV techniques	2020	KAR E
81		Ms. Pooranam	Automatic Diagonosis of Tumour detection in MRI images using Machine Learning Algorithm	2020	KAR E
82		TN Chitti	Protecting IOT Devices for Secure Smart Home	2021	KAR E
83		Junath Naseer Ahamed	Novel Defensive mechanisms against DDoS attacks in cloud computing environment using mobile agent technology	2022	KAR E
88		S V Hemanth	Artificial Intelligence Prognosis of Diabetic Retinopathy using Deep Learning	2020	KAR E
89	<b>Dr. C. Bala Subramania n</b>	Mr. K. Velkumar	Framework for Recommender system using Computational Intelligence based Web Mining Techniques	2020	KAR E
90		Ms. V. Gayathri	Enhancement of Medical Image Data Analytics using Deep Learning Techniques	2020	KAR E
91		Ho Chi Minh P	A Generalized Recommendation Model for Ratail Stores and Guest users for E-Commerce Sites.	2020	KAR E

92		Ms. M. Yuvarani	Detection of unauthorised IOT devices using Machine learning algorithms	2021	KAR E
93		Ramkumar R	Investigations on security concerns for data communication in internet of things	2021	KAR E
94		Ganesan G	Privacy Preserving Data Analysis in Healthcare using modified FL Algorithm	2022	KAR E
95	<b>Dr. R. Sumathi</b>	Lekshmi Vikraman	Detection of Multi- Fundus Retinal Disease and Conditions in Retinal Images Using Neural Networks	2022	KAR E
96		Sankarapandian B	Development of a Convolutional Neural Network based Medical Image segmentation in MRI	2022	KAR E
97		Ms.Syed Ali Fathima R	Smart Road Traffic Forecasting using Reinforcement Learning Techniques	2020	KAR E
98		N.Deepa	Machine learning based classification approach for handling imbalanced and unlabelled data	2020	KAR E
99	Dr. Pallikonda Rajasekar	Mr. Gautam Amiya	Estimation of Bone Mineral Density (BMD) for the Detection of Osteoporosis in Elderly Women using clinically practised DEXA images	2021	KAR E
100	Dr. V. Baby Shalini	Ms. M. Aruna	IoT based Micro Controller for Deaf and Dumb	2021	KAR E
101		S Chandra Sekhar	A Novel Approach for Patent Document Clustering Using Fuzzy Mapping	2020	KAR E
102	Dr. K. Suthendran	Ms. M. Sindhuja	Detection and Evaluation of Cyber Threats in IoT using Deep Learning methodologies	2021	KAR E
103		Srinath Reddy Ch	Strengthening cyber security and Protecting privacy using Blockchain technology	2020	KAR E
104		G Krishna Lava Kumar	Prediction of Heart Disease using Machine Learning Techniques	2020	KAR E
105	Dr. S. P. Velmurugan	Gurusigaamani A M	Brain Tumor Classification using multimodality image fusion.	2022	KAR E
106	Dr. S. P. Balakannan	Nagendra Chary Kotthoju	Privacy-Preserving Data Sharing for E-Healthcare System in cloud computing	2020	KAR E
107	<b>Dr. J. Jane Rubel Angelina</b>	Anjana Thampy S	Twitter Sentimental Analysis with Feature Selection and Classification using Deep Learning Techniques	2022	KAR E
108		Asha Chandran S	Medical Image analysis and prediction of chronic diseases using Deep Learning Techniques	2022	KAR E
109		Siju V Soman	Recognizing User Context in IoT based Smart Living Room using Hybrid Deep Neural Network Techniques	2021	KAR E
110	Dr. R. Sundarrajan	Asha S	Recognizing the State of Mind from Real Time Facial Expressions using Machine Learning Approach.	2022	KAR E

## 5.8.2 Sponsored Research (20)

### Details of funded projects received by the faculty members

Year	Name of the Investigators	Project Title	Approval Letter No with Sanctioned Date	Duration	Funding Agency	Amount (in INR)
2021-22 (CAY)	<b>Dr. P. Deepalakshmi</b>	Validation and digitization of indigenous medicinal knowledge of tribes of The Nilgiris, Namakkal, Thiruvannamalai and Tirunelveli districts, Tamil Nadu	DST/SEED/TSP/STI/2020/333  Date: 02.03.2022	3 Yrs	DST-SEED	30,64,938
2021-22 (CAY)	<b>Dr. B. S. Murugan</b>	Development of Science and Technology Software for School Children through Skill Building Activities	CO/B/FP/G76/2021  Date: 24.09.2021	1 Yr	DST	35,30,000
2020 - 21 (CAYm1)	Dr. Seshadhri Srinivasan <b>Dr. V. Vasudevan</b> Dr. B.Subathra	ATAL Community Innovation Center	15014/09/2021-AIM-ACIC-Kalasalingam Innovation Foundation-KARE dt 30.03.2021	3 yrs	ATAL	2,50,00,000
2019-20 (CAYm2)	<b>Dr. R. Kanniga Devi</b>	Establishment of STI hub for production of eco-friendly and economical products to improve the socio-economic status of SC population in Srivilliputhur block, Virudhunagar District, Tamil Nadu State	DST/SEED/S CSP/STI/2019/127  Date: 01.04.2020	3 Yrs	DST-SEED	2,38,43,900
2018-19 (CAYm3)	Dr. Seshadhri Srinivasan <b>Dr. V. Vasudevan</b>	Resilient and optimal micro-	INT/NOR/RN/ICT/P-05/2018	3 Yrs	International Bilateral Cooper	19,89,000

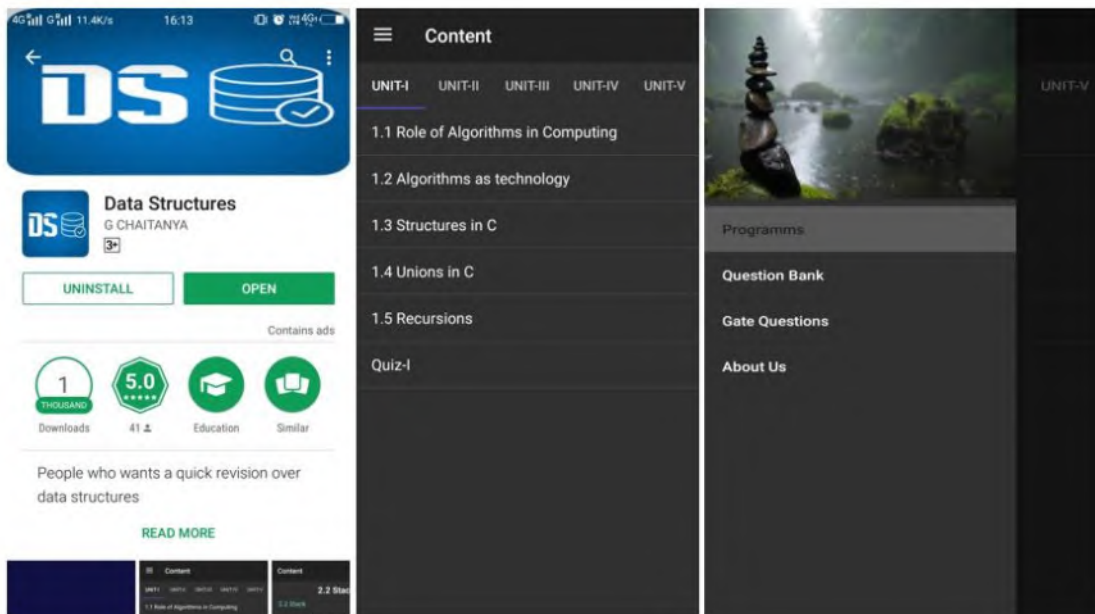


	Dr. B. Subathra	Energy-grid (ROME) (2018-21)	Date: 06.08.2018		ation Division	
					<b>Total</b>	<b>5,54,38,838</b>

### 5.8.3. Development activities (15)

#### a. Product Development:

All the Major and Minor Projects developed by the students are guided by the in-house faculty and undergo a meticulous evaluation procedure. Depending upon the quality of the project idea and evaluation on various metrics, the project is then approved for product or Software development.



**Fig.5.8.3a. App Created by the student and uploaded to google play store.**

Faculties involved in developing in-house Software Development Team:

- The members are deputed under various roles as part of the in-house software development team named KLU-SDC (Kalasalingam University - Software Development Center).
- In-house Software Development team developed automated software to offer the following services like
  - Health center,
  - Hostel room booking,
  - Purchase office
  - Transport booking

- Faculty recruitment portal
  - Guest house booking.
- The following software modules are developed by the software development team for the university **EDU-KARE** site,
    - Outcome-based mark entry and analysis,
    - Automated software (WebApp as well as MobileApp) for the pre-examination process including exam timetable,
    - Student seating arrangement,
    - Faculty invigilation duty,
    - Result processing,
    - Digital valuation by external experts.
    - External question paper collection through secured web server and online student verification process.

The screenshot displays the 'Transport Registration' page. On the left, a sidebar contains navigation links: Welcome MR. M. RAJA, Class Timetable, Personal Details, Student Wise Subjects, Attendance Details, Hour Wise Attendance, Fee Paid Details, Fee Due Details, Transport Registration (highlighted), Change Password, and Sign Out. The main content area includes a header 'Transport Registration' and a form with the following fields:

- From Boarding Point: ANNA BUS STAND
- From Route: MADURAI - ANNA BUS STAND
- Register Type: EVEN SEMESTER PAYMENT

Below the form, a 'Fee Details' table is shown:

Sl. No.	Fee Head	Fee Amount
1	TRANSPORT FEES	22800.00

A 'Pay Online' button is located below the fee details table. The browser address bar shows 'kalvi.kalasalingam.ac.in/klustudentportal/students/template/HRDSystem.jsp'. The system footer indicates 'User: MR. M. RAJA / Mon 21-Feb-2022 21:02:28' and 'eVarsity® ERP Developed by Firstline Infotech Pvt. Ltd., Chennai, INDIA.'.

**Fig. 5.8.3b. Transport booking**

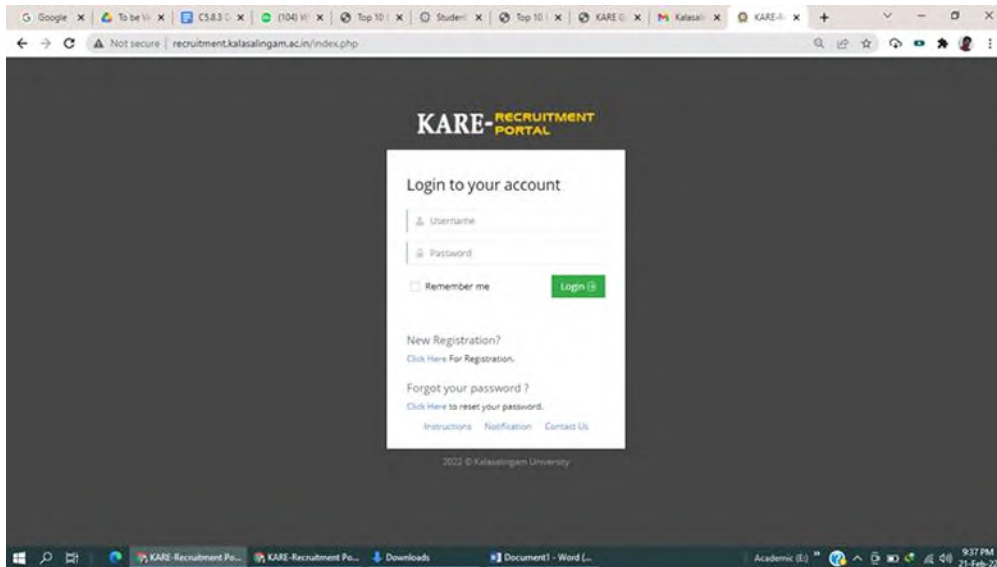


Fig. 5.8.3c. Recruitment portal

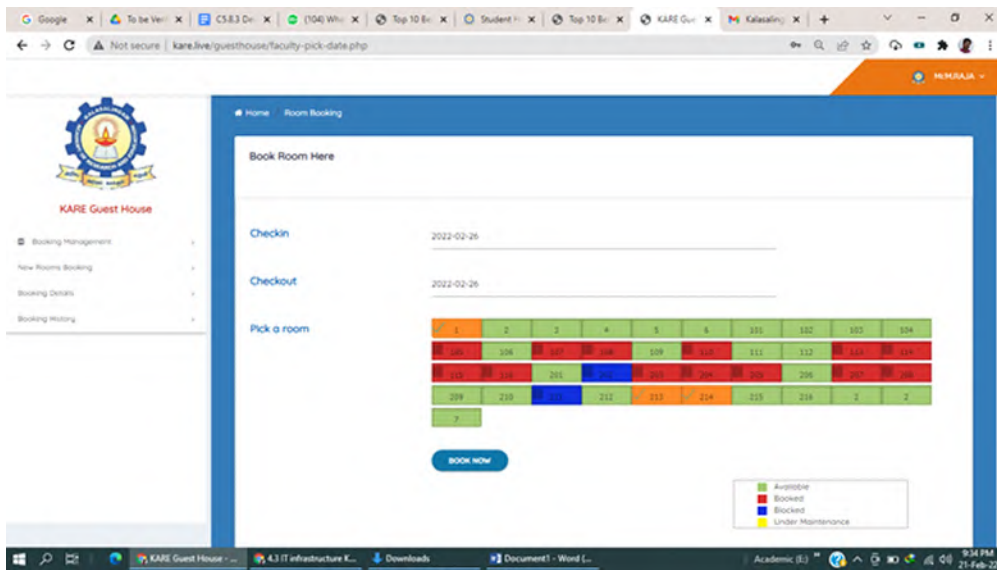


Fig. 5.8.3d. Guest House Booking

**Table 5.8.3b. Details of Published patents by CSE faculty members as well as students:**

<b>S. No</b>	<b>Year</b>	<b>Name of the Faculty Members</b>	<b>Title of Patent</b>	<b>Application No/C.B.R No</b>	<b>Date of Registration</b>	<b>Status of the Process</b>
1	AY-2019-20	Mr.S.Kathirvel <b>Dr.G.Murugaboopathi, Mr.K.Muthamil Sudar</b>	Sensor Based Blaze Less Smart Iron Box	201941016869	19/04/2019	Published
2	AY-2019-20	<b>Dr.G.Murugaboopathi, Dr.R.Kanniga Devi Dr.A.Francis Saviour Devaraj</b> Dr.S.Shasi Anand	Unlock Pattern To Remove Subscriber Identity Module (Sim) From A Mobile Phone	201941031048	01/08/2019	Published
3	AY-2019-20	Dr.R.Satheesh Kumar Dr.G.Kiruthiga Dr.S.Brilly Sangeetha Dr.S.Chidambaranathan <b>Dr.A.Francis Saviour Devaraj,</b> Dr. K. Saravanan Dr. Riboy Cherian <b>Dr. R. Ramalakshmi</b> Mr. P. Karuppanan Dr. V. Sasikala	A system and method of Internet of Things based Intelligence Greenhouse Surviving System with Cloud Computing	201941033012	15/08/2019	Published
4	AY-2019-20	Dr. T. Samraj Lawrence, Dr. Sobhana Mummaneni, <b>Mr.C.Bala Subramanian</b> Dr. G. Naga Rama Devi, Mr. Jenis Dharmadurai, R. Deenadhayalan Dr.K.Vinodha	System And Method For Selecting Base Station In A Worldwide Interoperability For Microwave Access Network	201941035228	01/09/2019	Published
5	AY-2019-20	Dr. S. Shasi Anand P. Jayakumar <b>M. Raja, S. Suprakash A. Saravanan C.Bala Subramanian</b>	Biometric and Image Sensing Digital Door	201941045092	15/11/2019	Published
6	AY-2019-20	<b>Dr.P.Deepalakshmi,</b> Dr.V.Praveena, Dr.P.Chinnasamy, Dr.S.Geetha, Danthuluri Sudha, <b>P.Nagaraj, K.Muthamil Sudar</b>	Automated Security Threat Analysis And Executing Optimal Response For Wireless Sensor Networks	201941052542	18/12/2019	Published

7	AY-2019-20	Dr. Joe Prathap P.M, Dr.R.Suganthini Rekha, Mrs. Mini Prince, Dr Lakshmi D, <b>Dr.P.Deepalakshmi</b> , Dr. Amandeep Kaur, Dr. V. Navya	Dynamically Understanding 3d Visual Scenes Using Deep Learning	202041002488	21/01/2020	Published
8	AY-2019-20	<b>P. Deepalakshmi</b> <b>K. Muthamil Sudar</b> <b>P. Nagaraj</b> , S. Geetha Y. Swathi, P. Chinnsamy	Using Wearable Device And Voice Analysis To Track Mental Health	2020100616	22/04/2020	Published
9	AY-2019-20	Dr. S. Shasi Anand P. Jayakumar <b>A. Robert Singh</b> Dr. K. Suthendran Dr. S. P. Balakannan <b>P. Velmurugadass</b>	Temporary Speed-Breaker Early Warning Device	201941045100	15/11/2019	Published
10	AY-2019-20	Dr. S. Shasi Anand P. Jayakumar <b>R. Ramalakshmi</b> <b>C. Bala Subramanian</b> <b>R. Kanniga Devi</b> <b>S. Karkuzhali</b>	Perceptible Handbag For Visually Impaired	201941045095	15/11/2019	Published
11	AY-2020-21	<b>Dr.C. Bala Subramanian</b> , Dr.S.Balakrishnan, Mr.Himayun Mukhtar Qureshi, Mr. Ankur Goyal, Mr. Shivkant Kaushik, Dr. K.Marimuthu, Dr. Penumathsu Suresh Varma, Dr. Yarramalle Srinivas, Dr. S.Karunakaran, Mr. G.A. Senthil	Next Generation Framework for Smart Building Monitoring using 6LoWPAN	2020102608	06/10/2020	Published
12	AY-2020-21	Dr. Sreelatha P, Dr. K. Hussain, Dr. Josephine Selvi, Dr. P. Iyappan, Dr. Tasneem Bano Rehman, Dr. Ravichandran Krishamoorthy, Dr. S. Chandra Sekaran, Mr. Vishal Ravichandran, Dr. T. Subramani <b>Dr. C. Bala Subramanian</b>	Object Identification System for Blind People	202111012748	24/03/2021	Published

13	AY-2020-21	Ms. Sushma, <b>Dr. N.C.Brintha</b> , V.Ajantha Devi, Rajeev, K Sumathi, E Priya, T. Jagadesh.	Artificial Neural Network Based Detection of COVID-19 from Chest X-RAY,	202121012313	26/03/2021	Published
14	AY-2021-22	<b>Dr. C. Bala Subramanian</b> Dr. S. P. Balakannan Dr. M. Maragatharajan Dr. S. Suprakash Dr. M. Karuppasamy <b>Mr. M. Raja</b>	An IOT Techniques to Detect and Prevent Crime over Cloud	202241002458	04/02/2022	Published
15	AY-2021-22	Dr. P. Chinnasamy <b>Dr. P. Deepalakshmi</b> Dr. K. Srinivasa Rao Dr. E. Anupriya Mrs. K. Pushpa Rani Mrs. N. Thulasi Chitra Mrs. T. Raja Rajeswari Dr. V. Praveena	Coin Counting Machine using Deep Learning based Image Processing	202141057652	04/02/2022	Published
16	AY-2021-22	Dr. P. Chinnasamy <b>Dr. P. Deepalakshmi</b> Dr. K. Srinivasa Rao Mr. Vishal Dhatrika Mr. Dachiraju Hemanth Kumar Mr. K Harish Chandra Prasad Mr. Sanagala Praveen Dr.M. Usha	System/Method to Create and Validate the Educational Certificates using Blockchain Technology	202241027370	27/05/2022	Published
17	AY-2021-22	<b>P. Nagaraj</b> Vutukuri Deepak Nithin Gupta Hemanth Kumar	System And Method for Disease Prediction	202141061314	04/02/2022	Published
18	AY-2021-22	<b>R.Sumathi</b> G.Poojitha Sree Vandana G.Kowshik	Water Quality Monitoring System and Method	202141058755	04/02/2022	Published
19	AY-2021-22	Dr.S.Balamurugan Ritambhara <b>Dr.T.Dhiliphan Rajkumar</b> Dr.K.Suganthi Dr.M.S.Abirami Dr.R.Kumar Dr.Alok Agrawal Yazusha Sharma Ajay Kumar Singh Yadav	COVID-19 Patient Healthcare Monitoring System Using IoT and Wearable Sensors	202241003768	04/02/2022	Published

		Siddharth Dhruva Parashar Dr.Sandeep Saxena Dr.Piyush Kumar Tripathi, Dr. Pavithra G Dr. T.C. Manjunath				
20	AY- 2021 -22	R. Raja Subramanian Sandhya Tanushkodiraman I Chinimilli Bhanu Mohan Kumar Monika SreeVelampudi R. Raja Sudharsan	Robotic Weed Removing Apparatus And Method Thereof	20224100296 5	04/02/2022	Publishe d
21	AY- 2021 -22	J. Jeyaranjani Praveen S V	Electrical Energy Controlling System And Method For Educational Institutions	20224100095 0	21/01/2022	Publishe d
22	AY- 2021 -22	R. Murugeswari R. Saivaraprasad	Grass Cutting Machine and Method	20214105837 8	4/02/2022	Publishe d
23	AY- 2021 -22	Marreddy Vamsidhar Reddy M. Sakthimohan Poleboina Gnaneswar N Saivivek G.Elizabeth Rani Prattipati Tharun	Garbage Bin Overflow Indication System and Method	20214105837 7	04/02/2022	Publishe d
24	AY- 2021 -22	K.Muthamil Sudar M.Akshaya M.Kaviya S.Akshaya B.Prudhvish	Remote Authentication System and Method	20214106104 1	07/01/2022	Publishe d
25		A. Robert Singh J.Deny Sunil Kumar U S. Vignesh Manikanda Prabhu P	Saline Level Monitoring System and Method	20214105803 2	28/01/2022	Publishe d

**B. Research laboratories**

S.No	Name of the Lab	Lab in Charge
1	Artificial Intelligence Lab	Mr. R. Raja Subramanian
2	Networks and Cyber Security lab	Dr. N.C. Brintha

**Artificial Intelligence Lab:**

The Embedded systems and Robotics laboratory was established with the support of IIT Bombay under “e-Yantra Lab Setup Initiative (eLSI)” in the year 2016. With the aim to enhance Artificial Intelligence oriented research at the department of Computer Science and Engineering, the lab is reformed with the state-of-the-art configurations pertaining to courses related to the Artificial Intelligence and machine learning elective stream of B. Tech(CSE) and renamed as Artificial Intelligence (AI) laboratory in the year 2020.

The lab is highly used for the faculty research, research projects, student projects and training programs. The major applications of the AI laboratory include Visual Computing, Natural Language Processing (NLP), Autonomous Systems, Smart Robotics, Virtual Agents, among others.

**AI Lab Configurations: 60 Numbers**

Component	Configuration
CPU	Intel Core i7-9700KF, 8 x 3.6 GHz
RAM	DDR-4, 16GB
SSD	500 GB
GPU	GeForce RTX 2080, 8 GB

**Academic Program(s) Offered:**

- B.Tech. Computer Science and Engineering
- M.Tech. Computer Science and Engineering



**Ph.D Scholars Awarded through AI Lab:**

S.No	Name of the Scholar	Name of the Supervisor	Title
1	Mr. K. Muthamil Sudar	IDS using Machine Learning techniques in SDN	Dr. P. Deepalakshmi

**Ph.D Scholars Working in AI Lab:**

S.No	Name of the Scholar	Title	Name of the Supervisor
1	Mr. P. Nagaraj (Completed)	Development of an e-Healthcare Interpretation and Recommendation System for Diabetes using AI-based techniques	Dr. P. Deepalakshmi
2	Ms. Divya Pushpalakshmi (Completed)	Design of machine learning approaches for community detection and sentiment analysis in social network	Dr. R. Ramalakshmi
3	Raja Sekar R	Biometric Spoofing Detection Using Texture Based Convolutional Neural Network	Dr. Koteswara Rao Anne
4	Mrs. V. Vaissnave	Applying Deep Learning techniques for qualitative and quantitative analysis of massive legal judgement texts to extract information	Dr. P. Deepalakshmi
5	Mr. T. Manjunath Kumar	Data Analytics using Machine learning techniques in Higher education	Dr. R. Murugeswari
6	G. Arul Prakash	Data breach prevention using machine learning techniques	Dr. N. Dhinakaran
7	M Jeya Sundari	Detection and Classification of Ovarian Tumours in Obstetric Ultrasound Imaging Using Machine Learning	Dr. N. C. Brintha
8	Abirami K	Assistive technology for Autism and Spectrum Disorder using novel deep learning algorithms	Dr. P. Deepalakshmi

**Publications by the Scholars:**

1. Muthamil Sudar, K., and P. Deepalakshmi., An intelligent flow-based and signature-based IDS for SDNs using ensemble feature selection and a multi-layer machine learning-based classifier, *Journal of Intelligent & Fuzzy Systems*, 40 (3), (2020), 4237-4256. (SCI –IF :1.851)
2. Muthamil Sudar, K., and P. Deepalakshmi., Comparative study on IDS using machine learning approaches for software defined networks, *International Journal of Intelligent Enterprise* 7, (2020), 15-27. (Scopus Indexed)
3. Muthamil Sudar, K., and P. Deepalakshmi., A two level security mechanism to detect a DDoS flooding attack in software-defined networks using entropy-based and C4. 5 technique, *Journal of High-Speed Networks*, 26 (1), (2020), 55-76 (ESCI – Scopus Indexed)
4. Muthamil Sudar, K., and Deepalakshmi, P., TFAD: TCP Flooding Attack Detection in Software-Defined Networking using Proxy-based and Machine Learning-based Mechanisms, *Malaysian Journal of Computer Science*. (SCI –IF :0.9)
5. Muthamil Sudar, K., P. Deepalakshmi, P. Nagaraj, and V. Muneeswaran., Analysis of Cyberattacks and its Detection Mechanisms, In *Fifth International Conference on Research in Computational Intelligence and Communication Networks (ICRCICN)*, (2020), 12-16. Scopus Indexed - Published in IEEE Explorer)
6. Muthamil Sudar K., and Deepalakshmi, P., Flow-based Detection and Mitigation of Low-rate DDoS attack in SDN Environment using Machine Learning, *International Conference on Wireless Sensor Networks, Ubiquitous Computing and Applications (ICWSNUCA) – Springer Series (Lecture Notes in Networks and Systems)*, (2021)
7. Muthamil Sudar, K., and Deepalakshmi, P. (2020). Flow Based Intrusion Detection System for Software Defined Networking using Hybrid Machine Learning Technique, *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, 9 (2S2), (2020) 1026-1033.
8. P. Nagaraj and P. Deepalakshmi., Artificial Flora Algorithm-Based Feature Selection with Gradient Boosted Tree Model for Diabetes Classification, *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, 14, (2021), 2789-2806. (SCI Indexed – IF :3.168)
9. P. Nagaraj and P. Deepalakshmi., An Intelligent Fuzzy Inference Rule (IFIR) Based Expert Recommendation System for Predictive Diabetes Diagnosis (PDD), *International Journal of Imaging Systems and Technology*, (2022). (SCI Indexed – IF :2.000)
10. P. Nagaraj and P. Deepalakshmi., Diabetes Prediction using Enhanced SVM and Deep Neural Network Learning Techniques – An Algorithmic Approach for Early Screening of Diabetes, *International Journal of Healthcare Information Systems and Informatics*, 16 (4), (2021), 1-20.

11. P. Nagaraj and P. Deepalakshmi., A framework for e-healthcare management service using recommender system, *International Journal of an Electronic Government*, 16 (1-2), (2020), 84-100.
12. P. Nagaraj and P. Deepalakshmi., Tree seed optimized adaptive Kalman filter for diabetes recommendation system - bi-level performance improvement strategy for health care applications, *Intelligent Data Centric Systems: Cognitive and Soft Computing Techniques for the Analysis of Healthcare Data*, 1, (2022), Elsevier
13. P. Nagaraj and P. Deepalakshmi., Sentiment Analysis on Diabetes Diagnosis Health Care using Machine Learning Techniques, *2nd International Conference on Congress on Intelligent Systems CIS 2021 / Springer Book Series Lecture Notes on Data Engineering and Communication Technologies*.
14. Vaissnave, V., & Deepalakshmi, P. (2022). A Keyword-Based Multi-label Text Categorization in the Indian Legal Domain Using Bi-LSTM. In *Soft Computing: Theories and Applications* (pp. 213-227). Springer, Singapore.
15. M.Divyapushpalakshmi and R. Ramalakshmi, "Hybrid machine learning approach for community and overlapping community detection in social network" *Transactions on Emerging Telecommunications Technologies-Wiley(IF:1.594)*
16. M. Divyapushpalakshmi and R. Ramalakshmi, "Improved Overlapping Community Detection In Weighted Complex Social Network Using Hybrid Agglomerative Hierarchical Clustering" in the *International journal of Information Technology-Springer*
17. M. Divyapushpalakshmi and R. Ramalakshmi "Empirical Analysis of Community Detection over Social Network Intelligent Machine Learning Strategies "in the *Journal of Design Engineering*.
18. M. Divyapushpalakshmi and R. Ramalakshmi, "An Efficient sentimental analysis using hybrid deep learning and optimization technique for twitter using parts of speech (POS)tagging. *International Journal of Speech Technology-Springer*
19. M Divyapushpalakshmi and R. Ramalakshmi, "Analysis of twitter data using logistic regression classification-based Machine learning Method" *International Journal of Future Generation Communication and Networking*
20. Manjunath Kumar, T., Murugeswari, R., Devaraj, D., & Hemalatha, J. (2020). Comparison of deep learning and random forest for rumor identification in social networks. *International Conference on Innovative Computing and Communications* (pp. 133-146). Springer, Singapore.

**UG Project Outcome in terms of Paper Publications through AI Lab:**

1. Deepalakshmi P, Prudhvi Krishna T, Siri Chandana S, Lavanya K, Parvathaneni Naga Srinivasu, “Plant Leaf Disease Detection Using CNN Algorithm”, International Journal of Information System Modeling and Design, IGI Global. Vol.12, No.1, pp.1-12, Jan-2021.
2. Lok Sundar Ganthi, Nallapaneni Yaswanthi, PerumalsamyDeepalakshmi and Mahalingam Krishna Kumar, “Employee Attrition Prediction using Machine Learning Algorithms”, International Conference on Data Science and Applications - ICDSA 2021, April 10-11, 2021. (Presented, Proceedings to be published in Springer LNNS).
3. T.Dhiliphan Rajkumar , L. Manish Kumar , N. Akhila , P. Sai Keerthana, “Performance Analysis Of Machine Learning Techniques To Predict Diabetes Mellitus”, International Journal of Advanced Science and Technology, Vol. 29, No. 9s,( May2020), pp. 6366-6373
4. Elizabeth Rani, G Reddy, A.T.V., Vardhan, V.K., Harsha, A.S.S., Sakthimohan, M.” Machine learning based Cibil verification system” Proceedings of the 3rd International Conference on Smart Systems and Inventive Technology, ICSSIT 2020, October 2020, pp. 780–782, 9214195, DOI: 10.1109/ICSSIT48917.2020.9214195
5. G Elizabeth Rani.; Harini Mohan; Bendela Kusuma; P Shiridi Kumar; Ardhala Mounika Jenny; NukalaAkshith “Automatic Evaluations of Human Blood Using Deep Learning Concepts” November 2021 6th International Conference on Signal Processing, Computing and Control (ISPCC), 2643-8615, DOI: 10.1109/ISPCC53510.2021.9609519
6. Mounika Rajeswari Pichika, Brintha, N.C., “Glaucoma Detection Using Fundus Image of Eye”, International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE), Vol. 27, No.1, pp.1-6, April. 2020.
7. M. Saravanan, J. Karthik, V. Rahul, T. Dhiliphan Raj Kumar, “Secure Health Care System Based on Mobile Computing”, International Journal of Research in Engineering, Science and Management, Volume-2, Issue-11, November-2019, ISSN (Online): 2581-5792
8. Elizabeth Rani, G., Deetshana, S., Naidu, K.Y., Sakthimohan, M., Sarmili, T.” Automated Interactive Irrigation System – IoT Based Approach” IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing, INCOS 2019, Jan 2020, 8951382, DOI: 10.1109/INCOS45849.2019.8951382
9. J. Ashok Lawrence , L. Alagappan , K. Vignesh Varadhan , K. MuthamilSudar, Detection of Distributed Denial of Service Attacks using Machine Learning Techniques, International Journal of Research in Engineering, Science and Management Vol. 2, No.11 2019, pp. 310-314
10. R. R. Subramanian, R. Nikhil Mourya, V. Prudhvi Teja Reddy, B. Narendra Reddy, Srikar Amara, “Lung Cancer Prediction using Deep Learning Framework”, Int. Journal of Control and Automation, vol. 13, no. 3, pp. 154-160, May 2020.

11. S. Amara and R. R. Subramanian, "Collaborating personalised recommender system and content-based recommender system using TextCorpus", 2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS), Coimbatore, India, pp. 105-109, April 2020.
12. J. Jeyaranjani K. Aishwarya, B. Anitha, P. Yavanarani, Dynamic Task Scheduling using Genetic Algorithm in Private Cloud Environment, International Journal for Research in Applied Science & Engineering Technology (IJRASET), pp. 2300 - 2304, April 2018, DOI: 10.22214/ijraset.2018.4392.
13. J. Mahesh Varian, A. Harivardhan, M. Raja, "Surveillance using Humanoid Robot" International Conference On Research Techniques In Engineering & Technology – April 2018, ISBN-13: 978-1729728116.
14. A. Saravanan, S. Sairam, A. Soma Vigneshwar, T. N. Ajith Kumar, Lesion Identification and Tissue Segmentation in Magnetic Resonance (MR) Image using Interval type based Clustering, International Journal of Digital Communication and Networks (IJDCN), vol.4, no.5, pp. 4501-4504, April 2018.
15. S. Lakshmi Narayani, A. Saravanan, S. Anushiya, G. Kodieswari, Identifying various type of Pathologies in Magnetic Resonance (MR) Image using Jaya algorithm, International Journal of Innovative Research in Applied Sciences and Engineering (IJIRASE), vol.2, no.5, pp. 298-310, November 2018.
16. R. R. Subramanian, B. R. Babu, K. Mamta and K. Manogna, "Design and Evaluation of a Hybrid Feature Descriptor based Handwritten Character Inference Technique," 2019 IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS), Tamilnadu, India, pp. 1-5, January 2020.

## **2. Network and Cyber Security Laboratory:**

In the year 2015, the department has taken steps to instantiate the Network and Cyber Security Laboratory with the intent to enhance teaching and research in the area of digital security. In association with the National Cyber Defence Research Centre (a research institution controlled by national cyber safety and security standards) the department established the Cyber Security lab. Later it was renamed as Network and Cyber Security Laboratory in the year 2017. This Laboratory has a dedicated space in which research scholars and students perform projects pertaining to malware detection and deactivation, and penetration testing, in a contained and controlled environment without possible impact to other campus networks.

**Lab Configurations: 60 Numbers:**

Component	Configuration
CPU	Intel Core i5, 2.8 GhZ
RAM	DDR4, 16GB
SSD	1 TB

**Academic Program(s) offered:**

- B.Tech. Computer Science and Engineering
- M.Tech. Computer Science and Engineering

**Ph.D Scholars Awarded through Network and Cyber Security Lab:**

S.No	Name of the Scholar	Title	Name of the Supervisor
1	Mr. S. Wilson Prakash	Design of Dynamic Load Balancing for Software Defined Networking	Dr. P. Deepalakshmi
2	Ms. B. Balakiruthiga	Design of efficient routing mechanisms for software defined data centre (SDDC)	Dr. P. Deepalakshmi
3	Mr. S. Sankara Narayanan	Development Of Secure Routing Protocols to Mitigate Various Network Layer Attacks In Mobile Ad Hoc Networks	Dr. G. Murugaboopathi
4	Mr. Pitchaimanickam B	Biologically Inspired Algorithms for the Optimization of Wireless Sensor Networks Lifetime and Energy Consumption	Dr. G. Murugaboopathi
5	Ms. M. Syed Rabiya	Design of Opportunistic Routing Protocols for Intermittently Connected Mobile Networks	Dr. R. Ramalakshmi
6	Mr. C. Bala Subramanian	Effective Localization in Wireless Sensor Network Using Trajectory Planning of Mobile Anchors	Dr. S. P. Balakannan

**Ph.D Scholars working in Network and Cyber Security Lab:**

S.No	Name of the Scholar	Title	Name of the Supervisor
1	Mr. M. Raja	An Analysis of Attribute Based Encryption in Lightweight Cryptography	Dr. S. Dhanasekaran
2	Mr. S. Krishna Narayanan	Security Assessment in Cyber Physical System using Machine Learning Techniques	Dr. S. Dhanasekaran
3	Mr. R. Raja Subramanian	A Secure Ambulatory Healthcare Service leveraging Fog Computing	Dr. V. Vasudevan
4	Esakki Muthu S	Blockchain Enabled Agri Goods Tracing and Cryptocurrency Transaction in Supply Chain Management	Dr. K.Kartheeban

**Publications:**

1. Prakash, S. W., & Deepalakshmi, P. (2019). Flow-based Dynamic Load balancing algorithm for the Cloud networks using Software Defined Networks. *International Journal of Cloud Computing*, 8(4), 299-318.
2. WilsonPrakash, S., & Deepalakshmi, P. (2019, April). Artificial neural network based load balancing on software defined networking. In *2019 IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS)* (pp. 1-4). IEEE.
3. Deepalakshmi, P. (2018). DServ-LB: Dynamic server load balancing algorithm. *International Journal of Communication Systems*, 1(32),
4. B. Balakiruthiga, P. Deepalakshmi, S.N Mohanty, D. Gupta, P. P Kumar and K. Shankar, Segment routing-based energy aware routing for software defined data center, *Cognitive Systems Research*, 64, (2020), 146-163. [IF – 1.9]
5. B. Balakiruthiga, P. Deepalakshmi, A Distributed Energy Aware Controller Placement Model for Software-Defined Data Centre Network, *Iran J Sci Technol Trans Electr Eng*, (2021), 1-19. [IF – 0.657]
6. B. Balakiruthiga and P. Deepalakshmi, A Simple Congestion Avoidance mechanism for Open Daylight (ODL) - Multipath TCP (MPTCP) Network structure in Software Defined Data Center (SDDC), *International Conference on Advanced Computing & Communication Systems (ICACCS)*, (2019), 886-893.

7. B. Balakiruthiga and P. Deepalakshmi, A Simple Traffic Management Approach Using Multipath TCP (MPTCP) in Software Defined Data Center (SDDC), IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing (INCOS), (2019), 1-6.
8. B. Balakiruthiga, P. Deepalakshmi, Intelligent traffic management (ITM) approach for software defined data center (SDDC), Journal of Ambient Intelligence and Humanized Computing, Springer [IF – 3.348]
9. B. Balakiruthiga, P. Deepalakshmi, ITMP–Intelligent Traffic Management Prototype using Reinforcement Learning approach for Software Defined Data Center (SDDC), Sustainable Computing: Informatics and Systems, Elsevier. [IF – 2.7]
10. Sankara Narayanan, S., & Murugaboopathi, G. (2020). Modified secure AODV protocol to prevent wormhole attack in MANET. *Concurrency and Computation: Practice and Experience*, 32(4), e5017.
11. Sankaranarayanan, S., & Murugaboopathi, G. (2017, February). Secure intrusion detection system in mobile ad hoc networks using RSA algorithm. In 2017 Second international conference on recent trends and challenges in computational models (ICRTCCM) (pp. 354-357). IEEE.
12. Narayanan, S. S., & Murugaboopathi, G. (2020). Prevention of rushing attack in MANET using threshold-based approach. *International Journal of Internet Technology and Secured Transactions*, 10(5), 576-584.
13. B.Pitchaimanickam, G.Murugaboopathi, “A Hybrid Firefly Algorithm with Particle Swarm Optimization for Energy Efficient Optimal Cluster Head Selection in Wireless Sensor Networks”, *Neural Computing and Applications*, SPRINGER, 2019. <https://doi.org/10.1007/s00521-019-04441-0>. (Impact factor: 4.664)
14. B.Pitchaimanickam, G.Murugaboopathi, “Bacteria Foraging Algorithm based Optimal Multi Sink Placement in Wireless Sensor Networks”, *Journal of Intelligent Systems*, Vol 27, Issue 4, (2018) 609-618.
15. B.Pitchaimanickam, S.Radhakrishnan, “A Hybrid Bacteria Foraging and Particle Swarm Optimization Algorithm for clustering in Wireless Sensor Networks”, *IEEE International Conference of Science, Engineering, Management and Research (ICSEMR)*, (2014), 1-6. IEEE Explore.
16. B.Pitchaimanickam, S.Radhakrishnan, “Bacteria Foraging Algorithm based Clustering in Wireless Sensor Networks”, *Fifth IEEE International Conference on Advanced Computing (ICoAC)*, (2013), 190-195. IEEE Explore.



17. Rabiya, M. S., & Ramalakshmi, R. (2019). Replica Reduced Routing Protocol for Intermittent Connected Networks in Emergency Scenarios. *International Journal of Distributed Systems and Technologies (IJ DST)*, 10(2), 84-109.
18. Syed Rabiya, M. S & Ramalakshmi, R. Contact time Expectation based Routing Protocol for Opportunistic Networks. *International Journal of computer communication. International Journal of Future Generation Communication and Networking* Vol. 13, No. 4, (2020), pp. 3284-3303.
19. Syed Rabiya, M., Ramalakshmi R.: Multi attribute-based routing for lifetime maximization in opportunistic mobile social networks. *International Journal Of Communication Systems*. (2020) Impact Factor : 1.3
20. Syed Rabiya, M. S & Ramalakshmi, R. Regular Routine Aware Routing for Opportunistic Mobile Social Networks. *International Journal of Computer Communication*. IF : 2.8
21. Syed Rabiya, M. S & Ramalakshmi, R. Partial Connectivity Aware Routing for Opportunistic Networks". Accepted in 3C Proceedings.
22. Syed Rabiya, M. S & Ramalakshmi, R. (2019, December). RIT: Remaining Inter-Contact Time based Routing for Intermittent Connected Networks. In 2019 IEEE International Conference on Clean Energy and Energy Efficient Electronics Circuit for Sustainable Development (INCCES) (pp. 1-4). IEEE.
23. C. Bala Subramanian, M. Maragatharajan and S.P. Balakannan, Inventive Approach of Path Planning Mechanism for Mobile Anchors in WSN, *Journal of Ambient Intelligence and Humanized Computing*, DOI: 10.1007/s12652-020-01752-2. (IF:4.594)
24. C. Bala Subramanian and S.P. Balakannan, Scan and Z-Curve Trajectory for Mobile Anchor in Localization of Wireless Sensor Network, *International Journal of Recent Technology and Engineering*, **8** (3) (2019), 8057 – 8061.
25. C. Bala Subramanian, M. Maragatharajan and S.P. Balakannan, A Range Based and Range Free Localization in Wireless Sensor Network, *International Journal of Recent Technology and Engineering*, **8** (4S2) (2019), 669-705.
26. C. Bala Subramanian and S.P. Balakannan, Optimized Trajectory Planning For Mobile Anchors In Wireless Sensor Networks, *IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing*, (2017).
27. C Bala Subramanian and I Renuka, Enhanced Route Planning for Mobile Anchors in Localization of WSN, *IEEE International Conference on Advanced Communications, Control and Computing Technologies*, (2014), 649 – 652.
28. M. Raja, S. Dhanasekaran, V. Vasudevan, "Opposition Based Joint Grey Wolf-Whale Optimization Algorithm Based Attribute Based Encryption in Secure Wireless

- Communication” *Journal of Wireless Personal Communications*, ISSN: 0929-6212 (IF: 1.019) 2021. <https://doi.org/10.1007/s11277-021-08357-8>
29. M. Raja, S. Dhanasekaran, V. Vasudevan “Attribute-based encryption for Ciphertext in advanced encryption standard” *Materials Today: Proceedings*. (Scopus) 2020 ISSN: 2214-7853. <https://doi.org/10.1016/j.matpr.2020.09.288>
  30. M. Raja, S. Dhanasekaran, V. Vasudevan, ”Lightweight cryptography based medical data and image encryption scheme” *Journal of Webology* (Scopus) 2021.
  31. M. Raja, S. Dhanasekaran, V. Vasudevan, ”An Energy Efficient Multi Secret Sharing For Encrypted Images Using Homomorphic Encryption Algorithms”, *Journal of Green Engineering*, pg. 1575-1586, Volume-11, Issue-2, February 2021.
  32. Narayanan, S. K., Dhanasekaran, S., & Vasudevan, V. (2021). Minimizing Overloads of Critical Tasks Using Machine Learning in CPS by Extending Resources. *Webology*, 18(2).
  33. Subramanian, R. R., & Vasudevan, V. (2021). A deep genetic algorithm for human activity recognition leveraging fog computing frameworks. *Journal of Visual Communication and Image Representation*, 77, 103132.

### **UG Project Outcome in terms of Paper Publications through Networks and Cyber Security**

#### **Lab:**

1. C Bala Subramanian, Etlam Jaswanth and Ch Pushyanth Reddy, “Secured Patient Record in Cloud Environment”, *International Journal of Advanced Science and Technology*, ISSN: 2005-4238, Volume-28, Issue-7, June 2020. Page No. 105666-105684.
2. K. Aashish Dubey, K. Bharath Ganesh, V. Gowtham, Mr.D. Balakrishnan, Phishing Email Detection, *International Journal of Emerging Technology in Computer Science & Electronics (IJETCSE)* ISSN: 0976-1353 Volume 28 Issue 4 – April 2021, pp 5-8.
3. Elizabeth Rani, G., Ajay Sukumar, G.V., Umesh Chandra, T., Anki Reddy, K., Sakthimohan, M. “Load Allocation as Quality and secured in Mobile Cloud Networking Location” *Journal of Physics: Conference Series*, August 2021, 1979(1), 012045. DOI:10.1088/1742-6596/1979/1/012045.
4. Sakthimohan. M; Elizabeth Rani. G; Busireddy Ganeswar Reddy; Sadhu Lokaan Reddy; Vangam Chennareddy “Wireless Power Transmission Science Model” *Proceedings of the 2nd International Conference on Electronics and Sustainable Communication Systems, ICESC 2021*, September 2021, pp. 577–581 DOI: 10.1109/ICESC51422.2021.9532606.
5. M. Saravanan, J. Karthik, V. Rahul, T. Dhiliphan Raj Kumar, “Secure Health Care System Based on Mobile Computing”, *International Journal of Research in Engineering, Science and Management*, Volume-2, Issue-11, November-2019, ISSN (Online): 2581-5792

6. J. Ashok Lawrence , L. Alagappan , K. Vignesh Varadhan , K. Muthamil Sudar, Detection of Distributed Denial of Service Attacks using Machine Learning Techniques, International Journal of Research in Engineering, Science and Management Vol. 2, No.11 2019, pp. 310-314
7. T. Raghupathi , M. Sivabalan , S. S. Jeganath , K. MuthamilSudar, Preventing Man in the Middle Attack Using Machine Learning, International Journal of Research in Engineering, Science and Management Vol. 2, No. 11 2019, pp. 327-331
8. B.Vishnuvardhan, D.Lokesh Babu, K.MuthamilSudar - “Pro Guard: Detecting Malicious accounts in Social Network Based Online Promotions” in International conference on Research Techniques in Engineering and Technology( 11<sup>th</sup> November 2018), held at Ramee Guestline, Tirupati.
9. D.Yaswanth, K.Raviteja, Y.Harish kumar, M. Raja, “Key Management Protocol In Ciphertext Policy For Cloud Data Sharing”, International Journal of Research, ISSN NO:2236-6124 Volume 7, Issue XI, November/2018 pp: 565-573

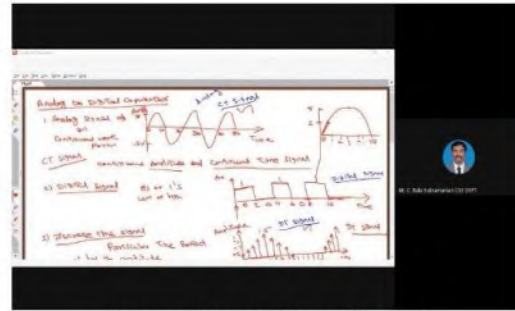
### **C. Instructional Materials**

Instructional materials are provided to the students and faculty members in various forms such as:

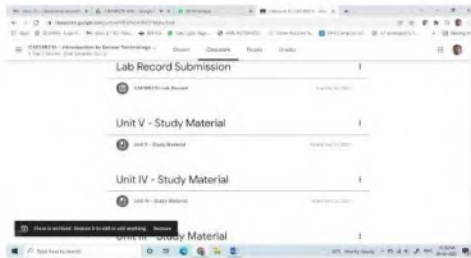
1. Course Plan, Course materials uploaded all the faculties in Google Classroom
2. Preparation of handouts/lecture notes by faculty members
3. Impartus Lecture Capturing System Videos.
4. Flipped Video Lectures prepared by faculty members
5. Books authored by the faculty members.
6. Lab manuals are prepared for different labs for guiding students.
7. Labs and Lecture rooms are equipped with Media projectors for effective lecture delivery.
8. ICT based webinars are arranged for FDP/workshops.
9. Online Courses recorded by the Faculty Members
10. Virtual Laboratory



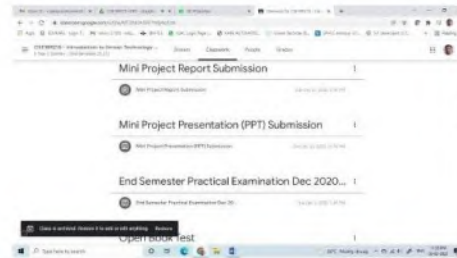
**Impartus Classroom**



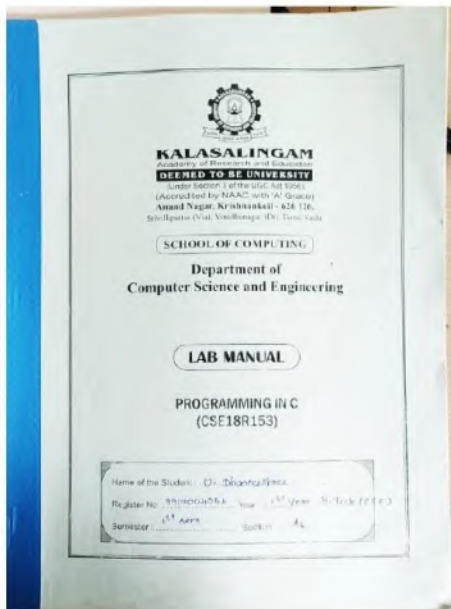
**Lecture through Interactive Pad**



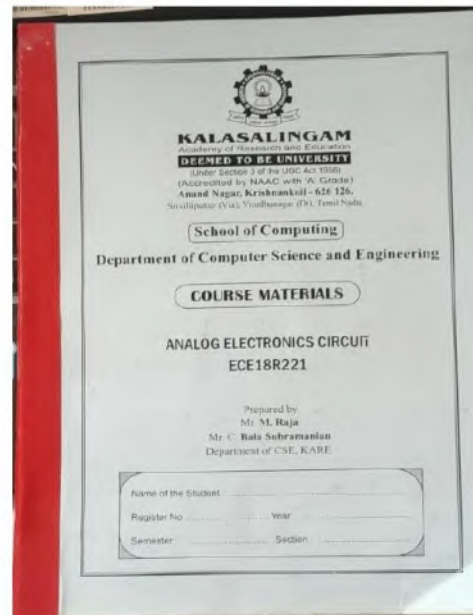
**Google Classroom**



**Google Classroom**



**Lab Manuals**



**Lecture/Course materials**

**Fig. 5.8.3b Some sample Instructional Materials (selective only)**

**D. Working models/charts/monograms etc**

The department is very keen in providing the basic level understanding for its fellow students by focusing on the ability of the student in applying the concepts.

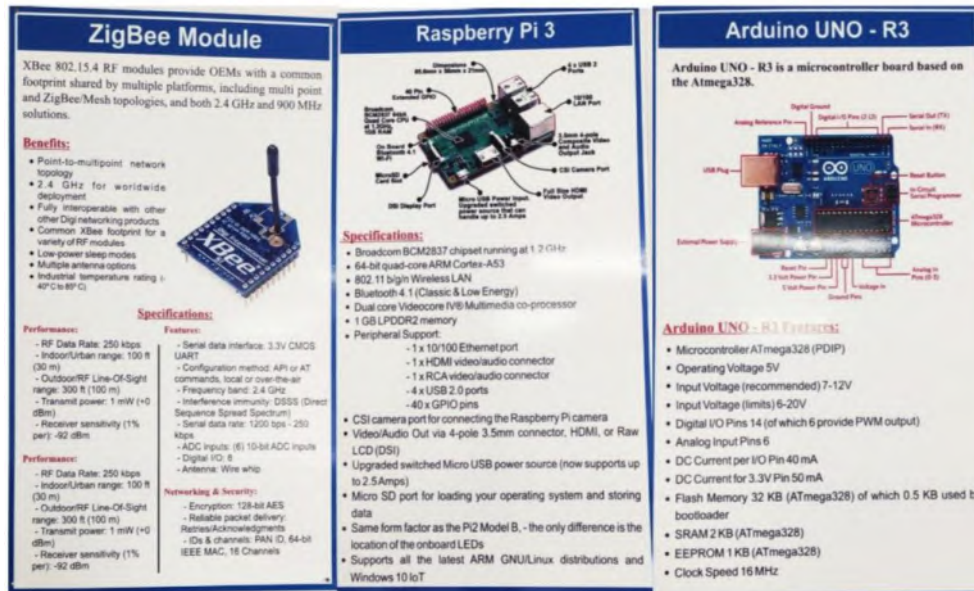
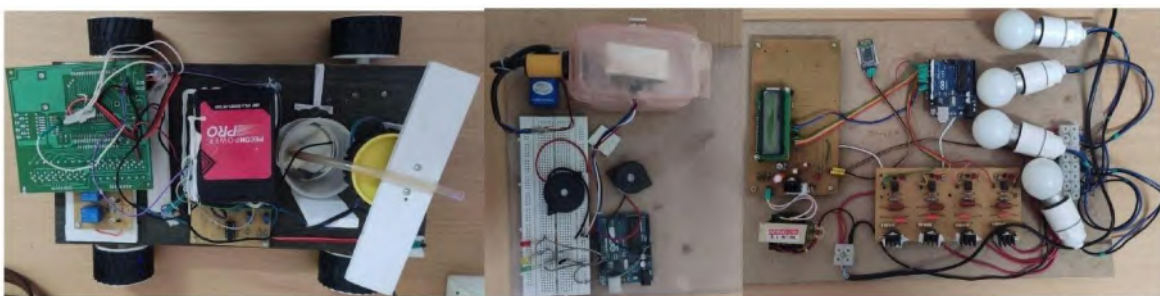
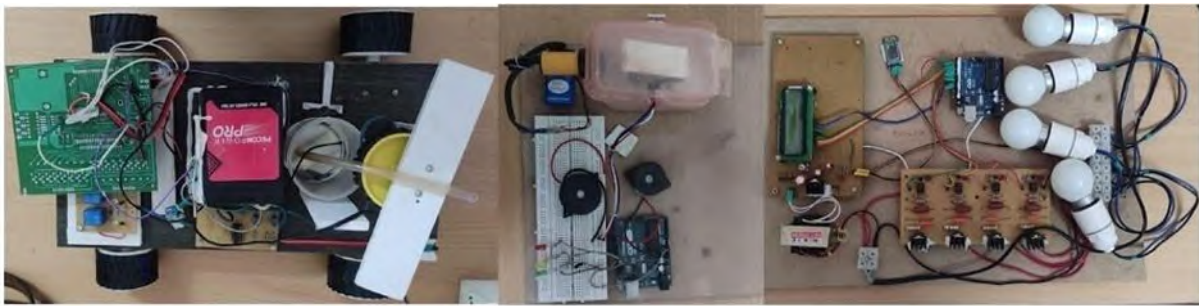


Fig.5.8.3c. Wall charts display on laboratories (Selective only).

Therefore, stringent measures are imposed by explaining the concept with the aid of charts and working models for theory as well laboratory courses. Some of the working models are explicitly shown in this report (Selective only).





**Fig.5.8.3d Models used in explaining Internet of Things (selective only)**

#### 5.8.4. Consultancy (from Industry) (20)

(Provide a list with Project Title, Funding Agency, Amount and Duration)

Funding Amount (Cumulative during CAYm1, CAYm2 and CAYm3): Amount >10 Lacs – 20 Marks,

Amount  $\leq 10$  and  $\geq 8$  Lakh – 15 Marks,

Amount  $< 8$  and  $\geq 6$  Lakh – 10 Marks,

Amount  $< 6$  and  $\geq 4$  Lakh – 5 Marks,

Amount  $< 4$  and  $\geq 2$  Lakh – 2 Marks,

Amount  $< 2$  Lakh – 0 Mark

##### A. Consultancy (From Industry)

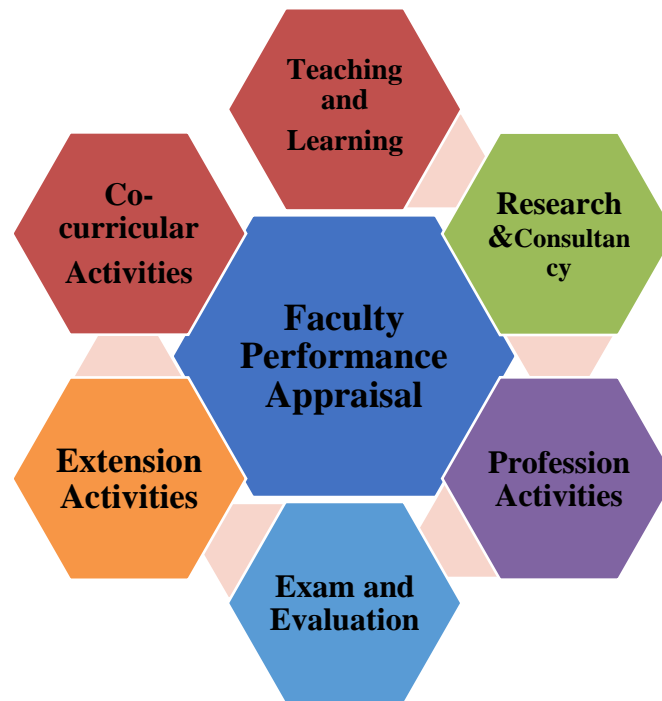
S. No.	Name of the consultant	Project Title	Funding Agency	Duration with Academic Year	Amount (in Lakhs INR)
1	Dr. B. S. Murugan	Integrated university management system (IUMS) development	Anand Techverce	2018-2019	1500000
2	Dr. P. Deepalakshmi	Mobile app for tracking the laying of underwater sea cables in the Gulf of Mannar region	Centurylink LLP	2018-2019	925000
3	Dr. C. Balasubramanian	Training of faculty members in a school in Business English Certification (BEC)	Maharishi Group of Schools	2018-2019	210000
4	Dr. P. Deepalakshmi	Expert system in determining the quality of nutmeg	Thillai Masala	2018-2019	90000
5	Dr. R. Ramalakshmi	Up & Cross Selling	CK Fortunes, IT Ventures, Chennai	2019 - 2020	29500

6	R. Raja Subramanian	Price Comparison (Ecommerce)	CK Fortunes, IT Ventures, Chennai	2019 - 2020	13275
7	Dr. R. Ramalakshmi	Health Checker	CK Fortunes, IT Ventures, Chennai	2019 - 2020	8850
8	Dr. A. Francis Saviour Devaraj	Energy aware reliable route selection scheme with clustered RP model for wireless sensor networks to promote interaction between human and sensors	Affle (India) Ltd.	2019 - 2020	1500000
9	Dr. R.Ramalakshmi	Multi Attribute-based routing for lifetime maximization in opportunistic mobile social networks	Trident Ltd.	2019 - 2020	655000
10	Dr.A.Robert Singh	Recognition of Ancient Tamil Palm Leaf Vowel Characters in Historical Documents using B-spline Curve Recognition	Mishra Dhatu Nigam Ltd.	2019 - 2020	550000
11	Dr.G.Muruga Boopathi	Enhanced security using hybrid parallel integrity key data service access control method in virtual cloud	Cyient Ltd.	2019 - 2020	425000
12	Dr.G.Muruga Boopathi	Modified secure AODV protocol to prevent wormhole attack in MANET	Take Solutions Ltd.	2019 - 2020	416000
13	Dr.P.Deepalakshmi	Rapid retrieval of secured data from the sensor cloud using a relative record index and energy management of sensors	Ingersoll Rand (India) Ltd.	2019 - 2020	382000

## 5.9. Faculty Performance Appraisal and Development System (FPADS) (10)

### A. Notified performance appraisal and development system; Appraisal Parameters; Awareness

Faculty Performance Appraisal form is collected from each faculty members mainly focuses on major areas like Teaching learning and evaluation activities, Co-curricular activities, professional related activities, Research and consultancy related contributions.



**Figure 5.9.1 Faculty Performance Appraisal**

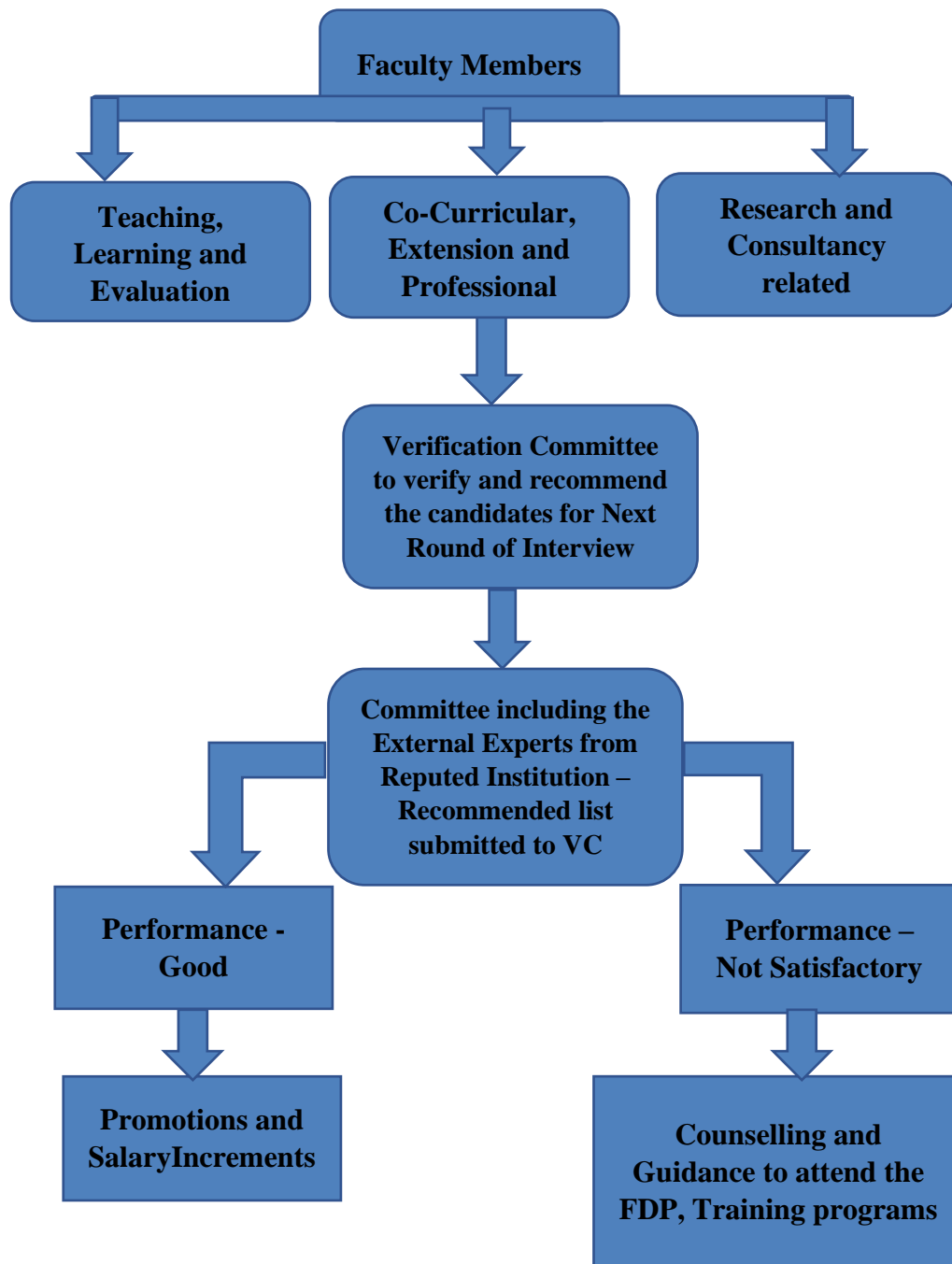
#### **Teaching, Learning and Evaluation Activities:**

- This parameter endorses the faculty to complete 100% syllabus, conduct seminar/Workshop/Seminar and tutorial classes.
- This also encourages the faculty to emphasizes on Innovative teaching learning methodologies and assessments that can be used by the faculty in imparting knowledge/Skills to the students.
- The faculty contribution towards the development of E-Content/MOOCs for the courses is also a criterion used for self-evaluation to test their teaching competency.

#### **Co-curricular, Extension and Profession Activities:**

- Faculty's interaction with outside world can be measured by looking into parameters like Orientation Course /Refresher Courses/ Research Methodology/Workshops/ Syllabus Up-gradation Workshop/ Soft Skills development Programmes/Teaching-Learning-Evaluation/ Technology Programmes, Faculty Development Programs, seminars attended by the faculty.
- Faculty contribution as session chair, judge, reviewer, editorial board member of journals/Conferences, invited lectures/ Resource Person/ Paper presentation in Seminars/ Conference is also a criterion used for self-evaluation.
-





**Figure 5.9.2. Faculty Performance System followed**

**Research and consultancy related contributions:**

- To promote quality research publications, more weightage is given to Scopus and SCI journals in comparison with other journals.
- In addition to this, to promote quality research, more weightage is given to IEEE, Elsevier and Springer conferences in comparison with other international conferences.
- Faculty members are encouraged to author books, book chapters (National and International Publisher) and knowledge-based volumes.

- This parameter also gives a lot of Importance to sponsored research projects from government and non-Government agencies. The weightage of marks has varied in accordance with the amount mobilized.
- To motivate the faculty for applying for national and international patent and technology transfer Maximum marks is being allotted which includes applying as well as sanctioning.
- Faculty members are also expected to provide consultancy services to the industry by providing real time solution.

### ***B. Implementation, Transparency and Effectiveness***

- Each faculty is supposed to submit the self-assessment cum performance appraisal form duly filled bi-annually (in the month of June and December) as a systematic procedure.
- A committee of the senior faculty is constituted to evaluate and recommend the candidates for promotion, as per the Career Advancement notification issued by the Vice Chancellor.
- Based on the details filled in the form and upon producing the corresponding evidence, the committee evaluates the performance of the faculty and may/may not recommend the faculty to the next level of interview for promotion under the Career Advancement Scheme (CAS).
- Shortlisted faculty members are meant to appear before the screening committee which consist of external experts from reputed institutions and make a brief presentation which includes the present research standing and future plan towards teaching and research for 10 minutes.
- Based on the presentation by the faculty members, suitable actions are taken. Best faculty members are awarded with the promotion, increment in salary and those who needs improvement are counselled and guided appropriately to improve their performances in forthcoming semesters.
- The entire process is based on the guidelines suggested by the UGC on promotion and assessment.

## 5.10. Visiting/Adjunct/Emeritus Faculty etc. (10)

### Provision of visiting/adjunct faculty (1)

There is the provision for the Institution to invite experts from different industries to organize Webinars, Workshops, Value Added Courses and One Credit Courses. With a good mix of theory and practice, they teach the latest technologies used by industries. This has contributed to students getting a placement at core companies. The following list contains information about visitors from various industries (Selective Only):

**Table 5.10a. List of Industry Experts**

S.No	Name of the Resource Person	Industry/ Institute
1	Dr. Vijay Athithan	Society for Electronics Transaction and Security, Chennai
2	Mr. Harsh Sharma	Associate Deep Learning Engineer, 360 DT, New Delhi
3	Nithiyanandam Ramesh	Founder and President, Nephos, systems, Chennai
4	Mr. P. K. P. Paventhan	Lead - Quality Assurance, Fidelity Investments, Chennai
5	Mr. V. Ramprasanth	Technical Lead, Eon Collective, Bangalore
6	Arunkumar Selvaraj,	TCS
7	Dr. Venkat Subramanian,	IBM
8	Er. Shibin Vargheese	Viberal Digital Solutions Pvt., Ltd
9	Er. Pranay Das, Er. Aman	IBM, Bangalore

- **Minimum 50 hours per year of interaction with adjunct faculty from industry/retired professors etc. (9)**

(Minimum 50 hours of interaction in a year will result in 3 marks for that year;  
3marks x 3years= 9marks)

**Table 5.10b List of Training Programs offered by Visiting Faculties to Students**

S. No	Academic Year	Name of the Industrial Expert	Industries/ Institute	Topic/ Subject	Contribution to Curriculum	Total Hours engaged by a faculty in an academic year	Date
1.	2019-20	Dr. Vijay Athithan	Team Lead, Society for Electronics Transaction and Security, Chennai	Predictive Modeling (40 Hours)	Data Science	80 Hrs	14/09/19- 15/09/19, 20/10/19, 19/10/19 28/10/19
2.	2019-20	Dr. Vijay Athithan	Team Lead, Society for Electronics Transaction and Security, Chennai	Introduction to Devops (40 Hours)	Beyond the Syllabus		25/07/2020- 05/08/2020
3.	2019 - 20	Mr. V. Ramprasanth	Technical Lead, Eon Collective, Bangalore	Mule soft development (40 Hours)	Internet Programming	80 Hrs	07/09/2019, 08/09/2019 14/09/2019, 15/09/2021 22/09/2021
4.	2019 - 20	Mr. V. Ramprasanth	Technical Lead, Eon Collective, Bangalore	Mule soft development (40 Hours)	Internet Programming		25/01/2020, 26/01/2020 02/02/2020, 08/02/2020, 09/02/2020
5.	2020 - 21	Mr. Harsh Sharma	Associate Deep Learning Engineer, 360 DT, New Delhi	Full Stack Management (40 Hours)	Java Programming	80 Hrs	05/06/2020 to 12/06/2020
6.	2020 - 21	Mr. Harsh Sharma	Associate Deep Learning Engineer, 360 DT, New Delhi	Web Application with React Native Beginners (40 Hours)	Java Programming Internet Programming		20/02/2021, 21/02/2021 27/02/2021, 28/02/2021 07/03/2021
7.	2020 - 21	Nithyanandam Ramesh	Founder and President, Nephos, systems, Chennai	Neural Network Architectures in Computer Vision (40 Hours)	Machine Learning	80 Hrs	20/07/2020 to 24/07/2020
8.	2020 - 21	Nithyanandam Ramesh	Founder and President, Nephos systems, Chennai	Web application using Django (40 Hours)	Internet Programming		07,14,21,27,18/02/2021

9.	2020 - 21	Mr. P. K. P. Paventhan	Lead - Quality Assurance, Fidelity Investments, Chennai	Software automation and validation <b>(120 Hours)</b>	Software Testing	120 Hrs	13/09/2020- 27/09/2020
10.	2021-22	Arunkumar Selvaraj,	TCS	CCNA CyberOps <b>(40 Hours)</b>	Computer Networks	40 Hrs	24/05/2022 to 28/05/2022
11.	2021-22	Dr. Venkat Subramanian,	IBM	Practical Machine Learning Using Python	Machine Learning, Python Programming	40 Hrs	24/05/2022 to 28/05/2022
12.	2021-22	Er. Shibir Vargheese,	Associate Developer, Viberal Digital Solutions Pvt., Ltd	Full Stack Development	Java Programming	40 Hrs	24/05/2022 to 28/05/2022
13.	2021-22	Er. Pranay Das, Er. Aman,	IBM, Bangalore	IoT using Arduino	Introduction to Internet of Things	40 Hrs	24/05/2022 to 28/05/2022
14.	2021-22	Mr. Ranga Krishnan	IBM, Bangalore	Deep Learning	Artificial Intelligence and Machine Learning	60 Hrs	27/12/2021 to 29/04/2022
15.	2021-22	Dr. Venkat Subramanian	IBM, Bangalore	Pattern and Anomaly Detection	Artificial Intelligence and Machine Learning	45 Hrs	27/12/2021 to 29/04/2022
16.	2021-22	Mr. Ranga Krishnan	IBM, Bangalore	Social, Web, and Mobile Analytics	Data Science	45 Hrs	27/12/2021 to 29/04/2022
17.	2021-22	Dr. Venkat Subramanian	IBM, Bangalore	Big Data Analytics	Data Science	60 Hrs	27/12/2021 to 29/04/2022
18.	2021-22	Mr.Mohsin Quresh	IBM, Bangalore	IT Network Security	Cyber Security and Forensics	60 Hrs	27/12/2021 to 29/04/2022
19.	2021-22	Mr.Mohsin Quresh	IBM, Bangalore	Ethical Hacking & Penetration Testing	Cyber Security and Forensics	45 Hrs	27/12/2021 to 29/04/2022
20.	2021-22	Er. Aman	IBM, Bangalore	Smarter City	Internet of Things	45 Hrs	27/12/2021 to 29/04/2022
21.	2021-22	Er. Aman	IBM, Bangalore	Analytics for IOT	Internet of Things	45 Hrs	27/12/2021 to 29/04/2022

In addition to workshops and guest lectures, industry specific trainings are offered to students as part of Placements and Projects. The sample list of industry specific training offered to the students during the academic year 2020-21 alone is depicted in Table 5.10b.

**Table 5.10b List of Training Programs offered by Industries to Students**

<b>List of Training Programs - (2019-21)</b>				
<b>S. No.</b>	<b>Date of Training</b>	<b>Hours of Training</b>	<b>Name of Training</b>	<b>Name of the Organization</b>
1	26-06-2019 To 31-07-2019	220	SAP Certification Training	Software Training Institute, Chennai.
2	8-06-2020 To 2-07-2020	45	TCS NINJA	Innovative Pvt Ltd, Chennai
3	05-07-2020 To 03-08-2020	212	SAP Certification Training	Software Training Institute, Chennai.
4	7-08-2020 To 16-08-2020	60	Capgemini, Aspire, IBM	Aspirations Consulting Services Pvt Ltd, Bangalore
5	27-08-2020 To 5-09-2020	60	Automata Fix Training	Innovative Pvt Ltd, Chennai
6	5-09-2020 To 14-09-2020	60	CTS Specific Training	SMART Resources Pvt Ltd, Chennai
7	3-10-2020 To 9-10-2020	42	CTS Specific Training	FACE, Coimbatore.
8	4-01-2021 To 13-01-2021	40	Aptitude and Technical (Programming) Training	AICL Communications Pvt Ltd, Mumbai
9	26-02-2021 To 28-02-2021	18	Aspire Specific Training	Innovative Pvt Ltd, Chennai
7	01-03-2021 To 05-03-2021	30	Java Specific Training	Free Lancer, Chennai
9	05-05-2021 To 06-05-2021	16	Accenture Specific Training	SMART Resources Pvt Ltd, Chennai
10	11-05-2021 To 14-05-2021	8	Wipro Specific Training	Global Talent Track, Chennai
11	24-05-2021 To 25-05-2021	10	Capgemini Specific Training	SMART Resources
	31-05-2021 To 05-06-2021	24	Employability skill Training	Pvt Ltd, Chennai  Global Talent Track, Chennai

12	07-06-2021 To 11-06-2021	30	DXC and HCL Specific Training	SMART Resources Pvt Ltd, Chennai
13	12-06-2021 To 13-06-2021	12	DXC and HCL Specific Training-Extension	
14	18-06-2021 To 21-06-2021	12	C Specific Training	Innovative Pvt Ltd, Chennai
15	24-06-2021 To 25-06-2021	12	Analytical & Verbal Training	New Leaf Learning Solutions, Trichy
16	01-07-2021 To 31-07-2021	238	SAP Certification Training	Software Training Institute, Chennai.
17	17-11-2021 To 24-11-2021	20	AWS Cloud Foundation	AWS Solution – AICTE Eduskill Program
18	13-11-2021 To 16-11-2021	187	Programming Skills Training	Global Talent Track, Chennai
19	20-11-2021 To 27-11-2021	233	Training Programme on SoftSkills, Communication and Aptitude	SMART Resources Pvt Ltd, Chennai
20	25-11-2021	92	Edvoy Specific Training	Free Lancer, Chennai

CRITERIA 6	
FACILITIES AND TECHNICAL SUPPORT	80

### 6.1 Adequate and well equipped laboratories and technical Manpower (40)

The Department of Computer Science and Engineering includes well-equipped laboratories with all of the required hardware and software to enhance student's technical knowledge with innovative engineering programmes and tasks. The detailed description of all the labs is given in Table 6.1.

**Table. 6.1. List of Laboratories and Technical Manpower**

Sl. No	Name of the Laboratory	No of Students per setup (Batch size)	Name of the Important equipment	Weekly Utilization status (all the courses for which the lab is utilized)	Technical Manpower support		
					Name of the technical staff	Designation	Qualification
1	Web Programming Lab (8601A)	39	Acer Veriton series (UJSSI.m19) Intel Corei5-4460Processor (3.2ghz) Intel h81ChipsetMother board 8GBDDR3@1600 Mhz Ram1TB@7200RpmSATA Hard Disk Drive/Dos Keyboard/Optical Mouse/Mini Tower Cabinet/DVD RW 19.5'Wide Led Monitor(Acer) HCL Intel Core 2 Duo 2.93Ghz,	20-30 hrs per week	Mr. S. Murali	Lab Instructor	Diploma (ECE)



			3 GB DDR2 RAM,250GB HDD 17" TFT Colour Monitor. DVD Writer, USB Optical Mouse, USB Keyboard (104 Key's)			
2.	Open Source Technology Lab (8601B)	27	Acer Veriton series (UJSSI.m19) Intel Corei5- 4460Processor (3.2ghz) Intel h81ChipsetMother Board. 8GBDDR3@1600 Mhz Ram1TB@7200R pmSATA Hard Disk Drive/Dos Keyboard/Optical Mouse/Mini Tower Cabinet/DVD RW 19.5'Wide Led Monitor(Acer)	20-30 hrs per week		
3.	Distributed Computing Lab (8601C)	40	IBM LENOVO Think Centre model (8985 Az7) Pentium ®D CPU 2.80GHz Processor 800 MHZ FSB 3GB DDR2 RAM.160GB SATA HDD.17" TFT colour Monitor. DVD Writer	20-30 hrs per week		
4.	Programing Language	34	Acer-Veriton M200-H81 (i5),Intel Core i54570 4th	25-40 hrs per week	Mr. R. Sudhakar	Lab Instructor  B.C.A

	Lab - I (8501A)		Generation processor,8gb DDR3 RAM, 1TB Sata Hard disk,21.5" LCD HD monitor, DVD Writer,104 keys keyboard, USB & Serial Port mouse.				
5.	Programming Language Lab - II (8501B)	32	HP Desktop Pro- G2 intel core i5- 9400 6C- 5W, Intel core i5 processor, 1 TB Sata Hard Disk, 16GB DDR3 Ram, 19.5" HP P-204-V LED Monitor, DVD Writer, 104 Keys HP USB Keyboard, HP USB Mouse.	25-40 hrs per week			
6.	Software Development Lab (8501C)	34  06	1)IBM Lenovo Think centre B- 33Intel core2duo 2.4Ghz Processor,3GB DDR2 Ram,80Gb Sata HDD,14" Lenovo TFT Monitor,104 Keys Keyboard, Serial port mouse. (34 nos) 2) IBM Lenovo Think Centre E- 73(10AS- A0AQ1H) Intel core i5-4590s 4th Generation Processor, Intel H- 81Chipset Mother Board,8GB DDR3 Ram,1TB Sata Hard Disk,19.5" LED Lenovo	20-30 hrs per week			

			Monitor, 104 keys keyboard, Lenovo USB Mouse. (6 nos)				
7.	DBMS Lab-II (8401A)	30	N-Computing Raspberry-Model: RX300. 1.2GHz Quad Core Processor, 1GB LPDDR2 RAM Memory. Micro SDHC- 8GB Storage	10-20 hrs per week	Mr. G. Ragavendran	Lab Instructor	BSC, MCA
8.	Operating Systems Lab	26	Processor: Intel Core'2 Duo E8400 (3.0 GHz) RAM: 1GB Hard Drive: 160GB SATA Optical Drive: DVD +/- R/RW, Acer-Veriton M200-H81 (i5), Intel Core i5-4570 4th Generation processor, 8gb DDR2 Ram,1 TB Hard disk,21.5	10-20 hrs per week			
9.	DBMS LAB-I (Computer Block)	59	N-Computing Raspberry-Model: RX300. 1.2GHz Quad Core Processor, 1GB LPDDR2 RAM Memory. Micro SDHC- 8GB Storage	10-20 hrs per week	Ms.S.Gayathri	Lab Instructor	B.Sc.,
10.	Network and Compiler Design Lab (Computer Block)	35	N-Computing Raspberry-Model: RX300. 1.2GHz Quad Core Processor, 1GB LPDDR2 RAM Memory. Micro SDHC- 8GB Storage	20-30 hrs per week			

11.	Microprocessor Lab (Computer Block)	30	IBM Lenovo Think Centre B-33(9439) Intel Core2duo processor, 2GBDDR Ram, 160GB HDD, 19" TFT Monitor. Vi Arm LPC 2148 Advanced Development Board Digital storage Oscilloscope, Bread Board Soldering Iron with stand 8086 Trainer Kit Wire cutter	10-20 hrs per week			
12.	Artificial Intelligence Lab (8301A)	60	Intel Core i7-9700KF, 8 x 3.6 GHz DDR-4, 2 x 8 GB 500 GB GeForce RTX 2080, 8 GB	25-40 hrs per week	Mr. C.Chidambaram	Lab Instructor	Diploma (ECE)
13.	Cyber security and Forensics Lab (8301B)	60	Intel Core i7-9700KF, 8 x 3.6 GHz DDR-4, 2 x 8 GB 500 GB GeForce RTX 2080, 8 GB	20-30 hrs per week			
14.	IoT sensor Technology Lab (Computer Block)	30	Intel i7, 16 GB RAM, 1 TB HDD, MS Windows 10, Keyboard, Optical Mouse Arduino UNO R3 Development Board Node MCU Esp8266 Development Board Broadcom BCM2711, Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz	10-20 hrs per week	Mr.S.Mahalingam	Lab Instructor	Diploma (Computer)

			8GB LPDDR4-3200 SDRAM, 2.4 GHz and 5.0 GHz IEEE 802.11ac wireless, Bluetooth 5.0, BLE Gigabit Ethernet, Ultrasonic Sensor HC-SR04, PIR Motion Sensor HC-SR501, IR Proximity Sensor, Soil Moisture Sensor Module, BMP180, Tricolour LEDs, LDR, LM35, DHT11				
15.	Data Science and Visualization Lab (8004)	30	HP 280 G2, MT Intel Core TM i5-6500 Cpu@3.20GHz 8GB DDR4 1TB HDD 19	10-20 hrs per week	Mr.M.Jothi Mahalingam	Lab Instructor	B.Com, M.C.A

## **6.2 Laboratories maintenance and overall ambiance (10)**

### **Laboratories maintenance and overall ambiance**

All labs are well equipped and have advanced computing facilities maintained by dedicated and experienced supporting staffs. So as to monitor the maintenance of laboratories, a departmental committee is constituted headed by the head of the department. All the laboratories are maintained periodically. Each laboratory maintains a lab register for detailing the proper utilization of labs and information related to lab records. All the Lab in charges maintain the indent book on a regular basis and also the overall ambience of the laboratories is well maintained. To maintain the laboratories a departmental committee is constituted which is headed by head of the department and the faculty lab incharge. This committee is responsible for monitoring and taking necessary actions for maintenance of labs. All the laboratories are maintained periodically. In house maintenance is carried out as per requirement on a periodic basis and major issues are outsourced as per the procedure followed by the institution.

Policy: Equipment is operated in accordance with manufacturer's instructions and in a way which minimizes the cost of repairs and maintenance.

#### **Procedure:**

1. Do's and Don'ts and Safety measures are displayed in each lab.
2. Skilled Technical Staff are available for maintenance of Electronic equipment's and software.

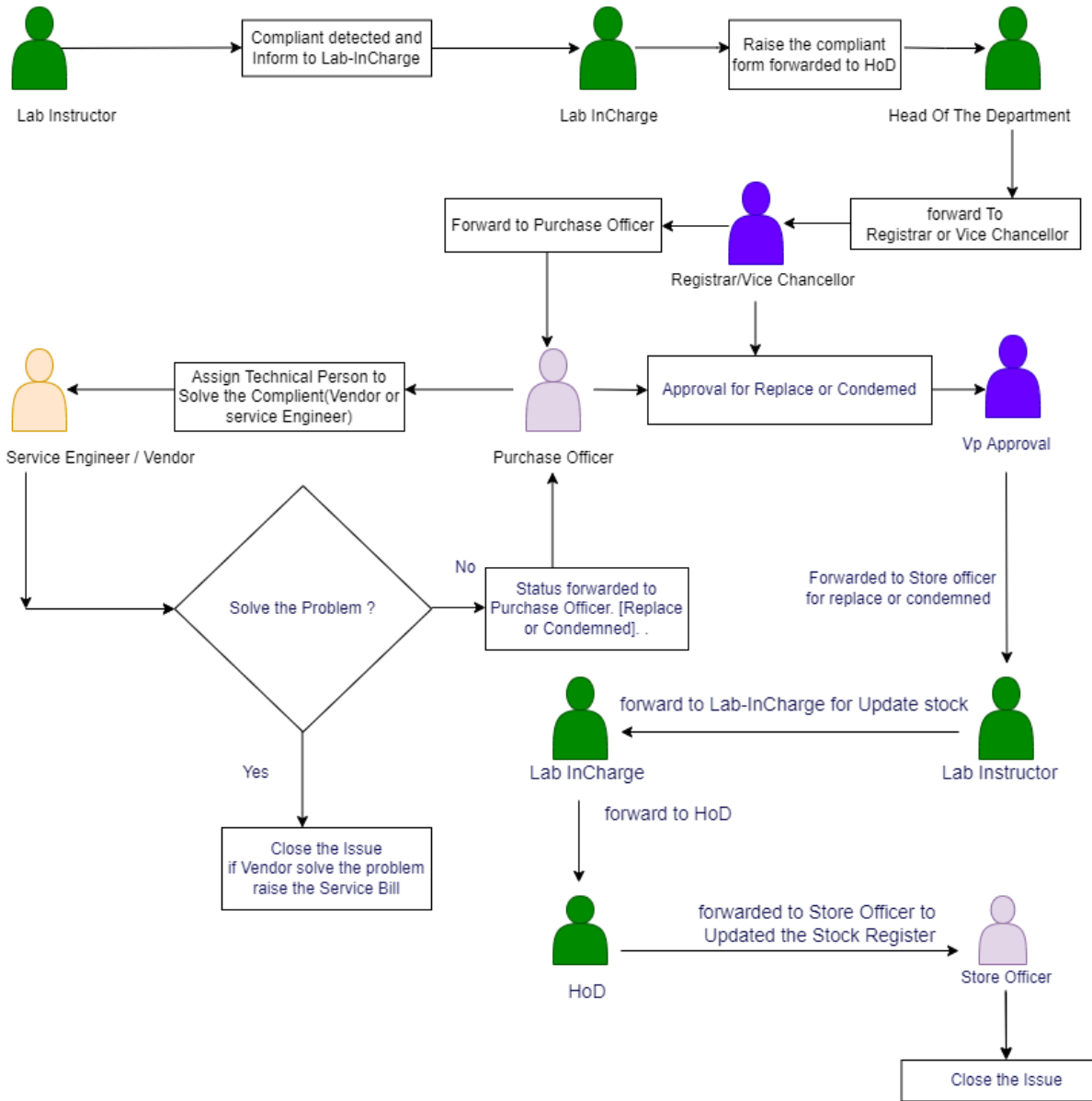
#### **Laboratory maintenance**

1. All the systems are checked and updated as per the requirements, before the start of every semester.
2. Student Attendance Register is maintained for Students IN/OUT time and PCs usage.
3. Dos and Donts and Safety estimates rules are displayed in each laboratory.
4. Department has 20KVA UPS along with batteries and backup to support power suppliers.
5. One Teaching faculty and a Lab instructor are in-charge of the overall functioning of each lab.
6. Stock register is maintained separately for each lab.
7. Fire Extinguishers are available in each lab and floor.

8. First Aid Kit is available for emergencies.
9. The list of lab programs is displayed in all the labs.
10. Software installation and minor software/hardware issues are solved by lab instructor.
11. Major problem is outsourced by Institution.

### **Overall Ambiance**

1. All laboratories are equipped with state of art equipment to meet the requirements of curriculum for all UG and PG courses.
2. All labs have experienced faculty to educate the students in all the aspects of Computer science and engineering. All faculty members who are involved in labs are well trained in all recent software and tools to educate the students in new technologies.
3. All labs are spacious and equipped with comfortable furniture like chairs and benches.
4. Hard copy and soft copy of lab manuals are available in the lab for student reference as well as distributed to students.
5. Every lab is provided with one entry / exit and sufficient number of windows for ventilation and natural light.
6. Project lab has been provided for the students to carry out their mini and major projects.
7. Cup-boards are available in each lab for students to place their belongings.
8. Each lab is equipped with white board, multimedia projector, computer, Internet, and other amenities.
9. The laboratories are facilitated with proper air conditioning systems.
10. All labs are supported by Uninterrupted Power Supply which ensures that all laboratory slots are utilized effectively. Separate rooms are allotted for maintaining UPS and batteries.



**Fig. 6.2.1. Lab Compliant registration and resolving process**

The lab instructor detects the complaint and informs the lab in-charges who forward it to the HoD. Then, the request is submitted to the registrar or vice chancellor and it is forwarded to the purchase officer. The purchase officer will either assign a technical person to solve the complaint or approve replacing the item or declare as condemned. In the first case, the technical person will check the feasibility to solve the problem. If it can be solved, the status will be forwarded to the purchase officer and then to the vice president. In the second case, the approval from the Vice president is required. Then the details are forwarded to the store officer and replacement will be



done or status of condemned will be registered. The final update will be given by the lab instructor to the lab technician to update the stock. The stock details will be forwarded to the HoD and then to the store officer for making the stock update.

The technical supporting staff (Teaching) of our computer science and engineering department is shown in Table 6.2.1.

**Table 6.2.1 Technical Supporting Staff (Teaching)**

S. No	Name of the Faculty	Designation	Qualification	Name of the Laboratory
1.	Dr.B.Pitchaimanickam	Associate professor	M.E., Ph.D.	(Computer Block) DBMS LAB-I Network and Compiler Design Lab Microprocessor Lab
2.	Dr.T.Dhilipan Rajkumar	Assistant professor-III	M.E., Ph.D.	(8401 ) DBMS Lab-II Cyber forensics & Information security Lab Data Analytics and Cloud Computing Lab
3.	Dr.A.Saravanan	Associate professor	M.E., Ph.D.	(8501) Programming Language Lab - I Programming Language Lab - II Software Development Lab
4.	Dr.A.Robert Singh	Associate professor	M.E., Ph.D.	(8601) Web Programming Lab Open Source Technology Lab Distributed Computing Lab
5.	Mr.R.Raja Subramanian	Assistant professor-II	M.E., (Ph.D.)	(8301a) Artificial Intelligence Lab
6.	Dr.N.C.Brintha	Associate professor	M.E., Ph.D.	(8301a) Networks and Cyber Security Lab
7.	Dr.C.Balasubramanian	Associate professor	M.E., Ph.D.	(Computer Block) IoT sensor Technology Lab
8.	Dr.B.S.Murugan	Associate professor	M.E., Ph.D.	(8004) Data Science and Visualization Lab

The curriculum laboratory utilization of our computer science and engineering department is shown in Table 6.2.2.

**Table 6.2.2 Curriculum Laboratory Utilization**

S. No	Laboratory Name	Curriculum Utilization	Related CO's	Related P.O.'s	Related PSO's
1.	Web Programming Lab	CSE481- Internet Programming Lab	CO1 to CO5,	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R272- Java Programming Lab	CO1 to CO5,	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12	2, 3
2.	Open Source Technology Lab	CSE483- Mobile Application Development Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 3
		CSE18R212- Machine Learning Lab	CO1 to CO5,	1, 2, 3, 4, 7, 8, 9, 10, 11, 12	2, 3
		CSE18R273- Operating Systems Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R291- IT Data Security Lab	CO1 to CO5,	4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 4
3.	Distributed Computing Lab	CSE482- Object Oriented Software Development Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 3
		CSE18R371- Computer Networks Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R290- Cloud Architecture and Deployment Models Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 4
4.	Programming Language Lab - I	CSE282- System Software Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R271- Object Oriented Programming Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
5.	Programming Language Lab - II	CSE18R171- Programming for problem solving Lab	CO1 to CO6,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 3

		CSE18R254- Introduction to Python Programming Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
6.	Software Development Lab	CSE381- Software Engineering Lab	CO1 to CO5,	4, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R387- Computational Linguistics and Natural Language Processing Lab	CO1 to CO5,	1, 2, 3, 4, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R388 - Pattern and Anomaly Detection	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2,
7.	DBMS Lab-II	INT18sdR371- Data Base Management Systems Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R292- Algorithms for Intelligent Systems and Robotics Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 4
8.	Operating Systems Lab	CSE18R252- Formal Language and Automata Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2,
		CSE18R172-Data Structure & Algorithms Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
9.	Cyber security and Forensics Lab	CSE18R375- Digital Forensics Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R264- IT Application Security Lab	CO1 to CO5,	3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R454- Cyber Security and Forensics Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
10.	Data Science and Visualization Lab	CSE18R258- Descriptive Analytics Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2
		CSE18R381- Data Visualization for Analytics Lab	CO1 to CO5,	4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2,

		CSE18R352- Big Data Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
11.	DBMS LAB-I	CSE18R173- Design and Analysis of Algorithms Lab	CO1 to CO5,	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12	1, 2,
		CSE18R379- Wireless Sensor Networks (WSN) and IoT Standards Lab	CO1 to CO5,	3, 4, 5, 7, 8, 9, 10, 11, 12	2, 3
12.	Network and Compiler Design Lab	CSE18R274-Compiler Design Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
		CSE18R352- Network and Information Security Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3
13.	Microprocessor Lab	CSE286- Microprocessor and Microcontroller Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 3
		CSE18R174-Computer Architecture and Organization Lab	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 3
14	IoT sensor Technology Lab (Computer Block)	CSE18R210 - Introduction to Sensor Technology & Instrumentation	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 4
		CSE18R263 - Analytics for IoT	CO1 to CO5,	3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 3
15.	Artificial Intelligence Lab (8301A)	CSE18R396-Deep Learning	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 4
		CSE18R257 Predictive Analytics	CO1 to CO5,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3

The technical supporting staff (Teaching) of our computer science and engineering department is shown in Table 6.2.3.

**Table 6.2.3 Workshops attended by Technical Staff**

S.No	Name of the Technical Staff	Events Attended	Organizing Institution	Duration
1.	Mr. G. Ragavendran	Workshop Learning on the 'Moodle Management System'	Kalasalingam Academy Research and Education	of 1 March 2019
		Moodle Learning Management System	Kalasalingam Academy Research and Education	of 15 March 2019
		Linux	Kalasalingam Academy Research and Education	of 23 August 2019
		IT Fundamentals for Cyber Security	IBM Software Education	4 <sup>th</sup> & 5 <sup>th</sup> March 2022
		Two Day Workshop on Adobe Photoshop	Kalasalingam Academy Research and Education	of 17 <sup>th</sup> & 18 <sup>th</sup> June 2022
2.	Mr. R. Sudhakar	Workshop Learning on the 'Moodle Management System'	Kalasalingam Academy Research and Education	of 1 March 2019
		Moodle Learning Management System	Kalasalingam Academy Research and Education	of 15 March 2019
		Linux	Kalasalingam Academy Research and Education	of 23 August 2019
		IT Fundamentals for Cyber Security	IBM Software Education	4 <sup>th</sup> & 5 <sup>th</sup> March 2022
		Two Day Workshop on Adobe Photoshop	Kalasalingam Academy Research and Education	of 17 <sup>th</sup> & 18 <sup>th</sup> June 2022
3.	Mr. S. Murali	Workshop Learning on the 'Moodle Management System'	Kalasalingam Academy Research and Education	of 1 March 2019
		Moodle Learning Management System	Kalasalingam Academy Research and Education	of 15 March 2019
		Linux	Kalasalingam Academy Research and Education	of 23 August 2019

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		IT Fundamentals for Cyber Security	IBM Software Education	4 <sup>th</sup> & 5 <sup>th</sup> March 2022
		Two Day Workshop on Adobe Photoshop	Kalasalingam Academy Research and Education	of 17 <sup>th</sup> & 18 <sup>th</sup> June 2022
4.	Mr.C.Chidambaram	Workshop Learning on the 'Moodle Management System'	Kalasalingam Academy Research and Education	of 1 March 2019
		Moodle Learning Management System	Kalasalingam Academy Research and Education	of 15 March 2019
		Linux	Kalasalingam Academy Research and Education	of 23 August 2019
		IT Fundamentals for Cyber Security	IBM Software Education	4 <sup>th</sup> & 5 <sup>th</sup> March 2022
		Two Day Workshop on Adobe Photoshop	Kalasalingam Academy Research and Education	of 17 <sup>th</sup> & 18 <sup>th</sup> June 2022
5.	Mr.S.Mahalingam	Workshop Learning on the 'Moodle Management System'	Kalasalingam Academy Research and Education	of 1 March 2019
		Moodle Learning Management System	Kalasalingam Academy Research and Education	of 15 March 2019
		Linux	Kalasalingam Academy Research and Education	of 23 August 2019
		IT Fundamentals for Cyber Security	IBM Software Education	4 <sup>th</sup> & 5 <sup>th</sup> March 2022
		Two Day Workshop on Adobe Photoshop	Kalasalingam Academy Research and Education	of 17 <sup>th</sup> & 18 <sup>th</sup> June 2022
		Workshop Learning on the 'Moodle Management System'	Kalasalingam Academy Research and Education	of 1 March 2019
6.	Mr.M.Jothi Mahalingam	Moodle Learning Management System	Kalasalingam Academy Research and Education	of 15 March 2019
		Linux	Kalasalingam Academy Research and Education	of 23 August 2019

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		IT Fundamentals for Cyber Security	IBM Software Education	4 <sup>th</sup> & 5 <sup>th</sup> March 2022
		Two Day Workshop on Adobe Photoshop	Kalasalingam Academy Research and Education	of 17 <sup>th</sup> & 18 <sup>th</sup> June 2022
		Workshop Learning on the 'Moodle Management System'	Kalasalingam Academy Research and Education	of 1 March 2019
7.	Ms.S.Gayathri	IT Fundamentals for Cyber Security	IBM Software Education	4 <sup>th</sup> & 5 <sup>th</sup> March 2022
		Two Day Workshop on Adobe Photoshop	Kalasalingam Academy Research and Education	of 17 <sup>th</sup> & 18 <sup>th</sup> June 2022
8.	Mrs.A Siva Meena	Two Day Workshop on Adobe Photoshop	Kalasalingam Academy Research and Education	of 17 <sup>th</sup> & 18 <sup>th</sup> June 2022

The laboratory facilities of our computer science and engineering department is depicted in Fig. 6.2.2.

**Web Programming Lab (Venue: 8601A)**



**Open Source Technology (Venue: 8601B)**





**Distributed Computing Lab (Venue: 8601C)**



**Programming Language Lab - I (Venue: 8501A)**



Programming Language Lab - II (Venue: 8501B)



Software Development Lab (Venue: 8501C)



DBMS LAB-II (Venue: 8401)



Operating Systems Lab (Venue: 8401)



DBMS LAB-I (Venue: Computer Block)



Network and Compiler Design Lab (Venue: Computer Block)





**Fig. 6.2.2. Sample Lab facilities**

### 6.3 Safety measures in laboratories (10)

S. No	Laboratory Name	Safety Measures
1	Web Programming Lab (8601A)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
2	Open Source Technology Lab (8601B)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> </ul>

		<ul style="list-style-type: none"> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
3	Distributed Computing Lab (8601C)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
4	Programming Language Lab - I (8501A)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>

5	Programming Language Lab - II (8501B)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
6	Software Development Lab (8501C)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
7	DBMS (8401A) Lab-II	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> </ul>



		<ul style="list-style-type: none"> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
8	Operating Systems Lab	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
9	DBMS LAB-I (Computer Block)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> </ul>

		<ul style="list-style-type: none"> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
10	Network and Compiler Design Lab (Computer Block)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
11	Microprocessor Lab (Computer Block)	<ul style="list-style-type: none"> <li>• Properly connect the 8085 / 8086 -microprocessor kit with power supply terminals. Laboratory Rules are displayed inside the venue. Well-trained technical supporting staff monitors the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory.</li> <li>• Periodical servicing of the lab equipment. Proper earthing has been done for all Electrical Equipment.</li> </ul>

12	Artificial Intelligence Lab (8301A)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
13	Cyber security and Forensics Lab (8301B)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it.</li> <li>• The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>
14	IoT sensor Technology Lab (Computer Block)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> </ul>

		<ul style="list-style-type: none"> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> </ul> <p>The student must check the computer unit and its Peripherals attached before using it. The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</p>
15	Data Science and Visualization Lab (8004)	<ul style="list-style-type: none"> <li>• Specific Safety Rules in the form of Do's and Don'ts are displayed in the Laboratory. Well-trained technical supporting staff is available to monitor the labs at all times.</li> <li>• First aid box, Fire extinguishers are kept in the laboratory. Periodical servicing of the lab equipment.</li> <li>• Proper earthing has been done for all Electrical Equipment.</li> <li>• Maintain a clean and organized laboratory.</li> <li>• Avoiding the use of cell phones.</li> <li>• Appropriate storage areas Permission denied for pen drives.</li> <li>• Sign the log-out register before leaving the lab.</li> <li>• Computers should be turned off properly before leaving the lab.</li> <li>• Students must remove their footwear before entering to the lab.</li> <li>• The student must check the computer unit and its Peripherals attached before using it. The student must immediately inform the instructor if there's any defect, error, or damage observed at the computer (Hardware/software).</li> </ul>

## 6.4 Project laboratory (20)

In the CSE department, an exclusive lab is available for project / mini works to be carried out by students.

Project Laboratory enables UG students to obtain hands-on experience and to realize their project ideas as executable projects.

1. Several successful projects have been carried out by students in this lab.
2. High speed internet facilities are always available to these systems.
3. Final year projects and mini projects of all semesters are carried out in this lab
4. The details of project lab is depicted in Table. 6.4.1.

**Table. 6.4.1. Project Lab Details**

Lab	Facilities	Utilization	Utilization in Hrs
<b>Distributed Computing Lab</b>	IBM LENOVO Think Centre model (8985 Az7) Pentium ®D CPU 2.80GHzProcessor 800 MHZ FSB3GB DDR2 RAM.160GB SATA HDD.17" TFT colour, Monitor. DVD Writer <b>Open Source Software</b> Turbo C,DevC++,Adobe Reader, NetBeans with Java1.8.0, MySQL plus- Python3.6.7. Wireshark, Tableau, Cisco Pocket Tracer, JFlap, Logisim, RStudio	UG students PG students Research Scholars Faculty members Students/Faculty members use this lab to do their mini projects, projects and research activities.	24 hrs per week
<b>Data Science and Visualization Lab (8004)</b>	HP 280 G2, MT Intel Core TM i5-6500 Cpu@3.20GHz 8GB DDR4 1TB HDD 19" LED Monitor DVD Writer <b>Open Source Software</b> Apache Spark, Tableau, RStudio		20 hrs per week
<b>IoT sensor Technology Lab (Computer Block)</b>	Intel i7, 16 GB RAM, 1 TB HDD, MS Windows 10, Keyboard, Optical Mouse Arduino UNO R3 Development Board		20 hrs per week

	<p>Node MCU Esp8266 Development Board Broadcom BCM2711, Quad core Cortex-A72 (ARM v8) 64-bit SoC @ 1.5GHz 8GB LPDDR4-3200 SDRAM, 2.4 GHz and 5.0 GHz IEEE 802.11ac wireless, Bluetooth 5.0, BLE Gigabit Ethernet, sensors, LEDs, LDR, LM35, DHT11 <b>Open Source Software</b> Arduino UNO IDE, Thinger.io</p>		
<p><b>Cyber security and Forensics Lab (8301B)</b></p>	<p>HP 280 G2, MT Intel Core TM i5-6500 Cpu@3.20GHz 8GB DDR4 1TB HDD 19" LED Monitor DVD Writer <b>Open Source Software</b> KaliLinux, Virtual Box, Wireshark, Open Vulnerability Assessment Scanner (OpenVAS), Zed Attack Proxy (ZAP), sqlmap, KeePass, metasploit framework, Nmap, OSSEC</p>		<p>20 hrs per week</p>

The project labs are depicted as follows Fig. 6.4.1., 6.4.2., 6.4.3., and 6.4.4.



**Fig. 6.4.1. Distributed Computing Lab**



**Fig. 6.4.2. Cyber security and Forensics Lab**



**Fig. 6.4.3. IoT sensor Technology Lab**



**Fig. 6.4.4. Data Science and Visualization Lab**



<b>CRITERIA 7</b>	
<b>CONTINUOUS IMPROVEMENT IN COS, POS AND PSOS</b>	<b>100</b>

### **7.1 Continuous improvement in COs, POs and PSOs (75)**

#### **Continuous Improvement in PO:**

Based on the student performance on PO attainment, the remedial measures were taken in various aspects such as, teaching and learning process, curriculum modification, and elimination of academic content and dissemination of academic flexibility based on course exit survey. All these modifications were performed with the focus of improving CO attainment for the individual student since the enhancement of CO attainment will aid to improve the PO attainment.

For 2016-2020 batch, target level is fixed as 1.8. Accordingly, the entire PO was attained by means of achieving the direct and indirect attainment of CO with the support of existing teaching learning process and curriculum design. For the next batch (2017-2021), the target level is set as 2 which is indicated within the \*\*. In order to achieve the modified target, various factors were considered and the action plans were listed out in the following Table for different courses towards the attainment of target value. From the calculation, the significant improvement in the PO attainment (up to six semester) was observed which was represented as (2.1)\*\* for the PO1. Similarly, for each PO attainment the existing target value was achieved and the new target and the attainment of PO for the next batch of students (up to six semester) were indicated in (\*) and (\*\*)\* respectively.

PO	Target Level	Attainment Level	Observations
<p><b>PO1: Engineering Knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.</p>			
<p><b>PO1</b></p>	<p><b>1.8</b>  <b>(2.0)*</b></p>	<p><b>2.10</b>  <b>(2.42)**</b></p>	<p><b>Observation</b></p> <p><b>CSE102 Programming Languages:</b> Target is achieved. The course being the base and prerequisite of higher-level programming courses, conceptual and practical knowledge on advanced C programming constructs (CO4, CO5) need to be improved. Hence it has positive reflection during placements and competitive examinations like GATE.</p> <p><b>CSE103- Data Structures:</b> In this course, all COs are attained well except CO5. Improvement is required in CO attainment level.</p> <p><b>CSE209- Algorithms and Complexity:</b> Attainment Level is low. Attainment level of CO2 and CO3 are comparatively low. Concepts under the CO2 and CO3 need to be focused for further improvement.</p> <p><b>ECE202 Digital Electronics:</b> Contributing Attainment level is low towards PO1. This is mainly because of less attainment in CO4 which indicates that the students face difficulty in applying the flip flop and Memory concepts.</p>
<p><b>Action 1- CSE102:</b> The course is revised and offered as Integrated Course (IC). Hence students will experientially learn entire topics dealt in the syllabus. In addition, examinations and assignments are inculcated with questions from GATE. Also, students are motivated to take Online Courses pertaining to Programming in C in NPTEL platform, as part of Exploratory learning. The regularized assignments from NPTEL, and programming assignments curated by the faculty have developed strong coding skills into the students</p> <p><b>Action 2- CSE103:</b> CO5-Performance analysis and evaluation concepts in terms of time and space are practiced by giving tutorial problems. Problem based learning is inculcated to impart the design thinking. With subsequent theory and laboratory sessions, students are motivated to practice efficient programs leveraging complex data structures.</p> <p><b>Action 3- CSE209:</b> CO2 and CO3 include the problem solving, optimization problems, graphs and tree concepts. To cater the requirement, the algorithmic design and competitive coding skills in the course is inculcated by mandating regular coding challenges to students in online platforms like Hacker rank. To regularize the same, the course is offered with X Component with additional contact hours.</p> <p><b>Action 3- ECE202:</b> Syllabus has been updated by splitting the combination and sequential logic focusing the memory concepts separately. Additional tutorials are added to improve the learning capabilities. Course type is changed as Integrated course (IC) so that theory concepts and practical components are merged well.</p>			

PO	Target Level	Attainment Level	Observations
<p><b>PO2: Problem analysis:</b> Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.</p>			
PO2	1.8  (2.0)*	2.13  (2.39)**	<p><b>Observation</b></p> <p>Target is achieved but the following subjects have further scope of refinement.</p> <p><b>CSE103- Data Structures:</b> In this course, target achieved, students lagging in analyze the advanced concepts and that need to be improved for further growth.</p> <p><b>CSE204- Theory of Computation:</b> Overall CO attainment of this course did not contribute well in PO2. Among all CO attainments, CO1 and CO3 got less attainment values. Students faced difficulties in construction of push down automata and Turing machines (PDA and TM).</p>
<p><b>Action 1- CSE103:</b> - Many tutorial problems are given and trained on the basis Performance analysis and evaluation concepts in terms of time and space. Problem based learning is inculcated to impart the design thinking. The course is offered as an Integrated Course to support the PBL pedagogy. With subsequent theory and laboratory sessions, students are motivated to practice efficient programs leveraging complex data structures. Real time problem statements are provided in the laboratory manual. Fast learners are encouraged to solve challenges in coding sites like Hackerrank.</p> <p><b>Action 2- CSE204:</b> Concepts under CO1 and CO3 are practiced in additional classes. Animation videos, Tutorial problems and Assignments are given to the students. J-Flap tool is used to explain the step by step procedure of PDA and TM construction. GATE oriented questions are included in the internal examinations and assignments.</p>			

PO	Target Level	Attainment Level	Observations
<b>PO3: Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.			
PO3	1.8  (2.0)*	2.20  (2.35)**	<p><b>Observation:</b></p> <p><b>CSE398, CSE399 Community Service Project:</b> Target achieved, It is observed that students need to find the problems related to real time problems in terms of public and other environmental considerations</p> <p><b>CSE305 Database Management System:</b> Target is achieved significantly. All COs attained level is high except CO3. It indicates that students should understand more about normalization which is highly correlated with PO3 by means of Database design. Students are not aware about social issues which can be solved using the technical knowledge. Application project exposure is need to be improved.</p>
<p><b>Action 1 – CSE398, CSE399:</b> Target level is increased. Students are asked to take survey on public real time problems and asked them to find the proper technical solution. Workshop on recent trends like AIML technologies has been given to students to improve the technical knowledge to solve the real time problems.</p> <p><b>Action 2 – CSE305:</b> Normalization plays a vital role in database design and is highly related to PO3. Assignments on Normalization are given to students. Industry level database design problems are discussed and seminars on normalization are conducted through industry resource persons. Mini project is included as part of X-component.</p>			

PO	Target Level	Attainment Level	Observations
<b>PO4: Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.			
PO04	1.8  (2.0)*	2.20  (2.34)**	<p><b>Observations:</b></p> <p><b>CSE209 Algorithms and complexity:</b> The attainment levels pertaining to the outcomes CO2 and CO3 are comparatively less. CO5 has high compliance with PO4. Hence, the concepts required to achieve the corresponding COs need more focus in terms of pedagogy, contact hours, assessment methodologies.</p> <p><b>CSE207 Operating System:</b> Target achieved significantly. The compliance of the course with CO4 can further be strengthened through case studies and evaluation schemes.</p>
<p><b>Action 1-</b> CSE209: CO2 and CO3 correspond to design strategies pertaining to optimization algorithms. To cater the requirement, the algorithmic design and competitive coding skills in the course are inculcated by mandating regular coding challenges to students in online platforms like Hacker rank. To regularize the same, the course is offered with X Component with an additional of two contact hours . CO5, corresponding to advanced design strategies, is enriched by motivating students to do an Online Course “Divide &amp; Conquer, Searching &amp; Sorting, and Randomization Algorithms” in Coursera, as part of Exploratory Learning Pedagogy.</p> <p><b>Action 2-</b> CSE207: Target value can be raised for this course. Complexity level of questions has been increased by adding GATE questions in internal examinations. Complex OS concepts and problems are dealt through real time case studies. Real time server configurations, user profile generation, file permission settings are dealt through Virtualization mechanisms. Hence students are able to comprehend and solve complex problems easily.</p>			

PO	Target Level	Attainment Level	Observations
<p><b>PO5: Modern Tool Usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.</p>			
<p><b>PO5</b></p>	<p><b>1.8</b>  (2.00)*</p>	<p><b>2.24</b>  (2.21)**</p>	<p><b>Observation:</b> Observation: <b>CSE428 Big Data Analytics:</b> Target is achieved. Using tools such as R and Tableau to develop real-time projects may reduce the degree of complexity involved in implementing real time projects.  <b>CSE499- Project Work:</b> Target achieved remarkably. Students may choose more real-world problem statement, which may also help to improve PO6.</p>
<p><b>Action 1-CSE428:</b> Target level can be raised. Usage of Data Visualization and Analytics tools like Tableau and R are taught to the students as part of X Component. Hence the students gathered more specific knowledge in the areas of Modern tools. Through this, students may develop their own projects using Data Analytics concepts.</p> <p><b>Action 2 – CSE499:</b> The department research groups are advised to provide various tools available in their research domain to the students involved in Course level, CSP and Capstone projects. Various new tools including NLTK, Tensorflow, Keras, Android Studio, Tableau among others are leveraged by the students to perform complex projects with the support of faculty guides.</p> <p><b>Action 3 -</b> Various Guest lectures, Workshops and Value Added Courses are organized with Industry resource persons to induce the knowledge of students as well as the faculty members on Modern tools and technologies.</p>			

PO	Target Level	Attainment Level	Observations
<p><b>PO6: Engineer and Society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.</p>			
<p><b>PO6</b></p>	<p><b>1.8</b>  (2.00)*</p>	<p><b>2.18</b>  (1.97)**</p>	<p>Observation:  <b>CSE399 - Community Service Project:</b>            Students lagging in indentifying the right problems that need to be solved with technical assistance. Attainment level of CO3 is comparatively lower than other COs.   <b>CSE499- Project Work:</b> Target achieved. Since it's a project work, it always resolve the problem of society, so further enhancement can be done depends on social needs.</p>
<p><b>Action 1- CSE399:</b> By participating in appropriate field trips, students are required to address real-time societal problems.            Throughout the course, faculty guides are required to ensure that all student projects adhere to IEEE Standards and Design Constraints in the areas of Social, Ethics, Health, Sustainability, and Manufacturability, among others.            Project expos like Aswamedha are conducted to identify the best projects and the same is recommended to implement as a pilot version in real time.            We organize guest lecturers in association with Innovation and Entrepreneurship Development Cell (IEDC) regarding community problems that require engineering solutions and patentable projects.</p> <p><b>Action 2- CSE499:</b> Target Level can be raised. The faculty guides are asked to ensure that all the student projects are following IEEE Standards and Design Constraints in the areas of Social, Ethics, Health, Sustainability, Manufacturability, among others. Project expos like Aswamedha are conducted to identify the best projects and the same is recommended to implement as a pilot version in real time. In order to contribute to society, students are motivated to convert their projects into publications, patents, and products.</p>			

PO	Target Level	Attainment Level	Observations
<p><b>PO7: Environment and Sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.</p>			
PO7	1.8  (2.00)*	2.17  (2.06)**	<p>Observation:</p> <p><b>CSE318- Computer Networks:</b> Target is achieved significantly. There is scope for improvement in CO2 and CO3.</p> <p><b>CSE402 Internet Programming:</b> Target achieved well. Aside from understanding Internet Protocols, students lack a working knowledge of server-side scripting.</p>
<p><b>Action 1- CSE318:</b> Being the core component of CSE program, this course is a prerequisite for providing sustainable solutions for various societal and environmental issues, including communication control and cyber theft. In order to improve compliance with PO and also to instill the required skills in the students, the course is offered with an X component. Cyber Forensics tools are taught as part of the X Component in order to protect students' resources from third parties.</p> <p><b>Action 2 - CSE402:</b> Python and Script Programming, Web Technology courses are offered which will enrich the knowledge on scripting language. In order to address real-time problems statements, students are motivated to develop sustainable solutions utilizing Python and Web technologies.</p>			



PO	Target Level	Attainment Level	Observations
<p><b>PO8: Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.</p>			
<p>PO8:</p>	<p>1.8 <b>(2.0)*</b></p>	<p>2.21  (1.89)</p>	<p><b>Observation:</b>  Capstone Project – CSE499, Community Service Project - CSE399 and Course Level Projects in various courses including CSE18R272 - Java Programming require more focus towards ethical principles in algorithm design, implementation and documentation. Though the standards are good, the percentage of students following the same can be increased.</p>
<p><b>Action 1</b> - Ethical principles are inculcated in Course level projects at a deeper level. Hence subsequent major projects at CSP and Capstone level are improved. All the projects are mandated to follow IEEE Standards and Design Constraints. It is ensured that all the projects are following Ethical Constraints.</p>			

PO	Target Level	Attainment Level	Observations
<p><b>PO9: Individual and Team Work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. .</p>			
<p><b>PO9</b></p>	<p><b>1.8</b>  <b>(2.0)*</b></p>	<p><b>2.29</b>  <b>(2.06)**</b></p>	<p><b>Observation:</b>  Capstone Project – CSE499, Community Service Project - CSE399 and Course Level Projects are the key areas to judge teamwork and collaborative learning. The contribution of individual members in the team needs to be visualized and improved.</p>
<p><b>Action 1 – CSE499:</b> Students are always motivated to work on interdisciplinary projects. Also, during the review and project viva presentation sessions, every student is individually assessed about the role he played in the project. Also, all the students are motivated to participate in various public forums like Conferences (National/International), Paper Presentation/Project Presentation, Workshops, Seminars and Technical events to improve the team work spirit. Marks are allotted in the rubrics for the projects presented in journals/ conferences or symposiums.</p> <p><b>Action 2 -</b> Complementary courses and Events are periodically conducted to visualize talents of individual students and also to inculcate collaboration in student groups. Students are mandated to participate in NSS/ NCC/ Sport activities. All the students are motivated through the faculty advisors to participate/ organize department level events like Symposiums, Guest Lectures, Workshops and Club Activities.</p>			

PO	Target Level	Attainment Level	Observations
<p><b>PO10: Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.</p>			
<p><b>PO10</b></p>	<p><b>1.8</b> <b>(2.0)*</b></p>	<p><b>2.29</b> <b>(2.41)</b></p>	<p><b>Observation:</b> HSS101 / 102 : English for Technical Education I and II – The attainment level is low , and it is observed that students are struggling in language and leads to fail in understanding the comprehensive kind of problems. CSE499: Project work- observed that students are lagging in technical communication and that need to be improved. Interactive Instruction pedagogies in corresponding courses need vital improvement.</p>
<p><b>Action 1</b> - Participation in Course level seminars, brainstorming sessions and Training pertaining to communication are offered in terms of soft skills course</p> <p><b>Action 2</b> - The rubrics of course level projects, CSP projects and capstone projects are framed with communication criterion</p> <p><b>Action 3</b> - Faculties are encouraged to incorporate interactive interaction pedagogies in various possible courses especially.</p>			

PO	Target Level	Attainment Level	Observations
<b>PO11: Project Management and Finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.			
PO11	1.8 (2.0)*	2.28 (2.03)**	Observation: This PO is mapped with 41 courses. The required level of proficiency has been met. To sustain this level of achievement, the following steps are taken in Regulation 2018.
<p><b>Action 1:</b> In Regulation 2018, Project Work has been offered in two phases. In CSE18R498 Project Work -Phase I Phase -I focusing on survey of state-of-art tools and technologies. CSE499 Project Work -Phase II dealing with implementation, reporting, and publication/patents. Industrial related projects are provided with mentorship support from industry. The department faculty members are grouped into four major groups to explore the possibilities for assessing/managing the project reports for both phases in their domains.</p> <p><b>Action 2:</b> Students are advised to undergo a Mini Projects for all laboratory courses.</p> <p><b>Action 3:</b> Students are counselled to execute multidisciplinary projects in CSE399-Community Service Projects.</p>			

PO	Target Level	Attainment Level	Observations
<b>PO12: Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.			
PO12	1.8 (2.0)*	2.27 (2.27)**	<b>Observation:</b> This PO is mapped with 32 courses. The required level of proficiency has been met. The following steps are taken to maintain this level of achievement.
<p><b>Action1:</b> Faculty highlights about the scope for self-learning to the students by taking online certification courses from Great learning, Coursera, NPTEL, Udemy, MOOCS, and other online platforms.</p> <p><b>Action 2:</b> Complementary Skill Courses introduce the self-learning culture among the students to learn outside a classroom environment by themselves without a set curriculum or examinations.</p> <p><b>Action 3:</b> Alumni interaction and expert lectures introduced a comprehensive notion about state-of-the-art technological concepts and tools, and students are advised and encouraged to pursue higher education.</p>			

**Continuous Improvement in PSOs:**

PSO	Target Level	Attainment Level	Observations
<b>PSO1: Problem-Solving Skills:</b> The ability to apply mathematics, science and computer engineering knowledge to analyze, design and develop cost effective computing solutions for complex problems with environmental considerations.			
PSO1	1.8 (2.0)	2.13 (2.39)**	<p>Observation:</p> <p>The required level of proficiency has been met. Core courses have enhanced the problem-solving skills among the students to analyze the problem in diverse angle and moulded them to design and develop solutions for the problem. Although there are 43 courses mapped to this PSO1, still there is possibility of improvement in CSE204(1.48/3), CSE103(0.88/2), CSE181(0.97/2). In order to improve level of achievement, the following steps are taken.</p>
<p><b>Action 1:</b> The abovementioned courses' challenges are analyzed and identified. As result more demonstrations, case studies, tutorial sessions and quizzes are adapted into the teaching learning process in Regulation 2018.</p> <p><b>Action 2:</b> For the course CSE204 Theory of Computation JFLAP based automata implementation and analysis are explained and exercised. Video lectures, animations, simulation are demonstrated to visualize the concept and to analyze the performance formal languages.</p> <p><b>Action 3:</b> Additional Lab experiments for the courses CSE103-Data Structures, CSE181-Programming Languages Laboratory are carried out through online coding challenges portal. And for these courses extra hours have been conducted and class assessments and problem exercises are given, especially for slow learners.</p>			

PSO	Target Level	Attainment Level	Observations
<b>PSO2: Professional Skills:</b> The ability to apply modern tools and strategies in software project development using modern programming environments to deliver a quality product for business accomplishment.			
PSO2	1.8 (2.0)*	2.21 (2.24)**	<b>Observation:</b> This PSO is mapped with 32 courses. The required target level has been nearly met. To enhance the profession skills of the students and to increase this level of achievement, the following steps are taken.
<p><b>Action 1:</b> Different Active learning pedagogy is used in Core courses to enhance the skill set. Some Professional Core courses like Java Programming is offered with 70% weightage in practical component and 30% weightage in Theory component.</p> <p><b>Action 2:</b> Professional elective courses are offered with the support from IBM and modern programming tools are used to enrich the professional knowledge.</p> <p><b>Action 3:</b> Trainers from industry (IBM) are training the students to work in modern programming environments (as used in industry) before the graduation.</p> <p><b>Action 4:</b> Students undergo In-plant training to boost their professional skills and it assessed through different rubrics.</p> <p><b>Action 5:</b> Various Guest lectures, Workshops and Value-Added Courses are organized with Industry resource persons to inculcate the knowledge on Modern tools and technologies.</p>			

PSO	Target Level	Attainment Level	Observations
<b>PSO3: Communication and Team Skill:</b> The ability to exhibit proficiency in oral and written communication as individual or as part of a team to work effectively with professional behaviors and ethics.			
PSO3	1.8 (2.0)*	2.28 (2.08)**	<b>Observation:</b> The required level of proficiency has been achieved. In order to sustain this level of achievement, the following action plan is followed in Regulation 2018
<p><b>Action 1:</b> Participation in Course level seminars, brainstorming sessions, Involvement in Interactive Instruction and active learning pedagogies such as think-pair-share, jig-saw methods in incorporated in some of courses like CSE18R498 - Project work Phase I, CSE499 - Project work Phase II, CSE399-Community Service Project to showcase their communication proficiency as individual as well as part of a team. Different rubrics with respect to communication and team work criterion are used during the assessment.</p> <p><b>Action 2:</b> Training pertaining to communication are offered in terms of soft skills courses.</p> <p><b>Action 3:</b> Various seminars and webinars are organized to insist the importance of Professional behavior and ethical principle and it is inculcated as well as assessed in Project based courses.</p>			

PSO	Target Level	Attainment Level	Observations
<b>PSO4: Successful Career and Entrepreneurship:</b> The ability to create an inventive career path by applying innovative project management techniques to become successful software professional, an entrepreneur or zest for higher studies.			
PSO4	1.8 (2.0)*	2.19 (1.65)**	<b>Observation:</b> This PSO is mapped with 23 courses. The required target level has been met. This measurable outcome will be increased significantly if the action is taken in deliberate mode. In order to increase this level of achievement, the following steps are taken.
<b>Action 1 -</b> <p><b>Action 1:</b> Students are encouraged to complete the core laboratory courses using programming in like hackerrank. These platforms help the students to learn, practice and compete hands-on modules, practice programming in C, Java, Python, C++, prepare for campus interviews, compete in contests. It also includes Daily Challenge and Tests for regular practice. It provides E-certificates with QR code in resume, profiles. More number of students got comparatively quality offers through this practice.</p> <p><b>Action 2:</b> Through this platform, faculty members can schedule MCQ/Programming tests, track students' activities (overall, weekly and daily), categorize and train based on strength and weakness analysis, extensive reports.</p> <p><b>Action 3:</b> Through the curriculum components like X Component lab, Project Based Learning students are encouraged to involve themselves in project-based/case studies learning.</p> <p><b>Action 4:</b> Conduct expert talks/seminars, alumni interactions on state-of-the-art technological concepts and tools using design engineering problems as the basis.</p> <p><b>Action 5:</b> Students can take-up in-house industrial training, certificate course, internship, industrial visit to promote an innovation ecosystem</p> <p><b>Action 6:</b> By adding Core complementary courses in the curriculum to adapt self-learning practice.</p> <p><b>Action 7:</b> KARE GATE Forum introduced to train and enhances the capability of our students to succeed in GATE.</p> <p><b>Action 8:</b> CSE18R498 - Project work Phase I, CSE499 - Project work Phase II, CSE399- Community Service Project courses are offered to the students through which they are able to identify and analyze real time computer science and engineering problems to address societal issues.</p> <p><b>Action 9:</b> Various orientation programmes, awareness programmes, ideathon, hackathon, programme on problem solution fit analysis, become a successful entrepreneur, etc are organized to bring and ignite the entrepreneurial culture among student community through Business Incubation cell and Entrepreneurship Development Cell</p>			



## **7.2 Academic Audit and Actions Taken Thereof during the Period of Assessment (15)**

KARE regularly conducts the academic audit by its own scientific and systematic approach referring to the guidelines prescribed by the accreditation bodies such as NAAC and NBA. The entire process of academic audit is taken care of by the Internal Quality Assurance Cell (IQAC) focusing on the key indicators such as student performance, curriculum enrichment, student feedback, research performance and extension activities. The IQAC has designed its own metrics and rubrics to assess the performance of the individual faculty and the departments. The academic audit process is performed once a year.

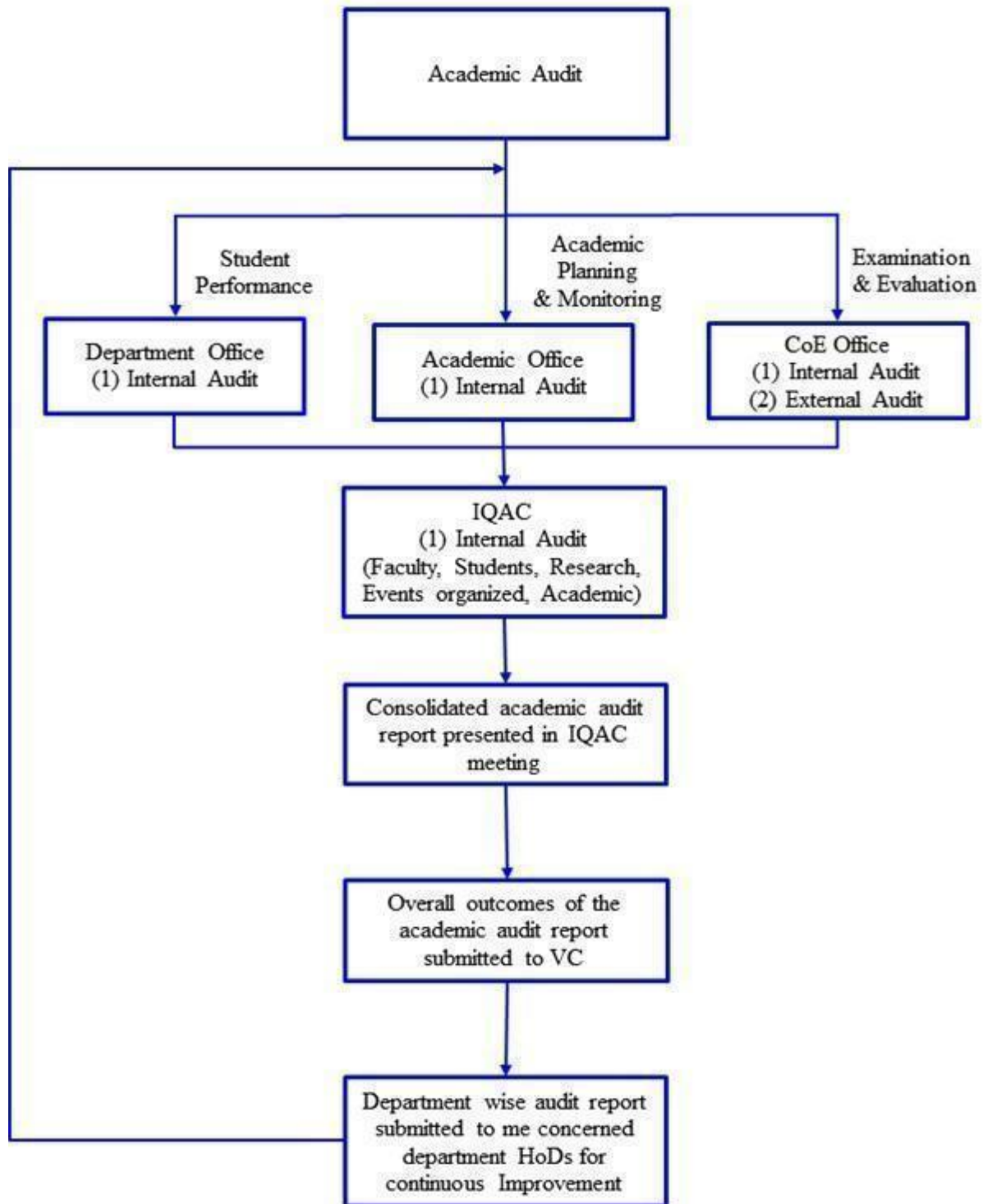
KARE-IQAC has performed this academic audit process with the following objectives:

- To identify and understand the self-reflection of the departments with respect to strengths and weaknesses.
- To ensure the quality enhancement in the curriculum innovations, teaching-learning process, examinations and evaluations and research
- To propose the methodology for the continuous improvement to the departments through scientific analysis and judgment

The academic audit is performed every academic year with different timelines based on the process shown in Fig.7.2.1 to continuously strive for quality assurance in the academic activities.

The auditing process adopted by the IQAC has a dual purpose viz., to audit the process as well as to train the faculty to meet the compliance. The auditing is done by internal peer team members proposed by the Director (IQAC) and approved by the Vice-Chancellor. The peer team conducts the audit based on the detailed rubrics for each category. The review report is analyzed and the summary is discussed in the next IQAC quarterly meeting. The Heads of the Departments are requested to take necessary action to improve the teaching-learning process.

**PROCESS OF ACADEMIC AUDIT ADOPTED IN THE KARE-IQAC SYSTEM**



**Fig.7.2.1 Process of Academic Audit Adopted in the KARE-IQAC System**

In addition, the academic audit for all the departments in the KARE will be held at different levels based on their guidelines using different mechanisms. The following Table 7.2.1 displays the details of academic audits with periodicity, schedule of audit and mechanism used by the various offices and the type of auditors used to perform the task.

**Table 7.2.1: Different key indicators and evaluation criteria used for the various levels of academic audit**

Sl.No	Level of Academic Audit	Key Indicators	Periodicity	Possible schedule of visits	Mechanisms to be followed for the evaluation
1	Department Office	Student Performance	Twice in a Year	July and January	Proceedings of Class committee meetings, course coordinator and module coordinator and faculty advisor meeting the committee is formed by the HoD in the department comprising with Chair person, faculty and student representatives
2	Academic Office	Academic Planning and monitoring	Twice in a Year	July and January	Physical verification of documents with the faculty by the Internal expert committee members nominated by the Director-Academic OR Dean of the School
3	CoE Office	Examinations and evaluation	Twice in a Year	November and May	Verification of the quality of the question papers based on the outcomes-based education by the module coordinator and the evaluation of answer script by the external peers
4	IQAC office	Student Achievements	Once in a Year	May	Data with respect to defined quality metrics and proof of evidence can be verified by the internal expert committee members nominated by the IQAC with the approval VC
5		Faculty performance			
6		Research and Consultancy			
7		Events organized			
8		Academic activities			

### **Department level academic audit:**

The department level academic audit will be conducted appointing some senior faculty members as auditors and also utilizing the services of course coordinators, module coordinators and programme coordinators. There are three levels in which the department used to perform the academic audit to ensure the quality assurance in the upcoming semester.

### **Class committee meeting:**

Each class of the B.Tech. programme will have a batch Committee meeting periodically comprising faculty members and students. The constitution of the committee will be as follows. A Senior faculty member who is not associated with teaching the particular batch nominated by the Head of the Department concerned, to act as the chairman of the class committee. The course handling faculty is also included as a part of the class committee members. Five students (in the combination of two from the toppers and three from the remaining students) from the respective batch are chosen along with the faculty advisors of the students of the respective class. The basic responsibilities of the Class Committees are

- To review periodically the progress of the Batch
- To discuss problems concerning curriculum, syllabi and conduct of the classes, for both CGPA and Non-CGPA courses.
- To resolve issues related to teaching/learning, addressing the slow learners in regular semesters, value-addition, and other grievances.

### **Faculty advisor meeting-**

The faculty advisory meeting will be held three times in a semester during the starting of the academic session, mid semester and the end of the semester. During this time, the FA audits the course registration of the student, attendance, academic performance and completion of credits and records the same in the corresponding Faculty advisor diary of the student.

Figure 7.2.2. Shows the sample class committee meeting circular and Figure 7.2.3 represents the sample class committee meeting report.



**KALASALINGAM**  
**ACADEMY OF RESEARCH & EDUCATION**  
**(DEEMED TO BE UNIVERSITY)**  
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SCHOOL OF COMPUTING  
DEPARTEMENT OF COMPUTER SCIENCE AND ENGINEERING  
CLASS COMMITTEE MEETING – II  
CIRCULAR

Date: 07.10.2021

A meeting of the Second-Class Committee for the III year "C" Computer Science and Engineering class will be held on 08.10.2021 through Google Meet at 4.20 pm. All the members of the committee are requested to make it convenient to attend the meeting without fail.

Google Meet Link: [meet.google.com/kaj-ujyp-mvk](https://meet.google.com/kaj-ujyp-mvk)

**Agenda for the Meeting:**

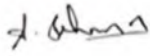
- 1.Result analysis of Sessional-I Examination
- 2.Status of Non-CGPA Courses
- 3.Status of fees payment
- 4.Registration detail of online courses NPTEL
- 5.Informing about the academic schedule
- 6.Discipline Activities of Students and action taken
7. Any other issues

**Committee Members - Faculty**

S.No	Subject Code	Name of the Subject	Staff In-charge
1	CSE18R466	Big Data (BD)	Dr. T. Dhiliphan Rajkumar
2	CSE18R290	Cloud Architecture and Deployment Models (CADM)	Mr.Suresh Kumar
3	CSE18R371	Computer Networks(CN)	Dr.A.Francis Saviour Devaraj
4	CSE18R252	Formal Language and Automata (FLA)	Mrs.G.Elizabethrani
5	CSE18R324	Augmented Reality (AR)	Mr.K.Vignesh

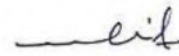
Committee Members - Student

S.No	Reg.No.	Name of the student
1	9919004015	ANUMULA DEVIKA REDDY
2	9919004078	GADHAMSETTY LEELAVATHI
3	9919004205	PALAGIRI VINEETHA
4	9919004038	BODDAPATI VENKATA HARISH KUMAR
5	9919004135	KATTA ARVIND
6	9919004211	PANDEY SHAGUN



Chair Person

Dr. A. Robert Singh



HOD/CSE

Dr. A. Francis Saviour Devaraj

Circulated to Class Committee Members

**Fig.7.2.2. Class Committee Meeting Circular**



**KALASALINGAM**  
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SCHOOL OF COMPUTING  
 DEPARTEMENT OF COMPUTER SCIENCE AND ENGINEERING

CLASS COMMITTEE MEETING – II

MINUTES

The Second-Class Committee for the III year "C" Computer Science and Engineering was held on 08.10.2021 through Google Meet at 4.20 pm. Dr. A. Robert Singh, Asst.Prof-III/CSE chaired the meeting. The following members were present.

S.No	Subject Code	Name of the Subject	Staff In-charge
1	CSE18R466	Big Data (BD)	Dr. T. Dhiliphan Rajkumar
2	CSE18R290	Cloud Architecture and Deployment Models (CADM)	Mr.Suresh Kumar
3	CSE18R371	Computer Networks(CN)	Dr.A.Francis Saviour Devaraj
4	CSE18R252	Formal Language and Automata (FLA)	Mrs.G.Elizabethrani
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3	9919004205	Palagiri Vineetha
4	9919004038	Boddapati Venkata Harish Kumar
5	9919004135	Katta Arvind
6	9919004211	Pandey Shagun

The following matters were discussed in the meeting

- The Chairperson asked the status of the syllabus completion before the Sessional I exam. He instructed the faculties to complete the syllabus as per the course plan, if any deviation, he asked them to complete by conducting special classes.

- The Chairperson has analyzed the Sessional-I exam results. The overall class percentage is 95%. The chairperson congratulated course teachers and students.

Exam	1 Arrear	2 Arrear	3 Arrear	4 Arrear	>4 Arrear	Appeared	Passed	Pass%
Sessional-I	2	0	0	0	0	39	37	95

- Students were informed about the importance of non-CGPA courses. The students were informed that they can avail the help from their faculty advisors to get proper guidance in registering for non-CGPA courses. As per the current status G-1(20 students not completed), G-2 (All completed), G-3 (2 students are not completed)

114	113	991900400	AASHRITHA REDDY SANKALAMADDI	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
115	114	991900401	ANANTHARAJU NIKHIL BHARADWAJ	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
116	115	991900401	ANUMULA DEVIKA REDDY	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
117	116	991900402	ATLA JAGADEESHWAR REDDY	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
118	117	991900402	BANDARU SAMAR	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
119	118	991900403	BASWAPUR NIKHIL	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
120	119	991900403	BODDAPATI PAVAN KUMAR	2019	C	NG18R2002, NG18R3004		completed	completed
121	120	991900403	BODDAPATI VENKATA HARESH KUMAR	2019	C	NG18R2002, NG18R3004		completed	completed
122	121	991900404	HOLLINEENI PRAVEEN KUMAR	2019	C	NG18R2002, NG18R3004		completed	completed
123	122	991900405	DASALETTI SRIBRANTH REDDY	2019	C	NG18R2002, NG18R3004		completed	completed
124	123	991900405	DASARI AKHIL	2019	C	NG18R2002, NG18R3004		completed	completed
125	124	991900407	GADHAMSETTY LEE LAVATHI	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
126	125	991900408	GANGAVARAPU NAVTEEN KUMAR REDDY	2019	C	NG18R2002, NG18R3004		completed	completed
127	126	991900408	GODDUMARRI NARENDRA KUMAR	2019	C	NG18R2002, NG18R3004		completed	completed
128	127	991900410	GUNTAKANDLA VIKRANTH REDDY	2019	C	NG18R2002, NG18R3004		completed	completed
129	128	991900410	GURIKANI BALAJI	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
130	129	991900411	JAGATHIAPU PRANATHI	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
131	130	991900411	JANGITI MANOJ KUMAR	2019	C	NG18R2002		completed	completed
132	131	991900412	JESUKARAN SAMUEL D R	2019	C	NG18R2002, NG18R3004		completed	completed
133	132	991900412	JONNA VENKATA SATHISH KUMAR	2019	C	NG18R2002, NG18R3004		completed	completed
134	133	991900412	KAMJULA VENUGOPAL REDDY	2019	C	NG18R2002, NG18R3004		completed	completed
135	134	991900412	KANAKABOINA MALLIKARJUN	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
136	135	991900412	KANDUGATLA ABHISHEK	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
137	136	991900413	KARUPPASAMYHARISHARAN A	2019	C	NG18R2002, NG18R3004		completed	completed
138	137	991900413	KATRAGUNTA NIKHIL	2019	C	NG18R2002, NG18R3004		completed	completed
139	138	991900413	KATTA ARVIND	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
140	139	991900416	MANCHALA PHANIKUMAR	2019	C	NG18R2002, NG18R3004		completed	completed
141	140	991900417	MEDA VENKATA ROHITH	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
142	141	991900418	MYLAVARAPU THANUSHA ACHUTHA	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
143	142	991900419	NANNURI VENKATA MAHESH BABU	2019	C	NG18R2002		completed	completed
144	143	991900419	NARALA LAKSHMI VINEELA	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
145	144	991900419	NETASHREE M	2019	C	NG18R2002, NG18R3004		completed	completed
146	145	991900420	PALAGIRI VINEETHA	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
147	146	991900420	PALAWALI MANJUNATHA REDDY	2019	C	NG18R1003, NG18R2002, NG18R3004	completed	completed	completed
148	147	991900421	PAPPURU AKHILA	2019	C	NG18R2002, NG18R3004		completed	completed
149	148	991900421	PASUPULETTI JAGADEESH	2019	C	NG18R2002, NG18R3004		completed	completed

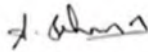
- The chairperson informed the students to pay the tuition fees on or before 18-10-21.
- The chairperson insisted the students to attend all placement related activities and training without fail. He also advised the students to take effort on completing international certification.



- The chairperson advised students to take NPTEL courses in this semester for the credit transfer purpose.
- No other issues are informed. Both the teachers and students are comfortable in class activities.
- The meeting ended with vote of thanks.

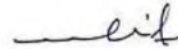
Google Meet Link: [meet.google.com/kaj-ujyp-mvk](https://meet.google.com/kaj-ujyp-mvk)

Drive Link: <https://drive.google.com/file/d/1x5fTHUkeWriWtHo2eRbpYBM-STkx0Rla/view?usp=sharing>



Chair Person

Dr. A. Robert Singh



HOD/CSE

Dr. A. Francis Saviour Devaraj

### Fig. 7.2.3. Class Committee Meeting Sample report

#### Gap Analysis:

- The student performance was analyzed based on the previous result in the end semester/ sessional examination.
- The subject which has to be focused more is identified and individual action to be taken to improve the performance in the forthcoming examination is planned.
- Few students' attendance percentage was less than 80 percent.
- From the results slow learners and fast learners are analyzed and a special coaching class was planned for them during the evening session.
- Also, students are motivated towards Non-CGPA related activities.

#### Actions Taken:

- Slow learners are motivated to attend the remedial classes. Fast learners are encouraged to participate in symposiums/ conferences and workshops.
- Non-CGPA related activities like Sports/ Club related activities/ International

languages /NSS are provided to the students to enable them to complete Non-CGPAs.

- The students who got less attendance were noted and informed to their parents. The faculty advisor monitors the students' attendance regularly.
- Observed that students aren't able to sit for a long time online. So, it was conveyed to the Academic Director. The class timing was reduced and a break of 5 min between each session was provided. Theory sessions are conducted in the morning slot and lab session in the afternoon slot.
- Informed all the class handling staff to teach the basics about the subject and then proceed further.
- All class handling staffs are asked to share the ppts, animated videos, and the videos of the classes on that day itself via WhatsApp and through Google classroom

#### **Academic office level academic audit:**

The academic office used to audit the preparedness of course plan, and course content, E-learning resources and other teaching-learning aids as per the academic calendar for the starting of every academic session. Further, the academic activities like delivery methods, student feedback will be monitored in between the semester through classroom monitoring committee and the concerned HOD.

At the beginning of each semester the internal auditors will be appointed by the academic office notifying the faculty to attend the audit in person with the required documents. The list of the sub clauses of evaluation criteria to be considered for the academic audit is included in Table 7.2.1 in Si. No-2 under the academic office. Any deficiency in the evaluation criteria will be informed to the concerned faculty through the concerned school Deans and IQAC office for further actions.

Fig. 7.2.4. indicates auditing circular, Fig. 7.2.5 depicts the department level academic audit circular and Fig. 7.2.6 shows the academic audit report sample for course material verification.




No: KLU/Academic/2019-20/034

Date: 18.12.2019

**Circular**

All the School Deans are informed to complete the Academic Audit on or before 24.12.19 (Tuesday) by constituting a team of senior faculty members within the school as per the format attached. Also, inform the timetable cell-PCs to complete the timetable entry in EDUKARE before 05.00PM of 20.12.19 (Friday)

  
**DIRECTOR ACADEMIC**

  
**REGISTRAR**

Copy submitted to Chancellor & Vice President – for kind information  
 Copy submitted to Vice Chancellor – for kind information  
 Copy to Controller of Examinations  
 Cc: to all Deans, Directors & HODs

**Fig.7.2.4. Sample academic Audit circular**



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

14-02-2020

**Circular**


The following faculties are requested to complete the following audits as per the schedule. The IQAC office will do random auditing and hence it is expected that the team members will carry out the task with seriousness and sincerity. All the auditing forms are attached for your kind perusal.

S.No	Auditing for Old Semester 2019	Deadline	Name of the Faculty
1.	SE Question Paper 2019-20	21-02-2020	Module Coordinator of 2019-20(Odd sem) Dr. K. Kartheeban Dr. R. Ramalakshmi Dr. R. Murugeswari Dr. P. Thendral Dr. N. C. Brintha
2.	Lab with mini Project	15-02-2020	Dr. G. Murugaboopathi Dr. S. Dhanasekaran
3.	Theory with Practical Component	17-02-2020	Dr. A. Saravanan Mr. R. Raja Subramanian
4.	One Credit Course	19-02-2020	Dr. R. Kanniga Devi Dr. K. Murugeswari
5.	UG/ PG project	24-02-2020	Dr. B. S. Murugan Mrs. R. Sumathi Mr. M. Raja
6.	IPF	26-02-2020	Dr. A. Robert Singh Mr. K. Muthamil Sudar

  
 Officer (IQAC)

  
 HoD/CSE 14/2/2020

**Fig.7.2.5. Sample Department level academic Audit circular**


**KALASALINGAM**  
 ACADEMY OF RESEARCH & EDUCATION  
 (DEEMED TO BE UNIVERSITY)

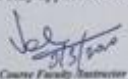
Under Sec. 3 of SSC Act 1956. Accredited by AAC with "B" Grade  
 Head Office: Kalasalingam - 605014, India. Phone: (91) 4562222222, Fax: (91) 4562222222, Email: info@kalasalingam.ac.in | www.kalasalingam.ac.in


**COURSE MATERIAL VERIFICATION**

Name of the Department: CSE Date of Evaluation: 3/3/20  
 Name of the Course Faculty/Instructor: P. VELMURUGAN Name of the Course Coordinator: P. Velmurugadas Name of the Evaluator: D.R. MURUGAS

S.No.	Course Code/Course Name	Verified by Evaluator	INSTRUCTIONAL MATERIALS TO BE VERIFIED										*Minutes of Meeting CCM/PC (YES/NO)
			Course Plan as Per OBE (Theory/Lab)	Question Bank	Lecture Notes Hard Copy	E-Learning (PPT/NPTL)	Flipped/Google Class Room	Tutorial Problems	Assignments	Use of Pedagogy Tools	Lab Manual (Lab)		
1.	Subject-1 Web Services (385 40)	Yes/NO	Yes	Yes	Yes	Yes	Google	Yes	Yes	NO	NA	CC	
		Quality of Content (in %)	100%	100%	100%	100%	100%	2 (90%)	2 (80%)	-	NA	Yes	
		Observations											
2.	Subject-2 Advanced Computer Architecture (CSE 18 220)	Yes/NO	Yes	Yes	Yes	Yes	Google	Yes	Yes	NO	NA	CC	
		Quality of Content (in %)	100%	100	100%	100%	100%	3 (90%)	3 (90%)	-	NA	Yes	
		Observations											
3.	Subject-3 Visual Cryptography (CSE 18 232)	Yes/NO	Yes	Yes	Yes	Yes	Google	Yes	Yes	NO	NA	CC	
		Quality of Content (in %)	100%	100%	100%	100%	100%	3 (90)	3 (90%)	-	NA	Yes	
		Observations											

\*This is only applicable for course coordinators, module coordinator, and program coordinator

  
 Signature of the Course Faculty/Instructor

  
 Signature of the Evaluator

**Fig.7.2.6. Course material verification Sample Report**

**Gap Analysis:**

- Some faculty members have not prepared the complete unit materials as per the requirement.
- Few materials did not incorporate value-addition based on current need.

**Actions Taken:**

- The faculties were asked to prepare all the contents as per prescribed format and they were asked to submit on or before the deadline.

**COE office level academic audit**

The Academic audit from the COE office is conducted for the faculty members based on the feedback from the students in the previous semester. The audit is done by the external experts from reputed institutions. They would be verifying the following documents and they provide their suggestions to improve their performance in coming semesters.

- Course material Files
- Evaluation Rubrics

- Teaching methodology
- Assessment Methods
- Quality of the sessional examination, End semester examination question paper

Fig. 7.2.7 depicts the sample circular of question paper internal audit schedule for semester 2020-2021. And Fig.7.2.8 shows the sample copy of question paper audit done by Controller of Examination



## OFFICE OF THE CONTROLLER OF EXAMINATIONS

Ref: KARE/COE/EVEN 2020-21/101/036

16-03-2021

**CIRCULAR**

HoDs are informed to kindly instruct the following Module Coordinators to report to Office of COE for Question Paper Internal Auditing on the Scheduled date.

The HoDs can nominate one more Module Coordinator / Senior Faculty / Program Coordinator to audit the Question Paper (if necessary).

**Internal Auditing schedule**

Department	Module Coordinator	Mobile no.	Date of Auditing	
AGRI	Dr. G. KALUSURAMAN	9994574058	18.03.2021 9.00AM to 4.45PM	
	Dr. A. BHARATHI	9655758728		
	Dr. K. KANNABIRAN	7904079121		
CAT	Mr. R. MAYANDI	7339469796		
CHY	Dr. P. RAMESHKUMAR	8012923515		
CS&IT	Dr. K. SATHESH KUMAR	9791569922		
COM	Ms. G. THAMARASELVI	9944591221		
ENG	Dr. A.HARIHARA SUDAN	9894816754		
MAT	Mr. P. SUTHERSAN	9976350851		
PHY	Dr. M.MUTHU VINAYAGAM	9942066575		
VCOM	Mr. ARUN SUBASH	9942109802		
ARCH	Ar. K. VASANTHA KOHILAM	9787704740		19.03.2021 9.00AM to 4.45PM
BIO	Dr. SANKARGANESH ARUNACHALAM	7200297907		
CIVIL	Dr. C. RAMESH BABU	9487970205		
CSE	Dr. N.C. BRINTHA	9789630346		
ECE	Dr. RADEEP KRISHNA	9633333844		
EEE	Dr. V.AGNES IDHAYA SELVI	9840659699	20.03.2021 9.00AM to 4.45PM	
EIE	Dr. P. MUTHUVEL	9952975726		
MBA	Dr. M. SELVAKUMAR	9952665757		
	Dr. T. CHANDRASEKAR	9443867024		
MCA	Mr. S. KARTHEESWARAN	9159676731		
MECH	Dr. S. THIRUMALAI KUMARAN	9865954612		

  
**CONTROLLER OF EXAMINATIONS**

Copy submitted to Chancellor and Vice President – for favour of information

Copy to Vice Chancellor

Copy to Registrar

Cc: to all Deans and Directors

Cc: to all Heads of the Department

**Fig.7.2.7. Audit schedule**



## OFFICE OF THE CONTROLLER OF EXAMINATIONS

Ref: KLU/COE/EVEN 2016-17/101/176-3

16/06/2017

**CIRCULAR**

The Office of the Controller of Examinations has conducted Post academic Auditing for the Sessional Examination –II answer scripts on 15-06-2017. The comments and suggestions given by the Internal Auditor was Summarized below for your kind reference.

The faculties who are handling Summer Term Courses are requested to take their inputs and follow the suggestions in the upcoming Sessional and End Semester examinations.

Name of the department: Computer Science & Engineering

SLNo	Course Code	Comments and suggestions	
		Question papers	Method of valuations
1	CSE206-Object oriented programming (SLOT II)	Answer key may be prepare on the order of the questions.	Good
2	CSE103-Data Structure (SLOT II)	Good	Good
3	CSE203-System Software (SLOT I)	Good	Good
4	CSE102-Programming Languages (SLOT I)	Good	Good
5	CSE102-Programming Languages (SLOT III)	Good	Good

  
 Controller of Examinations

Ce to: The Vice Chancellor for favour of information  
 Ce to: The Registrar  
 Ce to: HoD/CSE with a request to circulate among the staff members.

**Fig.7.2.8. Sample Copy of Question paper Audit by Controller of Examination**

### External and Internal Audit of Question papers:

The audit and scrutiny of External question papers will be done by the experts from other reputed institutions. They will verify the standard of the questions, availability of all data for answering and also will identify any questions set out of syllabus in the question paper. After the External Audit, the Office of Controller of Examination will invite the Senior Faculty members/Module Coordinator/Program Coordinator for verification of questions. They also cross verify the standard of the questions, data availability of the questions, any requirement for answering the questions and check for the out of syllabus questions in the question papers. After the successful external and internal auditing, the question paper will be printed in the office of CoE.

### **Answer booklet Audit after Valuation:**

The answer booklets of end semester examinations will be evaluated by the external experts from reputed institutions. The valued answer booklets will be audited in random by other experts to ensure the quality in the evaluation process. If variation is found to be large, the evaluated experts will be debarred from the valuation.

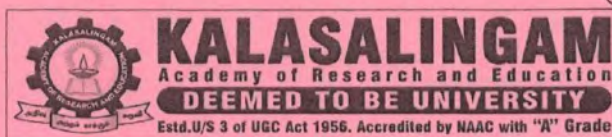
### **External Audit**

The department also undergoes an Academic audit by invited experts from external bodies. The External Audit occurs every semester end, and during the audit, the following academic elements are verified.

- Course plan
- Maintenance of Logbook
- Additional Topic covered
- Course material Files
- Quality of Assignment Questions
- Conduction of Tutorials/ Quizzes/Seminars
- Quality and Evaluation of Sessional Examination Questions
- Textbooks and Reference books used
- Self-learning
- Quality of E-materials
- Encouragement of Participative learning
- Use of Experiential learning
- Use of Smart board/ICT facilities
- Use of Virtual lab
- Support to the fast learners
- Actions taken keenly to the slow learners
- Follow up and of preventive and corrective measures.
- Fig. 7.2.9 is a sample external audit report conducted by Controller of Examination in odd semester (2019-2020)



NOV/DEC 2019



Anand Nagar, Krishnankoil - 626 126  
Srivilliputtur (via), Virudhunagar (DT)  
Tamilnadu, INDIA.  
Ph: 04563-289300  
e-mail : coe@klu.ac.in

www.kalasalingam.ac.in | 1800 425 7884 | 1800 425 9395

**OFFICE OF THE CONTROLLER OF EXAMINATIONS**

EXTERNAL AUDIT REPORT ON ACADEMIC PROCESS

Department: *Computer Science and Engineering* Sem: *VII*

Course Name with Code: *CSE 420 / Digital forensics* Credit: *3*

Theory / Practical

Name of the Staff Member: *Dr. G. Murugabogaithi* Designation: *Associate Professor*

Rating and Quality of Academic Procedure:

S.No	Activities	Rating	Suggestion for improvement
1.	Course Plan	B	
2.	Maintenance of Log Book	A	
3.	Additional Topics covered	C	<i>Additional topic must improve</i>
4.	Course Material File	B	
5.	Quality of Assignment Questions	B	
6.	Conduct of Tutorials / Quizzes/Seminars	B	
7.	Quality of SE I / SE II / SE III questions	A	
8.	Valuation of SE I / SE II / SE III Answer books	B	
9.	Number of Text Books/Reference Books used	A	<i>4 Books</i>
10.	Self Learning is ensured through assignments	B	<i>yes</i>
11.	Quality e-learning materials	B	<i>with min ppt</i>
12.	Encouragement of participative learning	C	
13.	Extent of use of experimental learning	B	
14.	Extent of use of Smart Board / ICT facilities	A	
15.	Use of Virtual Lab	C	<i>no lab</i>
16.	Extent of support offered to improve fast / advanced learners	B	<i>yes.</i>

S.No	Activities	Rating	Suggestion for improvement
17.	Special Efforts taken on Slow learners	B.	sp. class - only certificate
18.	Follow up of Preventive and Corrective measures	B	only class test

General Observation / Comments: good

Name and Designation: **Dr. K. SELVAKUMAR, M.E., Ph.D.** Signature(s) of the Expert(s) with date *[Signature]* 11/10/19  
**PROFESSOR**

Institution : **Dept. of Information Technology, Annamalai University, Annamalainagar - 608 002.**

Major Observation / Deficiency:

Minor Observation :

Noted by:

Course Teacher *[Signature]* Course Co-ordinator *[Signature]* Head of the Department *[Signature]*

Action Plan:

- 
- 
- 
- 
- 

Implementation of Action Plan:

*[Signature]*  
 Director (Academic)/Controller of Examinations




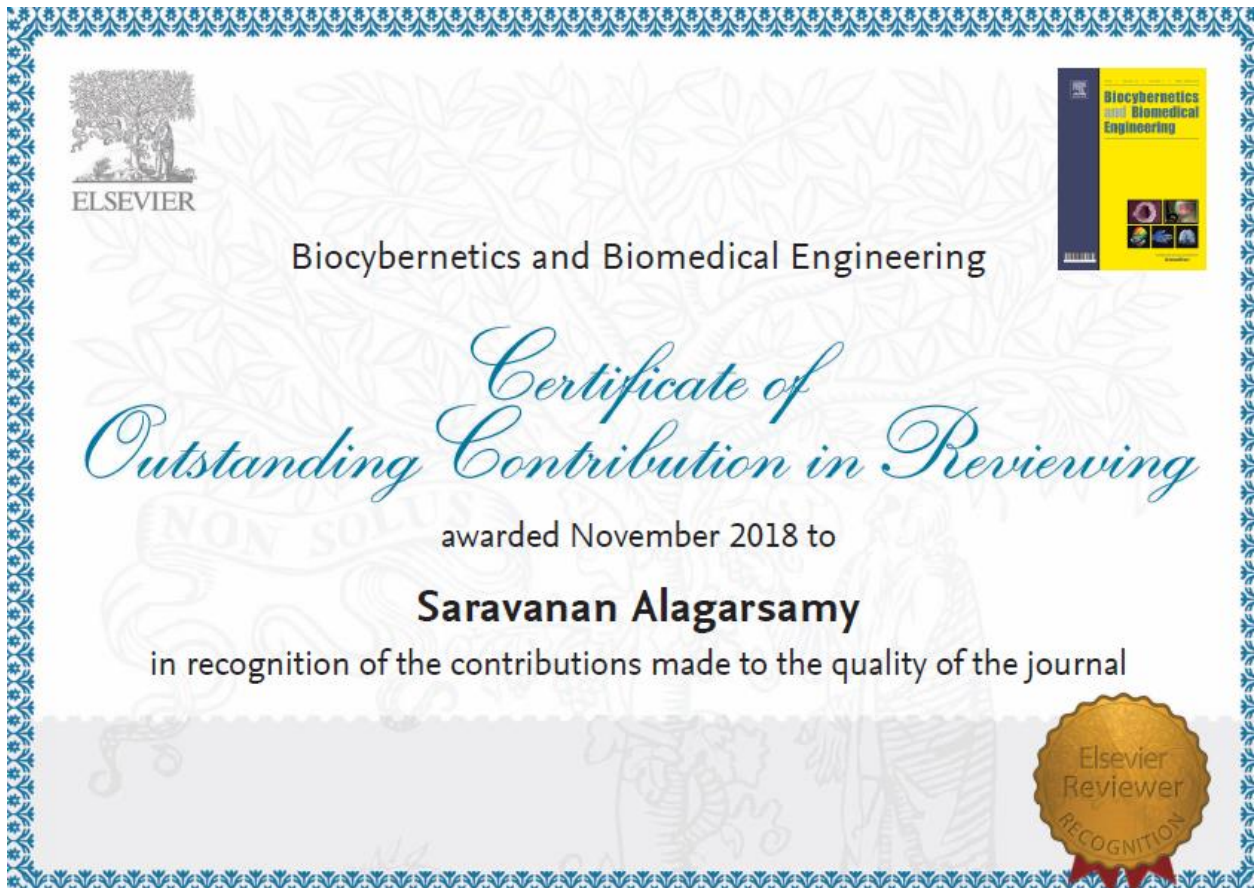
Fig. 7.2.9 is a typical external report sample of the Audit conducted in 2019-2020 (Odd Semester).

**IQAC Audit Report****Name of the Department: Computer Science and Engineering**

<b>S. No</b>	<b>Parameters</b>	<b>Observation/Remarks</b>
1	Department faculty strength	As per regulation body norms- satisfactory
2	Sponsored Research projects	Department needs to obtain more projects- satisfactory
3	Quality of PG Projects	All the PG projects are satisfactory and converted into publications
4	Quality of UG Projects	The outcome of the UG projects are good.
5	Publication in journals indexed in Scopus, WOS	Publication is good
6	Publications in National and International Conferences	Good
7	Textbooks, Edited Books, Chapters Published	Department must focus to improve the publication of books
8	Patent publication	Needs improvement
9	Faculty Awards and recognition	More faculty can apply for awards
10	FDPs and STTP attended by faculties	Almost all faculty involvement observed
11	Seminars, Workshop attended by faculties	Almost all faculties participation noticed
12	Extension activities	Satisfactory
13	Value added courses	It is more satisfactory
14	Event organized	Department organized quality international and national conferences, seminars/workshops.
15	Details of New Academic Programme Introduced	Four streams are newly introduced 1. Data Science 2. Internet of Things 3. Cyber Security 4. Artificial Intelligence and Machine Learning
16	Students' Achievements – Extracurricular Activities	It is quite good
17	Students' Achievements – Co Curricular Activities	Department must encourage students for more achievements

**Table 7.2.2- Actions Taken and Implementations for Continuous Improvement**

Type/Level of academic audit	Gap Analysis	Actions Taken	Implementations for Continuous Improvement
Students' Achievements – Co-Curricular Activities	Students participation is less in sports, NSS and NCC	Co-Curricular activities are made mandatory in the curriculum under Non-CGPA	All the students started participated in the Co-curricular events, thus in turn their co-curricular skills were enriched
Scopus journal publication, Textbooks publication and Patent filing	Less count on publications, and patent only made	Faculty were encouraged to publish Scopus indexed journal papers based on their designation. Also, they are motivated to publish textbooks. Faculties insist on attending various training programs related to patents.	Faculty published their papers in reputed Scopus indexed journals. and the count of papers in book chapters, and they started publishing books. Some of the faculties applied for patents also. Fig 7.2.10 shows patent proof
Faculty awards and Recognition	Only limited faculty are recognized with awards.	Encourage all the staff to apply for various awards in the field relevant to their research work	Most of them are acting as Journal Reviewers in International journals, and few got Young Scientist award etc. Figure 7.2.10 and fig.7.2.11 represent the sample for journal reviewer and Patent filing respectively.
PG and Research projects	More publication on PG project and funded Projects need to be improved	All the PG scholars are motivated to convert their project into journal paper. They insist on publishing their paper in IEEE conferences or reputed Scopus journals. Funding related Seminar and workshops were organized for faculties.	All PG scholars published their project work in Scopus and IEEE conferences. Thereby their projects are converted into papers. Two faculties received their grants from DST projects. Fig7.2.12 represents the sample for DST project received



**Fig 7.2.10 Sample- Journal Reviewer (Award and Recognition)**

**INTELLECTUAL PROPERTY INDIA**  
PATENTS | DESIGNS | TRADE MARKS  
GEOGRAPHICAL INDICATIONS

**भारत सरकार**  
GOVERNMENT OF INDIA

Controller General of Patents, Designs and Trademarks  
Department of Industrial Policy and Promotion  
Ministry of Commerce and Industry

### Design Application Details

**Application Number:**  
358295-001

**Cbr Number:**  
213196

**Cbr Date:**  
09/02/2022 22:43:38

**Applicant Name:**  
1. Dr.T.Dhiliphan Rajkumar    2. Dr.Battula Tirumala Krishna    3. Dr.J.Thimmia Raja  
4. Dr.K.Sathesh Kumar

### Design Application Status

**Application Status:**  
Application Under Process(wating for Technical Examination)

[Back \(/DesignApplicationStatus/\)](#)

Disclaimer: Application status is available for the application filed on or after 1st April 2009 with application no 222230. The information under " Design Application Status" is dynamically retrieved and is under testing, therefore the information retrieved by this system is not valid for any legal proceedings under the Design Act 2000. In case of any discrepancy you may contact the appropriate Patent Office or send your comments to following email IDs:  
Design Office, Kolkata : [controllerdesign.ipo@nic.in](mailto:controllerdesign.ipo@nic.in)  
Controller General of Patents, Designs and Trademarks

**Fig 7.2.11 Sample patent filing**

**CO/B/FP/G76/2021**  
Government of India  
Ministry of Science & Technology  
Department of Science & Technology  
(NCSTC Division)

Technology Bhavan,  
New Delhi-110016  
Dated: 24.09.2021

**ORDER**

**Subject: Development of Science and Technology Software for School Children through Skill building activities.**

Sanction of the President is hereby accorded to the approval of the above mentioned project at a total cost of **Rs. 35,30,000/-** (Rupees thirty five lakhs thirty thousand only) for a duration of One Year to Kalasalingam Academy of Research and Education, Anand Nagar, Krishnankoil, Srivilliputtur, Tamilnadu - 626126. **Out of the total cost of Rs. 35,30,000/-, an amount of Rs. 23,80,000/- will be the DST contribution.** The detailed breakup of the grant for General as are given below:-\*

**Budget Details for Recurring**

	Head	Amount Rs
A.	Training Cost for 5 teachers and 2 helpers for 110 days. (12000 * 110)It will cover 100 Schools and 4000 students.	13,90,000
B.	Tech-talk by Subject experts cost for 5 teachers for 20 days.(10000*20) (It will cover 100 schools and 4000 students)	2,00,000
C.	Food, Snacks	1,50,000
D.	Training advertising Materials	1,25,000(R)
E.	Science and Technology tools	8,00,000
F.	Demonstration of Working Software	5,00,000
G.	Travel Cost	50,000(R)
H.	Certificates, Medals, and Prizes	1,50,000(R)
I.	Admin Costs, Printing & Stationery	50,000(R)
J.	Publication of the software in terms of manuals, Kits etc.	1,00,000(R)
	<b>Total (A+B+C+D+E+F+G+H+I+J)</b>	34,25,000
	Overhead charges	1,05,000
	<b>Total</b>	<b>35,30,000</b>
	<b>Self-Generated Resources</b>	11,50,000
	<b>Total Funding requested</b>	<b>23,80,000</b>

2. The sanction of the President is also accorded to the release of **Rs. 19,00,000/- (Rupees nineteen lakhs only)** to Kalasalingam Academy of Research and Education, Anand Nagar, Krishnankoil, Srivilliputtur, Tamilnadu - 626126, being the first installment of grant under "General Component" for implementation of the above mentioned project. The balance will be released on submission of UC and statement of audited expenditure along with programme completion report.

3. This sanction is subject to the condition that the grantee organization will furnish to the Department of Science & Technology, financial year wise Utilization Certificate (UC) in the proforma prescribed as per GFR 2017 and audited statement of expenditure (SE) along with up to date progress report at the end of each financial year duly reflecting the interest earned / accrued on the grants received under the project. This is also subject to the condition of submission of the final statement of expenditure, utilization certificate and project completion report within one year from the scheduled date of completion of the project.



**Fig 7.2.12 Sample-Received grant for DST Project**

Fig.7.2.13 represents the sample circular of IQAC audit for Lab with Mini project, Theory with practical component, online course, one credit course and e-materials. And fig.7.2.14 represents the sample report of the IQAC audit

Ref. KARE/IQAC/Circular/2018-19/08

**Kalasalingam Academy of Research and Education  
(Deemed to be University)  
Anand Nagar, Krishnankoil – 626 126**

**Office of Director (IQAC)**

19.07.2018

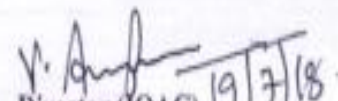
**Circular**

It is planned to audit the following special courses offered in the Even semester 2017-18:

1. Lab with Mini Project
2. Theory with Practical Component
3. Online Course
4. One Credit Course
5. e-material

All the HoDs are requested to instruct the concerned course coordinators to submit all the required details to IQAC office (including the project reports) **on or before 21.07.2018 (Saturday)**. In case of any clarification by the auditing team, the concerned course coordinator or course teacher or special course i/c may be called upon for explanation.

They can collect the materials back after the audit is completed.

  
Director (IQAC) 19/7/18  
f

Cc to : Chancellor, Vice President and Vice Chancellor – for favour of information  
: Registrar and CoE  
: all Directors and DoSs – with a request to circulate among all HoDs  
: Dy. Registrar (Public Relations)

**Fig.7.2.13 represents the sample circular of IQAC audit**



Ms P. Sumathi (A.B.C)

Kalasalingam Academy of Research and Education  
(Deemed to be University)  
Anand Nagar, Krishnankoil - 626 126  
Office of IQAC

Proactive

Date: 26.7.18

Audit Report of Theory with Practical Component 2017-18 (Even Semester)

Course Name/Code: CSE 314 / Digital Image Processing

Department: CSE

Year/Semester/Sec: III / VI

Name of the IQAC Officer: R. Kannika Devi

Name(s) & designation of auditing team members:

(a) R. Kannika Devi

(b)

1. Objectives of practical component

i. Objectives definition (Mark ✓)

- All the objectives are clearly defined and within curriculum
- Some of the objectives are either not clearly defined or outside curriculum
- Most of the objectives are either not clearly defined or outside curriculum

10

Explanation:

ii. Practical Skills (Mark ✓)

- All the objectives are designed to impart practical skill / knowledge
- Some of the objectives are not well defined to impart practical skill
- Most of the objectives doesn't impart practical skill

20

Explanation:

iii. COs definition (Mark ✓)

- All COs clearly defined
- Some of the COs not clearly defined
- Most of the COs not clearly defined

5

Explanation:

iv. COs/POs mapping (Mark ✓)

- All COs are mapped with POs correctly
- Some of the COs are mapped with POs correctly
- Most of the COs are not mapped with POs correctly

0

unavailable  
[ May be available in course plan ]

2. Evaluation

i. Evaluation method is clearly defined with relevant rubrics (✓)

- Method defined without rubrics
- Method defined with rubrics
- Method not clearly defined

W

ii. Evaluation is done as per the rubrics (✓)

- Evaluation is done as per the rubrics
- Evaluation is not done as per the rubrics
- No clarity in evaluation

W

iii. Mark range is evident (Yes / No)

Yes

W

Remarks:

85  
W

Remarks:  
Very good

Signature of IQAC Officer/Auditing team members

Dy. Director (IQAC) / Director (IQAC)

Fig.7.2.14 represents the sample report of the IQAC audit

### **7.3. Improvement in Placement, Higher Studies and Entrepreneurship (10)**

#### **A). Improvement in Placement**

KARE CSE is progressing towards 100% student's placement by strengthening them in both qualitative and quantitative aspects.

- The primary motto of the department relies on equipping the potential of the student to face the competency of the global scenario.
- To assimilate the motto, the soft skill training, aptitude training, technical training, arranging orientation program for placements by industrial experts are given to the students.
- Also, the students are provided with various sorts of value addition by the department through training by both internal and external experts from industrial sectors in order to gain the required expertise.
- Our department inculcates various technical training programmes in terms of value-added courses, one credit course, webinars, workshops, guest lectures on topics related current IT trends through external experts from industry to provide knowledge on state-of-the-art technologies and modern tools.

In addition to this, industry internship/industry training is made as a mandatory two credit course. Hence, students get preliminary knowledge about the IT industries, software development practices, and various levels of knowledge required at different phases of software development. In addition to workshops and guest lectures, industry specific training is offered to students as part of Placements and Projects. A sample list of training provided to our students during the academic year 2020-21 is listed in Table 7.3.1.

**Table 7.3.1 List of Training Programs offered by Industries to Students**

<b>List of Training Programs - (2020-21)</b>					
<b>S. No.</b>	<b>Date of Training</b>	<b>Hours of Training</b>	<b>Name of Training</b>	<b>Number of students Attended</b>	<b>Name of the Organization</b>
1	8-06-2020 To 2-07-2020	45	TCS NINJA	120	Innovative Pvt Ltd, Chennai
2	7-08-2020 To 16-08-2020	60	Capgemini, Aspire, IBM	116	Aspirations Consulting Services Pvt Ltd, Bangalore
3	27-08-2020 To 5-09-2020	60	Automata Fix Training	125	Innovative Pvt Ltd, Chennai
4	5-09-2020 To 14-09-2020	60	CTS Specific Training	120	SMART Resources Pvt Ltd, Chennai
5	3-10-2020 To 9-10-2020	42	CTS Specific Training	125	FACE, Coimbatore.
6	4-01-2021 To 13-01-2021	40	Aptitude and Technical (Programming) Training	125	AICL Communications Pvt Ltd, Mumbai
7	26-02-2021 To 28-02- 2021	18	Aspire Specific Training	120	Innovative Pvt Ltd, Chennai
8	01-03-2021 To 05-03- 2021	30	Java Specific Training	65	Free Lancer, Chennai
9	05-05-2021 To 06-05- 2021	16	Accenture Specific Training	25	SMART Resources Pvt Ltd, Chennai
10	11-05-2021 To 14-05- 2021	8	Wipro Specific Training	19	Global Talent Track, Chennai
11	24-05-2021 To 25-05- 2021	10	Capgemini Specific Training	94	SMART Resources Pvt Ltd, Chennai
12	31-05-2021 To 05-06- 2021	24	Employability skill Training	65	Global Talent Track, Chennai
13	07-06-2021 To 11-06- 2021	30	DXC and HCL Specific Training	120	SMART Resources Pvt Ltd, Chennai
	12-06-2021 To 13-06- 2021	12	DXC and HCL Specific Training- Extension	120	

14	18-06-2021 To 21-06-2021	12	C Specific Training	60	Innovative Pvt Ltd, Chennai
15	24-06-2021 To 25-06-2021	12	Analytical & Verbal Training	60	New Leaf Learning Solutions, Trichy
16	17-11-2021 To 24-11-2021	20	AWS Cloud Foundation	63	AWS Solution – AICTE Edu skill Program

Because of these initiatives done by the institute, many students have received their placement in Tier -1 IT service companies which includes TCS, Infosys, Cognizant, IBM, Wipro and several reputed companies in 2019 and 2020. Table 7.3.2 represents the placement progress in Tier1 companies

**Table. 7.3.2 Continuous improvement in Tier-1 Industry Recruitment**

S. No	Name of the company	2014-2018	2015-2019	2016-2020	2017-2021
1	IBM	-	4	4	-
2	TCS	1	3	25	7
3	CTS	1	8	58	9
4	WIPRO	4	5	15	8
5	HEXAWARE	3	1	1	-
6	ATOS SYNTEL	-	-	9	-
7	JMAN GROUPS	-	-	3	-
8	MPHASIS	-	-	10	3
9	SOFTSUAVE	-	-	7	-
10	SBL KNOWLEDGE-SERVICES	-	-	6	-

SAP- Systems, Applications & Products (ABAP- Advanced Business Application Programming) - Training has been given to all the final year B.Tech (CSE) students ( 2016-20, 2017-21 batches) which makes them certified eligible candidates for jobs related to SAP. With this certificate, a notable number of students got offers related to SAP jobs. Fig.7.3.1 represents the sample circular for SAP Training in 2019 for the 2016-20 batch. Fig. 7.3.2 depicts the SAP-ABAP online examination circular and Fig.7.3.3 shows the SAP sample certificate of our students.

KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION  
(Deemed to be University)  
Anand Nagar : Krishnankoil 626 126.  
----

No. KARE/Circular/095/2019/148

Date: 20.06.2019

**CIRCULAR**

This is to inform that SAP Orientation Programme will be conducted on **24.06.2019** for the final year students as per the schedule given below:

Department	Time	Venue	Overall incharge
Mechanical (A & B Sections) and Automobile Engg.	10.30 a.m. to 12.30 p.m.	<b>IX Block Seminar Hall</b>	Dr. N. Rajini and Dr. I. Siva
Mechanical Engg. (C & D Sections)	01.30 p.m. to 03.30 p.m.		
ECE, EEE & EIE	10.30 a.m. to 12.30 p.m.	<b>VIII Block Seminar Hall</b>	Dr. P. Sivakumār & Dr. Arunā Jeyanthi
CSE & IT	01.30 p.m. to 03.30 p.m.	<b>VIII Block Seminar Hall</b>	Dr. Ramalakshmi & Dr. K. Suthendran
MBA	11.30 a.m. to 01.30 p.m.	<b>Room No. 5102 (V Block)</b>	Dr. Viji, HOD/MBA

The overall in charges are requested to make necessary action to conduct the orientation programme in a fruitful manner.

A meeting of the Incharges of the above programme is scheduled to-day at 03.00 p.m. in the meeting hall of Administrative block. All are requested to attend the meeting. The Deans of the concerned Schools are also invited for the meeting.

  
VICE CHANCELLOR

Copy submitted to the Chancellor & Vice Presidents - for kind information  
cc: Registrar and Controller of Examinations  
cc: to Directors, Deans & HoDs

**Fig. 7.3.1 Sample Circular for SAP Training**


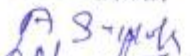

**Kalasalingam Academy of Research and Education  
(Deemed To Be University)  
Anand Nagar, Krishnankoil - 626126  
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**Circular**

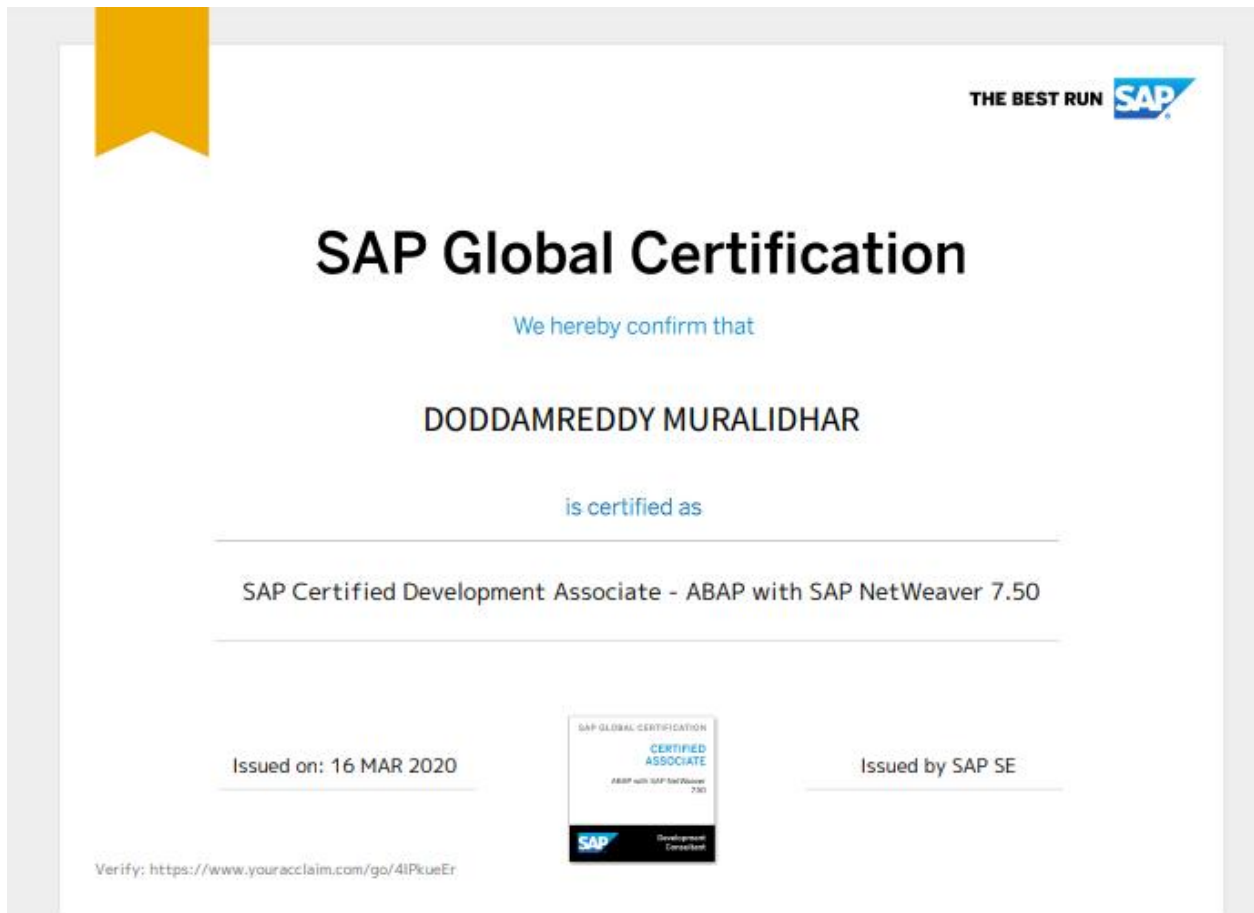
SAP (ABAP) online examination for the final year CSE students is planned to conduct from 22.10.2019 to 23.10.2019. All the class coordinators of final year classes ensure that all the students are appearing for the examination in the stipulated time. External project students are having provision to attend the online examination from their location. However class coordinators make sure that all the external students attending the online examination from their location. Instruction and time for the SAP online examination will be informed through their class coordinator later.

  
HOD/CSE

Cc:

IV Year CSE-A   
IV Year CSE-B   
IV Year CSE-C 

**Fig.7.3.2 SAP online Examination circular intimation**



**Fig7.3.3 Sample SAP Certificate**

Fig.7.3.4 depicts the sample Java Training program conducted for the pre-final year students (2015-19 batch) to perform well in the upcoming placement activities. Fig.7.3.5 shows the sample Core Java participation certificate of the student. And fig 7.3.6 shows the sample company specific Training-TCS Ninja conducted to improve the placement count in Tier-1 companies.



	<b>KALASALINGAM</b> Academy of Research and Education <b>UNIVERSITY</b>	Anand Nagar, Krishnankoil - 626 126 Srivilliputtur (via), Virudhunagar (Dt) Tamil Nadu, INDIA. Ph : 04563 289012 / 22 / 32 / 42 / 52 / 72 e-mail : admissions@klu.ac.in
	Estd. U/S 3 of UGC Act 1956. Accredited by NAAC with "A" Grade www.kalasalingam.ac.in   1800 426 7884   1800 426 9395	No: KLU/OCR/Training/2017-18/005

Circular

The Office of Corporate Relations is organizing a 5 days JAVA Training Program by Campus Interaction on 13<sup>th</sup>, 14<sup>th</sup>, 15<sup>th</sup>, 28<sup>th</sup> & 29<sup>th</sup> October, 2017 for all the pre final year B. Tech. and MCA students. Students are requested to pay the training fees of Rs. 2000 in the University Account Section and submit the receipt to the respective department placement coordinator on or before 29/10/2017.

Training Time 9.00 a.m. to 5.00 p.m.


All the HoDs are requested to depute the Placement Coordinators to make the following arrangements for the smooth conduct of the training program.

1. Instruct their department students to come with formal dress code.
  2. PCs are requested to make them available during the training session (9.00 a.m. to 5.00 p.m.)
  3. Student's attendance should be monitored during the start and end of the each session by the PC's.
- Note: Regular Assessment will be conducted from 5.15pm to 6.30 pm @ CCF, TIFAC-Core at the end of each day.**

Students are requested to assemble at Dr. V. Vasudevan Seminar Hall on 13.10.2017 by 09:00am.

Over all Coordinator : Mr. S. P. Veimurugan, AP – II / ECE (Mob: 9488335060).

  
 Dr. A. Alavudeen  
 Director – Corporate Relations

  
 Vice - Chancellor

Copy submitted to the Chancellor & Vice - President – for favor of information  
 Ce to: Registrar and Controller of Examinations  
 Ce to: All Deans, Directors, HoDs  
 Ce to: Dean – IQAC,  
 Ce to: Assistant Registrar & PRO  
 Ce to: Transport Officer & Sanitary Supervisor  
 Ce to: All department & Hostel Notice Boards

**Fig. 7.3.4 Sample Java Training Program Organized**

## CERTIFICATE OF PARTICIPATION



This is to certify that  
 .....GODA HARITHA.....  
 has successfully completed the five days workshop on  
**CORE JAVA**  
 held on January 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 12<sup>th</sup> & 13<sup>th</sup> 2019, at  
 Kalasalingam Academy of Research and Education,  
 Krishnankoil.

  
**D. SUJATHA**  
 Chief Executive Officer



**Fig. 7.3.5 Sample JAVA Certificate**



No: KARE/OCR/Training/2019 – 20/21

01.06.2019

**CIRCULAR**

Office of Corporate Relations is organizing online **TCS NINJA specific training programme (45 hours)** for the TCS eligible students from **3<sup>rd</sup> June to 25<sup>th</sup> June, 2020**. The main objective of this programme is to enhance the knowledge of students in terms of programming skills and conceptual skills. Students will have to pay the training fees of Rs.600/- through EASYSIS within one week from the date of commencement of the next academic year. Attending this training is mandatory for all the eligible students from B.Tech ( AUTO BIOMEDICAL CSE ECE EEE EIE IT & MECH) & MCA. Attendance will be provided only for the students who are present for the entire duration of the sessions.

Surprise quiz will be conducted in between the training to ensure the attentiveness of the students. Assessment will be conducted in between the training days to ensure the effectiveness of the training. Assessment dates and timings will be informed later.

Defaulters for the training will be viewed seriously and will not be permitted to attend the TCS NINJA drive.

**Course Coverage**

- A planned program to enhance the skills of the students to face the Programming Concepts and Coding section in TCS Ninja NQT.
- The course will strengthen the basic skills on C Programming Language needed by the students to face TCS Ninja NQT.

**Eligible branches:** B.Tech (All streams) of 2017 – 2021 batch & MCA of 2018 – 2021 batch

**Eligibility:** 60% and above in SSLC, HSC / Diploma, 6 CGPA and above in UG and PG(MCA) with up to 1 standing arrears.

**Session Timings:** 11am to 1pm.

**Mode of Training:** Online

**Note:** As students from all the B.Tech courses are eligible for TCS drive, eligible interested students from other departments (AGRI AERO BIOTECH CIVIL CHEMICAL FOOD) are requested to register their name with their concerned department placement coordinator and the consolidated list should be sent to placements email ID before 12noon tomorrow (02/06/2020)

  
Mr. S.P. Velmurugan  
Coordinator Cell - 12

  
Dr. A. Aiswadeen  
Director – Corporate Relations

Copy submitted to the Chancellor & Vice President – for favour of information  
Cc to: Vice Chancellor & Registrar  
Cc to: All Directors, Deans, Controller of Examination & HoDs  
Cc to: Assistant Registrar & PRO

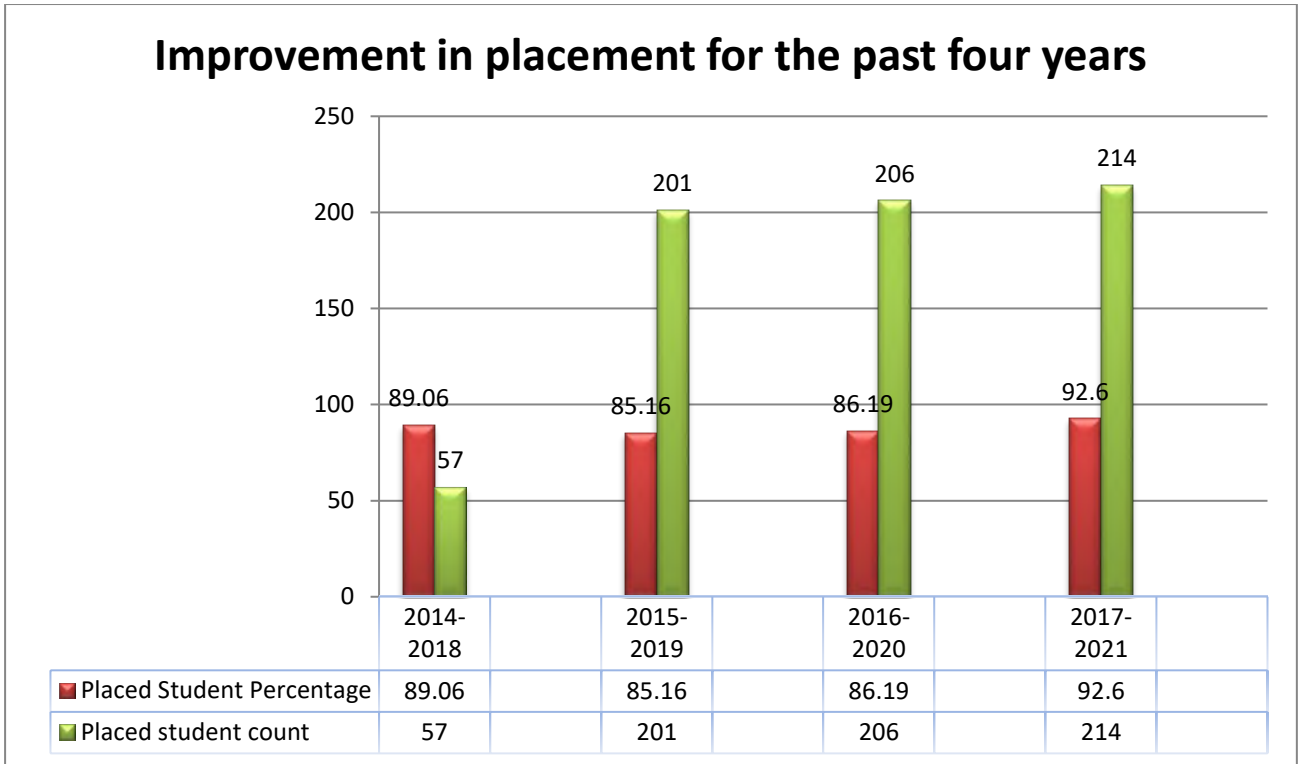
Fig.7.3.6. Sample company specific Training-TCS Ninja

Table 7.3.3 shows relevant data towards the continuous improvement in placement in core industries, placement percentage and pay package for the past Four years.

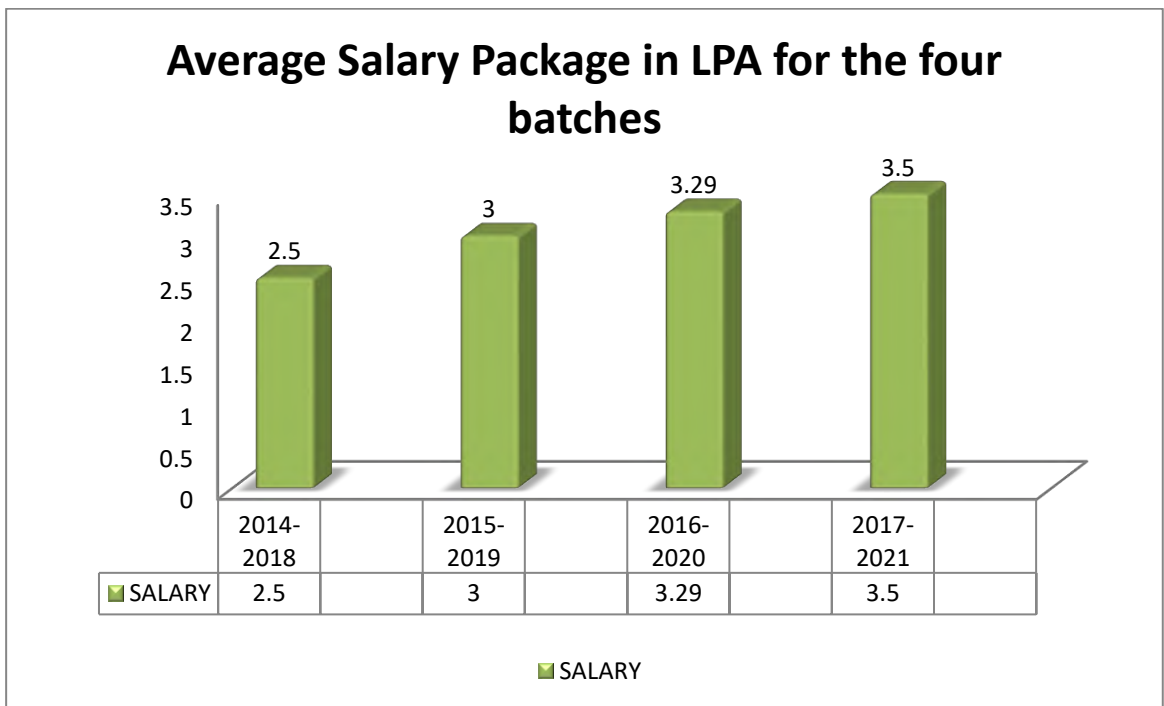
**Table. 7.3.3 Placement improvement percentage, focusing on core industries and their salary package.**

S. No	Academic Year	Total Number of Students	Total Count of Students Placed	Percentage of Placement	Average salary package in LPA	No. of Core Industry	Pay Package in Lakhs
1	2014-2018	64	57	89.06	2.5	18	Max -6 min -1.5
2	2015-2019	236	201	85.16	3	26	Max - 9 min - 1.8
3	2016-2020	239	206	86.19	3.29	28	Max - 6.5 min - 2
4	2017-2021	231	214	92.6	3.5	30	Max - 6.5 min - 2

Fig.7.3.7 shows the placement record for the graduated batches with the placed students details in terms of count as well as percentage. Fig.7.3.8 depicts the average salary package for the past four years and it is evident that improvement is observed. tfig.7.3.9 shows the sample appointment order of our student.



**Fig.7.3.7. Placements record of graduated batches**



**Fig.7.3.8 Average salary package for the past three batches**



29-Jun-2020

Dear Rahul V,  
B.Tech/B.E., Computer Science & Engineering  
Kalesalingam college of engg



Candidate ID – 1400951

In continuation to our discussions, we are pleased to offer you the role of **Programmer Analyst Trainee** in **Cognizant Technology Solutions India Private Limited ("Cognizant")**.

During your probation period of 12 months, which includes your training program, you are entitled to an Annual Total Remuneration (ATR) of **Rs.401,986/-**. This includes an annual incentive indication of **Rs.22,500/-**, as well as Cognizant's contribution of **Rs.19,500/-** towards benefits such as Medical, Accident, Life Insurance and Gratuity. The break up is presented in **Annexure A**.

On successful completion of the probation period, clearing the required training assessments and subject to you being part of a delivery project, your annual Total Remuneration (ATR) would stand revised to **Rs.450,500/-**. This includes an annual incentive indication of **Rs.22,500/-**, as well as Cognizant's contribution of **Rs.19,500/-** towards benefits such as Medical, Accident, Life Insurance, as applicable.

Your appointment will be governed by the terms and conditions of employment presented in **Annexure B**. You will also be governed by the other rules, regulations and practices in vogue and those that may change from time to time. Your compensation is highly confidential and if the need arises, you may discuss it only with your Manager.

Cognizant is keen that there is a secure environment for clients and internally too. You are required to be registered with the National Skills Registry (NSR) and provide the ITPIN while joining the organization. Please refer Annexure B for more details.

Please note

- This appointment is subject to satisfactory professional reference checks and you securing a minimum of 60% aggregate (all subjects taken into consideration) with no standing arrears in your Graduation/Past-Graduation.
- Prior to commencing employment with Cognizant you must provide Cognizant with evidence of your right to work in India and other such documents as Cognizant may request.

We look forward to you joining us. Should you have any further questions or clarifications, please log into <https://campus2.cognizant.com/cognizant.com>

Yours sincerely,  
For **Cognizant Technology Solutions India Pvt. Ltd.**,



Suresh Bethowanda  
Global Head-Talent Acquisition

I have read the offer, understood and accept the above mentioned terms and conditions.

### Fig.7.3.9. Sample Appointment order of the student Aptitude test training:

Based on the analysis report of brainstorming sessions, average and slow learners were unable to pass the preliminary level due to their incompetency in the aptitude test. In order to develop their aptitude knowledge, field experts were invited to train students with industry related training.

The training and placement division of our institute organizes aptitude training programs at regular intervals. The frequency of the tests and training are increased during the placement period; as a result, the 2020 academic year witnesses the notable increase in the percentage of success in the placement. Because of this around 80 students cleared CTS first round and around 60 students got placed in CTS.

**Soft skills training:**

Some students of weaker backgrounds found technical competence but failed to possess soft skills. Mainly, they lack communication skills. To compensate for this problem, soft-skill classes were conducted by the university to proliferate the skills of the students. Many experts were invited from the reputed training centers to train and forecast the diligence of the student. Business English Certificate (BEC) classes were given importance and student are asked to register and clear the exam for validation to ensure proficiency in English.

**Higher studies: performance in GATE, GRE, GMAT, CAT etc., and admissions in premier institutions**

**B). Improvement in higher studies**

The Department of Computer Science and Engineering has a valid forecasting towards the future arena and emphasizes greater importance towards Competitive Examinations. The university itself holds Centre for Competitive Examinations (CCE) and each department holds up with an individual CCE Cell in-charge. Students are motivated to garner their attributes towards GATE, IELTS, GRE and other competitive examinations.

GATE training to faculties are arranged to improve the level of GATE coaching to students as shown in fig.7.3.10. GATE training to the student of higher attributes in Cumulative Grade Point Average (CGPA) and wishes are inducted to the program and intensive coaching is provided. A sample copy of circular was attached in fig.7.3.11. Separate subsidies are arranged to garner GATE resources from the university library. The department deposes faculty members exclusively for providing GATE coaching to the students and mock tests are conducted through cell in-charges.



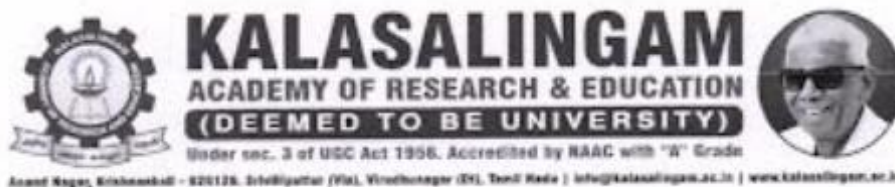
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**Faculty List for GATE Training Program**

The Following faculty members are asked to attend the GATE training program from 4.12.2017 to 8.12.2017 without fail.

S.No	Name	Designation
1.	Mrs.R.Sumathi	Assistant Professor
2.	Mrs.A.Nesarani	Assistant Professor
3.	Dr.T.Dilipan Rajkumar	Assistant Professor
4.	Mr.K.Muthamil sudar	Assistant Professor
5.	Mr.P.Nagaraj	Assistant professor
6.	Ms.C.M.Sowmya	Assistant professor
7.	Mrs.S.Karkuzhali	Assistant Professor
8.	Ms.V.Devisurya	Assistant Professor

  
 HOD/CSE

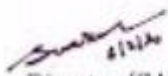
Fig.7.3.10. Sample Training for staffs handling GATE coaching



**Office of Director (Students Affairs)**

**Circular**

In connection with the GATE 2021, the HoDs of Engineering Departments are requested to submit the list of eligible students who's are currently studying the third-year engineering through the concern Cell PD. Further, the HoDs and Deans of the Engineering Departments are requested to schedule the GATE 2021 coaching classes possibly between 4.00 pm to 6.00 pm. The Schedule should reach the Office of Director SA possibly on or before 08.02.2020.

  
 Director (SA)

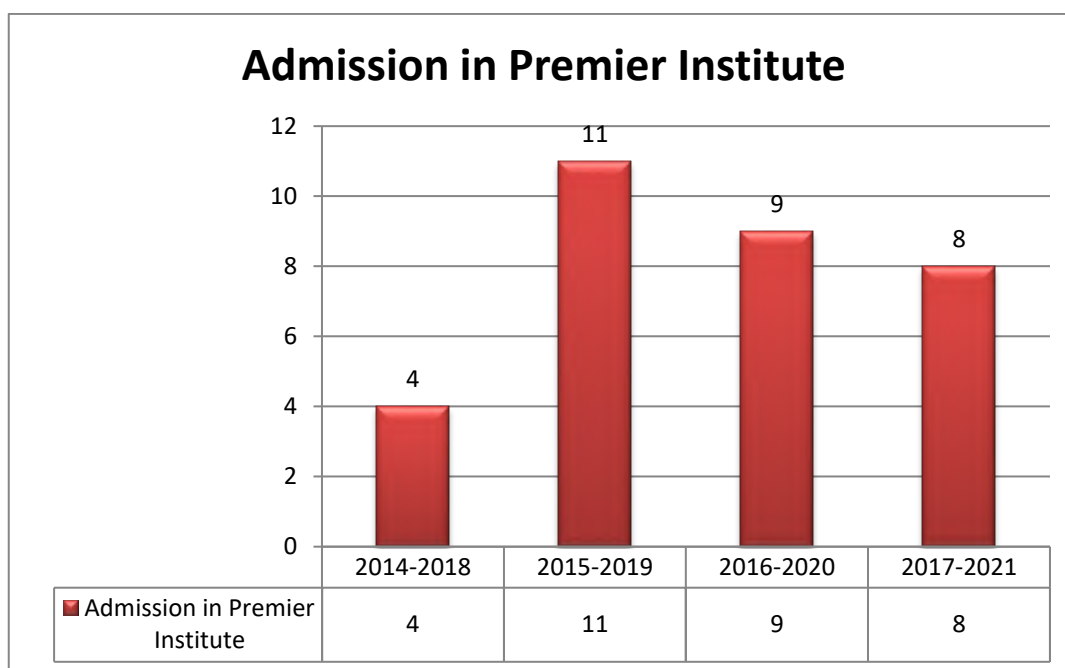
  
 Registrar

Figure 7.3.11. GATE coaching class circular

Table 7.3.4. shows the count of students who cleared GATE, IELTS and GRE for the past three batches and Table. 7.3.5 represents the sample student details who have gone for higher studies. Fig.7.3.12 shows the admitted students in Higher education details for the past four Batches.

**Table. 7.3.4. Competency towards Higher Education Eligibility Tests**


S.No	Academic Year	Total Number Of Students	Gate	ielts	Gre	Admission In Premier Institute
1	2014-2018	64	-	2	1	4
2	2015-2019	236	1	1	1	11
3	2016-2020	239	1	1	1	9
4	2017-2021	240	1	2	3	8



**Fig 7.3.12 Admitted students in Higher education for Past 4 Batches)**


Fig.7.3.10 shows the sample Gate score card of our students. Fig 7.3.11. depicts the sample TOFEL score card of our student and Fig 7.3.12 represents the sample GRE score card of our student.





# GATE 2021 Scorecard

## Graduate Aptitude Test in Engineering (GATE)



Organising Institute  
Indian Institute of Technology Bombay


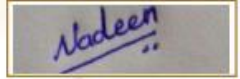
Candidate's Details

Name: **SHAIK MAHAMMED NADEEN**

Parent's / Guardian's Name: **SHAIK KAMAL BASHA**

Registration Number: **CS21S67327182**      Date of Birth: **11-Jul-2000**

Examination Paper: **Computer Science and Information Technology (CS)**

(Candidate's Signature)

Performance

GATE Score: **348**

Marks out of 100\*: **25.94**


Qualifying Marks\*\*

<b>26.1</b>	<b>23.4</b>	<b>17.4</b>
General	EWS/OBC (NCL)	SC/ST/PwD


Number of Candidates Appeared in this paper: **101922**

All India Rank in this paper: **14991**

Valid up to 31<sup>st</sup> March 2024



19<sup>th</sup> March 2021  
Prof. Deepankar Choudhury  
Organising Chairperson, GATE 2021  
(on behalf of NCB - GATE, for MoE)




93aeca7eb04a385d6c8e3c0badaac19

\* Normalized marks for Civil Engineering (CE), Computer Science and Information Technology (CS) and Mechanical Engineering (ME) Papers.

\*\* A candidate is considered qualified if the marks secured are greater than or equal to the qualifying marks mentioned for the category for which valid category certificate, if applicable, is produced along with this scorecard.

Fig 7.3.13. Sample GATE score card of SHAIK MAHAMMED NADEEN (9917004139)



### Test Taker Score Report

---

Name: Challa, Harinath Reddy  
Last (Family/Surname) Name, First (Given) Name Middle Name

Email: chalahari9704@gmail.com

Gender: M      Appointment Number: 6595 2012 1372 9893

Date of Birth: June 26, 2000      Test Date: January 09, 2021

---


Challa, Harinath Reddy  
1/641 Mainroad, Gorantla  
1/641, mainroad, gorantla  
Ananthapur, Andhra Pradesh 515231  
India

---

Country of Birth: India  
Native Language: Telugu  
Test Center: ITILWFA - Prometric Testing Private Limited  
Test Center Country: India

---

ID Type: PASSPORT      ID No.: xxxxxxxxxxxxxxxxxxxxxx3488      Issuing Country: India




Inst. Code	Dept. Code
6013	78
6897	78
4705	78
2925	78

---

**January 09, 2021 Test Date Scores**

**Total Score**



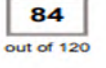
**81**  
out of 120

Reading: 17	30
Listening: 21	30
Speaking: 22	30
Writing: 21	30

**MyBest™ Scores**

Your highest section scores from all valid test dates, as of January 12, 2021.

**Sum of Highest Section Scores**



**84**  
out of 120

Reading: 18	30
Listening: 21	30
Speaking: 22	30
Writing: 23	30

Fig 7.3.14. Sample TOFEL score card of our student



**TEST TAKER SCORE REPORT**

Note: This report is not valid for transmission of scores to an institution.

**peddavandla Girish Kumar Reddy**

**Most Recent Test Date: November 4, 2020**

Address: 51/167-A, ngo colony, rayachoty, cuddapah, 516269 India

Registration Number: 8501999  
Print Date: November 12, 2020

Email: girishreddy1218@gmail.com

Phone: 91-7093712491

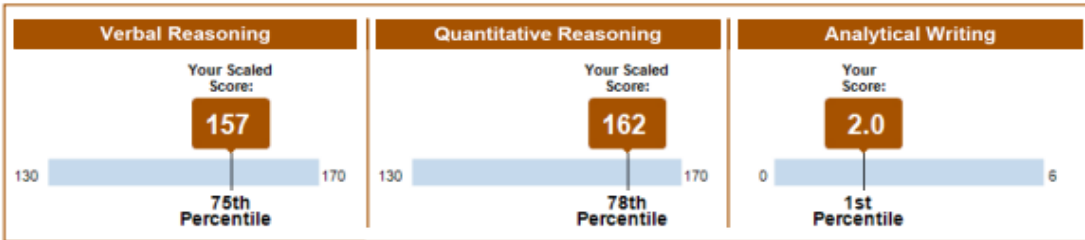
Date of Birth: June 19, 2000

Social Security Number (Last Four Digits):

Gender: Male

Intended Graduate Major: Computer Science (0402)

**Your Scores for the General Test Taken on November 4, 2020**



**Your Test Score History**

**General Test Scores**

Test Date	Verbal Reasoning		Quantitative Reasoning		Analytical Writing	
	Scaled Score	Percentile	Scaled Score	Percentile	Score	Percentile
November 4, 2020	157	75	162	78	2.0	1

**Fig 7.3.15. Sample GRE score card of our student**

Table 7.3.5 shows the students who went for higher studies with their registration number, course name and Institution name are represented clearly. Figure 7.3.16 shows the sample id cards of the students.

**Table. 7.3.5 Students gone for higher education details – Sample list**

S. No	KARE Register Number	Name of the Student	PG institute Register Number	Course	University
1	9917004158	Sai Varsha	3003166	Masters in Cyber Security	The University of Tampa, 401 W Kennedy Blvd, Tampa, Fl 33606, United States
2	9917004022	Ritish Reddy	6279110139644205	Masters in Computer Science	Texas A&M University, College Station, Texas
3	9917004074	Madhu Priya	6279110137926380	Masters in Computer Science	Texas A&M University, College Station, Texas
4	9917004101	Girish Kumar Reddy	2021592452	Masters in Information Technology & Management	The University of Texas At Dallas, Austin, TX 78712, United States
5	9917004031	Sujith Emmadi	U00831205	Masters in Data Science	The University of Memphis, 3720 Alumni Ave, Memphis, Tn 38152, United States
6	9916004174	Chandrasekhar Tholla	N0032324763	Masters in Computer Science	Wichita State University, 1845 Fairmount St, Wichita, KS 67260, United States
7	9915004102	KaviyaDevi.V	1953001	MTech Information and Cyber Warfare	National Engineering College,K.R.Nagar, Kovilpatti, Nallatinputhur, Tamil Nadu 628503
8	9916004023	Sumath V Chinni	21022351	Masters in Cyber Security	University of Hertfordshire, De Havilland Campus, Mosquito Way, Hatfield AL10 9EU, United Kingdom
9	9915004143	GaliguttaChaithanya	19MA10007	MTech Artificial Intelligence and Machine Learning	Vellore Institute of Technology, VIT, Vellore Campus, Tiruvalam Rd, Katpadi, Vellore, Tamil Nadu 632014
10	9915004080	Vaishnavi M	9919115062	MBA	Kalasalingam Academy of Research and Educarion, Anand Nagar, Krishnan Koil, Srivilliputhur, Virudhunagar District, TamilNadu-626126
11	9915004195	Donthireddy Kamal Reddy	919583428	Masters in Computer Science	Northwest Missouri State University 800 University Dr, Maryville, Mo 64468, United States
12	9915004201	Kailash Chowdary Bodduluri	20911018	Masters in Computer Science	Dalarna University, Högskolegatan, Falun Sweden
13	9915004224	KunalaManoj Kumar	19019144	Masters in Computer Science	University of Hertfordshire, De Havilland Campus, Mosquito Way, Hatfield AL10 9EU, United Kingdom
14	9915004169	Prabhakar Reddy	219257313	Masters in Cyber Security and Digital forensics	Deakin University, Melbourne, Victoria, Australia
15	9915004232	Srikanth Reddy	219405461	Masters in Cyber Security and Digital forensics	Deakin University, Melbourne, Victoria, Australia



**Fig 7.3.16. Sample ID card of students who are studying PG courses in PREMIER INSTITUTE**

### **C) Improvement in entrepreneurship**

The Innovation and Entrepreneurship Development Centre (IEDC) at KARE was established in 2014 as an initiative of the National Science and Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology (DST), New Delhi with the intention to develop mechanism to create an entrepreneurial culture to foster growth of innovation and entrepreneurship amongst the faculty and students. It focuses on three areas namely Technopreneurship, Women Entrepreneurship and Rural Entrepreneurship.

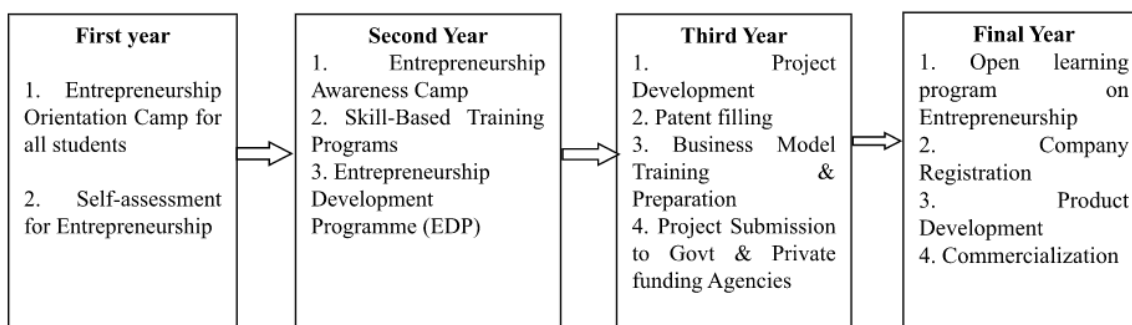
### **The methodology of Entrepreneurship Ecosystem Creation**

Innovation and Entrepreneurship Development Centre & Institution Innovation Council aims to provide the pre-incubation specialties for student projects. Through this cell, we are organizing orientation camps, awareness camps related to entrepreneurship and Innovation. Fig 7.3.14 depicts the four-year model of Entrepreneurs activity.

1. Firstly, Orientation camps have been given to all the freshman students in their first year. Through these camps, we give brief knowledge about entrepreneurship and give ideas for business and motivate them to create or plan to initiate their own business.
2. Secondly, Awareness camps have been given to second-year students for three days. During these camps, students learn about their relative domain business ideas and projects in their domain. We also provide the details about how to find the best business plan, how to create the best solution for the problems facing the business plan, and where to get

funding to start a company. We educate them about all the government funding, grants, and private funding agencies. We also provide a Skill- development program for second-year students through this program we give domain base training regarding student's interests and industrial experts share their knowledge and guidance to the students in their domain courses.

3. Thirdly, the students have to find the problems their local ventures are facing and come up with solutions that are useful for uplift the ventures. They learn through real-time case studies. In the third year, students submit their business projects. We help them to patent their business ideas and give training for project models and submit these models for getting funds in both government and private agencies. We provide the Intellectual Property Rights (IPR) awareness program for both students and faculty members. Through this program we brief about the products that can be patented and steps in the patent filing procedure.
4. Lastly in the fourth year, we focus on company registration, product development through incubation centres, Technology transfer and commercialization of the products. On the whole, IEDC hands it out to students and entrepreneurs for their dream future.



**Fig.7.3.17 Model of Entrepreneurship Activity**

In the growing competitive world to improve the quality of the students, the institute is taking steps to mold the students not only as job seekers but also as job providers. At Kalasalingam Academy of Research and Education, Innovation and Entrepreneurship Development Centre has provided various training to the students to make them a good Entrepreneur. Table. 7.3.6. represents the sample events organized during 2019-2020 for the students.

**Table. 7.3.6. Sample of Events organized during 2019-2020**

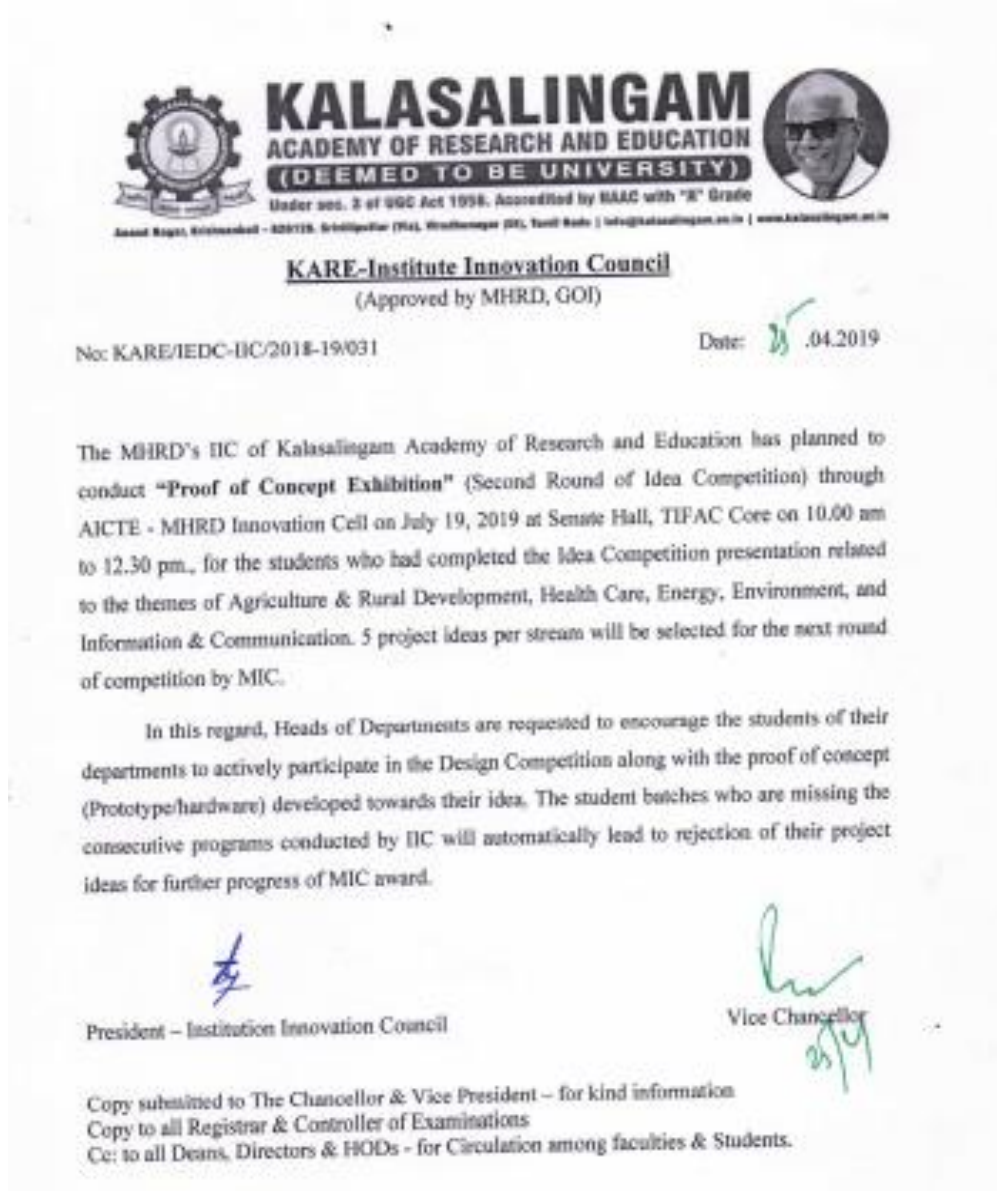
S. No	Date	Resource Person	Event Title	Department	No. of Beneficiaries	Fund
1	07-04-2020	Mr. Abhishek Suryawanshi, Director, Wikipedia Swastha	IIC- India First Leadership Talk Series	All	102	MIC
2	08-04-2020	Prof. K Vijay Raghavan, Principal Scientific Adviser, Government of India	IIC- India First Leadership Talk Series	All	128	MIC
3	09-04-2020	Prof. Anil D.Sahasrbudhe, Chairman, AICTE	IIC- India First Leadership Talk Series	All	104	MIC
4	10-04-2020	Prof. Partha Chakraborty, Chairman National Digital Library, Ex-Director, IIT Kharagpur	IIC- India First Leadership Talk Series	All	132	MIC

This type of training helps as an enabler for the students to develop their own start-up company on a small scale in the areas where they are interested in Table 7.3.7 represents the entrepreneur details of the students for the last three years.

**Table. 7.3.7 Entrepreneur details of the students for the last three years.**

S.NO	ACADEMIC YEAR	ENTREPRENEURS
1	2014-2018	2
2	2015-2019	4
3	2016-2020	0 (Yet to start)
4	2017-2021	0 (Yet to start)

The separate cell for entrepreneurship called Innovation and Entrepreneurship Centre (IEDC), is functioning in the university and conducts an awareness camp for students to become entrepreneurs helping them to innovate new projects and be helpful to the community. A sample circular of an event conducted by IEDC is depicted Fig 7.3.17.



**Fig.7.3.18 Sample Circular of an event conducted by IEDC**

Listed below are some of the funded projects that are awarded to students and staff through Innovation and Entrepreneurship Development Centre.

- Funding Amount: Rs. 1 Lakh /Project, POINT OF SALE : An App For Small Business received by Prateek Gaurav Divyanshu Vishal S.Diselva and Dr. P. Deeplakshmi IEDC

**PROJECTS 2015-16**

- Funding Amount: Rs. 10 Lakhs /Project, Smart Cart for Supermarket received by V.Ramachandran, PemmasaniManoj Kumar (9915004131), Vengat Rahul and Dr.Ramalakshmi

**IEDC PROJECTS 2017-2018**

- Funding Amount: Rs. 1 Lakh /Project, Development of Electronic Lockers with Multiple keys using Visual Cryptography Scheme received by Sai anand.M(9917004126), Harish R, and Dr. K.Suthendran

**IEDC PROJECTS 2018-2019**

- Student Start-up Company incubated at KARE is functioning in the name of Yugti Smart Solutions Pvt. Ltd “, from 2018 till date.

**7.4 Improvement in the quality of students admitted in the program****Table.7.4 Consolidated report for student's admission**

Item		CAY 2021-2022	CAYm1 2020-2021	CAYm2 2019-2020
<b>National Entrance Examination (AIEEE)</b>	<b>Level</b>			
	<b>No. of Students admitted</b>	33	31	19
	<b>Opening Score/Rank</b>	98	96.10	96.51
	<b>Closing Score/Rank</b>	85	87	85
<b>Institute Entrance Examination- KEEE Examination</b>	<b>Level</b>			
	<b>No. of Students admitted</b>	207	207	220
	<b>Opening Score/Rank</b>	100	100	59
	<b>Closing Score/Rank</b>	65	59	40
<b>Name of the Entrance Examination Lateral Entry for</b>	<b>No. of Students admitted</b>	2	2	3
	<b>Opening Score/Rank</b>	96.5	96	88
	<b>Closing Score/Rank</b>	80	80	75
<b>Average CBSE/Any other Board Result of admitted students (Physics, Chemistry &amp; Mathematics)</b>		83.01%	81.77%	82.87%



CRITERIA 8		
FIRST YEAR ACADEMICS		50

### 8.1 First Year Student-Faculty Ratio (FYSFR) (5)

Name of the faculty member	PAN No.	Qualification	Date of Receiving Highest Degree	Area of Specialization	Designation	Date of joining	Teaching load (%)			Currently Associate (Yes/No)	Nature of Association (Regular/Contract)	Date Of leaving (In case Currently Associated is 'No')
							CAY 21-22	CAY m1 20-21	CAY m2 19-20			
ANISHA M	CJEP1703P	ME/ M. Tech and PhD	5/1/2018	Bioinformatics	Associate Professor	6/27/2018	100	100	100	Yes	Regular	
NIRMALA DEVI S	BSWPN1263R	M.E/M.Tech	5/1/2018	Genetic Engineering	Assistant Professor	7/1/2019	100	100	0	Yes	Regular	
REKHA M	CDXPR3025E	M.E/M.Tech	5/1/2013	Bioprocess Engineering	Assistant Professor	7/1/2017	100	100	100	No	Regular	5/30/2022
SUSHMITHA M	IVJPS6533J	M.E/M.Tech	6/1/2017	Microbiology	Assistant Professor	7/24/2017	100	100	100	No	Regular	5/30/2022
UPEKSHA T G U	ADOPU6302Q	M.E/M.Tech	5/1/2014	Microbial Technology	Assistant Professor	7/28/2017	100	100	100	Yes	Regular	
VIGNESHWARAN R	AJSPV6897R	M.E/M.Tech	5/1/2013	Molecular Biology	Assistant Professor	7/2/2018	0	100	100	No	Regular	5/28/2021
VIGNESHWARI N	AVXPV1981F	M.E/M.Tech	6/1/2017	Biochemistry	Assistant Professor	6/12/2017	100	100	100	No	Regular	5/30/2022
POORNIMA B	FMOPP1727E	M-E/M-Tech	7/10/2021	Biotechnology	Assistant Professor	7/15/2021	100	0	0	Yes	Regular	
LAKSHMANAN P	ANSPL7514R	M.Sc. and PhD	6/27/2007	Inorganic chemistry	Associate Professor	12/14/2016	0	100	100	No	Regular	5/20/2021
RAJAJEYAGAN THAN R	ALKPR9252N	M.Sc. and PhD	11/13/2012	Physical Chemistry	Assistant Professor	6/12/2017	0	100	100	No	Regular	5/20/2021
RAMESHKUMAR P	CDFPR3481Q	M.Sc. and PhD	9/22/2016	Inorganic chemistry	Assistant Professor	12/14/2016	0	100	100	No	Regular	5/20/2021
KALAIARASI T	EBGPK4165K	M.Sc. and PhD	4/1/2016	Pharmaceutical Chemistry	Assistant Professor	3/2/2020	0	100	0	No	Regular	5/21/2021
RAMALINGAM S	BEKPR9928B	M.Sc. and PhD	7/6/2015	Industrial Chemistry	Professor	9/1/2009	0	100	100	No	Regular	5/25/2021
VELAYUTHAM PILLAI	BIFPP3194Q	M.Sc. and PhD	2/26/2016	Organic Chemistry	Assistant Professor	8/18/2007	0	100	100	No	Regular	5/25/2021

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ARUNACHALA M S	ARDPA53 18F	M.Sc. and PhD	3/12/2012	Physical Chemistry	Assistant Professor	7/8/2016	0	100	100	No	Regular	5/28/2021
GANGADHARA A	AMKPA3 080A	M.Sc. and PhD	3/8/2017	Organic Chemistry	Assistant Professor	6/30/2015	100	100	100	Yes	Regular	
GEETHA D	ASCPG27 88H	M.Sc. and PhD	8/9/2016	Industrial Chemistry	Associate Professor	6/12/2017	100	100	100	Yes	Regular	
LAKSHMINARA YANAN P	BIFPP319 4Q	M.Sc. and PhD	8/9/2016	Inorganic chemistry	Associate Professor	12/3/2008	100	100	100	Yes	Regular	
NAGARAJAN E R	AGLPN08 24E	M.Sc. and PhD	1/25/2001	Polymer Chemistry	Professor	9/1/2000	100	100	100	Yes	Regular	
RAMALINGAN C	BDTPR76 26A	M.Sc. and PhD	10/6/2002	Organic Chemistry	Professor	12/3/2002	100	100	100	Yes	Regular	
SELVAPALAM N	DLJPS556 7K	M.Sc. and PhD	5/26/1997	Organic Chemistry	Associate Professor	3/2/2000	100	100	100	Yes	Regular	
SIVARANJANA P	DDGPS65 21E	M.Sc. and PhD	1/4/2020	Material Chemistry	Assistant Professor	6/13/2008	100	100	100	Yes	Regular	
SUNDARAVEL B	CCQPS66 42Q	M.Sc. and PhD	11/5/2014	Organic Chemistry	Assistant Professor	12/12/2016	100	100	100	Yes	Regular	
SWAMINATHA N M	AGEPS51 49N	M.Sc. and PhD	5/17/1983	Organic Chemistry	Professor	7/6/2015	100	100	100	Yes	Regular	
SYED ALI FATHIMA S	GFBPS144 2N	M.Sc. and PhD	4/3/2021	Inorganic chemistry	Assistant Professor	7/15/2020	100	100	0	Yes	Regular	
DATTATRI K NAGESHA	AUSPN23 364	M- Sc-, Ph- D	1/8/2004	Nanomaterials	Professor	7/1/2021	100	0	0	No	Regular	6/30/2022
PRANEETH K K	FQAPK56 41G	M- Sc-, Ph- D	2/4/2008	Inorganic chemistry	Associate Professor	8/2/2021	100	0	0	Yes	Regular	
THIRUPPATHI M	ATCPT47 21E	M- Sc-, M- Phil-, PhD	4/3/2021	Material Chemistry	Assistant Professor	7/1/2021	100	0	0	Yes	Regular	
SIVARAMAKA RTHIKEYAN R	FCDPS978 0P	M- Sc-, Ph- D	9/15/2021	Organic Chemistry	Assistant Professor	7/1/2021	100	0	0	Yes	Regular	
AMUTHA	DURPA48 84L	M- Sc-, Ph- D	12/8/2006	Industrial Chemistry	Assistant Professor	8/2/2021	100	0	0	Yes	Regular	
STALIN DURAI	HENPS17 85C	M- Sc-, Ph- D	4/12/2018	Organic Chemistry	Assistant Professor	8/2/2021	100	0	0	Yes	Regular	
KUMERESAN M	HCFPM92 48Q	M- Sc-, Ph- D	11/11/2020	Material Chemistry	Assistant Professor	8/2/2021	100	0	0	Yes	Regular	
PANDIAN C	BUEPP24 87M	M.E/M.Tech	6/20/2010	Cloud Computing	Assistant Professor	7/2/2018	0	100	100	No	Regular	5/18/2021
VEERAPATHIR AN S	APIPV187 7K	M.E/M.Tech	8/6/2012	Cloud Computing	Assistant Professor	7/2/2018	0	100	100	No	Regular	5/18/2021
ELAVARASI G	ABQPE38 28D	M.E/M.Tech	1/4/2020	Wireless Sensor Networks	Assistant Professor	7/1/2019	0	100	100	No	Regular	5/20/2021
KATHIRVEL S	EFVVK35 42H	M.E/M.Tech	9/25/2014	Internet of Things	Assistant Professor	6/18/2014	0	100	100	No	Regular	5/22/2021

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SUBBULAKSHMI	BUOPS4152C	M.E/M.Tech	8/21/2010	Data Mining	Assistant Professor	7/1/2010	0	100	100	No	Regular	5/22/2021
GURULAKSHMI K	AUFGP1391R	M.E/M.Tech	10/29/2018	Networks and Security	Assistant Professor	7/2/2018	0	100	100	No	Regular	6/30/2021
SAHILA T	CMUPS7244A	M.E/M.Tech	8/21/2013	Data Mining	Assistant Professor	6/19/2018	0	100	100	No	Regular	6/30/2021
GLORY A	DHMPG8498E	M.E/M.Tech	5/8/2020	Networks and Security	Assistant Professor	7/13/2020	100	100	0	Yes	Regular	
MANJUNATH T	BUYPM7523B	M.E/M.Tech	9/3/2011	Data Science	Assistant Professor	8/1/2020	100	100	0	Yes	Regular	
PARVATHA DEVI R	AVMPP9361L	M.E/M.Tech	8/21/2010	Cloud Computing	Assistant Professor	6/19/2018	100	100	100	Yes	Regular	
PONSURESH M	BEJPP2423Q	M.E/M.Tech	4/18/2009	Networks and Security	Assistant Professor	6/19/2018	100	100	100	Yes	Regular	
SUMATHI G	EGSPS2254E	M.E/M.Tech	9/3/2011	Cloud Computing	Assistant Professor	7/2/2018	100	100	100	Yes	Regular	
SMRITHY G S	FQAPS2652P	ME/M- Tech and PhD	4/22/2021	Data Science	Associate Professor	7/20/2021	100	0	0	No	Regular	6/27/2022
BALAJI C	BFSPB4768J	ME/M- Tech and PhD	6/30/2019	Networks & Security	Associate Professor	7/20/2021	100	0	0	No	Regular	6/27/2022
MOHD- USAMA	ACYPU5228N	ME/M- Tech and PhD	6/28/2020	Deep Learning	Associate Professor	7/20/2021	100	0	0	No	Regular	5/30/2022
MUTHULAKSHMI M	DSVPM7592F	M-E/M-Tech	4/30/2016	Image Processing	Assistant Professor	7/30/2021	100	0	0	Yes	Regular	
SURESH KUMAR S	DLAPS4033M	M-E/M-Tech	6/30/2014	Cloud Computing	Assistant Professor	7/30/2021	100	0	0	Yes	Regular	
MALATHI V	COJPM1368A	M-E/M-Tech	5/31/2016	Artificial Intelligence	Assistant Professor	7/6/2021	100	0	0	No	Regular	5/29/2022
VETRI SELVI V S	CEUPV4213G	M-E/M-Tech	5/31/2021	Machine Learning	Assistant Professor	7/6/2021	100	0	0	Yes	Regular	
KIRTHIGA N	BOFPK8117L	M-E/M-Tech	6/30/2014	Machine Learning	Assistant Professor	7/6/2021	100	0	0	Yes	Regular	
BAVANI K	DAZPB2825Q	M-E/M-Tech	4/30/2020	Deep Learning	Assistant Professor	7/6/2021	100	0	0	Yes	Regular	
RADHIKA NAMBIAR	BJGPN3489Q	M-E/M-Tech	5/22/2021	Machine Learning	Assistant Professor	8/13/2021	100	0	0	No	Regular	5/30/2022
RAJIB DEBNATH	CFIPD0547J	M-E/M-Tech	6/30/2013	Image Processing	Associate Professor	8/13/2021	100	0	0	No	Regular	5/30/2022
MOHANDAS R	AMFPR4996K	M-E/M-Tech	12/15/2020	IoT	Associate Professor	6/15/2021	100	0	0	No	Regular	6/27/2022
MARIA SHANTHI J	CGVPM6683A	M-E/M-Tech	4/26/2012	Networks & Security	Assistant Professor	6/15/2021	100	0	0	Yes	Regular	
SYED ALI FATHIMA R	BSIPS0707D	M-E/M-Tech	6/30/2016	Machine Learning	Assistant Professor	6/15/2021	100	0	0	Yes	Regular	

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SURENDIRAN MUTHUKUMAR D	DOEPS4095L	M-E/M-Tech	6/30/2015	Networks & Security	Assistant Professor	7/1/2021	100	0	0	Yes	Regular	
PRASANTH S	DVXPP4250C	M-E/M-Tech	5/31/2021	Machine Learning	Assistant Professor	7/1/2021	100	0	0	No	Regular	5/30/2022
KALAIARASI P	BDYPK3797E	M-E/M-Tech	5/12/2011	Data Science	Assistant Professor	7/30/2021	100	0	0	Yes	Regular	
KARUPPASAMY PANDIAN M	DHOPK8636L	M.E/M.Tech	6/5/2014	Power System	Assistant Professor	6/22/2015	100	100	100	Yes	Regular	
PRIYA P	AXEPP2874L	M.E/M.Tech	5/30/2010	Power Electronics and Drives	Assistant Professor	6/22/2016	100	100	100	Yes	Regular	
RAJENDRAN S	BCGPR5179G	M.E/M.Tech	6/10/2011	Power Electronics and Drives	Assistant Professor	7/1/2011	100	100	100	Yes	Regular	
RAJESH K	AORPR0656Q	ME/M. Tech and PhD	3/1/2018	Power System	Associate Professor	7/27/2011	100	100	100	Yes	Regular	
SHILAJA C	BQVPS2054Q	ME/M. Tech and PhD	4/5/2018	Power System	Assistant Professor	7/9/2018	100	100	100	Yes	Regular	
VIJAYAKUMAR K	ANGPV8484Q	ME/M. Tech and PhD	12/11/2021	Power Electronics and Drives	Associate Professor	7/1/2011	100	100	100	Yes	Regular	
VINOTH KUMAR V	AMIPV6813E	ME/M-TECH	20-07-2013	Power Electronics and Drives	Assistant Professor	7/1/2021	100	0	0	Yes	Regular	
GURUSAMY K	AKZPG1047L	M.A and Ph.D	8/18/2017	English Language Teaching	Assistant Professor	10/7/1997	100	100	100	Yes	Regular	
HARIHARASUDAN A	AEHPH0160B	M.A and Ph.D	3/5/2018	English Language and Literature	Assistant Professor	1/2/2010	100	100	100	Yes	Regular	
HEPSIBA S	AWNPH6935J	M.Phil	3/19/2016	Common Wealth Literature	Assistant Professor	6/1/2016	100	100	100	Yes	Regular	
JOTHI C	BJSPJ0464K	M.A and Ph.D	10/23/2013	Latin American Literature	Assistant Professor	6/1/2016	100	100	100	Yes	Regular	
KANNAN R	BGWPK8723R	M.A and Ph.D	8/12/2009	English Language Teaching	Assistant Professor	7/1/2004	0	100	100	No	Regular	5/6/2021
MOHAN S	AXGPM2867C	M.A and Ph.D	6/13/2013	African American Literature	Assistant Professor	7/8/2015	100	100	100	Yes	Regular	
PANDIA RAJAMMAL P	CCLPP3080Q	M.A and Ph.D	7/14/2017	Comparative Literature	Assistant Professor	6/12/2017	100	100	100	Yes	Regular	

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RAMKUMAR E V	BXLPR8008J	M.A and Ph.D	4/14/2014	English Language Teaching	Assistant Professor	6/1/2016	100	100	100	Yes	Regular	
REMA DEVI S	AJVPD3399K	M.A and Ph.D	1/11/2016	India Writing	Assistant Professor	6/12/2017	100	100	100	Yes	Regular	
Aravindan B R	AXZPA9295R	M-A	7/17/2014	English Language Teaching	Assistant Professor	7/1/2021	100	0	0	Yes	Regular	
NAGARAJAN K	AAWPN0715D	M.Sc. and PhD	5/1/2010	Graph Theory	Assistant Professor	6/12/2017	0	100	100	No	Regular	5/6/2021
AMMAKKANN U G	AOVPA8259A	M.Phil	4/1/2008	Algebra	Assistant Professor	7/1/2002	0	100	100	No	Regular	5/25/2021
ANITHA M	BTNPA4382A	M.Phil	6/25/2015	Graph Theory	Assistant Professor	7/17/2020	0	100	0	No	Regular	5/25/2021
HEMALATHA S V	ACPPH5737G	M.Sc. and PhD	10/1/2017	Fluid Dynamics	Assistant Professor	6/12/2017	0	100	100	No	Regular	5/25/2021
KARUNAKARAN P	EFDPK3188H	M.Phil	4/1/2013	Topology	Assistant Professor	6/29/2013	0	100	100	No	Regular	5/25/2021
NIRMALA K	AMTPN5584H	M.Sc. and PhD	5/17/2017	Differential Equations	Assistant Professor	6/3/2019	0	100	100	No	Regular	5/25/2021
PRABHU C	CZSPP1923Q	M.Phil	7/1/2019	Fuzzy Topology	Assistant Professor	12/29/2010	0	100	100	No	Regular	5/25/2021
PRAKASH B	CYFPP7043B	M.Sc. and PhD	4/18/2018	Topology	Assistant Professor	6/29/2015	0	100	100	No	Regular	5/25/2021
RAJAKUMAR S	AFOPR8593L	M.Sc. and PhD	11/1/2015	Topology	Assistant Professor	6/25/2017	0	100	100	No	Regular	5/25/2021
SANKARA NARAYANAN P	GLZPS0006N	M.Phil	5/1/2015	Algebraic Graph Theory	Assistant Professor	6/29/2015	0	100	0	No	Regular	5/25/2021
SARAVANAKUMAR S	HDTPS3739D	M.Sc. and PhD	7/28/2017	Graph Theory	Assistant Professor	5/4/2011	0	100	100	No	Regular	5/25/2021
SARAVANAN M	GXDPS4198R	M.Sc. and PhD	12/8/2017	Graph Theory	Assistant Professor	6/29/2015	0	100	100	No	Regular	5/25/2021
SUTHERSAN P	DCUPS6588E	M.Phil	10/1/2016	Statistics	Assistant Professor	6/29/2015	0	100	100	No	Regular	5/25/2021
MERLIN S	BSLPM4085R	M.Phil	4/1/2000	Graph Theory	Assistant Professor	6/18/2000	0	100	100	No	Regular	6/4/2021
AHILA A	BBSPA8104R	M.Phil	12/1/2007	Graph Theory	Assistant Professor	9/8/2014	100	100	100	Yes	Regular	
INDIRA K	AENPI3699N	M.Sc. and PhD	3/2/2015	Differential Equations	Assistant Professor	7/10/2020	100	100	0	Yes	Regular	
KAMESWARI M	AINPK7170L	M.Sc. and PhD	11/19/2012	Fuzzy Topology	Assistant Professor	8/10/2020	100	100	0	Yes	Regular	
MATHESWARAN M	AWWPM4526B	M.Phil	5/9/2009	Topology	Assistant Professor	6/27/2018	100	100	100	Yes	Regular	

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MUTHUSUBRA MANIAN L	BHRPM34 35Q	M.Phil	6/15/2018	Graph Theory	Assistant Professor	12/2/2019	0	100	0	No	Regular	6/30/2021
RADHA S	DUTPK99 09J	M.Sc	8/21/2010	Queuing Theory	Assistant Professor	6/23/2018	100	100	100	Yes	Regular	
SHUNMUGA PRIYA B	CPAPS948 4M	M.Phil	4/25/2007	Statistical Quality Control	Assistant Professor	11/26/201 9	100	100	0	Yes	Regular	
YEGNANARAY ANAN V	AANPY23 56A	ME/M. Tech and PhD	3/6/1997	Graph Theory	Professor	2/22/2021	100	100	0	Yes	Regular	
DEVIKA V	HDBPD34 24E	M-Sc-, M-Phil-, Ph-D	12/22/202 1	Statistical Quality Control	Assistant Professor	7/1/2021	100	0	0	Yes	Regular	
HYDER ABBAS RIZVI	BVRPR86 58A	M-Sc-, M-Phil-, Ph-D	4/8/2017	Variational Inequalities	Assistant Professor	8/2/2021	100	0	0	Yes	Regular	
KARTHICK P	BRUPK85 81N	M-Sc-, M-Phil-, Ph-D	4/30/2018	Fuzzy Graph Theory	Assistant Professor	8/3/2021	100	0	0	Yes	Regular	
MUTHUKANI VAIRAVEL T	AXLPM34 77F	M-Sc-, M-Phil-, Ph-D	7/6/2021	Graph Theory	Assistant Professor	8/3/2021	100	0	0	Yes	Regular	
SRIDEVI S	BLXPS64 33G	M-Sc-, M-Phil-, Ph-D	2/28/2017	Queuing Theory	Assistant Professor	8/3/2021	100	0	0	Yes	Regular	
RAJESHKUMAR MOHAPATRA	CGGPM80 80A	M-Sc-, M-Phil-, Ph-D	7/19/2021	Fuzzy Set Theory	Assistant Professor	8/3/2021	100	0	0	Yes	Regular	
ASHA N	EHUPA32 50P	M-Phil	4/30/2019	Graph Theory	Assistant Professor	8/3/2021	100	0	0	Yes	Regular	
CHITRA G	BGNPC93 37E	M-Sc-, M- Phil-, Ph-D	7/28/2021	Graph Theory	Assistant Professor	8/4/2021	100	0	0	Yes	Regular	
ANUSHRAJ B	CBTPB07 71R	M.E/M.Tech	11/14/201 4	Energy engineering	Assistant Professor	5/10/2018	0	0	100	No	Regular	5/26/2020
GOWTHAM RAJAN A	VJWPV00 86Q	M.E/M.Tech	10/8/2016	Automobile Engineering	Assistant Professor	5/23/2016	100	100	100	No	Regular	5/16/2022
GOWTHAMAN S	BCPPG72 51K	ME/M. Tech and PhD	1/17/2017	Internal Combustion Engineering	Associate Professor	6/12/2017	100	100	0	Yes	Regular	
JESSY MICHLA J R	AVTPJ247 9A	M.E/M.Tech	1/5/2013	CAD	Assistant Professor	5/1/2018	0	0	100	No	Regular	5/26/2020
KARTHIK K	BMAPK71 07H	ME/M. Tech and PhD	7/27/2021	CFD	Associate Professor	7/2/2018	100	100	100	No	Regular	5/6/2022
KARTHIKEYAN S	BDFPK53 92C	ME/M. Tech and PhD	5/16/2017	Production Engineering	Associate Professor	6/1/2009	100	100	100	Yes	Regular	
KOPPIAHRAJ K	EPJPK642 8G	M.E/M.Tech	11/27/201 6	CAD CAM	Assistant Professor	5/16/2018	0	100	100	No	Regular	5/25/2021
SANKAR J	GICPS049 0A	M.E/M.Tech	9/9/2015	Nano Science and Nano Technology	Assistant Professor	5/16/2018	0	0	100	No	Regular	5/26/2020

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SARATHKUMAR SEBASTIN J	AZNPJ1008K	M.E/M.Tech	5/5/2017	Solid Propulsion	Assistant Professor	6/12/2017	100	100	0	Yes	Regular	
SENTHILMUTHU KUMAR T	CVBPS1817D	ME/M. Tech and PhD	10/28/2018	Automotive Engineering	Associate Professor	1/2/2010	100	100	100	Yes	Regular	
SHYAMLAL C	DIWPS3034K	M.E/M.Tech	6/10/2011	Production Engineering	Assistant Professor	5/1/2018	0	100	100	No	Regular	5/25/2021
SIVASUBRAMANIAN M	AXOPS8894F	ME/M. Tech and PhD	10/16/2016	Production Engineering	Associate Professor	6/5/2008	100	100	100	Yes	Regular	
VELMURUGAN K	BJFPV3765C	M.E/M.Tech	8/31/2017	Manufacturing Engineering	Assistant Professor	5/12/2017	0	100	100	No	Regular	5/27/2021
Dr.G. Kalusuraman	AZZPK9807F	ME/M- Tech and PhD	5/9/2017	Manufacturing Engg	Associate Professor	6/4/2009	100	0	0	Yes	Regular	
Mr. M. ManojPrabhakar	AXRPM3548F	M-E/M-Tech	6/8/2011	CAD/CAM	Assistant Professor	1/12/2012	100	0	0	Yes	Regular	
Mr. G. Poomarimuthumar	ATZPP6870D	M-E/M-Tech	6/7/2005	Manufacturing Engg	Assistant Professor	5/2/2016	100	0	0	Yes	Regular	
ARIVARASAN A	BYPPA4607P	M.Sc. and PhD	10/20/2014	Nanotechnology	Associate Professor	7/4/2016	100	100	100	Yes	Regular	
ASATH BAHADUR S	AENPA1181R	M.Sc. and PhD	12/8/1994	Crystal Growth	Professor	3/2/1998	100	100	100	Yes	Regular	
DEVENDRAN P	ANYPD2662C	M.Sc. and PhD	4/4/2016	Nanomaterials	Assistant Professor	6/12/2017	100	100	100	Yes	Regular	
JEYA VIJAYAN S	BAYPJ8153J	M.Sc. and PhD	7/20/2014	Spectroscopy	Assistant Professor	6/20/2006	100	100	100	Yes	Regular	
KRISHNA KUMAR M	AXOPK2479A	M.Sc. and PhD	3/26/2015	Nonlinear Optics	Assistant Professor	7/2/2015	100	100	100	Yes	Regular	
MUTHU VINAYAGAM M	ASQPM9491F	M.Sc. and PhD	6/26/2015	Polymer Electrolytes	Associate Professor	10/4/2002	0	100	100	No	Regular	5/25/2021
NAIDU DHANPAL JAYRAM	AHEPN8689H	M.Sc. and PhD	12/3/2015	Plasmonics	Assistant Professor	7/2/2018	100	100	100	Yes	Regular	
NALLAMUTHUN	AOVPN9174P	M.Sc. and PhD	10/17/2012	Electrochemical Energy Storage Devices	Associate Professor	7/1/2011	100	100	100	Yes	Regular	
REVATHY M S	ARLPR4734J	M.Sc. and PhD	12/9/2016	Thin Film	Assistant Professor	6/5/2017	100	100	100	Yes	Regular	
SARAVANAKUMAR S	FDMPS1972M	M.Sc. and PhD	8/27/2015	Optoelectronic Materials	Assistant Professor	9/19/2009	100	100	100	Yes	Regular	
SASIKUMAR S	HVFPS1260H	M.Sc. and PhD	12/14/2018	Ceramic Materials	Assistant Professor	6/20/2020	100	100	0	Yes	Regular	
SELVA RENGAN P	CVHPS2083R	M.Sc. and PhD	6/17/2005	Spectroscopy	Associate Professor	10/30/2006	100	100	100	Yes	Regular	

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SRIKUMAR S R	BTMPS85 37G	M.Sc. and PhD	1/22/1998	Solar Cell and Thin Films	Professor	7/1/1984	100	100	100	Yes	Regular	
THANGARASU S	AILPT380 7H	M.Sc. and PhD	4/11/2017	Spectroscopy	Assistant Professor	7/14/2007	100	100	100	Yes	Regular	
THEIVA SANTHI T	AHEPT81 10F	M.Sc. and PhD	12/14/201 4	Nanomaterials	Associate Professor	11/1/2001	100	100	100	Yes	Regular	
VANITHA D	AGUPV68 18M	M.Sc. and PhD	12/5/2016	Polymer Electrolytes	Assistant Professor	8/8/2007	100	100	100	Yes	Regular	
VISWANATHA N K	ABNPV66 89C	M.Sc. and PhD	11/29/198 9	Spectroscopy	Professor	8/17/2017	0	100	100	No	Regular	5/25/2021
INDIRA DEVI M P	AFOPI377 7H	M-Sc-, M-Phil-, Ph-D	6/28/2019	Polymer Composites	Assistant Professor	7/1/2021	100	0	0	No	Regular	5/30/2022
SANDEEP AASHISH	BDTPA43 90N	<u>M-Sc-, Ph-D</u>	7/17/2020	Cosmology	Assistant Professor	7/1/2021	100	0	0	No	Regular	6/10/2022
Dr. S. MARAGATHA SUNDARI	AUXPS60 60P	M-Sc-, M-Phil-, Ph-D	8/16/2016	Queuing Theory	Assistant Professor	6/1/2016	100	0	0	Yes	Regular	
PRIYA NAIR	ANZPN98 07E	M-Sc-, M-Phil-, Ph-D	4/16/2021	Stochastic Differential Equations	Assistant Professor	7/1/2021	100	0	0	No	Regular	5/30/2022
MANIVANNAN M	GTRPM39 98B	M-Sc-, M-Phil-, Ph-D	10/8/2021	Complex Analysis	Assistant Professor	7/1/2021	100	0	0	No	Regular	5/30/2022
SRIRAMAN R	FYNPS72 71D	M-Sc-, M-Phil-, Ph-D	1/6/2020	Stability Analysis	Assistant Professor	8/3/2021	100	0	0	No	Regular	5/30/2022
AMRITHA V C	BPIPA464 4E	M-Sc-, M-Phil-, Ph-D	3/18/2021	Algebraic Graph Theory	Assistant Professor	8/3/2021	100	0	0	No	Regular	5/30/2022
TAMILVANAN K	AWJPT15 36F	M-Sc-, M-Phil-, Ph-D	9/30/2021	Functional Equations	Assistant Professor	8/3/2021	100	0	0	No	Regular	5/30/2022



**8.1 First Year Student-Faculty Ratio (FYSFR) (5)**

Academic Year	No. of Students (Approved Strength) (N)	No. of Faculty (Considering Fractional Load) (F)	FYSFR(N/F)	Assessment (5x20)/FYSFR (Limited to 5)
2019-2020	1290	88	15	5
2020-2021	1470	100	15	5
2021-2022	1590	110	15	5
<b>Average</b>	<b>1450</b>	<b>99</b>	<b>15</b>	<b>5</b>

**8.2 Qualification of Faculty Teaching First Year Common Courses (5)**

Academic Year	No. of Regular Faculty with Ph.D. (X)	No. of Regular faculty With Post-Graduation(Y)	RF (No. of Faculty required for SFR 1:20)	Assessment for faculty Qualification ((5x+3Y)/RF)
2019-2020	52	37	65	5
2020-2021	57	39	74	5
2021-2022	70	40	80	5
<b>Average Assessment</b>				<b>5</b>

**Details of the Ph.D. Faculty for the First Year Courses****Academic Year: 2021-2022**

S.No	Name of the faculty member	PAN No.	Qualification	Date of Receiving Highest Degree	Area of Specialization	Designation	Date of joining
1.	ANISHA M	CJEP A1703P	ME/M- Tech and PhD	01-05-2018	Bioinformatics	Associate Professor	27-06-2018
2.	GANGADHARA A	AMKPA3080A	M-Sc- and PhD	08-03-2017	Organic Chemistry	Assistant Professor	30-06-2015
3.	GEETHA D	ASCPG2788H	M-Sc- and PhD	09-08-2016	Industrial Chemistry	Associate Professor	12-06-2017
4.	LAKSHMINARAYANAN P	BIFPP3194Q	M-Sc- and PhD	09-08-2016	Inorganic chemistry	Associate Professor	03-12-2008
5.	NAGARAJAN E R	AGLPN0824E	M-Sc- and PhD	25-01-2001	Polymer Chemistry	Professor	01-09-2000
6.	RAMALINGAN C	BDTPR7626A	M-Sc- and PhD	06-10-2002	Organic Chemistry	Professor	03-12-2002
7.	SELVAPALAM N	DLJPS5567K	M-Sc- and PhD	26-05-1997	Organic Chemistry	Associate Professor	02-03-2000
8.	SIVARANJANA P	DDGPS6521E	M-Sc- and PhD	04-01-2020	Material Chemistry	Assistant Professor	13-06-2008
9.	SUNDARAVEL B	CCQPS6642Q	M-Sc- and PhD	05-11-2014	Organic Chemistry	Assistant Professor	12-12-2016
10.	SWAMINATHAN M	AGEPS5149N	M-Sc- and PhD	17-05-1983	Organic Chemistry	Professor	06-07-2015
11.	SYED ALI FATHIMA S	GFBPS1442N	M-Sc- and PhD	03-04-2021	Inorganic chemistry	Assistant Professor	15-07-2020
12.	DATTATRI K NAGESHA	AUSPN23364	M- Sc-, Ph- D	08-01-2004	Nanomaterials	Professor	01-07-2021

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S.No	Name of the faculty member	PAN No.	Qualification	Date of Receiving Highest Degree	Area of Specialization	Designation	Date of joining
13.	PRANEETH K K	FQAPK5641G	M- Sc-, Ph- D-	04-02-2008	Inorganic chemistry	Associate Professor	02-08-2021
14.	THIRUPATHI M	ATCPT4721E	M- Sc-, M- Phil-,PhD	03-04-2021	Material Chemistry	Assistant Professor	01-07-2021
15.	SIVARAMAKARTHIKEYAN R	FCDPS9780P	M- Sc-, Ph- D-	15-09-2021	Organic Chemistry	Assistant Professor	01-07-2021
16.	AMUTHA	DURPA4884L	M- Sc-, Ph- D-	08-12-2006	Industrial Chemistry	Assistant Professor	02-08-2021
17.	STALIN DURAI	HENPS1785C	M- Sc-, Ph- D-	12-04-2018	Organic Chemistry	Assistant Professor	02-08-2021
18.	KUMERESAN M	HCFPM9248Q	M- Sc-, Ph- D-	11-11-2020	Material Chemistry	Assistant Professor	02-08-2021
19.	SMRITHY G S	FQAPS2652P	ME/M- Tech and PhD	22-04-2021	Data Science	Associate Professor	20-07-2021
20.	BALAJI C	BFSPB4768J	ME/M- Tech and PhD	30-06-2019	Networks & Security	Associate Professor	20-07-2021
21.	MOHD- USAMA	ACYPU5228N	ME/M- Tech and PhD	28-06-2020	Deep Learning	Associate Professor	20-07-2021
22.	RAJESH K	AORPR0656Q	ME/M- Tech and PhD	01-03-2018	Power System	Associate Professor	27-07-2011
23.	SHILAJA C	BQVPS2054Q	ME/M- Tech and PhD	05-04-2018	Power System	Assistant Professor	09-07-2018
24.	VIJAYAKUMAR K	ANGPV8484Q	ME/M- Tech and PhD	11-12-2021	Power Electronics and Drives	Associate Professor	01-07-2011
25.	GURUSAMY K	AKZPG1047L	M-A and Ph-D	18-08-2017	English Language Teaching	Assistant Professor	07-10-1997
26.	HARIHARASUDAN A	AEHPH0160B	M-A and Ph-D	05-03-2018	English Language and Literature	Assistant Professor	02-01-2010
27.	JOTHI C	BJSPJ0464K	M-A and Ph-D	23-10-2013	Latin American Literature	Assistant Professor	01-06-2016
28.	MOHAN S	AXGPM2867C	M-A and Ph-D	13-06-2013	African American Literature	Assistant Professor	08-07-2015

S.No	Name of the faculty member	PAN No.	Qualification	Date of Receiving Highest Degree	Area of Specialization	Designation	Date of joining
29.	PANDIA RAJAMMAL P	CCLPP3080Q	M-A and Ph-D	14-07-2017	Comparative Literature	Assistant Professor	12-06-2017
30.	RAMKUMAR E V	BXLPR8008J	M-A and Ph-D	14-04-2014	English Language Teaching	Assistant Professor	01-06-2016
31.	REMA DEVI S	AJVPD3399K	M-A and Ph-D	11-01-2016	India Writing	Assistant Professor	12-06-2017
32.	PRIYA NAIR	ANZPN9807E	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	16-04-2021	Stochastic Differential Equations	Assistant Professor	01-07-2021
33.	MANIVANNAN M	GTRPM3998B	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	08-10-2021	Complex Analysis	Assistant Professor	01-07-2021
34.	SRIRAMAN R	FYNPS7271D	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	06-01-2020	Stability Analysis	Assistant Professor	03-08-2021
35.	AMRITHA V C	BPIPA4644E	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	18-03-2021	Algebraic Graph Theory	Assistant Professor	03-08-2021
36.	TAMILVANAN K	AWJPT1536F	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	30-09-2021	Functional Equations	Assistant Professor	03-08-2021
37.	INDIRA K	AENPI3699N	M-Sc- and PhD	02-03-2015	Differential Equations	Assistant Professor	10-07-2020
38.	KAMESWARI M	AINPK7170L	M-Sc- and PhD	19-11-2012	Fuzzy Topology	Assistant Professor	10-08-2020
39.	YEGNANARAYANAN V	AANPY2356A	ME/M- Tech and PhD	06-03-1997	Graph Theory	Professor	22-02-2021
40.	DEVIKA V	HDBPD3424E	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	22-12-2021	Statistical Quality Control	Assistant Professor	01-07-2021
41.	HYDER ABBAS RIZVI	BVRPR8658A	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	08-04-2017	Variational Inequalities	Assistant Professor	02-08-2021
42.	KARTHICK P	BRUPK8581N	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	30-04-2018	Fuzzy Graph Theory	Assistant Professor	03-08-2021
43.	MUTHUKANI VAIRAVEL T	AXLPM3477F	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	06-07-2021	Graph Theory	Assistant Professor	03-08-2021
44.	SRIDEVI S	BLXPS6433G	<u>M-Sc-</u> , <u>M-Phil-,Ph-D</u>	28-02-2017	Queuing Theory	Assistant Professor	03-08-2021
45.	RAJESHKUMAR MOHAPATRA	CGGPM8080A	<u>M-Sc-, M-Phil-, Ph-D</u>	19-07-2021	Fuzzy Set Theory	Assistant Professor	03-08-2021

S.No	Name of the faculty member	PAN No.	Qualification	Date of Receiving Highest Degree	Area of Specialization	Designation	Date of joining
46.	CHITRA G	BGNPC9337E	M-Sc-, M-Phil-, Ph-D	28-07-2021	Graph Theory	Assistant Professor	04-08-2021
47.	GOWTHAMAN S	BCPPG7251K	ME/M- Tech and PhD	17-01-2017	Internal Combusion Engineering	Associate Professor	12-06-2017
48.	KARTHIK K	BMAPK7107H	ME/M- Tech and PhD	27-07-2021	CFD	Associate Professor	02-07-2018
49.	KARTHIKEYAN S	BDFPK5392C	ME/M- Tech and PhD	16-05-2017	Production Engineering	Associate Professor	01-06-2009
50.	SENTHILMUTHU KUMAR T	CVBPS1817D	ME/M- Tech and PhD	28-10-2018	Automotive Engineering	Associate Professor	02-01-2010
51.	SIVASUBRAMANIAN M	AXOPS8894F	ME/M- Tech and PhD	16-10-2016	Production Engineering	Associate Professor	05-06-2008
52.	Dr.G. Kalusuraman	AZZPK9807F	ME/M- Tech and PhD	09-05-2017	Manufacturing Engg	Associate Professor	04-06-2009
53.	ARIVARASAN A	BYPPA4607P	M-Sc- and PhD	20-10-2014	Nanotechnology	Associate Professor	04-07-2016
54.	ASATH BAHADUR S	AENPA1181R	M-Sc- and PhD	08-12-1994	Crystal Growth	Professor	02-03-1998
55.	DEVENDRAN P	ANYPD2662C	M-Sc- and PhD	04-04-2016	Nanomaterials	Assistant Professor	12-06-2017
56.	JEYA VIJAYAN S	BAYPJ8153J	M-Sc- and PhD	20-07-2014	Spectroscopy	Assistant Professor	20-06-2006
57.	KRISHNA KUMAR M	AXOPK2479A	M-Sc- and PhD	26-03-2015	Nonlinear Optics	Assistant Professor	02-07-2015
58.	NAIDU DHANPAL JAYRAM	AHEPN8689H	M-Sc- and PhD	03-12-2015	Plasmonic	Assistant Professor	02-07-2018
59.	NALLAMUTHU N	AOVFN9174P	M-Sc-, M-Phil-, Ph-D	17-10-2012	Electrochemical Energy Storage Devices	Associate Professor	01-07-2011
60.	REVATHY M S	ARLPR4734J	M-Sc- and PhD	09-12-2016	Thin Film	Assistant Professor	05-06-2017
61.	SARAVANAKUMAR S	FDMPS1972M	M-Sc- and PhD	27-08-2015	Optoelectronic Materials	Assistant Professor	19-09-2009
62.	SASIKUMAR S	HVFPS1260H	M-Sc- and PhD	14-12-2018	Ceramic Materials	Assistant Professor	20-06-2020
63.	SELVA RENGAN P	CVHPS2083R	M-Sc- and PhD	17-06-2005	Spectroscopy	Associate Professor	30-10-2006

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S.No	Name of the faculty member	PAN No.	Qualification	Date of Receiving Highest Degree	Area of Specialization	Designation	Date of joining
64.	SRIKUMAR S R	BTMPS8537G	M-Sc- and PhD	22-01-1998	Solar Cell and Thin Films	Professor	01-07-1984
65.	THANGARASU S	AILPT3807H	M-Sc- and PhD	11-04-2017	Spectroscopy	Assistant Professor	14-07-2007
66.	THEIVA SANTHI T	AHEPT8110F	M-Sc- and PhD	14-12-2014	Nanomaterials	Associate Professor	01-11-2001
67.	VANITHA D	AGUPV6818M	M-Sc- and PhD	05-12-2016	Polymer Electrolytes	Assistant Professor	08-08-2007
68.	INDIRA DEVI M P	AFOP13777H	<u>M-Sc-</u> <u>M-Phil-,Ph-D</u>	28-06-2019	Polymer Composites	Assistant Professor	01-07-2021
69.	SANDEEP AASHISH	BDTPA4390N	<u>M-Sc-, Ph-D</u>	17-07-2020	Cosmology	Assistant Professor	01-07-2021
70.	Dr. S. MARAGATHA SUNDARI	AUXPS6060P	<u>M-Sc-</u> <u>M-Phil-,Ph-D</u>	16-08-2016	Queuing Theory	Assistant Professor	01-06-2016

**8.3 First Year Academic Performance (10)**

<b>Academic Performance</b>	<b>2020-21</b>	<b>2019-20</b>	<b>2018-19</b>
Mean of CGPA (X)	7.8	7.46	6.81
Total No. of Successful Students (Y)	1228	1160	752
Total No. of students appeared in the examination (Z)	1228	1160	752
<b>API [X*(Y/Z)]</b>	7.8	7.46	6.81
<b>Assessment - Average</b>	<b>7.356</b>		

## 8.4. Attainment of Course Outcomes of first year courses (10)

### 8.4.1. Describe the assessment processes used to gather the data upon which the evaluation of Course Outcomes of first year is done (5)

#### A. Assessment tools for evaluation of Course Outcomes (COs)

The data collection process for the attainment of Course Outcomes begins from the collection of the relevant data using various assessment tools. Most of the data for the direct attainment are collected from written examinations. In the regulation for 2020-2021 admitted batch, the written examination includes sessional examinations, semester end examinations and descriptive assignments. The next major form of assessment methodology is practical based examinations which examines the ability of the students to solve the problems. Some of the other data collection techniques include quizzes using online tools, seminars, paper presentations, projects, model creation, etc. During the evaluation process, data collection tools represented above are coming under the head of assignment. The list of tools adapted for the data collection is listed in the Table 8.4.

**Table 8.4 Assessment Tools for data collection process to evaluate Course Outcome (COs)**

Evaluation tool	Description
<b>THEORY COURSES</b>	
<b>Sessional Examinations (SE) (Online)</b>	<p>For the 2020-2021 admitted batch, there are 2 sessional examinations (online mode) conducted and both focusses on attainment of each course outcome during the semester.</p> <p><b>Question pattern for sessional examination I:</b></p> <p>Multiple choice questions (MCQs) = 40</p> <p>The marks scored by the students are converted into 100. Both CO1 and CO2 are equally weighted (20 MCQs from each COs).</p> <p>Further, among the 40 MCQs, 10 MCQs are common for the all the students to measure the CO attainment and they are equally weighted as well (i.e., CO1 = 5 Questions and CO2 = 5 Questions).</p>



	<p><b>Question pattern for sessional examination II:</b></p> <p>Multiple choice questions (MCQs) = 40</p> <p>The marks scored by the students are converted into 100. Both CO3 and CO4 are equally weighted (20 MCQs from each COs).</p> <p>In addition, among the 40 MCQs, 10 MCQs are common for the all the students to measure the CO attainment and they are also equally weighted (i.e., CO3 = 5 Questions and CO4 = 5 Questions).</p>
<p><b>Assignments (ASS)</b></p>	<p>Assignments are given by the faculty in order to inspect the level of understanding of the students during study. Some of the assignments utilized for the evaluations are descriptive type ones, quizzes using online tools, seminars, mini projects, models creation, etc.</p> <p><b>Assignment: 50 marks:</b></p> <p>For each COs, a minimum of one assignment is given and the total marks secured by the students for a particular CO is converted as the cumulative marks out of 10 and stored.</p> <p>By adopting similar strategy, marks for rest of the COs are gathered.</p> <p>COs evaluated: CO1, CO2, CO3, CO4 and CO5.</p> <p><b>Question pattern for assignment:</b></p> <p>No specific question pattern for the assignments is suggested, however, the course coordinator can guide the course faculty in connection with the same.</p> <p>Specifically in the pandemic, all the faculty used the online module such as Google classroom to manage assignments.</p>

<p><b>Semester End Examination (University level evaluation) (SEE) (Online)</b></p>	<p>In the case of semester end examinations conducted through online mode, multiple choice questions (MCQs) are used.</p> <p><b>Semester End Examination: 100 marks</b></p> <p><b>Question pattern for semester end examination:</b> Multiple choice questions (MCQs) = 80</p> <p>The marks secured by the students are converted into 100. All the COs such as CO1, CO2, CO3, CO4 and CO5 are almost equally weighted.</p> <p>Further, among the 80 MCQs, 25 MCQs are common for the all the students in order to evaluate the CO attainment. All the COs such as CO1, CO2, CO3, CO4 and CO5 are equally weighted.</p>
<p><b>LABORATORY BASED COURSES</b></p>	
<p><b>Continuous Internal Evaluation (Practical) (CIEP) (Online)</b></p>	<p>For the online mode of continuous internal evaluation (Practical), virtual labs, online compilers, mobile based CAD tools etc. are commonly used.</p> <p><b>Continuous Internal Evaluation: 50 marks</b></p> <p>Internal marks secured by the students for a particular CO is converted as the cumulative marks out of 10 and stored.</p> <p>Similar approach has been adopted for all the COs such as CO1, CO2, CO3, CO4 and CO5.</p>
<p><b>Semester End Practical (SEP) (Online)</b></p>	<p>The semester end practical examination (online mode) is conducted at the end of the semester for 3 hours. It is evaluated based on rubrics framed by the course coordinator for the corresponding laboratory course.</p> <p><b>Semester End Practical Examination: 100 marks</b></p> <p>Semester end practical examination marks secured by the students for a particular CO is converted as the cumulative marks out of 20 and stored.</p> <p>Similar strategy has been adopted for all the COs such as CO1, CO2, CO3, CO4 and CO5.</p>

<b>SURVEYS</b>	
<b>COURSE END SURVEY</b>	<p>At the end of every semester, each student is asked to provide a feedback report on the courses he/she has studied with assigned rubrics. The course end survey is assessed based on rubrics which are designed by the course coordinator.</p> <p><b>Course End Survey: 5-point scale evaluation</b></p> <p><b>COs evaluated:</b> CO1, CO2, CO3, CO4 and CO5.</p> <p>During the study period of virtual mode, the surveys are collected through online forms such as Google forms etc.</p>

### **B. Types of the courses and their evaluation weightage**

The courses are categorized into four major types based on the knowledge level need to be inculcated to the students.

1. Theory courses (T)
2. Laboratory courses (P)
3. Theory with practice courses (TP)
4. Integrated courses (IC)

The weightage for evaluation of the course outcomes for each course is different and the same is furnished in the Table 8.5.

**Table 8.5 Weightage for the evaluation of the course outcomes**

<b>Type of course</b>	<b>INTERNAL</b>				<b>EXTERNAL</b>			<b>OA</b>
	<b>SE</b>	<b>ASS</b>	<b>CIEP</b>	<b>Total</b>	<b>SEE</b>	<b>SEP</b>	<b>Total</b>	<b>Total</b>
Theory courses	35	15		50	50		50	100
Practical Course			50	50		50	50	100
Theory with Practical	20	15	15	50	50		50	100
Integrated course	20	15	15	50	30	20	50	100

\*OA = Overall attainment

### **C. Illustration of CO attainment procedure**

There are 5 COs for each course in the curriculum. The following procedure shows the calculation of CO attainment for a single CO of a course.

- STEP 1. Setting Benchmark score for the course
- STEP 2. Setting the level of attainment of the course
- STEP 3. Selection of weightage for the respective course
- STEP 4. Calculating Cumulative internal mark for the course
- STEP 5. Calculating Cumulative external mark for the course
- STEP 6. Calculating Cumulative total mark for the course
- STEP 7. Calculation of number of students attained
- STEP 8. Calculation of percentage of students attained
- STEP 9. Calculation of level of CO assessment
- STEP 10. Calculation of Direct CO attainment by considering average attainment of all COs

#### **8.4.2. Record the attainment of Course Outcomes of all first-year courses (5)**

The list of basic courses offered from humanities, sciences and engineering to the first year UG students in the academic year 2020-2021 is depicted in Table 8.6a. In total, there are 23 courses offered in the first year for various branches.

The PO attainment calculation for the first-year academics is based on the basic courses offered in both the semesters.

The CO attainment for all the courses imparted in the first year are calculated based on the steps provided above and the outcomes are furnished in Table 8.6b.

**Table 8.6a List of basic courses offered to first year students (2020-2021 admitted batch)**

S. No	Course Code	Course name
1	BIT18R101	Biology for Engineers
2	ECE18R171	Electronic devices
3	CHY18R171	Chemistry
4	CSE18R171	Programming for Problem Solving
5	CSE18R153	Programming in C
6	CSE18R108	IT Infrastructure Landscape Overview
7	CSE18R174	Computer Architecture and Organization
8	CSE18R254	Introduction to Python Programming
9	EEE18R171	Basic Electrical and Electronics Engineering
10	EEE18R172	Basic Electrical Engineering
11	HSS18R151	English for Technical Communication
12	MAT18R101	Calculus and Linear Algebra
13	MAT18R102	Multiple Integration, Ordinary Differential Equations and Complex Variable
14	MAT18R103	Multiple Integration, Ordinary Differential Equations and Vector Spaces
15	MAT18R104	Multiple Integration, Ordinary Differential Equations, probability and statistics
16	MEC18R151	Engineering Graphics and Design
17	MEC18R152	Engineering Practice
18	PHY18R171	Introduction to Electromagnetic Theory
19	PHY18R172	Introduction to Mechanics
20	PHY18R173	Oscillations, Waves and Optics
21	PHY18R174	Semiconductor Physics
22	PHY18R175	Optics, Electromagnetism and Quantum Mechanics
23	PHY18R176	Physics for Biotechnology

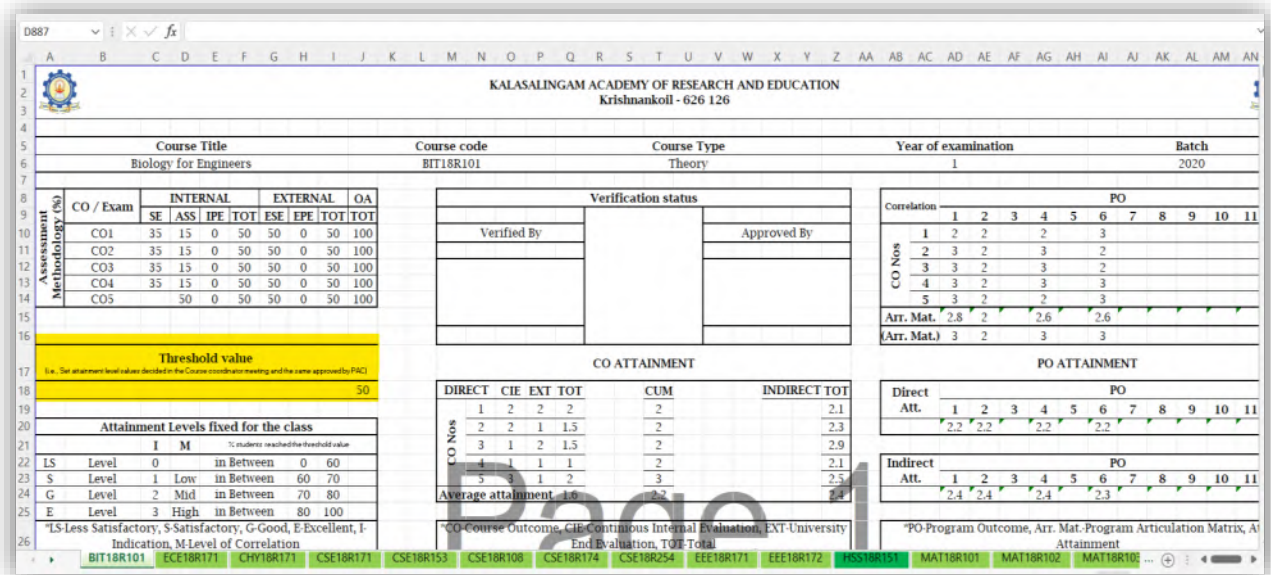
**Table 8.6b Consolidation of CO attainment for the first year students (2020-2021 admitted batch)**

<b>S. No</b>	<b>Course Code</b>	<b>Course name</b>	<b>Benchmark</b>	<b>CO attainment</b>
1	BIT18R101	Biology for Engineers	50	2.20
2	ECE18R171	Electronic Devices	70	2.60
3	CHY18R171	Chemistry	70	1.20
4	CSE18R171	Programming for Problem Solving	70	1.20
5	CSE18R153	Programming in C	70	2.80
6	CSE18R108	IT Infrastructure Landscape Overview	65	2.20
7	CSE18R174	Computer Architecture and Organization	65	2.60
8	CSE18R254	Introduction to Python Programming	65	1.60
9	EEE18R171	Basic Electrical and Electronics Engineering	70	2.20
10	EEE18R172	Basic Electrical Engineering	65	1.40
11	HSS18R151	English for Technical Communication	65	2.80
12	MAT18R101	Calculus and Linear Algebra	55	1.80
13	MAT18R102	Multiple Integration, Ordinary Differential Equations and Complex Variable	55	1.60
14	MAT18R103	Multiple Integration, Ordinary Differential Equations and Vector Spaces	60	1.60
15	MAT18R104	Multiple Integration, Ordinary Differential Equations, Probability and Statistics	55	2.60
16	MEC18R151	Engineering Graphics and Design	70	1.60
17	MEC18R152	Engineering Practice	70	2.00
18	PHY18R171	Introduction to Electromagnetic Theory	70	2.60
19	PHY18R172	Introduction to Mechanics	70	1.20
20	PHY18R173	Oscillations, Waves and Optics	70	1.80
21	PHY18R174	Semiconductor Physics	70	1.80
22	PHY18R175	Optics, Electromagnetism and Quantum Mechanics	70	1.60
23	PHY18R176	Physics for Biotechnology	70	1.60

**STEP 1. Setting Benchmark score for the course:**

The benchmark score is fixed by taking approximation of previous end semester marks average during first meeting of the course coordinators at the beginning of the course.

*BIT18R101-Biology for Engineer was taken as an example, threshold value/benchmark value decided in the course coordinator minutes and the same is highlighted in the attainment sheet.*



*Fig. 1. Snapshot of Benchmark score in the attainment*

**STEP 2. Setting the level of attainment of the course:**

The level of attainment of the course is based on the capability of the students during the entry of the course.

*For 2020-2021 admitted batch, the attainment level for the students was fixed as shown in the following snapshot, the same has been decided in the meeting of the course coordinators.*

Attainment Levels fixed for the class						
		I	M	% Students reached the threshold value		
LS	Level	0		in Between	0	60
S	Level	1	Low	in Between	60	70
G	Level	2	Mid	in Between	70	80
E	Level	3	High	in Between	80	100
*LS-Less Satisfactory, S-Satisfactory, G-Good, E-Excellent, I-Indication, M-Level of Correlation						

Course Title		Course code		Course Type		Year of examination	
Biology for Engineers		BIT18R101		Theory		1	

CO / Exam	INTERNAL				EXTERNAL			OA
	SE	ASS	IPE	TOT	ESE	EPE	TOT	TOT
CO1	35	15	0	50	50	0	50	100
CO2	35	15	0	50	50	0	50	100
CO3	35	15	0	50	50	0	50	100
CO4	35	15	0	50	50	0	50	100
CO5		50	0	50	50	0	50	100

Verification status	
Verified By	Approved By

Threshold value	
(i.e., Set attainment level values decided in the Course coordinator meeting and the same approved by PAC)	50

Attainment Levels fixed for the class	
	% students reached the threshold value
LS	Level 0 in Between 0 60
S	Level 1 Low in Between 60 70
G	Level 2 Mid in Between 70 80
E	Level 3 High in Between 80 100
*LS-Less Satisfactory, S-Satisfactory, G-Good, E-Excellent, I-Indication, M-Level of Correlation	

CO Nos	DIRECT				CUM	INDIRECT TOT
	CIE	EXT	TOT	TOT		
1	2	2	2	2	2.1	
2	2	1	1.5	2	2.3	
3	1	2	1.5	2	2.9	
4	1	1	1	2	2.1	
5	3	1	2	3	2.5	
Average attainment				1.6	2.2	2.4

Correlation	
CO Nos	1 2 3 4 5
1	2 2 2 2
2	3 2 2 3
3	3 2 2 3
4	3 2 3 3
5	3 2 2 2
Arr. Mat.	2.8 2 2.6
(Arr. Mat.)	3 2 3

CO ATTAINMENT	
Direct Att.	1 2 3 4 5
1	2.2 2.2 2.2
Indirect Att.	1 2 3 4 5
1	2.4 2.4 2.4

CONSOLIDATION OF CO ATTAINMENT	
MICRO ANALYSIS	MACRO ANALYSIS

Fig. 2. Snapshot of attainment levels in the attainment sheet

**STEP 3. Selection of weightage for the respective course:**

Selecting the weightage for continuous internal evaluation (CIE) and semester end examination (SEE) are based on the weightages mentioned in Table 8.5 as per the category of the course.

For example, BIT18R101-Biology for Engineer is chosen. This is a theory course, the weightage for the course is Sessional Examination – 35, Assignment – 15, and



Semester End Examination – 50. The marks split ups for the COs are highlighted in the snapshot provided.

The screenshot displays an Excel spreadsheet for the course 'Biology for Engineers' (BIT18R101). The spreadsheet is organized into several key sections:

- Course Information:** Course Title (Biology for Engineers), Course code (BIT18R101), Course Type (Theory), and Year of examination (1).
- Assessment Methodology (%):** A table showing the distribution of marks for five Course Outcomes (CO1-CO5) across Internal (SE, ASS, IPE, TOT) and External (ESE, EPE, TOT) assessments, along with Overall Attainment (OA).
- Verification Status:** A section for recording the verification and approval of the attainment data.
- Attainment Levels:** A table defining the performance levels (LS, S, G, E) based on marks in different assessment components.
- CO Attainment:** A table showing the cumulative attainment for each CO, calculated from direct and indirect sources.
- PO Attainment:** A table showing the attainment for each Program Outcome (PO1-PO7) based on the correlation matrix.

Fig. 3. Snapshot of Weightage shown in the attainment sheet

**STEP 4. Calculating Cumulative internal mark for the course:**

To calculate the CO attainment for a particular course outcome, the cumulative internal mark has been calculated as follows.

For example, BIT18R101-Biology for Engineer is chosen.

$$\text{i.e., } \left(\frac{3}{5} \times 35\right) + \left(\frac{9}{10} \times 15\right) = 34.5$$

The formula used for calculating the internal marks is depicted in the following snapshot.

The screenshot displays a comprehensive Excel spreadsheet for calculating cumulative internal marks. Key sections include:

- Methodology:** A table with columns SE, ASS, IPE, TOT, ESE, EPE, TOT, TOT for CO1 through CO5.
- Threshold value:** A table with a threshold value of 50.
- Attainment Levels fixed for the class:** A table with columns I, M, % students reached the threshold value for Level 1, 2, and 3.
- CO ATTAINMENT:** A table with columns DIRECT, CIE, EXT, TOT, CUM, and INDIRECT TOT for CO Nos 1 through 5.
- PO ATTAINMENT:** Two tables for Direct and Indirect Attainment with columns PO and Att.
- MICRO ANALYSIS:** A large table with columns CONDITION, Sessional, Assignment, Practical Examination, End semester, End Practical, Internal, External, and Total.
- MACRO ANALYSIS:** A table with columns Reg. No., Internal Examinations, University Examination, Internal, External, and Overall.

Fig. 4. Snapshot of calculation of cumulative Internal marks of the students appeared for the course.

**STEP 5. Calculation Cumulative mark for the course:**

To calculate the CO attainment for a particular course outcome, the cumulative external mark has been calculated as follows.

For example, BIT18R101-Biology for Engineer is chosen.

$$\text{i.e., } \left(\frac{4}{5} \times 50\right) = 40$$

The formula used for calculating the external marks is furnished in the following snapshot.

The screenshot displays a complex Excel spreadsheet used for academic assessment. Key sections include:

- Assessment Methodology (9-14):** A table with columns for CO/Exam, SE, ASS, IPE, TOT, ESE, EPE, TOT, and OA. Rows CO1 through CO5 show scores for different assessment types.
- Verification status (9-14):** A table with 'Verified By' and 'Approved By' columns.
- Threshold value (17-18):** A table indicating a threshold of 50.
- Attainment Levels fixed for the class (20-25):** A table with columns for Level (LS, S, G, E) and marks (0, 60, 70, 80, 100).
- CO ATTAINMENT (20-25):** A table with columns for DIRECT, CIE, EXT, TOT, CUM, and INDIRECT TOT. It includes a 'Average attainment' of 1.0.
- PO ATTAINMENT (20-25):** A table with columns for Direct and Indirect attainment across 12 POs.
- CONSIDERATION OF CO ATTAINMENT (28-37):** A large table with 'MICRO ANALYSIS' and 'MACRO ANALYSIS' sections, showing student-level data for various conditions and courses.
- University Examination (39-44):** A table with columns for Reg. No., S.No., Exam mark, Target mark, and various examination types (Internal, External, Overall, Total).

**Fig. 5.** Snapshot of calculation of cumulative External marks of the students appeared for the course

**STEP 6. Calculating Cumulative total mark for the course:**

To calculate the CO attainment for a particular course outcome, the cumulative total mark has been calculated as follows.

i.e., *Internal marks + External marks*

For example, *BIT18R101-Biology for Engineer* is chosen.

$$34.5 + 40 = 74.5$$

The formula used for calculating the cumulative marks is furnished in the following snapshot.

KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION Krishnankoil - 626 126																																											
Course Title										Course code					Course Type					Year of examination					Batch																		
Biology for Engineers										BIT18R101					Theory					1					2020																		
Assessment Methodology (%)	CO / Exam	INTERNAL			EXTERNAL			OA	Verification status																			PO															
		SE	ASS	IPE	TOT	ESE	EPE	TOT	TOT	Verified By																			Approved By														
	CO1	35	15	0	50	50	0	50	100																				Correlation														
	CO2	35	15	0	50	50	0	50	100																				CO Nos														
	CO3	35	15	0	50	50	0	50	100																				Att. Mat.														
	CO4	35	15	0	50	50	0	50	100																				(Att. Mat.)														
Threshold value <small>(i.e., Set attainment level values decided in the Course coordinator meeting and the same approved by PSC)</small>								CO ATTAINMENT																				PO ATTAINMENT															
50								DIRECT CIE EXT TOT CUM INDIRECT TOT																			Direct PO																
Attainment Levels fixed for the class								CO Nos																			Indirect PO																
I M % students reached the threshold value								Average attainment																			Att.																
LS Level	0	in Between			0	60																																					
S Level	1	Low in Between			60	70																																					
G Level	2	Mid in Between			70	80																																					
E Level	3	High in Between			80	100																																					
*LS-Less Satisfactory, S-Satisfactory, G-Good, E-Excellent, I-Indication, M-Level of Correlation								*CO-Course Outcome, CIE-Continuous Internal Evaluation, EXT-University End Evaluation, TOT-Total																			*PO-Program Outcome, Att. Mat-Program Articulation Matrix, Att.-Attainment																
CONSOLIDATION OF CO ATTAINMENT																																											
CONDITION	MICRO ANALYSIS															MACRO ANALYSIS																											
	Sessional					Assignment					Practical Examination					End semester					End Practical					Internal					External					Total							
Total Strength	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841								
Absent	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
Attained	428	380	233	307	830	821	830	828	823	0	0	0	0	652	583	662	575	555	0	0	0	0	667	603	562	581	823	652	583	662	575	555	631	641	618	604	787						
% attained	0.51	0.45	0.28	0.37	0.99	0.98	0.99	0.98	0.98	0.00	0.00	0.00	0.00	0.78	0.69	0.79	0.68	0.66	0.00	0.00	0.00	0.00	0.79	0.72	0.67	0.69	0.98	0.78	0.69	0.79	0.68	0.66	0.75	0.76	0.73	0.72	0.94						
Level of the class	0	0	0	0	3	3	3	3	3	0	0	0	0	2	1	2	1	1	0	0	0	0	2	2	1	1	3	2	1	2	1	1	2	2	2	2	3						
Reg. No.	Internal Examinations															University Examination										Overall																	
	Sessional					Assignment					Practical Examination					End semester					End Practical					Internal					External					Total							
S.No	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5				
Exam mark	5	5	5	5	10	10	10	10	10	10	10	10	10	10	5	5	5	5	5	20	20	20	20	20	50	50	50	50	50	50	50	50	50	50	50	50	50	50	100	100	100	100	
Target mark	2.5	2.5	2.5	2.5	5	5	5	5	5	5	5	5	5	5	2.5	2.5	2.5	2.5	2.5	10	10	10	10	10	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	50	50	50	50
1 9821004002	3	2	1	2	9	9	9	8	8	0	0	0	0	0	4	4	4	3	3	0	0	0	0	0	35	28	21	26	40	40	40	40	40	30	30	75	68	61	56	70			

Fig. 6. Snapshot of calculation of cumulative marks of the students appeared for the course

**STEP 7. Calculation of number of students attained:**

Number of students secured above benchmark score, set by the course coordinator have been calculated as follows.

For example, BIT18R101-Biology for Engineer is chosen. Number of students reached the benchmark score is represented in the attained tab. In total cumulative marks for CO1 out of 841, 631 students are crossed the benchmark score. Similarly, the values are calculated for all other COs.

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Krishnankoil - 626 126

Course Title: Biology for Engineers  
Course code: BIT18R101  
Course Type: Theory  
Year of examination: 1  
Batch: 2020

**Assessment Methodology (CO)**

CO / Exam	INTERNAL				EXTERNAL				OA
	SE	ASS	IPE	TOT	ESE	EPE	TOT	TOT	
CO1	35	15	0	50	50	0	50	100	
CO2	35	15	0	50	50	0	50	100	
CO3	35	15	0	50	50	0	50	100	
CO4	35	15	0	50	50	0	50	100	
CO5	50	0	0	50	50	0	50	100	

**Verification status**

Verified By: \_\_\_\_\_ Approved By: \_\_\_\_\_

**Threshold value**  
50

**Attainment Levels fixed for the class**

Level	I	M	% students reached the threshold value
LS Level	0	in Between	0-60
S Level	1	Low	in Between 60-70
G Level	2	Mid	in Between 70-80
E Level	3	High	in Between 80-100

**CO ATTAINMENT**

CO Nos	DIRECT				CUM	INDIRECT	TOT
	1	2	2	2			
1	2	2	2	2	2.1	2.1	
2	2	2	1	1.5	2.3	2.3	
3	1	2	1.5	2	2.9	2.9	
4	1	1	1	2	2.1	2.1	
5	3	1	2	3	2.5	2.5	
Average attainment	1.6	2.2			2.4	2.4	

**PO ATTAINMENT**

Direct Att.	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
1	2	2	2	2	3							
2	3	2	3	2								
3	3	2	3	2								
4	3	2	3	3								
5	3	2	2	2	3							
Arr. Mat.	2.8	2	2.6	2.6								
(Arr. Mat.)	3	2	3	3								

**Consolidation of CO Attainment**

CONDITION	MICRO ANALYSIS																MACRO ANALYSIS																					
	Sessional				Assignment				Practical Examinations				End semester				End Practical				Internal				External				Total									
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4	CO3	CO1	CO2	CO3	CO4	CO3	CO1	CO2	CO3	CO4	CO3	CO1	CO2	CO3	CO4	CO3	CO1	CO2	CO3	CO4	CO3	CO1	CO2	CO3	CO4	CO3				
Total Strengths	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841			
Absent	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Attained	428	380	233	307	830	821	830	828	823	0	0	0	0	652	583	662	575	555	0	0	0	0	0	667	603	562	581	823	652	583	662	575	555	631	641	618	604	787
% attained	0.51	0.45	0.28	0.37	0.99	0.98	0.99	0.98	0.98	0.00	0.00	0.00	0.00	0.78	0.69	0.79	0.68	0.66	0.00	0.00	0.00	0.00	0.00	0.79	0.72	0.67	0.69	0.98	0.78	0.69	0.79	0.68	0.66	0.75	0.76	0.73	0.72	0.94
Level of the class	0	0	0	0	3	3	3	3	3	0	0	0	0	2	1	2	1	1	0	0	0	0	0	2	2	1	1	3	2	1	2	1	1	2	2	2	3	

Fig. 7. Snapshot of number of students attained the COs shown in the attainment sheet

**STEP 8. Calculation of percentage of students attained:**

To calculate the percentage of attainment of the students for the CO of a course, the formula mentioned in equation (1) is used.

$$\text{i.e., } \frac{\text{Total no of students attained the particular CO of the course}}{\text{Total no of students appeared for the course}} \text{-----(1)}$$

For example, BIT18R101-Biology for Engineer is chosen. In total cumulative marks for CO1 out of 841, 631 students are crossed the benchmark score. Using the formula mentioned in eqn (1), the percentage of students attained the CO is calculated. i.e., 631/841 = 0.75 i.e., 75%. Similarly, the values are calculated for all other COs.

**Course Title:** Biology for Engineers  
**Course code:** BIT18R101  
**Course Type:** Theory  
**Year of examination:** 1  
**Batch:** 2020

**Threshold value:** 50

**Attainment Levels fixed for the class:**

Level	Indication	Level of Correlation
LS	Level 0 in Between	0 60
S	Level 1 Low in Between	60 70
G	Level 2 Mid in Between	70 80
E	Level 3 High in Between	80 100

**CO ATTAINMENT**

CO Nos	DIRECT	CIE	EXT	TOT	CUM	INDIRECT	TOT
1	2	2	2	2	2	2	2.1
2	2	2	1	1.5	2	2	2.3
3	1	2	1.5	2	2	2	2.9
4	1	1	1	1	2	2	2.1
5	1	1	2	3	3	2.5	2.5
<b>Average attainment:</b> 1.6						2.2	2.4

**CONSIDERATION OF CO ATTAINMENT**

CONDITION	MICRO ANALYSIS										MACRO ANALYSIS													
	Sessional		Assignment		Practical Examinations		End semester		End Practical		Internal		External		Total									
	CO1	CO2	CO3	CO4	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5	CO1	CO2	CO3	CO4	CO5
Total Strength	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841	841
Absent	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Attained	428	380	233	307	830	821	830	828	823	0	0	0	0	667	603	562	581	823	652	583	662	573	555	631
% attained	0.51	0.45	0.28	0.37	0.99	0.98	0.99	0.98	0.98	0.00	0.00	0.00	0.00	0.79	0.72	0.67	0.69	0.98	0.78	0.69	0.79	0.68	0.66	0.75
Level of the class	0	0	0	0	3	3	3	3	3	0	0	0	0	2	2	1	2	1	1	1	2	1	2	2

Fig. 8. Snapshot of percentage of students attained the COs shown in the attainment sheet

**STEP 9. Calculation of level of CO assessment:**

To calculate the level of CO attainment, the cumulative internal assessment based on sessional examinations, internal practical and assignments has been made as per the strategy provided below:

- If > 80% = Level 3 = High
- If > 70% but < 80% = Level 2 = Medium
- If > 60% but < 70% = Level 1 = Low
- If < 60% = Level 0 = Not attained

For example, BIT18R101-Biology for Engineer is chosen. In total cumulative marks, 75% of students attained the CO. By using the above levels, the level of attainment is “2”. Similarly, the values are calculated for all other COs.

**Course Title:** Biology for Engineers  
**Course code:** BIT18R101  
**Course Type:** Theory  
**Year of examination:** 1  
**Batch:** 2020

**CO Attainment Summary:**

CO No.	Direct Att.	Indirect Att.	Average Attainment
CO1	2.2	2.1	2.15
CO2	2.2	2.1	2.15
CO3	2.2	2.1	2.15
CO4	2.2	2.1	2.15
CO5	3.0	2.1	2.55
<b>Average attainment</b>	<b>2.2</b>	<b>2.1</b>	<b>2.15</b>

Fig. 9. Snapshot of level of program for the COs shown in the attainment sheet

**STEP 10. Calculation of Direct CO attainment by considering average attainment of all COs:**

The direct CO attainment is calculated using the following formula.

$$\frac{((\text{Level of } CO1) + (\text{Level of } CO2) + (\text{Level of } CO3) + (\text{Level of } CO4) + (\text{Level of } CO5))}{5}$$

BIT18R101-Biology for Engineer is chosen, the average is calculated (from the below table) as follows,

$$((2 + 2 + 2 + 2 + 3))/5 = 2.2$$

**Direct CO Attainment Data:**

CO No.	Direct Att.
CO1	2.2
CO2	2.2
CO3	2.2
CO4	2.2
CO5	3.0

Fig. 10. Snapshot of direct CO attainment of the course shown in the attainment sheet

## 8.5. Attainment of Program Outcomes from first year courses (20)

### 8.5.1. Indicate results of evaluation of each relevant PO and/or PSO if applicable (10)

The Program Outcome attainment of a particular batch is based on the academic regulation's evaluation strategies, and the types of courses provided. The Program Outcome attainment can be calculated by both direct and indirect methods. Direct method represents that the attainment is calculated based on the academic marks. On the other hand, the indirect method represents that the attainment is calculated based on the feedbacks from the students. Table 8.7 describes the list of assessment tools, its measuring frequency and person responsible for the assessment and evaluation process.

**Table 8.7 Assessment tools for POs attainment**

Assessment Tools	Frequency (Per course)	Responsible Person
<b>Direct Assessment</b>		
Sessional	Twice in a semester	Course Coordinator
Assignment	Five in a semester	Course Teacher
End Semester	Once in a semester	Course Coordinator
Laboratory / Practical Examination (Model & End Semester)	Once in a Semester	Course Coordinator
<b>Indirect Assessment</b>		
Course Exit survey	Every Semester	Program Coordinator



**A. Illustration of Program Outcome attainment procedure:**

The procedure used to calculate PO attainment is explained below.

**STEP 1. Calculation of Program articulation matrix:**

The Program articulation matrix for the basic courses in the first-year curriculum is calculated and the same is provided in Table 8.8

**Table 8.8. Program Articulation matrix for the first-year courses (2020-2021 admitted batch)**

S. No	Course code	Course name	Program outcome											
			1	2	3	4	5	6	7	8	9	10	11	12
1	BIT18R101	Biology for Engineers	3	2		3		3						1
2	ECE18R171	Electronic devices	3	3	2	1	3	3	3		2			2
3	CHY18R171	Chemistry	2	2			1				1			1
4	CSE18R171	Programming for Problem Solving	3	3	3	3	3	2	2				2	2
5	CSE18R153	Programming in C	3	3	3	3	3	2	2				2	2
6	CSE18R108	IT Infrastructure Landscape Overview	3	3	3	3	3	2	2				2	1
7	CSE18R174	Computer Architecture and Organization	3	3	3	3	3	2			2		2	1
8	CSE18R254	Introduction to Python Programming	3	3	3	3	3	2					2	1
9	EEE18R171	Basic Electrical and Electronics Engineering	3	2		3		3						
10	EEE18R172	Basic Electrical Engineering	3	2		3		3			1			1
11	HSS18R151	English for Technical Communication						1		2	1	3		2

S. No	Course code	Course name	Program outcome											
			1	2	3	4	5	6	7	8	9	10	11	12
12	MAT18R101	Calculus and Linear Algebra	3	3		3		3			1			1
13	MAT18R102	Multiple Integration, Ordinary Differential Equations and Complex Variable	3	2		3		3						
14	MAT18R103	Multiple Integration, Ordinary Differential Equations and Vector Spaces	3	3		3	2		1					
15	MAT18R104	Multiple Integration, Ordinary Differential Equations, probability and statistics	3	3		3	2		1					
16	MEC18R151	Engineering Graphics and Design	2	2	2		3		3					2
17	MEC18R152	Engineering Practice	2	1	1			2	2		2			1
18	PHY18R171	Introduction to Electromagnetic Theory	3	2		3		3						
19	PHY18R172	Introduction to Mechanics	3	2		3		3						
20	PHY18R173	Oscillations, Waves and Optics	3	2		3		3						
21	PHY18R174	Semiconductor Physics	3	2		3		3						
22	PHY18R175	Optics, Electromagnetism and Quantum Mechanics	3	2		3		3						
23	PHY18R176	Physics for Biotechnology	3	2		3		3						

As a model, MAT18R101 - Calculus and Differential Equation has been chosen and the Course articulation matrix is presented below. The Program Articulation matrix is calculated by taking the average of correlation of all correlated COs.

Correlation		PO											
		1	2	3	4	5	6	7	8	9	10	11	12
CO Nos	1	3	3		2		3			1			
	2	3	3		3		2			1			
	3	3	3		3		2			1			1
	4	3	3		3		3			1			1
	5	3	2		2		3			1			1
Arr. Mat.		3	2.8		2.6		2.6			1			1
(Arr. Mat.)		3	3		3		3			1			1

Consider, PO1, the Program Articulation matrix is calculated as follows

$$\text{Program Articulation} = \frac{3+3+3+3+3}{5} = 3$$

Similarly, the Program Articulation Matrix is calculated for all the first-year courses.

## STEP 2. Calculation of Program Outcome attainment

The PO attainment, based on the basic courses offered to first year students, is calculated based on the level of correlation between the course and program Outcomes.

The Program Outcome attainment for all the courses are shown in the table 8.9.

Program Outcome attainment is calculated using the below mentioned formula

### PO attainment

$$= \frac{\sum_{i=1}^5 (\text{Correlation between the course outcome}_i \text{ and PO} \times \text{CO attainment}_i)}{\text{Sum of Correlation}}$$

Where, i = Number of Course outcomes of a particular course

**Table 8.9. PO attainment of first year courses (2020-2021 admitted batch)**

S. No	Course code	Course name	PO											
			1	2	3	4	5	6	7	8	9	10	11	12
1	BIT18R101	Biology for Engineers	2.21	2.20		2.15		2.23						2.33
2	ECE18R171	Electronic devices	2.67	2.33	2.83	2.75	3.00	3.00	3.00		3.00			3.00
3	CHY18R171	Chemistry	1.18	1.18			1.25				1.20			1.00
4	CSE18R171	Programming for Problem Solving	1.20	1.67	3.00	1.25	1.25	3.00	3.00				2.50	3.00
5	CSE18R153	Programming in C	2.80	3.00	3.00	2.75	2.75	3.00	3.00				3.00	3.00
6	CSE18R108	IT Infrastructure Landscape Overview	2.20	2.00	2.09	2.08	2.08	2.00	2.33				2.33	2.29
7	CSE18R174	Computer Architecture and Organization	2.60	2.75	2.73	2.69	2.69	2.63			2.63		2.67	2.57
8	CSE18R254	Introduction to Python Programming	1.60	1.75	1.73	1.69	1.69	1.63					1.67	1.57
9	EEE18R171	Basic Electrical and Electronics Engineering	2.21	2.20		2.15		2.23						
10	EEE18R172	Basic Electrical Engineering	1.40	1.50		1.31		1.38			1.40			1.00
11	HSS18R151	English for Technical Communication						2.86		2.78	2.80	2.80		2.88
12	MAT18R101	Calculus and Linear Algebra	1.80	1.71		1.69		1.85			1.80			1.67
13	MAT18R102	Multiple Integration, Ordinary Differential Equations and Complex Variable	1.57	1.60		1.46		1.69						

S. No	Course code	Course name	PO											
			1	2	3	4	5	6	7	8	9	10	11	12
14	MAT18R103	Multiple Integration, Ordinary Differential Equations and Vector Spaces	1.60	1.57		1.36	1.50		1.50					
15	MAT18R104	Multiple Integration, Ordinary Differential Equations, probability and statistics	2.60	2.57		2.45	2.50		2.50					
16	MEC18R151	Engineering Graphics and Design	1.80	1.38	1.90		1.90		1.90					1.89
17	MEC18R152	Engineering Practice	2.00	1.67	1.83			1.89	1.60		2.00			1.86
18	PHY18R171	Introduction to Electromagnetic Theory	2.64	2.60		2.62		2.62						
19	PHY18R172	Introduction to Mechanics	1.21	1.20		1.15		1.23						
20	PHY18R173	Oscillations, Waves and Optics	1.86	1.80		1.77		1.85						
21	PHY18R174	Semiconductor Physics	1.79	1.80		1.69		1.85						
22	PHY18R175	Optics, Electromagnetism and Quantum Mechanics	1.57	1.60		1.46		1.69						
23	PHY18R176	Physics for Biotechnology	1.60	1.60		1.57		1.60						
	Direct PO attainment		1.91	1.89	2.39	1.90	2.06	2.12	2.35	2.78	2.12	2.80	2.43	2.16

Akin to the same, the calculation of PO attainment of all courses of the first year has been executed.

Consider PO1 in the table 8.9, overall PO attainment is calculated by the sum of all the PO attainment values divided by number of courses correlated to PO1.

Similar calculation has been made for rest of the POs

### 8.5.2. Actions taken based on the results of evaluation of relevant POs (10)

The direct attainment levels (student performance) and their targets are presented in the following table.

POs	Target Level	Attainment Level	Observations
<b>PO1: Engineering Knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.			
<b>PO1</b>	<b>2.1</b>	<b>1.91</b>	The PO1 is not attained, the following courses need improvement
			CHY18R171 1. The students felt Unit-1 and Unit-5 were tough for them as they both deal with higher level concepts. 2. Since the classes were online, the understanding of the students was poor.
			MAT18R102 1. Students were unable to understand the basic concepts of the mathematics. 2. Students were found difficulty in learning through the online teaching, most of the students used mobile phones instead of laptops.
			PHY18R172 1. Students were unable to understand the basic concepts. 2. Students lack writing practice.
			BIT18R101: Commonly the usage of the virtual tools for the study was newer for the students.

			<p>1. The concept of the infection and immunity were not understood by the students because the students are mostly from the computer science background.</p> <p>2. Students were unable to present themselves in the examinations since it was quiz-based examination.</p>
Action 1: Conducted bridge courses for the chosen students to provide a basic knowledge on the given subjects.			
Action 2: Coaching classes for the slow learners were conducted in order to make them understand the concepts. Also, recorded sessions and the handouts were shared among the students to accelerate the learning.			
Action 3: More writing practice were given on important topics. The assignments related to description were also given.			
Action 4: Coaching classes were conducted for the slow learners. The students were advised to take special attention on Assignments.			
<b>PO2: Problem analysis:</b> Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.			
<b>PO2</b>	<b>2.1</b>	<b>1.89</b>	The PO2 is not attained, the following courses require improvement.
			<p>CHY18R171</p> <p>1. The students felt the concepts were tough for them as they deal with higher level of chemistry.</p> <p>2. Identification of the practical experiments were troubling because of lack of resources among the students.</p>
			<p>CSE18R171</p> <p>1. The students felt tough to deal with programming fundamentals.</p>
			<p>MAT18R102</p> <p>1. The students were unable to understand the applications of</p>

			<p>the common mathematical concepts. So answering the real time based questions are difficult.</p>
			<p>MEC18R151</p> <p>1. Students were unable to understand the concepts and the applications of the projections.</p>
			<p>PHY18R172</p> <p>1. Students were unable to understand the real applications of the physics.</p>
<p>Action 1: Conducted special classes to improve the understanding which made the students to grasp the concept. A newer platform for practicals using the mobile resources (android option) were identified and implemented for the benefit of the students.</p>			
<p>Action 2: Conducted special classes to improve the understanding which made the students to write the algorithm.</p>			
<p>Action 3: Conducted tutorial classes for the students to enrich their knowledge towards understanding the concept of the problem.</p>			
<p>Action 4: Conducted additional classes for the students to enrich their knowledge towards understanding the concept of the problem. More visual based materials with animations were given to improve the learning level of the students.</p>			
<p>Action 5: Conducted bridge courses for the students to enhance their knowledge towards understanding the application of the physics.</p>			
<p><b>PO3: Design/development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.</p>			
<b>PO3</b>	<b>2.1</b>	<b>2.39</b>	<p>The PO3 is attained but the following courses got scope for improvement</p>
			<p>CSE18R254</p> <p>1. Students' knowledge towards fundamentals of computers was lagging. Obviously, it was difficult for them to grasp the</p>



			<p>knowledge of programming for those students. Writing newer algorithm for the real time issue was quite difficult.</p>
			<p>MEC18R151</p> <p>1. The projected concept was found to be tough for the students especially they were undergone the quiz-based examination.</p>
<p>Action 1: Conducted special classes to improve the understanding in connection with grasping the concept. A newer platform for practicals using the mobile resources (android) were identified and implemented for the benefit of the students. Web resources and online platform were shared to the students to learn.</p>			
<p>Action 2: Conducted animated classes to improve the understanding. Web resources and online platform-based quiz examinations were conducted for the welfare of the students.</p>			
<p><b>PO4: Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.</p>			
<b>PO4</b>	<b>2.1</b>	<b>1.9</b>	<p>The PO4 is not attained, the following courses need improvement.</p>
			<p>CSE18R171</p> <p>1. Students found difficult to grasp the real time applications of programming. Writing newer algorithm for the real time issue was quite difficult.</p>
			<p>EEE18R172</p> <p>1. Difficult to solve problems in Mesh and Nodal Analysis. 2. Difficult to understand the construction and principle of operation of electrical machines.</p>
			<p>PHY18R172</p> <p>1. Students were unable to understand the real applications of the physics.</p>
<p>Action 1: Conducted classes by using the real time problems. Moreover, the assignments were also given to understand smaller level real time issues.</p>			

Action 2: Students were given more tutorial exercises on problems and also provided with more simple Animations and Flipped videos.			
Action 3: Conducted bridge courses for the students to enhance their knowledge towards understanding the application of the physics.			
<b>PO5: Modern Tool Usage:</b> Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.			
<b>PO5</b>	<b>2.1</b>	<b>2.06</b>	The PO5 is not attained, the following courses need improvement
			<b>CHY18R171</b> 1.Students were unable to present themselves in the examinations since they were quiz-based examinations. 2. Students were unable to concentrate more on the classes as they were exclusively online.
			<b>CSE18R171</b> 1.Students were unable to present themselves in the examinations since they were quiz-based ones. 2. Students were mostly relying on the mobiles for compiling the program during the laboratory classes seem difficult for the C programming.
			<b>MAT18R103</b> 1.Students were unable to present themselves in the examinations as they were quiz-based ones. 2. Students were mostly relying on the mobiles (android) for compiling the program for the laboratory classes seem difficult for MATLAB. 3. Usage of scientific calculators was difficult for the students.
Action 1: Provided practice classes for the needy students and started more demo to demonstrate procedure to improve the level of concentration of the students.			

Action 2: Provided practice classes for the needy students and compiling the codes using the online tools in the class helped the students. Secondly, students were trained in the online compiler available on the android-based mobiles.			
Action 3: Provided practice classes for the needy students and secondly, students were trained in the online compiler available on the android-based mobiles for MAT Lab applications.			
<b>PO6: Engineer and Society:</b> Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice.			
<b>PO6</b>	<b>2.1</b>	<b>2.12</b>	The PO6 is attained but the following courses got scope for improvement
			<p>EEE18R172</p> <p>1. Students found difficult to grasp the real time applications of electrical machineries in the society.</p>
			<p>PHY18R172</p> <p>1. Students were unable to understand the societal impact of the physics.</p>
			<p>BIT18R101</p> <p>1. Students were unable to draw the scientific diagrams which influence the real societal issues. Since the classes were conducted through online, the understanding of the students was poor.</p>
Action 1: Provided societal based problems in the assignments to improve the concentration towards the learning.			
Action 2: A case study related to usage of physics in solving the real time issue in the regular class was provided which motivated the students to critically think about the application.			
Action 3: Students were motivated to take literature study on basics of infection and immunity.			

<b>PO7: Environment and Sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of need for sustainable development.			
<b>PO7</b>	<b>2.1</b>	<b>2.35</b>	The PO7 is attained but the following courses got scope for improvement
			MAT18R103 1. Students experienced difficult to understand the impact of mathematics in the societal issues.
			MEC18R152 1. Students found difficulty in understanding the concepts and importance of sustainability.
Action 1: Provided societal based problems in the assignments to improve the concentration towards the learning.			
Action 2: Provided sustainable based product and program developments in the assignments to improve the concentration towards the learning.			
<b>PO8: Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.			
<b>PO8</b>	<b>2.1</b>	<b>2.78</b>	The PO8 is attained but the following courses got scope for improvement
			HSS18R151 1. Students experienced difficulty in committing the ethical guidelines in the practical classes. Since it is based on both individual and group activity, some of them were not involved much in the classes.
Action 1: Provided classrooms by virtual mode by having the discussion rooms in the G-meet, Zoom helped the students in discussion of practical experiments. Specific rubrics to clearly analyse the individual contribution towards the work completion motivated the students to learn ethical behaviour in practice.			

<b>PO9: Individual and Teamwork:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.			
<b>PO9</b>	<b>2.1</b>	<b>2.12</b>	The PO9 is attained but the following courses got scope for improvement
			<b>CHY18R171</b> 1. Since it was online based, the practical classes and project-based experiments were both individual and group activity. A few were not involved much in the classes. 2. Insufficient resources were notified by the students.
			<b>EEE18R172</b> 1. Involving all the students in the online mode was difficult.
Action 1: Provided classrooms by virtual mode by having the discussion rooms in the G-meet, Zoom helped the students in discussion of practical experiments. Specific rubrics to clearly analyse the individual contribution towards the work completion. Conducted periodic reviews for addressing the difficulty in the timely manner.			
Action 2: Provided classrooms by virtual laboratory to train the students during free hours. Provided periodic reviews for addressing the difficulty in the timely manner.			
<b>PO10: Communication:</b> Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.			
<b>PO10</b>	<b>2.1</b>	<b>2.8</b>	The PO10 is attained but the following courses got scope for improvement
			<b>HSS18R151</b> 1. The students faced problems in Word Formation since they lack basic knowledge about the origin of words. Some of the students lack resources for the learning.
Action 1: Provided online seminars to improve the level of communications. Third party quiz and Word Formation tools were utilized to know about the root of any words.			

<b>PO11: Project Management and Finance:</b> Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.			
<b>PO11</b>	<b>2.1</b>	<b>2.43</b>	The PO11 is attained but the following course got scope for improvement
			<p>CSE18R254</p> <ol style="list-style-type: none"> <li>1. Some of the students lack resources for the learning.</li> <li>2. Students lack industrial knowledge towards the application of the python.</li> <li>3. Some students were not concentrating much because some of the assignments were group tasks.</li> </ol>
Action 1: Easy tools using the mobile phones were shared among the students for learning. Some classes were conducted by the industrial expert and the same person evaluated based on the problems / project completed. Provided periodic reviews to understand the involvement of all the students.			
<b>PO12: Life-long learning:</b> Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.			
<b>PO12</b>	<b>2.1</b>	<b>2.16</b>	The PO12 is attained but the following course got scope for improvement
			<p>CHY18R171</p> <ol style="list-style-type: none"> <li>1. Students lack motivation in understanding their responsibilities towards learning the newer concepts.</li> </ol>
Action 1: Provided the advantage of the continuous learning and provided a program development in the assignments to motivate the learning.			

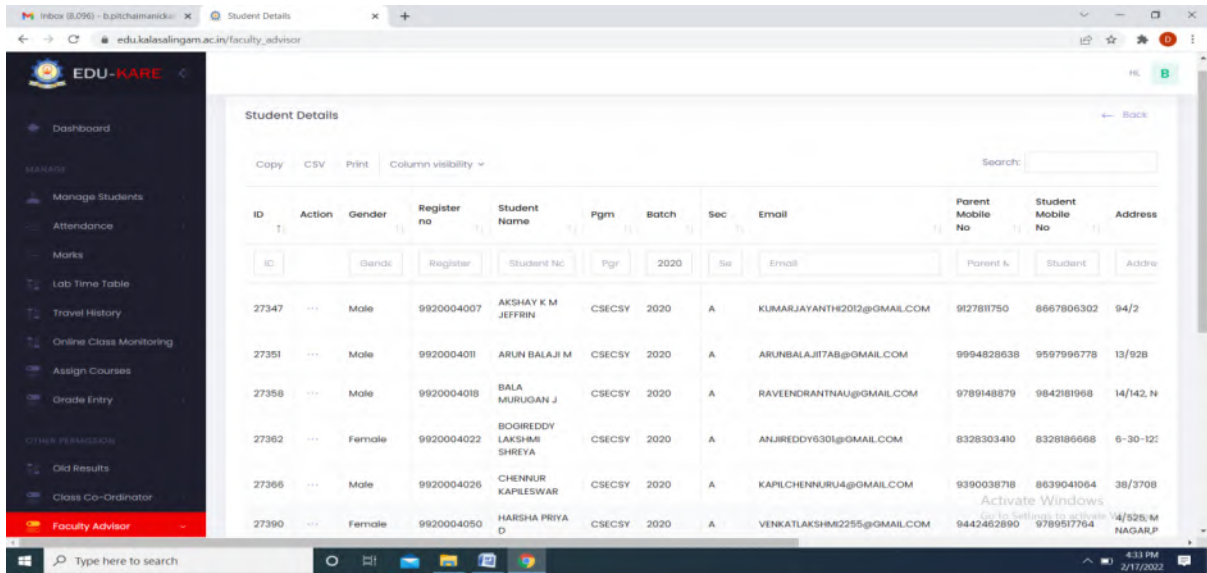
<b>CRITERIA 9</b>	
<b>STUDENT SUPPORT SYSTEMS</b>	<b>50</b>

### 9.1 Mentoring system to help at individual level (5)

KARE offers a well-established student support and mentoring system. The student support system is monitored by the office of Director Students’ Affairs. Based on the strength of the class the Mentors are allocated to the students and they will function as per the guidelines given in the B.Tech Regulation.

#### Faculty Advisory System (FAS)

FAS assist in academic, personal and career advancement through the centralized monitoring process. For every 20 students one Mentor is allocated. A software EDU\_KARE exclusively designed for the FAS has been established provides the academic information (CGPA, Non-CGPA, attendance, etc.,) of the students with regular updates. The academic and personal information of the students are available in the EDU\_KARE for tracking the students. Sample screen-shot of EDU\_KARE software showing the academic information of wards under the tab Faculty Advisor’ is given in Fig. 9.1.1.

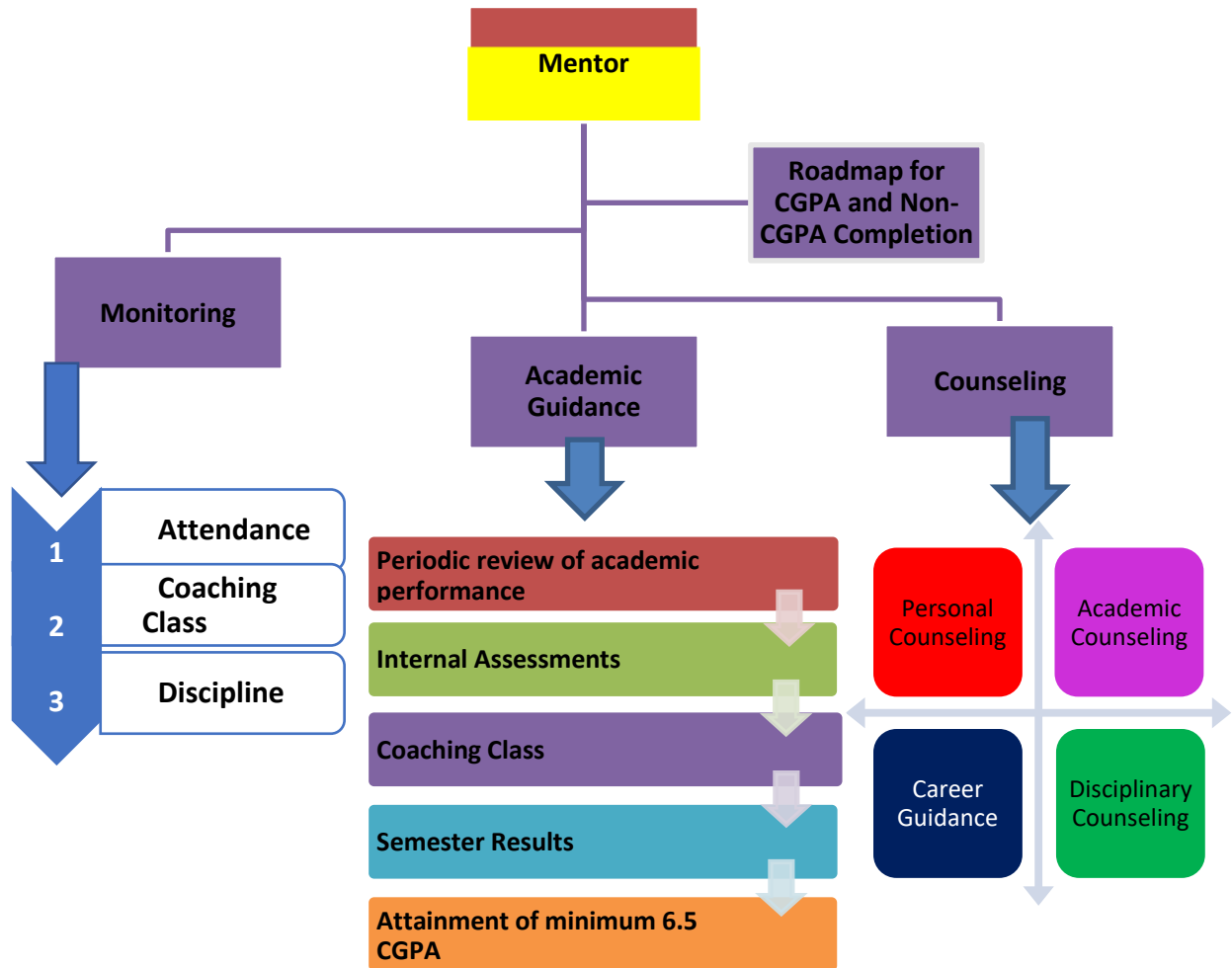


**Fig. 9.1.1 Sample Screenshot of the academic information of wards under FAS in EDU-KARE software**

### Summary of mentoring system

- Frequency of meeting:
  - **Attendance Monitoring:** Daily
  - **Class feedback:** Weekly once
  - **Academic discussion, result analysis and diary updating:** 3 Per Semester
  - **Any other guidance:** Any time based on student's requirement
- Faculty Mentors continuously monitor their wards to identify the slow-learners and advanced learners.
- Slow-learners are given special coaching to improve their academic performance and advised in selecting the courses, based on performance / ability.
- Fast learners are advised to register for additional courses and to undergo special training and certifications.
- The Faculty Mentor maintains a regular contact with parents/guardians of the wards and updates them about the wards' performance.
- External and internal professional counselors are available in special cases wherever a student needs special assistance (Counseling, Meditation, etc.). The various responsibility of the Faculty Advisory System is explained in Fig. 9.1.2.





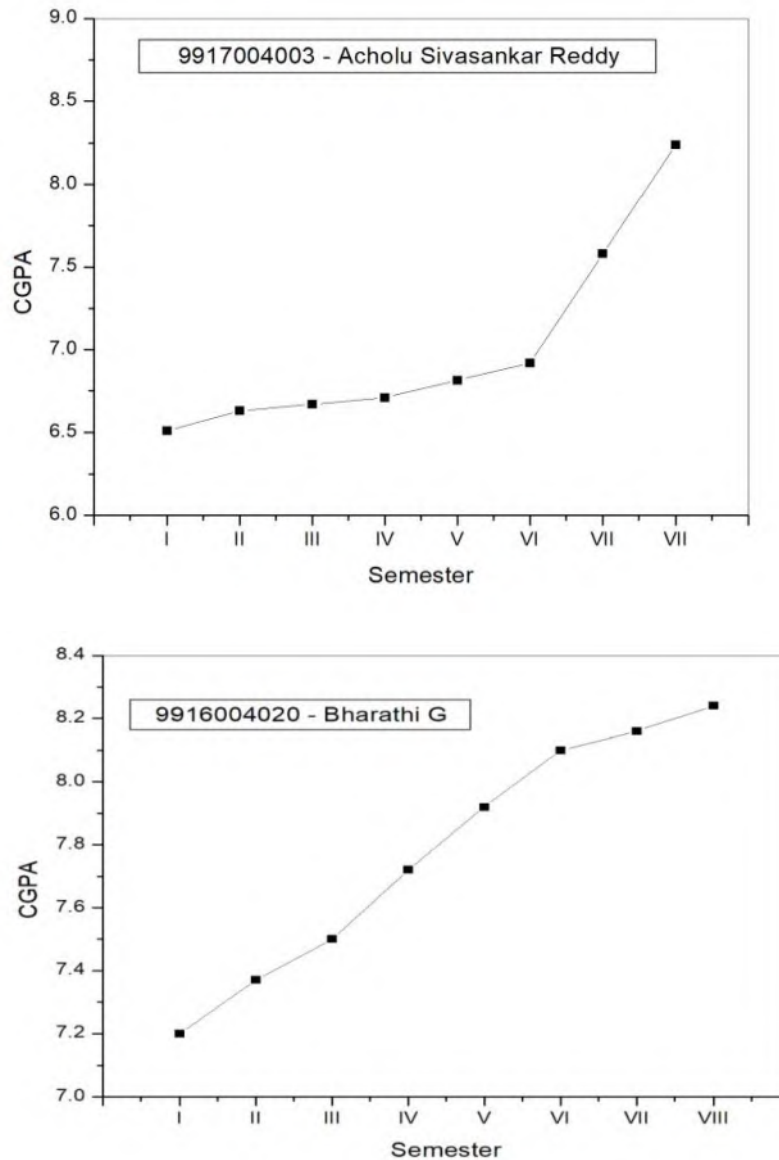
**Fig. 9.1.2 Responsibility chart for the FAS**

**Support offered to slow-learners**

1. Constant monitoring and interaction by mentors help to encourage, and arrange special classes by the faculty members and the peers.
2. Mentors are available and accessible to the students to interact one-on-one.
3. Faculty members repeat teaching the tough topics as per the students’ request and provide university question bank, discuss the ways of presenting the answers in the examinations.
4. The summer-term provides facility to undergo the failed courses during the summer.
5. ICT enabled tools and aids, such as animation videos, descriptions using models etc., to visualize the concepts, are provided.
6. Co-teaching/Team Teaching Concept: Course teacher along with additional subject experts works together in theory and laboratory sessions and provides one-to-one teaching or re-teaching so as to satisfy the special needs of slow-learners.
7. Bridge courses are also conducted for courses based on the requirement.

### Samples of slow-learner improvement

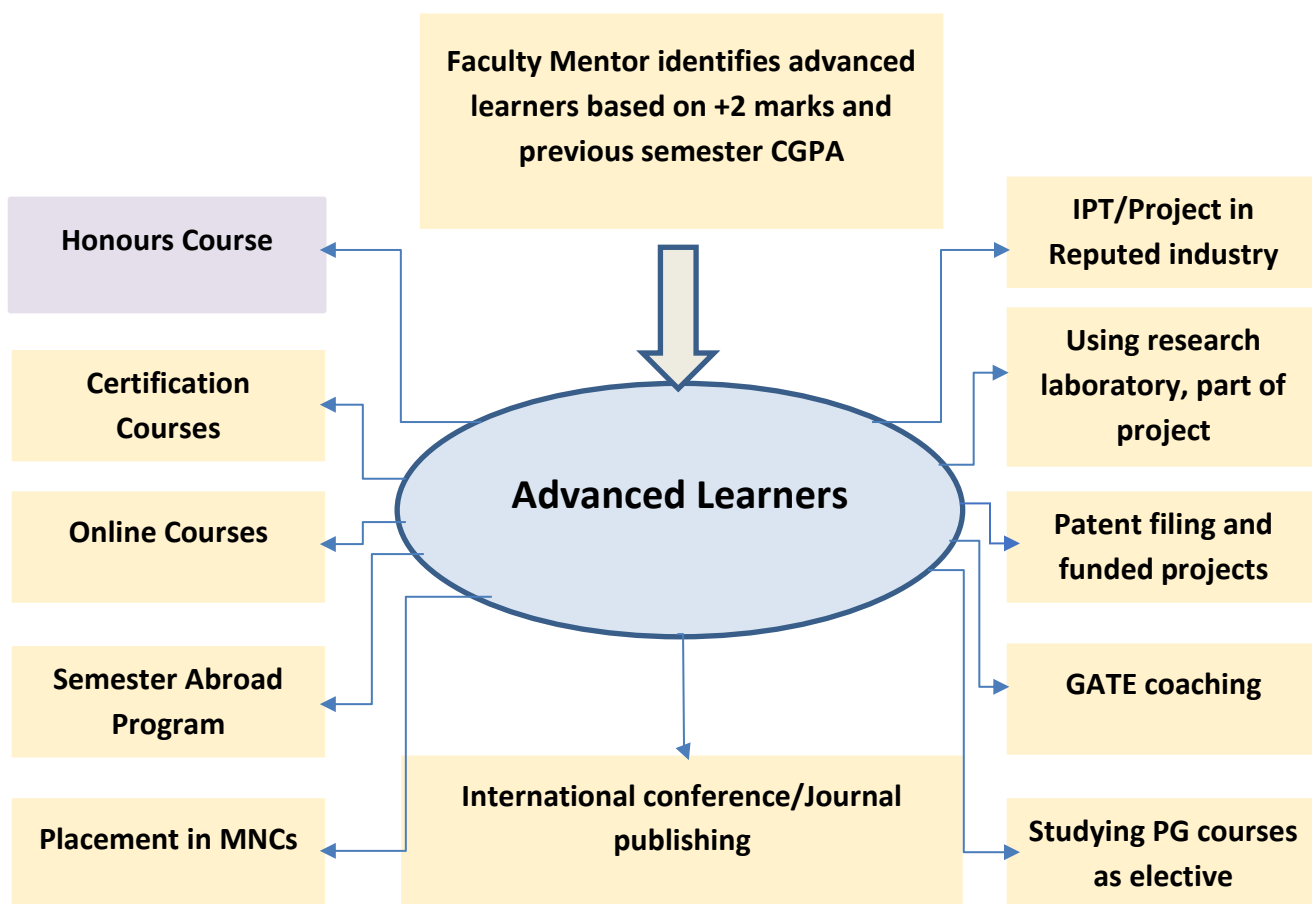
Sample of improvement in slow-learner performance by mentor is shown in Fig 9.1.3.



**Fig. 9.1.3 Sample proof for student’s improvement in CGPA through FAS**

### Support for Advanced Learners:

The FAS also helps the advanced learners to upgrade their knowledge and skills to reach the next level of their career growth. The Methodologies followed by the FAS for fast learners is explained in Fig. 9.1.4.



**Fig.9.1.4 Methodologies followed by the FAS for advanced learners**

**Programs offered to advanced learners:**

1. Provisions for receiving Honors degree and First Class with distinction degree are available.
2. Advanced learners are encouraged to study MOOC courses in NPTEL, SWAYAM, etc. with credits transfer provision.
3. ERP-SAP training is offered to suitable students. Students are encouraged to be members of professional bodies such as CSI, IEEE, ISTE, IETE, BSOI, and organize technical events.
4. Students participate in events such as hackathons, group discussions, and quizzes.
5. KARE offers training and guidance for appearing in competitive examinations such as GATE, GRE, TOEFL, IELTS, CAT and Banking Examinations.
6. Rank holders and the best project teams are provided with certificates and cash prizes.
7. Students are financially supported to participate in seminars etc, and to file patents.

8. Students are encouraged to participate in IUCEE students' events and network with other peer students.
9. Options such as associating in sponsored projects, taking internships in reputed industries, institutions in India and abroad, utilizing the Semester Abroad Scheme, and participating in Coders' Club, Researchers Club are well-utilized by students.
10. One-credit courses offered by the industrial experts enable the students to keep abreast of the needs of the industry.

## **9.2. Feedback analysis and reward /corrective measures taken, if any (10)**

**a. Feedback collected for all courses (Yes/No):** Yes

**b. Specify the feedback collection process**

The feedback collection process takes place twice in a semester.

- (i). After Sessional Exam I
- (ii). After Sessional Exam II

- A standard feedback questionnaire as given in Annexure 9.1 and 9.2 is prepared by the IQAC for all the students for every semester, and course wise. Feedback mechanism is systematically organized in the University and it is taken periodically in each semester to improve the teaching skills of the faculty members. The feedback is collected online.
- At the beginning of the feedback collection process, it is defined and communicated to the student about the purpose of the assessment. The students normally understand the purpose and outcome of the process and accordingly give their feedback.
- **Percentage of students participating:** 95 - 100%.

### **Feedback analysis process**

The feedback analysis process takes place in the following steps:

- All the parameters mentioned in the feedback form are analyzed.
- Ability of teaching with respect to each item and comprehensive ability of the teachers is analyzed.
- All the comments provided by the students in the feedback forms are communicated to the respective faculty members along with their feedback levels (score) to know their strengths and weaknesses and to enhance their teaching skills.
- The feedback is obtained online, and a descriptive summary of the feedback is submitted to the Head of Department for each faculty.

- The outcome of the evaluation process is reported back to the staff concerned and actions are taken based on that feedback.
- **Feedback through Impartus Lecture Capture System:** KARE has Impartus Lecture Capture System in all the departments which have been used more extensively and giving a greater impetus to use and experience the power of digital platform in education. Through the Lecture Capture System faculty teaching ability and performance is evaluated and also provide a base for flipped class where the students can retrieve the lecture at any time.

**Record of corrective measures, if any**

- Feedback along with the comments given by the students in the feedback forms is communicated to the respective faculty members to know their strengths and weaknesses and to enhance their teaching skills.

**Corrective Measures:** Faculty members who get average feedback below 0.8 on a 1.0 scale are identified.

- The score obtained through student feedback on different attributes helps faculty to plan improvement strategies. The faculty members who get a low feedback score are asked to prepare an action plan to improve their teaching skills.
- As part of the action plan, senior faculty members in the department mentor the junior faculty.
- Needy faculty members are deputed to attend workshops and Faculty Development Programs to improve their teaching skills.
- Center for Learning Technology (CLT) plans and organizes such programs based on the feedback analysis for individual faculty. Fig.9.2.1 shows the participants attended Faculty Development Program on ‘Introduction to Data Analytics’ on 20.11.2019.



**Fig.9.2.1. Group Photo – Trainer and Participants attended Faculty Development Program on ‘Introduction to Data Analytics’ on 20.11.2019.**

### Reward to Faculties on Best Performance

Faculty who gets the best feedback are appreciated and rewarded by the best teacher award. The best teacher awards, the best researcher awards and the best department awards are given through the office of IQAC as shown in Fig 9.2.2.



**Fig.9.2.2. Dr. R. Ramalakshmi Receiving the Best Teacher award 2019**

- The IQAC Day function is celebrated every year on Engineers Day. In the IQAC day function, faculty members will be awarded for best teacher, best faculty advisor, best project, best lab with mini project and research competence as shown in Fig 9.2.3 (a-c).



**Fig.9.2.3. (a) Dr. S.Dhanasekaran Receiving the award for Best Mentor for Project**



**Fig.9.2.3. (b)Ms. M. Sushmitha Receiving the award for Best Mentor Mini project**



**Fig.9.2.3.(c) Ms. Bala Hari Priya Receiving the award for Lab with Mini Project**

### 9.3. Feedback on facilities (5)

The feedback on academic infrastructure, hostel and other facilities are obtained through the questionnaire as shown in the Annexure 9.3 and the corrective actions are initiated.

**Infrastructure** - Classrooms/Laboratories/ Internet facilities - In Class Committee Meetings held thrice a semester, the students provide feedback on any issues related to classrooms, lab equipment which are communicated to the authorities concerned and are rectified.

**Hostel**- Hostel committee meetings are held at the hostel every month where hostel inmates raise problems, if any, related to hostels. Also, the Wardens, the Deputy Wardens and the teaching staff visit hostels daily and provide feedback on the food and other maintenance-related issues, if any. They are brought to the notice of the wardens and the maintenance department and are rectified immediately. Anti-ragging squads consisting of teaching staff visit all hostels every evening and interact with students to acquaint themselves with any issue. If any complaints are received, they are immediately addressed.

**Others**- When issues related to food courts, bank facilities, medical facilities etc. arise they are reported to the faculty or the respective Dean, and the issues are resolved immediately.

#### Analysis and Corrective Actions taken

The feedback collected online is compiled and statistically analyzed by a central committee of the University. The feedback analysis is deliberated in the IQAC meeting and the corrective measures are decided accordingly. The positive and the negative aspects of the feedback are communicated to the respective Heads of Departments/Facilities for effective implementation of easy and comfortable use of facilities. KARE created and upgraded the facilities wherever required and is also in the process of building better facilities on the basis of students' feedback. The consolidated No. of grievances appealed and No. of grievances redressed are as shown the Table 9.3.1. Table 9.3.2 gives the exact requirements from the students collected through the feedback and corrective action taken.

**Table 9.3.1 Consolidated grievances appealed and grievances redressed**

Year	No. of grievances appealed		No. of grievances redressed	Average time for grievance redressal in number of days
	Individual	Total		
2021-22	3	13	3	7
2020-21	3		3	7
2019-20	2		2	7
2018-19	5		5	7



**Table 9.3.2 Corrective action taken.**

<b>Year</b>	<b>No of cases received</b>	<b>No of cases redressed</b>	<b>Name of the cases received from Students</b>	<b>Name of the case redressed</b>
2021-22	3	1	Requested to conduct the vaccination Camp within the campus for 2 <sup>nd</sup> Dose	Vaccination Camp conducted within the campus in two times.
		2	Requested to conduct the cultural fest program in our university.	One Cultural fest was conducted in our campus.
		3	Need Online Learning study materials.	KALVI LMS portal was created for online learning management system.
2020-21	3	3	Requested to conduct the vaccination Camp within the campus	Vaccination Camp conducted within the campus in two times.
			Requested to conduct the Mack test for online examination.	Mack test for online examination was conducted in three times.
			Requested to conduct the online fest program in our university.	Based on the request, conducted cultural fest for inter and intra college fest through online mode.
2019-20	2	2	Requested to open the Xerox shop in working hours	Permitted to open the Xerox shop from 9.00 am to 7.30 pm
			Requested to conduct the fest program in our university.	Based on the request, conducted cultural fest for inter and intra college fest
2018-19	5	5	Need to improve the food quality	Implemented SODEXO
			Need for laundry facilities for hostel inmates	Implemented Sunshine
			Requested to no limit to be fixed for washing and ironing the clothes.	Based on the request, for hostel inmates there is no limit for washing and ironing the clothes and for others payment basis with minimum rate.
			Requested to provide the North Indian Menu	Based on the request, implemented South Indian, North Indian and Andhra Menu for preparing the students
		Requested to arrange the internship/ industrial training program for all the students.	Implemented and mandatory for all the students, and included in the curriculum.	

## 9.4. Self-Learning (5)

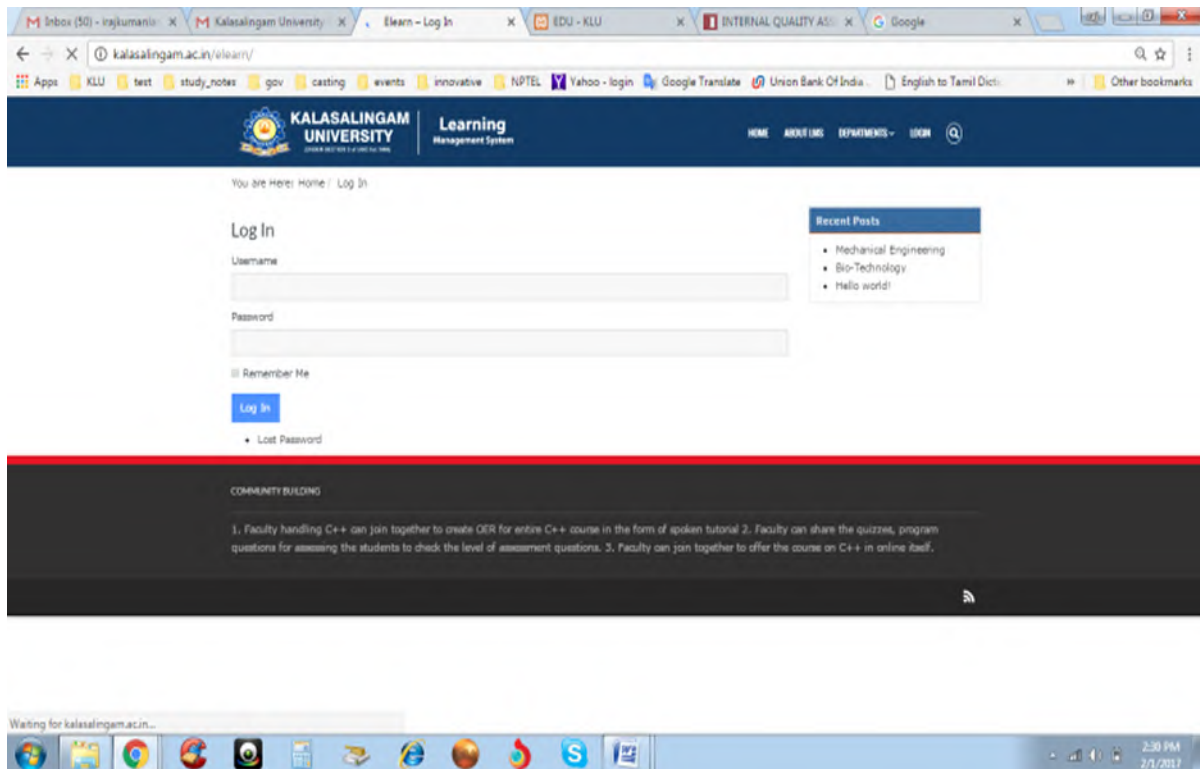
**Scope for Self-learning:** Apart from classroom interaction, provisions are available for self-learning of the students. These self-learning activities are more essential to stay motivated. These self-learning activities provide hands-on exercise while studying the theory subjects. KARE provides Wi-Fi facility throughout the campus which enables students to access the self-learning materials such as NPTEL, LMS etc. To enhance the self-learning activity seminar, workshop guest lectures are also organized. The following are the initiatives at KARE for self-learning;

- **NPTEL** provides 343 web courses and 327 video courses in engineering/science and humanities and have been available in the library for self-learning.
- **MIT Open Courseware** is a free publication of MIT course materials that reflects almost all the undergraduate and graduate subjects taught at MIT and it could be accessed in the central library
- **Coursera** is a U.S.-based massive open online course provider, offer online certification courses on variety of subjects.
- **Learning management system (LMS)**

The course materials are organized by course coordinators with the help of module coordinators and the same is uploaded to the server. Students can retrieve the course material using their username and password provided to them in the web portal <http://kalasalingam.ac.in/elearn> as shown in Fig.9.4.1.

User name: Register number;

Password: Register number

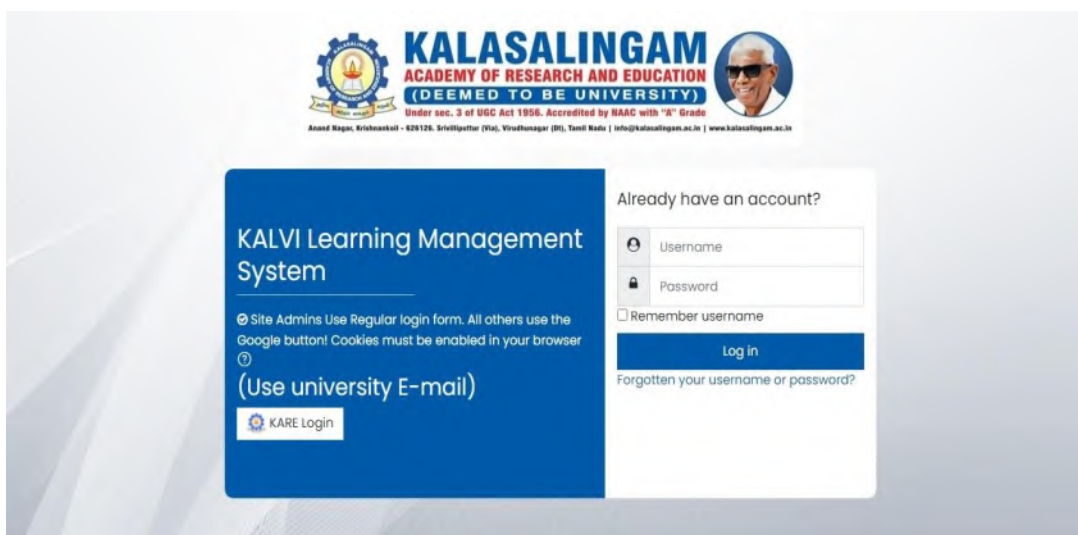


**Fig.9.4.1. Learning Management System (LMS) - student's login**

Fig 9.4.1 shows the Learning Management System (LMS) of students' login.

- **Kalvi LMS**

Kalvi LMS is utilized for managing all the materials for the course. The course teachers can upload the contents, quiz and assignments for their courses. The students can view and download the course materials for the learning purpose. The course teachers can also view their reports of quiz and assignment submission and evaluation. This system supports the development of the student career and enhances the learning skills. Fig 9.4.2 shows the Learning Management System (LMS) of students' login.



**Fig.9.4.2. KALVI-Learning Management System (LMS) - student's login**

- **Open Virtual Lab**

It provides remote access to laboratories in various disciplines of Science and Engineering. These Virtual Laboratories would cater to students at the undergraduate level, postgraduate level as well as research scholars.

- **Self-Study Elective:** During their project period, the student has to select one elective course from the major elective as self-study elective. This is a teacher-directed self-study elective in which the pattern of evaluation is similar to that of other courses.
- **Others:** X Option, Theory with Practical and Integrated Course options are available for the students to solve the real-time case studies through and hands-on exercise.
- Facility for self-learning activity at KARE is as shown in Table 9.4.2.

**Table.9.4.2. Facility for self-learning activity**

Sl No	Facility	Description
1	Digital Library	2000+ CD's and computers with journal links
2	E-learning resources	NPTEL, e-books, Intranet server
3	Central computer centre	200 computers with internet and intranet facilities
4	Wi-Fi Facility	All buildings are provided with Wi-Fi Facility
5	Department laboratories	Computers with internet and intranet facilities, Usage of Software and hardware facilities.
6	Events encouraging self-learning	Seminar, Workshop, Conferences, Guest lectures, Career guidance, Industrial tours, Associations Activity, ISTE, IETE, IEEE, IPT, Industrial Visit

## **9.5. Career Guidance, Training, Placement (10)**

### **a. Carrier guidance program for higher studies and placements**

- The institution has a very active Training and Placement Section which is part of the Office of Corporate Relations. The students are given comprehensive training in aptitude, group discussion and interview skills that help them in securing placements.
- The institution also offers career guidance and counselling programs to develop competencies in knowledge, educational and occupational exploration, and career planning.

### **b. Centre for Competitive Examinations**

- ✓ A Deputy Director is appointed for Centre for Competitive Examinations (CCE) under the Director (Student Affairs). The CCE organize various activities and motivates the students to take up competitive examinations such as GATE/GRE, GMAT etc. to pursue higher studies in the leading institutions in India and abroad.
- ✓ GATE/GRE, GMAT etc. training programs are provided to our students through CCE.

### **Pre-placement Training**

- Appropriate reforms have been made in the curriculum recently, for example, a course on “Soft Skills” carry one credit and has been incorporated into the regular curriculum and the students undergo “Soft Skills” course in semesters II, III, IV and V. ‘Soft Skills’ courses are conducted by the HR Personals out-sourced from various soft-skills training providers as given in Table 9.5.1.
- During First year, the students are trained under soft skills such as creativity, Analytical thinking, Emotional Intelligence, Interpersonal communication skills, Judgment, decision making and leadership skills
- During Second year, the students are trained under Aptitude which includes Numerical Reasoning, logical and verbal ability.
- During Third year, technical proficiency training will provide to enhance the skills on Programming languages such as C, C++, Python, Java, IOT and Artificial Intelligence based programs.
- Pre-Assessment will be conducted during third year to analyze the strength and weakness of the students.

- Based on Assessment Reports, the list of students will be segregated, and specific training programs will be planned from end of 6<sup>th</sup> semester.

**Table.9.5.1 Soft Skill & Placement Training programme**

Academic Year	Batch	Period	Training Name	No. of Students
2018-19	2015-19	19 <sup>th</sup> Nov, 2018	Soft skills by SMART Learning	186
		3 <sup>rd</sup> to 13 <sup>th</sup> Nov, 2018	Aptitude and Mock Interview Preparation by ABC Group	143
2019-20	2016-20	Jul – Nov, 2019	Soft skills by SMART Learning	112
2017-18	2014-18	21 July 2017	Training program on Placement Preparation (Mock Interview)	43
2017-18	2014-18	27/07/2017 to 06/08/2017	Training on “C and Java”	45
2017-18	2014-18	13 <sup>th</sup> to 15 <sup>th</sup> , 28 <sup>th</sup> & 29 <sup>th</sup> October 2017	Java Training Program	45
2017-18	2014-18	22 <sup>nd</sup> to 24 <sup>th</sup> Aug, 2017	Aptitude and Verbal Training	45
2017-18	2014-18	22 <sup>nd</sup> Aug – 24 <sup>th</sup> Aug, 2017	WIPRO Specific Training Programme	42
2017-18	2014-18	28 <sup>th</sup> Aug – 30 <sup>th</sup> Aug, 2017	Java Training for WIPRO eligible students	42
2017-18	2014-18	03/01/2018	Industry Ready Engineers-2020	45
2017-18	2014-18	15 <sup>th</sup> Sep, 2017	Verbal & Group Discussion for M/S.WIPRO Camps Drive	45
2017-18	2014-18	13, 14, 15, 28 & 29 Oct, 2017	JAVA Training Programme for Pre-Final Year Students	182
2017-18	2014-18	10/01/2018 and 24/01/2018	Guest Lecture on “Resume Preparation and Interview skills”	45
2017-18	2014-18	24/01/2018	Preparation of Resume and Interview Skills	45
2017-18	2014-18	24 Jan 2018 To 30 Jan 2018	WIPRO Ltd Company Specific Training	45
2017-18	2016-20	10 <sup>th</sup> April – 14 <sup>th</sup> April, 2018	Industry Specific Training for Second Year B. Tech Students	182
2018-19	2015-19	24 <sup>th</sup> -26 <sup>th</sup> July, 2018	Company Specific Training for ZOHO Corp eligible students Program by M/s. Top Freshers, Chennai	67
2018-19	2015-19	01 <sup>st</sup> Aug – 07 <sup>th</sup> Aug 2018	Company Specific Technical Training for ZOHO Corp eligible	67

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Academic Year	Batch	Period	Training Name	No. of Students
			students Program by M/s. Top Freshers, Chennai	
2018-19	2015-19	3 <sup>rd</sup> Oct, 2018	TCS Ninja Specific training program by Mr. MeyappanNatrajan/ Managing Director- Top Freshers	20
2018-19	2015-19	29 <sup>th</sup> Sep – 4 <sup>th</sup> Oct, 2018	WIPRO Specific Training Program for WIPRO eligible students by Top Freshers	112
2018-19	2015-19	13 <sup>th</sup> & 14 <sup>th</sup> Oct, 2018	Hexaware Company Specific Training Program for Hexaware eligible students by M/s Top Freshers	112
2018-19	2015-19	22 <sup>nd</sup> & 23 <sup>rd</sup> Oct, 2019	IBM Company Specific Training Program for IBM eligible students by Mission Ignite	112
2018-19	2015-19	19 <sup>th</sup> Nov, 2018	Soft Skills conducted for all the Final Year soft skills arrear students from by M/s Smart Learning Resources	186
2018-19	2015-19	19 <sup>th</sup> Nov, 2018	Training cum AMCAT test conducted based on Aptitude, C programming for all WIPRO eligible students by M/s Aspiring Minds	182
2018-19	2015-19	3 <sup>rd</sup> – 13 <sup>th</sup> Jan, 2019	Company Specific Training program by ABC Group	143
2018-19	2015-19	3 <sup>rd</sup> ,4 <sup>th</sup> ,5 <sup>th</sup> , 11 <sup>th</sup> & 12 <sup>th</sup> Jan, 2019	JAVA Training Program by Campus Connection	164
2018-19	2015-19	26 <sup>th</sup> & 27 <sup>th</sup> Jan, 2019	Cognizant Specific Training program by FACE	30
2018-19	2015-19	2 <sup>nd</sup> & 3 <sup>rd</sup> Feb, 2019	Cognizant Specific Training program by Mission Ignite	60
2018-19	2015-19	2 <sup>nd</sup> Feb, 2019	Mock online assessment by AMCAT	112
2018-19	2015-19	28 <sup>th</sup> Feb – 2 <sup>nd</sup> March, 2019	Conducted Diagnostic Test on Aptitude, Verbal, Logical ability & Programming language	112
2018-19	2015-19	July – Nov, 2019	Advanced Soft skills by M/s Smart training Resources	112
2019-20	2016-20	20 <sup>th</sup> June to 19 <sup>th</sup> July, 2019	SAP Training	823
2019-20	2016-20	2 <sup>nd</sup> Sep, 2019	Mphasis Training	124
2019-20	2016-20	5 <sup>th</sup> Sep, 2019	Svar And Writex Training	116
2019-20	2016-20	16 <sup>th</sup> Sep, 2019	Amcat Assessment	182
2019-20	2016-20	18 <sup>th</sup> Sep, 2019	Refreshing Training for Mphasis	143

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Academic Year	Batch	Period	Training Name	No. of Students
2019-20	2016-20	24 <sup>th</sup> Sep, 2019	Technical Training	164
2019-20	2016-20	5 <sup>th</sup> Oct, 2019	IBM Training	186
2019-20	2016-20	15 <sup>th</sup> Oct, 2019	Wipro Training	162
2019-20	2016-20	18 <sup>th</sup> Oct, 2019	Tcs Training	112
2019-20	2016-20	20 <sup>th</sup> Oct, 2019	Cts Training	306
2019-20	2016-20	3 <sup>rd</sup> Nov, 2019	Cts Refreshing Training	306
2019-20	2016-20	6 <sup>th</sup> Feb, 2020	Java Training	312
2019-20	2016-20	24 <sup>th</sup> Feb, 2020	Industry Specific training Programme	163
2020-21	2017-21	8 <sup>th</sup> June to 2 <sup>nd</sup> July (Except 12 <sup>th</sup> & 23 <sup>rd</sup> June)	TCS NINJA	483
2020-21	2017-21	7 <sup>th</sup> Aug to 16 <sup>th</sup> Aug	Company Specific Training (Capgemini, Aspire, IBM)	424
2020-21	2017-21	19 <sup>th</sup> Aug to 22 <sup>nd</sup> Aug	ZIFO Specific Training	178
2020-21	2017-21	27 <sup>th</sup> to 29 <sup>th</sup> Aug & 31 <sup>st</sup> Aug to 5 <sup>th</sup> Sep	Automata Fix Training	306
2020-21	2017-21	5 <sup>th</sup> Sep to 14 <sup>th</sup> Sep	CTS Specific Training	308
2020-21	2017-21	3 <sup>rd</sup> Oct to 9 <sup>th</sup> Oct	CTS Specific Training	511
2020-21	2017-21	14 <sup>th</sup> Dec to 18 <sup>th</sup> Dec	TCS Specific Training	33
2020-21	2017-21	16 <sup>th</sup> Dec to	Accenture Specific Training	639



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Academic Year	Batch	Period	Training Name	No. of Students
		21 <sup>st</sup> Dec		
2020-21	2017-21	4 <sup>th</sup> Jan to 13 <sup>th</sup> Jan	Aptitude and Technical (Programming) Training	289
2020-21	2017-21	26 <sup>th</sup> Feb to 28 <sup>th</sup> Feb	Aspire Specific Training	54
2020-21	2017-21	1 <sup>st</sup> to 5 <sup>th</sup> March	Java Specific Training	65
2020-21	2017-21	12 <sup>th</sup> Mar to 14 <sup>th</sup> Mar	Capgemini Specific Training	48
2020-21	2017-21	17 <sup>th</sup> , 18 <sup>th</sup> , 24 <sup>th</sup> , 25 <sup>th</sup> Apr & 1 <sup>st</sup> , 2 <sup>nd</sup> May	Interview and Employability skill Training	54
2020-21	2017-21	5 <sup>th</sup> & 6 <sup>th</sup> May	Accenture Specific Training	25
2020-21	2017-21	11 <sup>th</sup> May to 14 <sup>th</sup> May	Wipro Specific Training	19
2020-21	2017-21	24 <sup>th</sup> & 25 <sup>th</sup> May	Capgemini Specific Training	94
2020-21	2017-21	31 <sup>st</sup> May to 5 <sup>th</sup> June	Employability skill Training	205
2020-21	2017-21	7 <sup>th</sup> to 11 <sup>th</sup> June	DXC and HCL Specific Training	326
2020-21	2017-21	12 <sup>th</sup> & 13 <sup>th</sup> June	DXC and HCL Specific Training-Extension	134
2020-21	2017-21	18 <sup>th</sup> , 19 <sup>th</sup> & 21 <sup>st</sup> June	C Specific Training	324
2020-21	2017-21	24 <sup>th</sup> & 25 <sup>th</sup> June	Analytical & Verbal Training	304
2021 - 22	2018 - 22	18th June 2021 – 20th June 2021	C Programming Training	324
2021 - 22	2018 - 22	30th July 2021 – 06th Aug 2021	Training on Automata Fix	191

Academic Year	Batch	Period	Training Name	No. of Students
2021 - 22	2018 - 22	24th & 25th June 2021	Analytical and Verbal Training Programme	304
2021 - 22	2018 - 22	03rd & 04th July 2021	C Programming Training	249
2021 - 22	2018 - 22	12th July – 26th July 2021	Capgemini Specific Training	347
2021 - 22	2018 - 22	30th Aug – 3 Sep 2021	Cognizant Specific Training	404
2021 - 22	2018 - 22	2nd & 3rd Sep 2021	Group Discussion	143
2021 - 22	2018 - 22	11th – 13th Sep 2021	Accenture Specific Training	538
2021 - 22	2018 - 22	16th – 19th Sep 2021	Zoho Specific Training	72
2021 - 22	2018 - 22	25th & 26th Sep 2021	CTS – Specific Training	211
2021 - 22	2018 - 22	13th Nov – 16th Nov 2021	Programming Skills Training	187
2021 - 22	2018 - 22	20th Nov – 27th Nov 2021	Training Programme on Soft Skills, Communication and Aptitude	233
2021 - 22	2018 - 22	25 Nov 2021	Edvoy Specific Training	92

### c. Placement Process and Support

#### i. Campus Recruitment Process

Requirements of a company are received by the Director Corporate Relations (CR) for campus recruitment. The same is formalized by initiating a meeting of the recruitment committee. The committee approves the campus placement, and a circular is sent to the Department Heads and the students about the recruitment. The department shortlists the candidates and send the same to the Training and Placement Office. Consequently, the list of students is forwarded to the respective company.

**ii. Off Campus Recruitment**

The Training and Placement office shortlists the students from the database matching the company requirements and sends the list to Heads of the Departments and the Placement cell PDs of the respective departments. The list of students is forwarded to the respective company.

**iii. Placement Process and Rules**

- Companies are expected to give a Pre-Placement Talk [PPT] laying out the details of the company and the offer before the process. In case there is no PPT by the company, then the Training and Placement office gives the job description to the students.
- Once the student appears for the process, the student cannot reject the offer made by the company.
- In case if a company has a specific requirement / request, the recruitment committee has all the rights to nominate a set of / individual student(s) and it is mandatory that the student/s has/have to attend the interview. If the student is selected and an offer is made, then he/she is free to decide about the same.
- Every student is eligible for multiple offers.
- A company is free to make their choice of students irrespective of their specialization
- The Director CR shall decide on slots for companies. No company is allowed to make offers before the slotted day and time
- If, for any reason, a company wants to conduct its process before the slotted day and time they are free to do so.
- In case a student who is placed through the institute placement process takes up private placement as well in another company, the Director, in consultation with the companies concerned, shall nullify both the offers
- Students who have got an internship offer are eligible to attend placements provided the date of joining of the company is only after the completion of their internship period.
- If a student gets placed in IT or Core Company, then he/she is eligible for the IT/Core Company if the CTC of the company is at least Rs. 2lakhs more than the CTC of the company in which he/she has got already placed.
- All correspondence to and from the company is routed through the Office of Corporate Relations only.

## 9.6. Entrepreneurship Center (5)

### Innovation and Entrepreneurship Development Center

#### About The Centre

The Innovation and Entrepreneurship Development Centre (IEDC) at Kalasalingam University is established as an initiative of National Science and Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology (DST), New Delhi, with an aim of developing institutional mechanism to create entrepreneurial culture in academic institutions to foster growth of innovation and entrepreneurship amongst the faculty and students.

Every year this centre is providing financial support to a number of students for developing innovative products. Apart from this financial support, mentoring and Infrastructural support are provided for these projects. Moreover, the centre is arranges so many classes and camps to promote technology-based innovation and entrepreneurship among the students. The Vision of IEDC is "To be a self-funded department catering to the needs of young entrepreneurs with innovative ideas of national/international importance and societal needs" with the mission to Develop a mechanism with required infrastructure that can enable students and faculty to innovate and prototype their innovation with support from Govt., industry and academic institution

The KARE was 6<sup>th</sup> Rank in Deemed University category in Atal Ranking of Institutions on Innovation Achievements (ARIIA)-2021. KARE also got 5-star rating for Entrepreneurship, Innovation and Startup activities in 2019-20. KARE was approved as a knowledge partner for Innovation Voucher Program (IVP), supported by Entrepreneurship Development and Innovation Institute, Government of Tamilnadu. The following Table 9.6.1 gives the activities conducted of IEDC for the benefit of the students

**Table 9.6.1 Activities conducted by IEDC**

<b>S. No</b>	<b>Year</b>	<b>Number of Activities</b>	<b>Number of students Benefitted / Attended</b>
1	2018-19	14	1204
2	2019-20	11	1148
3	2020-21	25	2334
4	2021-22	24	2115

**Record on students Benefitted**

The following funds are used for conducting entrepreneurship awareness training programs and seed fund support for product development to the students' community. The funding details are shown in Table 9.6.2.

**Table 9.6.2. Funds Received for Innovation and Entrepreneurship Activities**

S.No	Year	Project Title	Funding Agency	Funded Amount
1	2018-2019	NIMAT-2018-19	EDII, Gujarat	Rs. 1,00,000
2	2018-2019	IEDC (Innovation and Entrepreneurship Development Centre)	DST	Rs. 8,00,000
3	2018-2019	DST STARTUP NIDHI	DST, EDII, Gujarat	Rs. 20,00,000
4	2019-2020	NIMAT-2019-20	EDII, Gujarat	Rs. 3,80,000
5	2019-2020	Technology Business Incubators (TBI)	MSME	Rs.2, 50,00,000*
6	2020-2021	Innovation Voucher Program	EDII, Tamilnadu	Rs. 3, 64, 400
7	2021-2022	Innovation Voucher Program	EDII, Tamilnadu	Rs.1,63, 280

**Student's projects supported by IEDC:**

The following students' innovative projects are supported by IEDC (Innovation and Entrepreneurship Development Centre). Each project got Rs. 1 Lakh for product development. The list of projects and student innovators is shown in Table 9.6.3.

**Table 9.6.3 IEDC Supported Projects**

S.No	Title of the Project	Department	Guide Name	Students Name
1	Development Of Juice To Prevent Gastro-Intestinal Tract Cancer Using Banana Stems	Biotech	Dr. K. Palanichelvam	Mulla Sariyanaz N.S. Supraja Sahana Parveen
2	Bio Polymer and Graphene Nano Sheet Based Food Packing Material Which Can Be Efficiently Used	Food	Mr. S. I. JeyanthAllwin	Ritujasree Anet B George Sreelakshmi

	For Carbonated Beverage Packaging			
3	Development of Electronic Lockers with Multiple keys using Visual Cryptography Scheme	CSE ECE	Dr.K.Suthendran	Sai Anand.M Harish R
4	Attachable Wheelchair Automator	Automobile	Mr. G. Balamurugan	A.Deepak Praveen K. Vijay R. Gurumoorthy
5	Smart Tube light	ECE	Dr.J.Deny Mr.V.Ramachandran	R.Vengat Rahul

### Student's projects supported by DST STARTUP NIDHI:

The following students' innovative projects are supported by DST STARTUP NIDHI. Each project got Rs. 10 Lakh for product development. The list of projects and team of innovators is shown in Table 9.6.4.

**Table 9.6.4 DST STARTUP NIDHI Supported Projects**

S. No	Title of the Invention	Department	Student Team	Mentor
1.	ECO friendly Manufacturing of Tiles from used PET Bottles	Mechanical	VB. Saravanan G. Ramkumar	Dr.I.Siva
2	Low cost Smart Cleaner for Solar Panels	EEE	G.P.Santhosh Ram M.AbubakkarSiddhik	Mr. K. Vijayakumar

Twelve students' start-up companies are functioning in the University campus as shown in Table 9.6.5.

**Table 9.6.5 Student Start-up Companies incubated in KARE**

S.No	Project Title	Dept	Company Name
1	Noise Reduction in Muffler	Auto	NAV Mufflers Pvt.Ltd
2	Production of Biofungicide with Earthworm	Bio Tech	IWO Biosciences Pvt. Ltd
3	Beneficial Enzyme for Bio processing Agro Industrial Waste	Bio Tech	SKIM Biotech Pvt. Ltd
4	Smart Cart for Super Market	CSE, ECE	Yugti Smart Solutions Pvt. Ltd.
5	Efficacy of Bio control Agents viz. Pseudomonas sp and Trichoderma sp. and control of onion diseases	Bio Tech	RingarrBiocontrol Pvt. Ltd
6	Design and Development of Low Cost Photomograph for Identification of Thyroid Dysfunction	ECE	Raj Bioelectronics and Intelligent Pvt. Ltd
7	Low Cost High Performance Inverter	EEE	Minniayal Pvt. Ltd
8	ECO friendly Manufacturing of Tiles from used PET Bottles	Mechanical	Compimero Makers Pvt.Ltd
9	Low cost Smart Cleaner for Solar Panels	EEE	ThaaniyalPvt.Ltd
10	SunFish - Hybrid Powered Low Cost Solar fish Dryer	ECE	M/s Optimum Energy Solar System
11	HC-EMG device: A Pamphlet sized Electromyography for Detecting Nerve Disorders	ECE	M/s HCTRNIQS
12	Wearable / Portable electrical muscle stimulation belt for cervicalgia patients	BME	M/s PSM Enterprise

**Other successful Milestones:**

**i. Innovation Ambassadors:** The following faculty members successfully completed Innovation Ambassador Training Program conducted by the Ministry of Education's Innovation Cell and AICTE.

**Foundation Level:**

- 1) Dr.Viji.R/MBA
- 2) Dr S. Suprakash/IT
- 3) Dr.B. Perumal/ECE
- 4) Dr Muneeswaran V/ECE
- 5) Mrs P Priya/EEE
- 6) Mr. M. Sakthimohan/ECE
- 7) Mr.S.Sakthivel/BME

- 8) Dr.S.Kavitha/Mech
- 9) Mrs. G. Elizabeth Rani/CSE
- 10) Dr. K. Pandiaraj/ECE

**Advanced level:**

- 1) Dr. J Deny/IEDC
- 2) Dr.S.B. Inayath Ahamed/MBA
- 3) Mr. K Vijayakumar/EEE
- 4) Mr. D. Prem Raja/IT
- 5) Mr.Ramesh G/ECE

**ii. IIC Mentor-Mentee Program**

Through IEDC academic institutions are also guided for successful implementation of IIC. The following intuitions are joined as a mentee to our University under the IIC Mentor-Mentee Program

1. P A C Ramasamy Raja Polytechnic College
2. AAA College of Engineering and Technology
3. M. Kumarasamy College of Engineering
4. Kamaraj College of Engineering
- 5.Vellaichamy Nadar Polytechnic College

**iii. Atal Community Innovation Center-Kalasalingam Innovation Foundation**

Atal Community Innovation Center-Kalasalingam Innovation Foundation (ACIC-KIF) is a non-profit community innovation center established by April 2021 with the support of Atal Innovation Mission, NITI Aayog, Govt. of India. The aim of ACIC is to promote economy, employment, and enable community-oriented innovations. We encourage innovative projects from all stages starting from ideation, early traction, validation, and scaling. The ACIC-KIF provides community innovation space at subscription charges to innovators and start-ups, handholding, prototyping, validation, POC, pre-commercial versions, software development and other services required for start-ups. We also conduct extensive training on different technological aspects, patenting and other services required for start-ups and innovators. Once the Proof-of-concept (POC) is developed, we provide scaling services to convert your POC to pre-commercial and commercial versions. So far, this center has incubated 24 start-ups and few common issues faced by the nearby community are identified and solved by ACIC-KIF.



## 9.7. Co-curricular and Extra-curricular Activities (10)

### a. Co-curricular Activities

The University encourages students to participate in various co-curricular and extra-curricular activities. Students actively participate in various co-curricular activities including in-plant training, industrial visit, conferences/ seminars and workshops.

**Table 9.7.1: List of Co-curricular Activities Organized**

S.No	Year	No of Conferences/ Seminars	No. of Guest Lectures/Industrial Lectures/Webinars	No of Workshops/ Training Programmes	No of Project Contest
1	2018-19	12	95	89	5
2	2019-20	51	43	33	6
3	2020-21	34	33	21	6
4	2021-22	1	47	27	3

### a. Extra-curricular activities

Students are encouraged to participate in various club activities and students have been actively organizing, participating in the activities of their choice. Students are encouraged to participate in extra-curricular activities as part of non-CGPA courses such as Tamil Mandram, Nature Club, Music Club, Photographic Club, Fine Arts Club, Youth Red Cross (YRC), NSS, Entrepreneurs Cell, NCC and Aquatic Club.

#### 1. Availability of Sports Facilities:

A state-of-the-art infrastructure for both indoor and outdoor games is established. Playgrounds with athletic tracks and floodlights are available for training students to take part in State and National level games such as Cricket, Hockey, Football, Basketball, Volleyball, etc. These facilities are built according to the appropriate standards followed by the various sports associations in India.

#### Indoor Facilities:

A standard multipurpose Indoor Stadium (1298 m<sup>2</sup>) with wooden flooring and following facilities is established as given in table 9.7.2.

**Table 9.7.2 Indoor Facility Details**

<b>Game</b>	<b>Dimension of Play Area (Court/Field)</b>	<b>Number of Courts / Rooms</b>
Badminton	82 m <sup>2</sup>	3
Basketball	420 m <sup>2</sup>	1
Volley Ball	162 m <sup>2</sup>	1
Boxing Training Hall	298 m <sup>2</sup>	1
Wrestling Training Hall	298 m <sup>2</sup>	1

**Outdoor Facilities****Table 9.7.3 Outdoor Facility Details**

<b>Game facility</b>	<b>Dimension of Play Area (Court/Field)</b>	<b>Number of units</b>
Athletic track and field	400 m Track with 8 Lanes(Std. Track)	1
Basketball Court	420 m <sup>2</sup>	3
Volley ball courts	162 m <sup>2</sup>	3
Tennis courts	195 m <sup>2</sup>	1
Football field	7000 m <sup>2</sup>	2
Hockey Field	5027 m <sup>2</sup>	1
Kabaddi Court	130 m <sup>2</sup>	2
Throw ball court	223.26 m <sup>2</sup>	1
Kho-Kho court	464 m <sup>2</sup>	1
Ball Badminton	288 m <sup>2</sup>	1
Cricket	Radius 60 yards.	2
Hand ball	800 m <sup>2</sup>	2
Swimming Pool	50m x 25m	1

**Gymnasium:** A standard gymnasium for training the students and ensuring their physical fitness equipped with the following facilities is available.

- 16 station multi gym, cross over machine
- Elliptical cross trainer
- Peck and deck butterfly
- Power station with leg press
- Recumbent bike
- Squat stand
- Weightlifting stand
- Weight plates
- Dumble bells
- Push- up stand
- Olympic weight bench
- Bar bell rod

- Roman chair
- Late rowing bar
- Belt vibrator
- Cheat press
- Karalakkatai
- Thigh press
- Weighing machine etc.

Further, additional gyms are available in the hostels.

**Swimming Pool:** An Olympic standard swimming pool (50 m x 25 m) 8 lanes, 5 feet deep, with modern filtering and chlorination facility, is one of the major attractions of the campus. Most of the state level and national level swimming competitions are periodically conducted here. The pool is provided with clinically sterile water. Male and female lifeguards are available full-time to assist in case of emergencies.

**(i) National Cadet Corps (NCC)**

The National Cadet Corps in Kalasalingam Academy of Research and Education (KARE) formerly Kalasalingam University was formed with the National Cadet Corps Act of 1948. It was raised in September 2003 under the Unit 4(TN) Engineering Company NCC, Madurai. Our Technical Unit was started with a sanctioned strength of 100 cadets. This subunit has achieved several landmarks and has added several feathers to the cap of the university.

Our NCC cadets are trained in various activities like drill for smart composure, weapon training for confidence, map reading for self-reliance, field craft for calculations and lateral thinking, physical training for toughness, social service for leadership and selflessness, Shooting, cycling, trekking activities and sports. The students participate in the various training camps, which consolidate their training every year. Moreover, they participate in special camps and centrally organized camps like Republic Day camp, National integrated camp, Army/Navy/Air force attachment camps and all India trekking camps. The B and C certificates are offered by the NCC, after one-year and two years of training respectively. From 2016 to the present 188 students have been successful in B certificate examination and 132 students have successfully cleared the C certificate examination. In addition, the NCC unit also conducts activities for the nation building and encourages the cadets to participate in all the events. The detail of the annual students' activities conducted is as shown in Table 9.7.4.

**Table 9.7.4 Activities conducted by NCC**

<b>S.No</b>	<b>Year</b>	<b>Number of Activities</b>	<b>Number of students Benefitted / Attended</b>
1	2018-19	11	100
2	2019-20	6	100
3	2020-21	8	100
4	2021-22	5	100

**List of Some Major Activities:**

1. Republic Day Celebration
2. Independence Day celebration
3. SWACHHTA PAKHWADA
4. Awareness Rally
5. Annual Training Camp

**(ii) National Service Scheme**

National Service Scheme (NSS) has been introduced in the erstwhile Arulmigu Kalasalingam College of Engineering in 1987 as part of the academic programmes and ever since NSS has been functioning as a regular feature in the realm of the University. Students are encouraged to participate in the NSS Programmes as a part of non-CGPA course. The NSS has 17 units with 100 volunteers in each unit. There is one NSS Programme officer. Every year, during the semester holidays, NSS camps are organized through which many villages have been served. Besides this, there are regular NSS activities organized throughout the year. The endowment awards are also given to the best male and the best female NSS Volunteers to encourage the students. The details of the annual students' activities conducted are as shown in Table 9.7.5.

**Table 9.7.5 Activities conducted by NSS**

<b>S.No</b>	<b>Year</b>	<b>Number of Activities</b>	<b>Number of students Benefitted / Attended</b>
1	2018-19	82	1769
2	2019-20	86	1827
3	2020-21	40	1822
4	2021-22	15	825

**List of Some Major Activities:**

1. Kerala Flood Relief Program
2. Youth Parliament
3. International Yoga day
4. NSS Day Celebration
5. Fit India Cyclothon 2020
6. Republic Day & Independence Day celebration
7. Blood donation camp

**(iii) Nature Club**

One of the active and popular clubs around Viruthunagar is Nature Club, KARE and it was started on September 20, 2008. It aims to inculcate a sense of awareness about the environment and how to improve it amongst the students and the general public. This club is formed mainly to create awareness among the campus community. The motto of the Nature Club is -“**to strengthen the unity of mankind and nature-for nature’s sake**”. This club actively helps in creating awareness among the people and in helping them to protect nature and wild life for the benefit of the future generations. The detail of the annual student’s activities conducted is as shown in Table 9.7.6.

**Table 9.7.6 Activities conducted by Nature Club**

S. No	Year	Number of Activities	Number of students Benefitted / Attended
1	2018-19	2	238
2	2019-20	4	382
3	2020-21	5	496
4	2021-22	6	475

**List of Some Major Activities:**

1. Vithai 2K19- world water conservation day Celebration
2. Orion 2K19- Intra-college event
3. Drizzle 2k19-intra university competition
4. Zoophiles-2020
5. Greenolin-2K21

**(iv) YOUTH RED CROSS**

In the University Youth Red Cross Club was inaugurated in the year 2015-16 Youth represent a substantial part of the membership of the Red Cross for its humanitarian commitment. Young volunteers can make a significant contribution to meeting the needs of the most vulnerable people within their local communities through Red Cross youth programme. The detail of the annual students' activities conducted is as shown in Table 9.7.7.

**Table 9.7.7 Activities conducted by Youth Red Cross**

S. No.	Year	Number of Activities	Number of students Benefitted / Attended
1	2018-19	5	303
2	2019-20	5	542
3	2020-21	3	759
4	2021-22	4	600

**List of Some Major Activities:**

1. Help for Kerala
2. Blood donation camp
3. Help for Delta

4. Water conservation Rally
5. Save Environment Rally
6. Awareness program on Hygiene practices

**(v) Green Army**

The Green Army works on the Vision to bring zero pollution level in the university by means of adopting new technologies and continuous monitoring through survey and analyze energy usage and emission of greenhouse gases in the area in order to reduce the amount of carbon footprint without affecting the output(s). Energy Audits are conducted within the campus; it is the need of a dedicated team to work in all aspects of energy conservation and environment protection. This thought leads to the birth of the Green Team and the Green Army. The Green Army is the group of student volunteers who will be responsible to keep a watch on the judicious use of resources (Energy and water) and green environment. The detail of the annual students' activities conducted is as shown in Table 9.7.8.

**Table 9.7.8 Activities conducted by Green Army**

<b>S.No</b>	<b>Year</b>	<b>Number of Activities</b>	<b>Number of students Benefitted / Attended</b>
1	2018-19	4	74
2	2019-20	7	116
3	2020-21	5	84
4	2021-22	2	120

**List of Some Major Activities:**

1. Energy Conservation for Sustainable development
2. Energy Auditing and Management for reducing the wastage of Power
3. Vehicle free day on all final Saturday of each Month
4. Carbon Footprint Calculation for each academic year
5. Motivational seminars on Renewable Energy Resources

**(vi) Fine Arts Club**

The energetic and charming bludgeon of the college is the Fine Arts Club. The Fine Arts Club is one of the popular clubs of the institution organizing Inter and Intra College Fest every year by providing the students, a platform to exhibit their talents to the world. On the aphorism of bringing out the unprecedented talents of students in KARE and also to cater to those students

who have an aptitude for dance or other talents in fine arts. The Fine Arts Club consists of many teams like Music, Dance, Variety, Art, Fashion, Gaming with more than 100+ talented members. Opportunities are given to all students to register for extra-curricular activities conducted by the Fine arts Club members to celebrate their club functions. The details of the annual student's activities conducted is as shown in Table 9.7.9.

**Table 9.7.9 Activities conducted by Fine Arts Club**

S. No.	Year	Number of Activities	Number of students Benefitted / Attended
1	2018-19	06	1962
2	2019-20	03	824
3	2020-21	05	1848
4	2021-22	2	973

**List of Some Major Activities:**

1. Intra College Fest - MIRTH 2K19
2. National Level Event - SPARKZ 2020
3. Online Intra College Fest - MIRTH 2020

**C. Annual Students Activities.**

**i. Freshman Induction Programme (FIP):** Freshmen Induction Programme (FIP) is conducted every year. An orientation programme about KARE's academic system, hostel residency, placement and other details are given by Vice Chancellor and respective Deans. The FIP is a full-time on-campus fully residential program conducted for one full week. It starts with yoga classes in the morning, and throughout the day students are trained in various aspects on personality development as expected for a budding Engineer. In the FIP, the students are given in the training on the topics:

- English for Engineers, Presentation Skills, Communication Skills, Socializing and Etiquette, Learning Focus, Career Planning, Team Building, Goal Setting, Success through Inner Journey, Aptitude Test, Computer Skills, Voice and Accent and Personality Tests.

**ii. Club activities**

The student's activity is planned for various student's club such as NSS, NCC, Sports, Nature club, Tamil Mandram, YRC, Fine Arts, Green Army, Photography and others by director of



student's affairs for every semester. This plan of activity will be disseminated to the student's community through HoD's and Faculty Advisors. Students are encouraged to participate in the club activities to improve their skills and show their talents.

**Table 9.7.10 Annual events conducted by all Clubs**

S. No	Event Name	Club Name
1.	Online Blood donation Awareness Program	NSS
2.	Online AIDS Awareness Program	
3.	Online Health Awareness Program	
4.	International Peace Day	
5.	National Road Safety month 2022	
6.	NSS Day	
7.	Yoga Awareness Program	
8.	National Blood Donation Day	
9.	Communal Harmony Day	
10.	First Year Registration	
11.	UBA Program	
12.	Swatch Bharat program	
13.	National Integration Day	
14.	World AIDS Day	
15.	World Human Rights Day	
16.	One student one Tree	
17.	Unnatbharatabhiyan	
18.	REPUBLIC DAY	
19.	Blood donation Awareness camp	
20.	Pulsem Polio awareness program	
21.	Climate Change Education and Awareness	
22.	Unnatbharatabhiyan	
23.	Global warming awareness program	
24.	Swatch Bharath Awareness program	
25.	International Women Day	
26.	Anti-Terrorism Day	
27.	7 days NSS Camp	

S. No	Event Name	Club Name	
28.	National Sports Day & Fit India Movement Celebration	Sports	
29.	AnandamAmmal& Kalasalingam Memorial State level Swimming Competition		
30.	State level Inter Collegiate Volleyball Men Tournament		
31.	KARE- ANNUAL SPORTS DAY		
32.	State level Inter Collegiate Kabaddi Men Tournament		
33.	NON-CGPA Sports Registration		
34.	Commencement of Non –CGPA Sports Class for UG and PG Course Students.		
35.	Fit India Movement Activities		
36.	38th Annual Sports Day Registration		
37.	1st Tamil Nadu State Kalvivallal Thiru.T.Kalasalingam Memorial Swimming Competition.		
38.	Intramural Sports and Games		
39.	NON CGPA Sports Practical		
40.	NON CGPA Result		
41.	KARE - 38th Annual Sports Day		
42.	Kalasalingam Sports Festival (Kabaddi, Volleyball, Taekwondo)		
43.	Fit India Movement Activities		
44.	Swimming Summer Coaching Camp for School Kids		
45.	Fit India Movement Activities		
46.	Independence Day Celebration		NCC
47.	Enrollment for 1st year students		
48.	Health awareness program		
49.	Swachh week celebration		
50.	Sadar Patel Jayanthi		
51.	SamvidhanDiwas (Constitution Day)		
52.	NCC day		
53.	Swachh Pakhwada		
54.	Flag day		

S. No	Event Name	Club Name
55.	CATC Camp – 3rd year	
56.	CATC Camp – 2nd year	
57.	National Youth Day Celebration	
58.	Republic day celebration	
59.	Blood donation camp	
60.	B certificate Exam	
61.	C certificate exam	
62.	Traffic Awareness Program	
63.	Zero Emissions Day-Celebration	
64.	World FOOD Day Celebration	
65.	World Soil Day Celebration	
66.	Envirofest	
67.	H2ODay	
68.	Ozonus	
69.	Healthify	
70.	Teachers' Day Celebration	Tamil Mandram
71.	International Literacy Day	
72.	Gandhi Jayanthi	
73.	Thai Pongal Thiruvizha	
74.	International Mother Language Day (Tamizhi)	
75.	World Poetry Day	
76.	Valam (Tamil New Year)	
77.	May Day (Kalanjiyam )	
78.	Yureon	YRC
79.	Mathara	
80.	Born to Win	
81.	Blood donation and Social Awareness Camp	
82.	YuReCa	
83.	Fantasy	Fine Arts
84.	Aarambh	

S. No	Event Name	Club Name
85.	Intra College Cultural Fest	
86.	Club Event	
87.	Net Zero Buildings	Green Army
88.	Strategies for energy conservation in Buildings	
89.	Energy auditing –Methodolgy	
90.	Reduce Heat Island Risks	
91.	Energy Conservation in Academic Campus – Guest Lecture	
92.	Global Warming & Plastic Ban – Awareness campaign at Srivilliputhur	
93.	Energy Auditing at KARE	
94.	Vehicle Free Day at University Campus	
95.	Carbon Footprint Calculation – Guest Lecture	
96.	'My Waste, My Responsibility' – Essay competition for Secondary School students	
97.	Tree Plantation – Watrap Taluk Government and Aided Schools	
98.	Trekking – Sadhuragiri Hills	
99.	WORLD PHOTOGRAPHY DAY	
100.	NOSTALGIA	
101.	FOTOGRAPHIA 3.0	
102.	KAPTURED	
103.	ATTAIN 3.0	
104.	PHOTOPEDIA	
105.	Kaptured	
106.	Enfoque	
107.	Trekking	
108.	Kameria	
109.	Awareness Program on Anti-Ragging Law Ragging Menace – Awareness Campaign Anti-Ragging and Anti-Drugs	Anti-Ragging Committee

<b>S. No</b>	<b>Event Name</b>	<b>Club Name</b>
110.	Awareness Program on Anti-Ragging Law Ragging Menace – Awareness Campaign Anti-Ragging and Anti-Drugs	Anti-Discrimination Committee
111.	Legal Empowerment of Women in India's Changing Scenario	Internal Complaint Committee
112.	Sexual Harassment of women at Workplace-Act & Rules	
113.	Sexism- a Psychological Perspective	
114.	Women Health & Hygiene	Women Empowerment Cell
115.	Cancer Prevention: Strategies for the younger generation	
116.	Violence against Women	
117.	International Women's Day 2022	

**Annexure 9.1**

**KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION**

**(Deemed to be University)**

**Anand Nagar, Krishnankovil-626126**

**Office of Director (IQAC)**

**STUDENT FEEDBACK FORM-Phase 1 2018-19 (Odd) (Theory courses)**

Name of the Faculty & Dept:

Name of the Course:

Year/Sec:

Name & Reg No of the Student:

**I. Course Plan /Text Books**

1. The course teacher given the course plan as prescribed by the University
  - (a) Course plan was given on first day itself.
  - (b) Course plan was given during first week
  - (c) Course plan was given after one week.
2. Classes conducted as per course plan
  - (a) All classes was conducted as per course plan
  - (b) Most Classes were conducted as per course plan with some deviations.
  - © Not allowed as per course plan
3. Course plan having innovative Teaching learning methods /assignments /projects are
  - (a) Course plan includes Innovative Teaching learning methods/assignments/projectsetc.
  - (b) Course plan has minimal innovative Teaching learning methods.
  - © Course plan do not have any innovative component.
4. Has the Text book/Xerox material issued on time?
  - (a) Materials and books received on first day of class
  - (b) Materials and books received during first week
  - © Materials and Books received after first week

**II Teaching Learning**

1. Punctuality of the Course teacher
  - (a) Always comes punctually to the classroom.
  - (b) Mostly comes punctually to the classroom.
  - (c) Rarely comes punctually to the classroom.

2. Basic concepts are taught clearly.
  - (a) Concepts are taught at the level understood by all students
  - (b) Concepts are taught at the level understood by fast learners
  - (c) Mostly dictation from notes/book and concepts not taught clearly
3. Adequate numbers of questions are discussed to explain concepts.
  - (a) Sufficient questions are discussed.
  - (b) A few questions and examples discussed.
  - (c) Questions are not discussed adequately.
4. Flipped mode of teaching is adopted.
  - (a) Practical case study based question are discussed for flipped class
  - (b) Only review questions are discussed for flipped class
  - (c) No flipped classroom mode of teaching is adopted.

### **III Testing and Evaluation**

1. Regular Class tests/unit tests are conducted (before SE -1)
  - (a) At least 2 class tests were conducted
  - (b) One class test was conducted
  - (c) No class test conducted
2. Teacher gives input to improve based on class tests/unit tests.
  - (a) Gave inputs to fast, average & slow-learners
  - (b) Gave inputs to slow-learners only.
  - (c) No input was given
3. Assignments are given
  - (a) At least two assignments per unit given
  - (b) One assignment per unit given
  - (c) No assignment was given
4. Assignments are evaluated on timely manner
  - (a) Within 2 days, assignments are evaluated and returned back
  - (b) Within a week, assignments are evaluated and returned back
  - (c) After a week, assignments are evaluated and returned back

#### **IV Communication Skill**

1. Teacher uses only English as language of Communication
  - (a) Always uses English as language of communication
  - (b) Mixing of English and local language of communication
  - (c) Mostly local language used for communication
2. Teacher adopts ICT (like LCD, animation etc) to communicate different topics.
  - (a) All difficult topics are covered by using ICT methods
  - (b) Only a few topics are covered by using ICT methods
  - (c) No topics covered by using ICT methods
3. Audibility and clarity in speech
  - (a) Clearly audible up to last benches.
  - (b) Clearly audible up to 2<sup>nd</sup> to 3<sup>rd</sup> benches only.
  - (c) Clearly audible for first benches only.



**Annexure 9.2**

**Kalasalingam Academy of Research and Education**

**(Deemed to be University)**

**Anand Nagar, Krishnankoil-626126**

**Office of Director (IQAC)**

**STUDENT FEEDBACK FORM – Phase I (Lab Courses)**

Name of the Faculty & Dept:

Name of the Course:

Year/Sec:

Name &Reg.No. of the

Student:

**I. Conduction of Lab Experiments**

1. Has the teacher given the course plan for experiments as prescribed by the University?

- (a) Course Plan was given on first day.
- (b) Course Plan was given within one week
- (c) Course Plan was given after one week.

2. Are Experiments conducted as per the course plan?

- (a) All the experiments conducted as per course plan
- (b) Most experiments conducted as per course plan with some deviations
- (c) Not followed as per course plan

**II. Explanation about Lab Experiments**

3. Lab Experiments are explained properly

- (a) Experiments explained by course teacher
- (b) Experiments explained partly by course teacher and partly by lab technician
- (c) Experiments explained by lab technicians or not explained at all

4. Teacher uses only English language of communication

- (a) Always uses English as language for communication
- (b) Mixing of English and local language for communication
- (c) Mostly local language for communication

5. Lab Technician has knowledge about experiments

- (a) Well knowledgeable about all experiments
- (b) Well knowledgeable about few experiments
- (c) No knowledge about experiments

6. Flipped mode of conducting lab experiments is adopted

- (a) More than 2 experiments were explained using flipped mode of teaching
- (b) At least 1 experiment was explained using flipped mode of teaching
- (c) Not flipped mode of teaching was adopted

**III. Support offered for results/Calculations**

7. Teacher gives constructive comments on results/calculations

- (a) Constructive comments given for all experiments
- (b) Constructive comments given for few experiments only
- (c) No specific comments given for any experiments

**IV. Working Condition of Lab equipment's**

8. Working Condition of Lab equipment's

- (a) All equipment's are in good condition
- (b) Some experiment setups are not working properly
- (c) Most of the equipment's are not working properly

**Annexure 9.3**

**SAMPLE FORM OF STUDENT FEEDBACK ON FACILITIES WITHIN THE KARE CAMPUS**

Date:

Name : .....

Degree : .....

Department : .....

Year/Semester: (.....) I/II/III/IV

Address : .....

.....

.....

Mobile : .....

Email : .....

Feedback on Facilities within the KARE campus. [Please tick (√) in the relevant cell]

SI. No	Item	Very good	Good	Average	Poor	Very poor
1	Lab Facilities					
2	Library Facilities					
3	Computer Facilities					
4	Hostel Facilities					
5	Food quality in the hostel					
6	Recreational facilities					
7	Extra-curricular activities					
8	Sport Facilities					
9	Bus Facilities					
10	Wi-Fi Facilities within the campus					
11	Food facility in the canteen					
12	Mineral water facility in campus					
13	Availability of wash rooms					

Signature of the student

<b>CRITERIA 10</b>	
<b>GOVERNANCE, INSTITUTIONAL SUPPORT AND FINANCIAL RESOURCES</b>	<b>120</b>

## **10. Governance, Institutional Support and Financial Resources (120)**

### **10.1 Organization, Governance and Transparency (55)**

#### **10.1.1 State the Vision and Mission of the Institute (5)**

**Response:**

**Vision:**“ To be a University of Excellence of International Repute in Education and Research.”.

**Mission:**

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.

#### **10.1.2 Availability of the Institutional Strategic Plan and its Effective Implementation and Monitoring (25)**

**Response:**

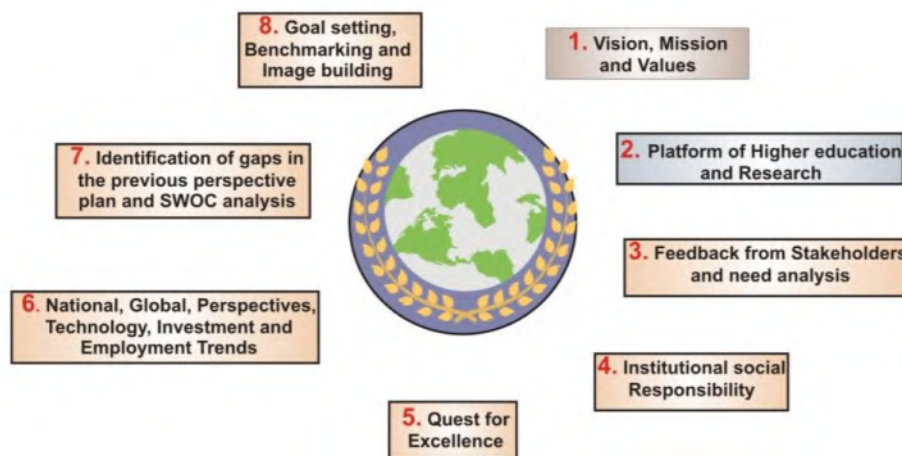
The Strategic Plan-2026 and a Case Study report for effective implementation of strategic plan on Research Activities are given below:

### **STRATEGIC PLAN FOR THE NEXT 10 YEARS – 2017- 2026**

**KARE reflect its commitment to:**

- ❖ Conserving, advancing and disseminating knowledge through teaching, learning, research and creative work of the highest standard.
- ❖ Creating a diverse, mutually respectful academic community with rational and high ethical standards.
- ❖ Placing a strong emphasis on serving our student body.

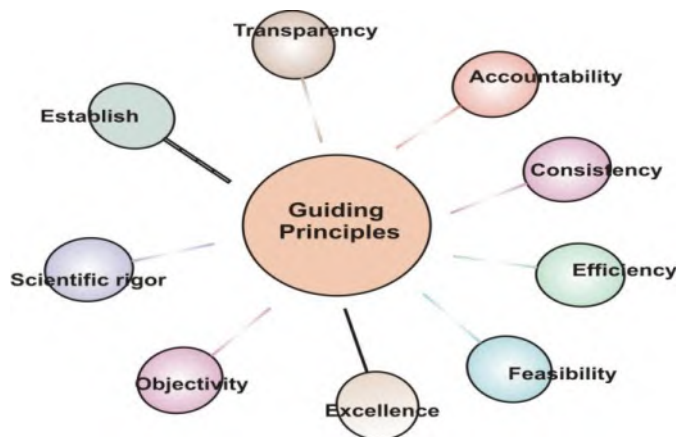
- ❖ Working to advance the intellectual, cultural, environmental, economic and social wellbeing of the people of state, country and abroad.
- ❖ Providing equal opportunities to all who have the potential to succeed in an Institution of international grade.
- ❖ Engaging with national and international scholars for both education and research to enhance intellectual development, educational quality and research productivity.
- ❖ The development and commercialization of enterprise based on the University's research and creative works.



**Figure 10.1.2.1 : Institutional Strategic Plan**

**KARE aims to:**

- ❖ Be a community of highly accomplished and well supported academic and professional faculty and staff.
- ❖ Attract students of high academic potential and give them an outstanding Institution experience so that they become successful and influential graduates and loyal alumni.
- ❖ Benefit society by conducting and applying research of the highest quality.
- ❖ Develop strong partnerships with key organizations and communities, nationally and internationally.
- ❖ Be a Institute of global standing that serves India, Asia and the World.



**Figure 10.1.2.2: Guiding Principles**

### **Objective 1: FACULTY and STAFF**

**A work environment is clear expectations, development of potential, extensiveness, high achievement and rewarding performance**

We have to use innovative employment practices to attract and retain outstanding academic and professional staff from India and internationally experienced staff. We need to provide staff with an environment that develops rewards their talents, and community responsibilities. These things must be achieved in the face of intense national and international competition for staff. However, we will be better placed to do this as the Institute becomes more successful through the achievements of its staff.

### **Measures:**

- Student: academic staff ratio.
- Academic: Professional staff ratio.
- Increasing Postgraduate students
- Introduce many Postgraduate Research program
- Increasing Doctoral students with KARE fellowship.
- Increasing Peer-reviewed publications
- Citations per Scopus.
- Number of prestigious awards held by staff.
- Number of national teaching excellence awards held by staff.

- Proportions of equity group staff in academic and professional positions by expertise and seniority.
- Equal opportunity to women employees
- Creating corpus fund for supporting the young faculty members

**Key actions:**

- Use innovative employment practices to recruit and retain high performing academic and professional staff, including those from diverse backgrounds.
- Ensure that all staff has clear performance expectations aligned to their roles and prospects of career development in the context of the University's strategy.
- Ensure that all staff has effective and regular performance feedback that links to reward, recognition and future development planning.
- Enhance staff research through fund generation, guiding graduate students, and peer publications.
- Provide career development opportunities and practices that support the aspirations of staff.

**Objective 2: Decentralized**

**An environment in which distributed leadership is developed and valued**

As a complex and highly devolved organization, the Institute relies on staff providing excellent leadership in relation to a number of activities, academic and administrative, in all parts and at all levels of the organization. It is also important to the University's role as a leading organization that staff provide leadership in their professional capacities outside the Institute and to the wider community, nationally and internationally.

**Measures:**

- Proportion of staff positive about leadership in staff surveys.

**Key actions:**

- Develop a clear understanding of leadership expectations at all levels in the University.
- Embed leadership expectations in processes for appointment of staff.
- Determine professional development needs of those progressing to leadership roles and invest in appropriate leadership development opportunities.

**Objective 3: student**

**A diverse student body of the highest possible academic potential**

Leading universities must attract students who have high academic potential, are prepared for

Institute study, have the ability to take advantage of degree study involving critical thinking, problem solving, and research-based teaching, and have a desire to learn and be challenged intellectually.

**Measures:**

- Proportion of school levels entering with 80% of minimum marks and secured scoring of Kalasalingam engineering entrance examination (KEEE).
- Scholarship from Institutional, national (State and Central) and private bodies (including first graduate, Sports quota students).
- Students will be admitted from other state and abroad
- Proportions of domestic students from equity groups at undergraduate and postgraduate levels.
- Numbers of students successfully transitioned into Institute through student equity support initiative.

**Key actions:**

- To provide KARE student fellowship of highly successful of both education and athletes.
- Ensure that the characteristics, aspirations and expectations of the students of high academic potential we wish to attract and retain within the Institute are well understood.
- Ensure that our processes for promoting the Institute to such students and for securing their interest and enrolment respond to their needs and are based on sound research.
- Ensure that we provide the kind of environment, both academic and extracurricular, that is particularly attractive to students of high academic potential.

**Objective 4: Student Community**

**A substantial increase in annual completions of taught undergraduate, masters, research masters and doctorates**

As the major national centers of higher education, universities have a particular role in UG, PG and graduate education. As the largest and highest ranked Research Institute in the country, KARE will be a pre-eminent place in this regard. The number and achievements of our graduates have a significant bearing on the University's reputation and ranking, and on our contribution to society.



**Table 10.1.2.1: Achievements of Graduates**

Programs	2017	2026
Undergraduate	6,000	25,000
Postgraduate	1,000	10,000
Doctoral	125	1000

**Key actions:**

- Enhance processes for staff-student enthusiastic interactions such as faculty advisory system / training mentors and allocating students to them so as to maximize the quality of supervision and probability of student success.
- Provide students with clear expectations as to the scope and duration of their studies.
- Support proper mentoring of both undergraduate and postgraduate students to ensure that they complete their programs within the allotted time.

**Figure 10.1.2.3: Student Equity Support****Objective 5: Teaching and learning environment**

**A high quality learning environment that maximizes the opportunity for all our students to succeed and provides them with comprehensive, intellectually challenging and transformative educational experience**

Our reputation with students, their parents and families, and our communities rests significantly on the quality of our teaching and learning. We expect our graduates to be independent and critical thinkers, open to new ideas, possessing intellectual curiosity and integrity, and to have a

mastery of a body of knowledge and professional skills. Our distinctive learning environment, we bring different insights into our classrooms, drive innovation in learning and research, and ensure our society remains open to the experience of other countries.

Curriculum design, enrichment and academic flexibility



**Figure 10.1.2.4: Teaching and learning environment**

**Measures:**

- Course completions.
- Qualification completions.
- Outcomes of student satisfaction and engagement surveys (academic).
- Number of UG and PG degrees accredited by professional associations / NBA, and ABET accreditation bodies.
- Increase learning environment in the campus.
- Teaching and Learning Process
- Students Participation in Research Projects
- Summer fellowships
- Earning an International Certification
- Internships in industry
- Appearance and securing scores in GATE, GRE and other standardized tests

**Key actions:**

- Ensure that our curricula reflect the relevant graduate profiles and deliver high quality programs that meet national needs and international standards in an efficient manner.
- Enrich teaching, learning and outreach activities by drawing on international best practice in the use of new technologies.

- Provide all students with the opportunity at each level of study to interact with senior staff and researchers, and ensure that they gain the educational benefits of research informed and research-based teaching and learning.
- Develop a coordinated, research-informed suite of programs to support equity students to succeed in their studies at all levels in the University.
- Develop objective measures and benchmarks of an outstanding teaching and learning environment and review

### **Objective 6: Extracurricular**

#### **A distinctive, high quality extracurricular experience that maximizes the value to our alumni of their Institute experience**

As well as achieving world-ranked qualifications, our students acquire increased independence, lifelong friends, a much broadened world view and – if we get it right – an enduring interest in and affection for their University. These are critical components of the student experience as a whole, and we must be very aware of their importance not only to our students and future alumni, and to the communities they will serve, but also to the reputation and standing of the University. The ability to access University-supported accommodation and to participate in shared extracurricular activities is crucial to the engagement of students with the University, as well as to their academic success. Engagement will in turn lead to lifelong, reciprocal relationships with alumni that connect them to the Institute and to one another.

#### **Measures:**

- Outcomes of student satisfaction surveys (extracurricular).
- Outcomes of graduate destination surveys.
- Proportions of graduates who have participated in international learning and research activities abroad and in India.
- -Alumni with whom the Institute is actively engaged.
- Philanthropic support per alumnus.

#### **Key actions:**

- Ensure that we have graduate profiles which clearly lay out the desired attributes of graduates and the value that students will obtain from their extracurricular, as well as their academic, university experiences.
- Encourage activities and events that engage students in campus life, and in the unique cultural attributes of Tamil Nadu, India and the Asian Pacific region.

- Collaborate with undergraduate and postgraduate student representatives as requirements for facilities and services that support the social, recreational, cultural and spiritual needs of students are determined.
- Actively engage with alumni to seek their financial, political and societal support for the Institute to benefit future generations of students.



**Figure 10.1.2.5: Extra Curricular Activity**

### **Objective 7: Research Perspective**

#### **A growing output of excellent research across all our disciplines**

High quality research which is reflected through guiding graduate students, peer-reviewed publications, and grant in full range of disciplines. This recognition of research excellence will in turn support the recruitment and retention of high quality staff and students, and enhance Indian's international standing and connectedness.

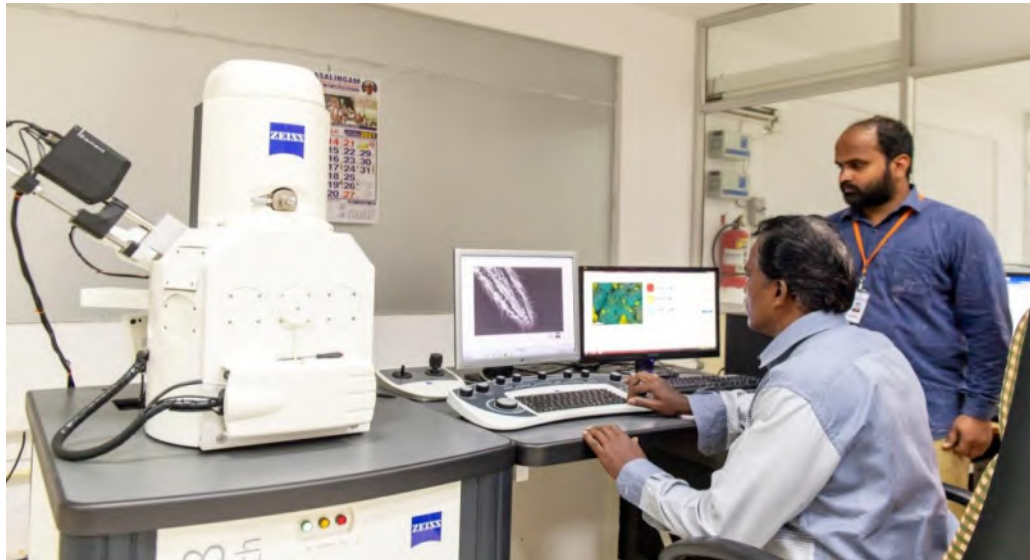
#### **Measures:**

- Increasing number of Ph.D students with URF, CSIR, UGC - JRFs/SRFs
- Number of peer-reviewed research and creative outputs.
- Consecutive increase in high-impact research articles every year
- Proportion of publications authored jointly with international colleagues.
- Increasing the success rates of research grants from both national and International funding agencies such as DST, SERB, DBT, CSIR, DHR, DRDO, ICMR, IEDC, NIH, WHO etc.,

- Increasing community service based research and enhances betterment of both students and state community.

**Key actions:**

- Establishment of new Research Centers and modern research laboratories
- Ensure that research quality and productivity are key attributes evaluated when academic staff are employed, continued or promoted.
- Invest in professional development activities that will enhance the quality and quantity of research performance across the University.
- Ensure that the importance of maximizing citations and impact is recognized across the Institute and is reflected in publishing behaviors.
- Ensure that our infrastructure is appropriate for the support of research.



**Figure 10.1.2.6 : Research Perspective**

**Objective 8: Create vibrant and unique research group**

**Establishment of New Research Laboratories**

The establishment of International Research Center at Kalasalingam University has greatly increased our identity and reputation as a research institution. To further strengthen our research activities, in the next five years we will establish at least four more research centers besides strengthening the existing centers.

- Energy particularly alternate energy and Smart Grid
- Water Technology

- Drug Design and Development
- Computing Sciences with a focus on Security and Big Data Analytics

### **Center for Energy**

As Energy is the need of the hour and the country and the world are looking for alternate source of energy. The thrust areas of the center would be:

- Development of Technology for Performance enhancement of Solar PV System
- Development of Embedded Processor based Smart meter
- Energy Auditing and Energy Management
- Modeling and Controller Design

### **Center for Water Technology**

The existing Center for Water Technology would be further strengthened. The research at this Center will focus on water resources and waste water treatment.

### **Center for Drug Design and Development**

The need for potential new drugs is increasing as there is still a lack of suitable medicines for many diseases. The drug discovery research has taken a new avenue in the post-genomic era. The Center for Drug Design and Development will carry out research in the following dimensions.

- Target Identification and validation
- Lead Identification using Computer Aided Drug Design
- Identification of Lead compounds from natural resources
- Synthesis of novel lead molecules using organic synthesis route
- Lead Optimization

### **Objective 9: Partnerships**

**Strong partnerships with key organizations and communities which have a positive impact on both parties**

An international, research-intensive Institute has many communities which contribute to and draw upon its research, teaching and ideas. The Institute engages with a variety of communities. Reputed research and academic institutes from both national and international are the key partners for national and local employers and businesses. The Institute must continue to strengthen its links with Asia, and enhance engagement with increasingly important Asian communities.

**Measures:**

- Number of engaged MoU with reputed Institute.

**Key actions:**

- Identify key partners with whom the University has or can develop strong relationships from within the very wide group of potential partners (including business communities, professional organizations, artistic and creative communities, and partner universities).
- Make available the expertise of the University to key partners.
- Keep partners well informed of the University's strategic direction and performance, and give them the opportunity to play a part in its future development.
- Develop a comprehensive, University-wide alumni engagement program.

**Objective 10: infrastructure facility**

**An infrastructure of the highest quality possible to support our teaching, learning, research, and community engagement**

The infrastructural elements that support our core academic and administrative activities – buildings, grounds, plant, equipment, information systems, and libraries – are also crucial enablers of our success. We have committed ourselves to refurbished and new buildings, and of investment in library collections, research and teaching equipment, commensurate with that of the Asia.

**Measures:**

- Space benchmarks.
- Utilizations benchmarks.
- Benchmarked construction of buildings

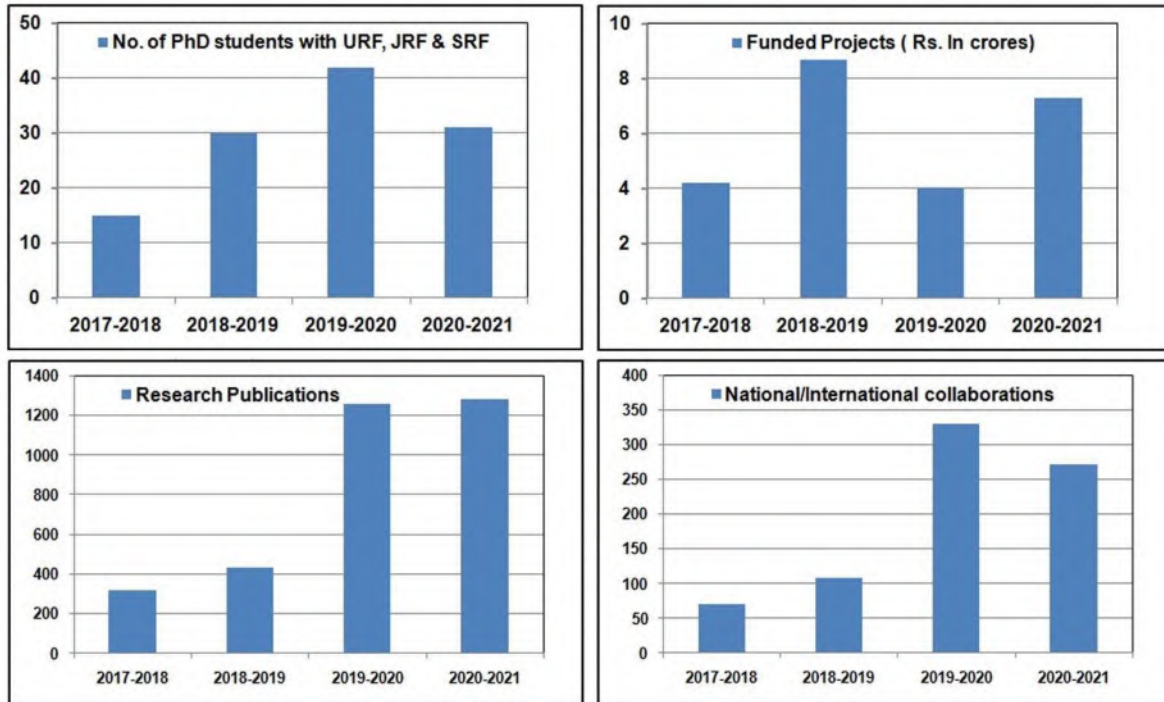
**Key actions:**

- Construction of 3000 seated Auditorium for campus activities
- Construction of tower buildings for faculty and staff quarters for create vibrant research communities
- Ensure that the University's capital planning is guided by appropriate benchmarks of the nature and extent of physical infrastructure provided by peer international universities.
- Ensure that all existing infrastructure is maintained and used as efficiently as possible.
- Continue investment in buildings, plant and equipment at an appropriate level, allowing for the proper maintenance of existing infrastructure and replacement of assets for teaching and research activities.

**CASE STUDY ON RESEARCH**

**KARE providing a growing output of excellent research across all our disciplines**

This case study shows that how KARE improved in Research and Development activities year wise. KARE has significant improvement by offering University Research Fellowship (URF) for doing Ph.D. students every year along with government-funded projects (CSIR, SERB, DBT, DRDO, and MOEF). In 2017-18 contributed 15 URF and gradually increased 103 Ph.D. students in 2021-22. The 4.22 crores are received during 2017-18, 8.67 crores in 2018-19, 4.25 crores in 2019, 7.30 crores in 2020-21. Altogether past four years received 24.22 crores from both government and non-government organizations. The output of research publications also gradually increased every year from 2017 (317), 2018 (432), 2019 (1256), 2020 (1278). Therefore, 4 folds of publications are increased over the four years. The faculty with international collaborations are 2017-18 (70), 2018 (107), 2019 (329), 2020 (271) and the collaborations are increased 3 folds during this period.



**Figure 10.1.2.7 : Research Outcome**



### **10.1.3 Governing body, administrative setup, functions of various bodies, service rules, procedures, recruitment and promotional policies (10)**

(List the governing, senate, and all other academic and administrative bodies; their memberships, functions, and responsibilities; frequency of the meetings; and attendance therein, in a tabular form. A few sample minutes of the meetings and action-taken reports should be annexed.

The published rules including service rules, policies and procedures; year of publication shall be listed. Also state the extent of awareness among the employees/students.

#### **Response:**

1. Chancellor of the institution holds the highest office and is involved in the furtherance of the objectives of the institution.
2. The Vice-Chancellor functions as the Ex-officio Chairperson of all statutory bodies which have specific functions. The Vice-Chancellor exercises powers relating to the governance and administration of the institution and functions as prescribed by the regulations and byelaws and is ably assisted by the Registrar, Finance Officer, Controller of Examinations, Directors, Deans, HOD's, and other teaching and non-teaching staff.
3. The Registrar is the ex-officio Secretary of the Board of Management, the Academic Council and the Planning and Monitoring Board. The Registrar directly reports to the Vice-Chancellor. The Registrar is responsible for the smooth conduct of all administrative activities such as record maintenance, official correspondence, convening meetings and represents the institution in all official meets and legal proceedings.
4. The Director-Student Affairs guides and coordinates the activities of the students.
5. The Director (Research and Development) coordinates the research and consultancy activities.
6. The Controller of Examinations is responsible for organizing examinations and evaluations.
7. The Director-Accreditation and Ranking carries out the works related to Accreditation and Ranking.
8. The Director-Faculty Affairs and IQAC coordinates the Quality Related activities and Faculty empowerment strategies.
9. The Finance Officer is responsible for the preparation of annual estimates, statements of account for submission to the Finance Committee and ensures mobilization of funds and its proper utilization.

10. The Estate Officer oversees the maintenance and upkeep of the infrastructure facilities.  
The Public Relations officer ensures communication with the public and press.
11. Every one of the Directors of the Institution is assisted by Deputy Directors.
12. The Heads of the Department Coordinate the Department level Academic and administrative activities.
13. The Class Coordinator of each class is responsible for the overall development of students in his/her class such as organizing seminars/workshops, etc.,
14. , The Class Committee Chairperson reviews periodically the progress of the classes, monitors the progress of syllabi coverage and resolves issues related to slow-learners.
15. For a group of 20-25 students, there is a Faculty Advisor who helps the students in getting general advice on the academic programme. Faculty Advisor maintains regular contact with the parents/guardians of their wards.
16. The practice of rotation of HoDs and Deans is taking place once in three years.
17. Every faculty member gets a chance to organize Faculty Development Programmes (FDP), National Conferences/Seminars/Workshops.
18. The faculty members also play a role as Programme Coordinator, Module Coordinator, Course Coordinator, Assistant Wardens and Deputy Wardens to facilitate academic and administrative needs.

**Various Statuary Bodies:**

1. Board of Management
2. Academic Council
3. Planning and Monitoring Board
4. Finance Committee
5. Internal Quality Assurance Cell

**Non-Statuary Bodies:**

1. Library Committee
2. Board of Studies

**The grievance redressal mechanism comprises of:**

1. Anti-ragging cell
2. Women's Empowerment Cell
3. Internal Complaints Committee
4. Anti-Discrimination Committee
5. Grievance Redressal Committee
6. EMGRC

**Table 10.1.3.1: Frequency of Meeting**

S. No	Name of the Authority	Frequency of meetings
1	Board of Management	4 meetings per Annum
2	Finance Committee	2 meetings per Annum
3	Planning & Monitoring Board	1 meeting per Annum
4	Academic Council	3 meetings per Annum
5	Internal Quality Assurance Cell	4 Meetings per Annum
6	Anti-Ragging Committee	At least One meeting per Annum
7	Internal Complaints Committee	At least One meeting per Annum
8	Anti-Discrimination Committee	At least One meeting per Annum
9	Grievances Redressal Committee	At least One meeting per Annum
10	Board of studies	2 Meetings per Annum
11	Women Empowerment Cell	At least One meeting per Annum
12	Library Committee	2 Meetings per Annum
13	EMGRC	Whenever Required

**Table 10.1.3.2. BOM Members**

S. No	MEMBERS	DESIGNATION
1.	Thiru. K. Sridharan	Chancellor
2	Dr. S.Arivalagi, Pro Chancellor	Member – Representing Sponsoring Society
3	Dr. R. Nagaraj, Vice Chancellor,	Vice Chancellor

	Kalasalingam Academy of Research and Education	
4	Dr. G. Swaminathan Retd. Dean, Madurai Medical College, Madurai	Trust Chairman
5	Dr. Chandrakant Kokate Vice Chancellor KLE Academy, Belgaum, Karnataka	Member- Chancellor's Nominee
-6	Dr. Rajkamal Former Vice Chancellor Devi Ahila University, Indore	Member- Chancellor's Nominee
7	Dr. H. Devaraj, Former Vice Chairman UGC	Member – Representing Sponsoring Society
8	Dr. Shasi Anand, Director, Kalasalingam Academy of Research and Education	Member – Representing Sponsoring Society
9	Mr. S. Arjun Kalasalingam Director, Kalasalingam Academy of Research and Education	Member – Representing Sponsoring Society
10	Dr. C. Ramalingan, Dean - FE, Kalasalingam Academy of Research and Education	Member
11	Dr. R. Viji, Dean – KBS, Kalasalingam Academy of Research and Education	Member
12	Dr. B. Subathra, Professor,	Member

	Department of EIE, Kalasalingam Academy of Research and Education	
13	Dr. Aruna Janani Associate Professor, Department of Chemical Engineering Kalasalingam Academy of Research and Education	Member
14	Dr. V. Vasudevan Registrar Kalasalingam Academy of Research and Education	Member Secretary

**Rules and Responsibility of Board of Management (BOM):**

1. The Board of Management shall be the principal executive authority of the University and, as such, shall have all powers necessary to administer the University subject to the provisions of the University Act and the Statues made there under; and may make regulations for that purpose and also with respect to matters provide hereunder.
2. The Board of Management shall have the following powers and functions, namely:-
  1. To recommend the names of three persons to the Chancellor for appointment as Registrar of the University on the recommendations of the selection committee constituted for that purpose by it and headed by the Vice-Chancellor;
  2. A report on the working of the University;
  3. Audited Statement of accounts;
  4. Budget proposals for the ensuing academic year;
  5. To manage and regulate the finances, accounts, investments, properties, business and all other administrative affairs of the University and for that purpose, constitute committees and delegate the powers to such committees or such officers of the University as it may deem fit;
  6. To invest any money belonging to the Institution, including any unapplied income, in such stock, funds, shares or securities, as it may, from time to time, think fit, or in the purchase of immovable property, with the like power of varying

such investments from time to time; except land acquired or building constructed with the assistance of the Government, in which cases the prior approval of the Government shall be required;

7. To enter into vary, carryout and cancel contracts on behalf of the University and for that purpose to appoint such officers as it may think fit;
8. To provide the buildings, premises, furniture and apparatus and other means needed for carrying on the work of the Institution ;
9. To entertain, adjudicate upon, and if it think fit, to redress any grievances of the officers, teachers, students and employees of the University;
10. To create teaching, administrative, ministerial and other necessary posts, to determine the number and emoluments of such posts, to specify the minimum qualifications for appointment to such posts on such terms and conditions of service as may be prescribed by the Regulations made in this behalf;
11. To appoint examiners and moderators, and if necessary to remove them and to fix their fees, emoluments and travelling and other allowances, after consulting the Academic Council ;
12. To select a common seal for the University;
13. To exercise such other powers and to perform such other duties as may be considered necessary, or imposed on it by or under the University Act.
14. The Board of Management shall meet, at least, once in three months and not less than fifteen days' notice shall be given of such meetings.
15. The meeting of the Executive Council shall be called by the Registrar under instructions of the Vice-Chancellor or at the request of not less than five members of the Board of Management.
16. One-half of the members of the Board of Management shall form the quorum at any meeting.
17. In case of difference of opinion among the members the opinion of the majority shall prevail.
18. Each member of the Board of Management shall have one vote and if there be equality of votes on any question to be determined by the Board of Management, the Chairman of the Board of Management or as the case may be, the member presiding over that meeting shall, in addition, have a casting vote.

19. Every meeting of the Board of Management shall be presided over by the Vice-Chancellor and in his absence by a member chosen by the members present.
20. If urgent action by the Board of Management becomes necessary, the Vice-Chancellor may permit the business to be transacted by circulation of papers to the members of the Board of Management. The action so proposed to be taken shall not be taken unless agreed to by a majority of members of the Board of Management. The action so taken shall be forthwith intimated to all the members of the Board of Management. In case the authority concerned fails to take decision, the matter shall be referred to the Chancellor whose decision shall be final.

**Table 10.1.3.3. Academic Council Members**

<b>S.No</b>	<b>Name of the Person</b>	<b>Designation</b>	
1	Dr. Nagaraj Ramarao	Vice - Chancellor	<b>Chairperson,</b> Ex-officio
<b>Dean(s) of Faculties:</b>			
<b>S.No</b>	<b>Name of the Person</b>	<b>Designation</b>	<b>Member</b>
1	Dr. N. Lakshmi Thilagam	Dean - Kalasalingam School of Architecture	Ex-officio
2	Dr.R.Rajam	Dean - School of Bio, Chemical and Processing Engineering	Ex-officio
3	Dr.P.Sivakumar	Dean - School of Electronics, Electrical and Biomedical Technology	Ex-officio
4	Dr.P.Deepalakshmi	Dean - School of Computing	Ex-officio
5	Dr.N.Rajini	Dean - School of Mechanical, Aero, Auto and Civil Engineering	Ex-officio
6	Dr. Jesu Edward George	Dean - Kalasalingam School of Agriculture & Horticulture	Ex-officio
7	Dr.R.Viji	Dean - Kalasalingam Business School	Ex-officio
8	Dr. Dattatri. K. Nagesha	Dean - School of Advanced Sciences	Ex-officio

9	Dr.V.Pandiyarajan	Dean - School of Liberal Arts and Education	Ex-officio
10	Dr. C. Ramalingan	Dean – School of Freshman Engineering	Ex-officio
<b>Heads of the Department</b>			
<b>S.No</b>	<b>Name of the Person</b>	<b>Designation</b>	<b>Member</b>
1	Dr.Sivakumar	HoD - Agricultural Engineering	Ex-officio
2	Dr.Vasumathi	HoD - Agriculture	Ex-officio
3	Mr.H.Ahamed Fazeel Akram	HoD - Architecture	Ex-officio
4	Dr.S.Arunvinthan	HoD - Aeronautical Engineering	Ex-officio
5	Dr.Thirumalaikumaran	HoD - Automobile Engineering	Ex-officio
6	Dr.T.Kathiresan	HoD - Biotechnology	Ex-officio
7	Dr.G.Vishnuvarthanan	HoD - Biomedical Engineering	Ex-officio
8	Dr. P. L. Meyappan	HoD – Civil Engineering	Ex-officio
9	Dr.Vikranth volli	HoD - Chemical Engineering	Ex-officio
10	Dr.K.K.Praneeth	HoD - Chemistry	Ex-officio
11	Dr.K.Kartheeban	HoD - Computer Applications and Computer Science & Information Technology	Ex-officio
12	Dr.S.Karthik	HoD - Commerce	Ex-officio
13	Mr.J.Prabhu	HoD - Catering Science and Hotel Management	Ex-officio
14	Dr.A. Ramkumar	HoD - Electrical and Electronics Engineering	Ex-officio
15	Dr.V.Yogeshwar Chakrapani	HoD - Electronics and Instrumentation Engineering	Ex-officio
16	Dr. S. Remadevi	HoD - English	Ex-officio
17	Ms. A.V. Surabhi	HoD - Forensic Science	Ex-officio
18	Dr. Selvarani	HoD- Horticulture	Ex-officio
19	Dr.S.Dhanasekaran	HoD - Information Technology	Ex-officio



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20	Dr.S.Kameshwari	HoD - Mathematics	Ex-officio
21	Dr.V.Arumuga Prabhu	HoD - Mechanical Engineering	Ex-officio
22	Dr. B. Selvakumar	HoD - Physics	Ex-officio
23	Dr.M.Maria Antony Raj	HoD - Social Work	Ex-officio
24	Mr.D.M.Rajan	HoD - Special Education	Ex-officio
25	Dr. K. Karthigadevi	HoD – Ship	Ex-officio
26	Mr.Prabhakar	HoD - Visual Communication	Ex-officio
<b>Professor</b>			
<b>S.No</b>	<b>Name of the person</b>	<b>Designation</b>	<b>Member</b>
1	Dr.S.Sampath	Professor - Computer Science and Information Technology	Member
2	Dr.D.Devaraj	Professor - Electrical and Electronics Engineering	Member
3	Dr.B.Subathra	Professor - Electronics and Instrumentation Engineering	Member
4	Dr.V.Yegna Narayanan	Professor - Mathematics	Member
5	Dr.S. Asath Bahadur	Professor - Physics	Member
<b>Associate Professors</b>			
<b>S.No</b>	<b>Name of the person</b>	<b>Designation</b>	<b>Member</b>
1	Ar.L.Vinu Pandian	Associate Professor - Architecture	Member
2	Dr.Muthukumaran	Associate Professor - Biotechnology	Member
3	Dr.G.Delina	Associate Professor - Business Administration	Member
4	Dr.M.Kalpana	Associate Professor - Electronics and Communication Engineering	Member
5	Dr.K.Suthendran	Associate Professor - Information Technology	Member
<b>Assistant Professors</b>			
<b>S.No</b>	<b>Name of the person</b>	<b>Designation</b>	<b>Member</b>
1	Dr.E.V. Ramkumar	Assistant Professor - English	Member

<b>External Members - Academia</b>			
<b>S.No</b>	<b>Name of the person</b>	<b>Designation</b>	<b>Member</b>
1	Prof.Maniklal Das	Professor, Computer Science, Dhirubhai Ambani Institute of Information and Communication Technology (DA-IICT), Gandhinagar, India	Member
2	Prof.Jagadeesh Gopalan	Professor, Department of Aerospace Engineering, Indian Institute of Science, Bangalore, India	Member
3	Dr.Sharad Mhaiskar	Pro Vice Chancellor · NMIMS University	Member
<b>External Members - Industry</b>			
<b>S.No</b>	<b>Name of the person</b>	<b>Designation</b>	<b>Member</b>
1	Shri Vithal Madyalkar	Country Manger - IBM Innovation, Centre for Partners at IBM India Ltd.	Member
2	Shri Venkatesh Prasad	Nanochip Solutions Pvt. Ltd.	Member
<b>Secretary</b>			
<b>S.No</b>	<b>Name of the person</b>	<b>Designation</b>	<b>Member</b>
1	Dr.V.Vasudevan	Registrar	Ex-officio
<b>Permanent Invitees</b>			
<b>S.No</b>	<b>Name of the person</b>	<b>Designation</b>	<b>Member</b>
1	Dr. A. Koteswararao	Director Academics	Ex-officio
2	Dr.M.Pallikonda Rajasekaran	Director - Research and Development	Ex-officio
3	Dr.P.Sarasu	Director - International Relations and Industry Interactions	Ex-officio
4	Dr.M.Muthukannan	Director - Student Affairs	Ex-officio
5	Dr.T.R.Neelakantan	Director - Ranking and Accreditation	Ex-officio

6	Dr.S.Seshadhri Srinivasan	Director - International Research Centre	Ex-officio
7	Dr.C.Sivapragasam	Director - FALT	Ex-officio
8	Dr. R. Ramalakshmi	Director – Centre for Distance and Online Education	Ex-officio
9	Dr.J.T.Winowlin Jappes	Controller of Examinations	Ex-officio

**Table : 10.1.3.4 Composition of Finance Committee**

<b>S.No</b>	<b>MEMBERS</b>	<b>DESIGNATION</b>
1.	Dr. K. Sridharan, Chancellor, Kalasalingam Academy of Research and Education	CHANCELLOR,
2	Dr. R. Nagaraj Vice Chancellor, Kalasalingam Academy of Research and Education	CHAIRMAN Finance Committee
3	Dr. S. Shasi Anand, Vice President, Kalasalingam Academy of Research and Education	MEMBER Nominated by Trust
4	Mr. T. Krishnamoorthy, No.30, 1 <sup>st</sup> Cross Street, Kasturba Nagar, Adyar, Chennai 600 020.	MEMBER Nominated by Board of Management
5	Dr. G. Swaminathan Retd. Dean, Madurai Medical College, Madurai	MEMBER Nominated by Board of Management
6	Dr. V. Vasudevan Registrar, Kalasalingam Academy of Research and Education	Special Invite

7	Mrs. Sundari Ramakrishnan, Finance Officer Kalasalingam Academy of Research and Education	Member Secretary Finance Committee
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The Academic Council is principal academic body of the Institute and shall subject to the provisions to the Memorandum of Association and the Rules and Bye-Laws shall have the control over and be responsible for the maintenance of standards of education, teaching and training, inter departmental co-ordination, research, examinations and tests with in the Institute and shall exercise such other powers and perform such other duties and functions as may be imposed or conferred upon it by the Rules and Bye-Laws.

**1. The functions and duties of the Finance Committee shall be as follows:-**

1. to examine and scrutinize the annual budget of the Institution and to make recommendations on financial matters to the Board of Management;
2. to consider all proposals for new expenditure and to make recommendations to the Board of Management;
3. To consider the periodical statements of accounts and to review the finances of the Institution from time to time and to consider re-appropriation statements and audit reports and to make recommendations to the Board of Management;
2. The Finance Committee shall meet at least, twice in every year. Three members of the Finance Committee shall form the quorum.
3. The Vice- Chancellor shall preside over the meetings of the Finance Committee, and in his absence, a member elected at the meeting shall preside. In case of deference of opinion among the members, the opinion of the majority of the members present shall prevail.
4. The constitution, powers and functions of the other authorities which may be declared by the Statutes to be the authorities of the Institution, shall be such as may be prescribed.

**Table 10.1.3.5: Planning and Monitoring Committee;**

<b>S. No.</b>	<b>Name and Address</b>	<b>Designation</b>
1.	Prof. R. Nagaraj Vice Chancellor Kalasalingam University	Chairman
2.	Dr. S. Shasi Anand, Vice President, Kalasalingam University	Member – Nominated by Board of Management
3.	Prof. S.K. Singh, Professor & Dean (AA), Department of Civil and Environmental Engineering, Delhi Technological University, New Delhi 110 042.	Member - UGC Nominee
4.	Prof. P. Gunasekaran Vice Chancellor VIT Bhopal University, Bhopal	Member – Nominated by Board of Management
5.	Prof. S. Sivasubramanian, Former Vice Chancellor, A-3, Lake View Apartment, 1, Anna Nedunchalai, Perungudi, Chennai 600 096.	Member – Nominated by Board of Management
6.	Prof. G. Arumugam, Former Professor, Dept. of Computer Science, MKU, 7/64, Punnagai Illam, Wellington Road, NGGO Colony, Nagamalai, Madurai - 625 010.	Member – Nominated by Board of Management
7.	Dr. D. Devaraj, Dean - SEET & Director – Academics,	-do-

	Kalasalingam University	
8.	Dr. K. Sundar, Dean – SBCE & Director - IRC Kalasalingam University	-do-
9.	Dr. S. AsathBahadur, Director – Student Affairs, Kalasalingam University	-do-
10.	Dr. S. Balamurali, Director – R & D Kalasalingam University	-do-
11.	Dr. C. Sivapragasam, Director (IQAC) Kalasalingam University	-do-

**1. The Planning Board shall be the principal planning body of the University and shall have the following powers and functions:**

- to prepare and recommend short-term and long-term plans of the University;
- to conduct periodic impact assessment of the educational programmes offered by the University;
- to recommend new structures to be created in the Institution such as Schools / Centres;
- to frame structures, rules, norms and processes to facilitate smooth functioning and quality enhancement;
- to identify and recommend to the Academic Council / Board of Management on new areas of study keeping in view the vision and mission of the University;
- to develop financial models and recommend ideas for resource mobilization, funding initiatives and fund management;
- to recommend the principles and policy framework for financial and human resource planning and norms for allocation for various activities of the University;
- to develop and recommend modes, designs and strategies of instruction, and structures required for these;
- to plan and review the infrastructure development of the University;

- to plan and recommend the design framework of comprehensive information system covering all aspects of the functioning of the University;
- any other work that the Planning Board can take for itself, or which other statutory bodies assign the Planning Board.

### **EMPLOYEE SERVICE RULE**

Employees appointed in KARE are governed solely by the rules and regulations laid down by the Board of Management.

#### **1. Authority**

KARE is wholly administered by a Trust and its Board of Management reserves its right to alter or amend or repeal or annul any or all of the rules and regulations.

#### **2. Appointment**

1. Qualifications for various posts shall always be in accordance with the norms prescribed by the Board of Management from time to time.
2. Employees appointed shall deposit all the original certificates of their academic qualifications with KARE on the date of joining duty. In cases where original certificates cannot be deposited due to reasons beyond their control, a security deposit equivalent to three months salary and allowances will have to be made on the date of joining. The deposit will be refunded on the date when the employee submits all original certificates.
3. When the employee has to necessarily produce the originals to an external body, the employee shall produce the proof of such a requirement and deposit a sum equivalent to 3 months gross salary (including allowances) of the employee and collect the originals from KARE. The holding of the certificates by the employee in such cases shall not exceed one month from the date of such withdrawal. The deposit amount will be refunded on surrendering all the certificates to KARE.

#### **3. Accountability and Responsibility**

1. Employees should maintain punctuality always. They should not leave the campus before the closing time of work for the day without obtaining the permission from the concerned authority.
2. Every faculty shall complete the syllabus for the courses as prescribed by KARE.
3. Every faculty is normally held responsible for the results of the students taught by him.

- Absence from duty without obtaining prior sanction of leave, or habitual late attendance will amount to gross misconduct attracting summary termination of service.

#### 4. Salary

- Salary payable to any employee is formulated by KARE from time to time.
- Salary is credited to the account maintained in the Bank by the employee within 7 working days in the succeeding month.

#### 5. Provident Fund

- Employees are governed by the Employees Provident Fund Miscellaneous Act 1952.

#### 6. Promotions and Increments

- Promotions shall be made only on the basis of ‘merit and performance.’
- The Board of Management has the right to prescribe the mode to assess the performance of the employee. Faculty members desires of promotion should apply when the application is called for in the proper format.
- The eligibility criteria for applying promotion are given in the table below. For Arts and Management, 2 papers in SCIE journal can be equated to 1 book publication through a reputed national level or international publisher. For higher categories of promotion, student feedback and examination results are not mentioned explicitly assuming that the aspirants are experienced teachers.

**Table 10.1.3.6: Minimum Expectation for Promotion**

Category	Engineering / Technology	Science/Arts/Management
ACP to Professor	<p>Any three of the below</p> <ul style="list-style-type: none"> <li>10 papers in SCIE indexed journals maintaining undisputed quality and having impact factors</li> <li>2 Ph.D.s produced</li> <li>2 research grants received</li> <li>4 years of service as ACP</li> </ul>	<p>Any three of the below</p> <ul style="list-style-type: none"> <li>10 papers in SCIE indexed journals maintaining undisputed quality and having impact factors</li> <li>4 Ph.D.s produced</li> <li>2 research grant received</li> <li>6 years of service as ACP</li> </ul>
AP III to Associate Professor	<p>Any three of the below</p> <ul style="list-style-type: none"> <li>5 papers in SCIE indexed journals maintaining undisputed</li> </ul>	<p>Any three of the below</p> <ul style="list-style-type: none"> <li>7 papers in SCIE indexed journals maintaining undisputed quality</li> </ul>



(ACP)	<p>quality and having impact factors</p> <ul style="list-style-type: none"> <li>• 2 Ph.D.s guiding</li> <li>• 1 research grant</li> <li>• 4 years of service as APIII</li> </ul>	<p>and having impact factors</p> <ul style="list-style-type: none"> <li>• 1 Ph.D. produced</li> <li>• 1 research grant</li> <li>• 6 years of service as APIII</li> </ul>
AP II to AP-III	<p>Any three of the below</p> <ul style="list-style-type: none"> <li>• Good feedback from students and 90% results in examinations</li> <li>• Ph.D. qualification</li> <li>• 2 papers in SCIE indexed journals maintaining undisputed quality and having impact factors</li> <li>• 4 years of service as APII</li> </ul>	<p>Any four of the below</p> <ul style="list-style-type: none"> <li>• Good feedback from students</li> <li>• 90% results in examinations</li> <li>• 2 Ph.D.s guiding</li> <li>• 4 papers in SCIE indexed journals maintaining undisputed quality and having impact factors</li> <li>• 6 years of service as APII</li> </ul>
AP I to AP II	<p>Any four of the below</p> <ul style="list-style-type: none"> <li>• Good feedback from students</li> <li>• 90% results in examinations</li> <li>• Ph.D. registration confirmed</li> <li>• 2 papers in scopus indexed journals with SNIP</li> <li>• 4 years of service as API</li> </ul>	<p>Any four of the below</p> <ul style="list-style-type: none"> <li>• Good feedback from students</li> <li>• 90% results in examinations</li> <li>• Ph.D. qualification</li> <li>• 2 papers in SCIE indexed journals maintaining undisputed quality and having impact factors</li> <li>• 5 years of service as API</li> </ul>

4. When the authorities realize extra-ordinary contributions from a faculty member, fast-track promotion will be conferred without separate application and processing. Fast-track promotion is possible in the case of extra-ordinary performance of faculty member in teaching and/or research and/or administration.
5. DA revisions and increments are decided based on the prevailing situations frequently.

### 7. Leave

Leave cannot be claimed as a matter of right. The essence of the leave regulations is to enhance the sense of responsibility in a faculty member to impart, without any break, credible and effective teaching to the students given to his or her charge during the academic session. Hence,

any leave application expected to state alternative arrangements made for the academic activities. Wherever suitable, the necessity of granting the leave in terms of benefits to the student community and administration of KARE is also to be stated. Granting of any leave is at the discretion of KARE.

1. Faculty members can apply for on-duty leave on their own for a period not exceeding 10 days in an academic year. On-duty leave may be granted to a staff member for attending conferences, Faculty Development Programmes, undertaking examiner-ship in a university, etc. On-duty leave can be availed after getting approval from HoD, Dean and Director-Accreditation and Ranking. During academic teaching session, applying for on-duty leave shall be avoided.
2. By completion of a month of service, an employee is eligible for a casual leave of one day. Employees are permitted to avail 12 days of casual leave in a year (July to June). Casual leave counting start afresh from July of every year and Casual leave is not carried over. However, staff working for admission and administration may be allowed to avail casual leave in special circumstances by the approval of the Vice-Chancellor.
3. The maximum period for which casual leave can be taken is not more than 3 days at a time, except under special circumstances. For more than 3 continuous days of casual leave approval is to be obtained from Vice-Chancellor. Sundays and holidays, when prefixed or suffixed to casual leave, will not count towards casual leave.
4. Employees are expected to avail casual leave with prior approval. Casual leave availed without prior sanction, or refusal of sanction by the competent authority or leave extended beyond the sanctioned period can be treated as leave on loss of pay and repeated such incidents may result in disciplinary action. Employees, after exhausting the casual leave, if required to proceed on leave on loss of pay, shall get prior sanction from the Vice-Chancellor through proper channel, clearly stating the emergency. The Vice-Chancellor treat appropriately the leave on loss of pay availed by the faculty without prior sanction.
5. Those who did not exhaust their casual leave at the end of June of every year are entitled for earned leave equal to  $\frac{1}{3}$ <sup>rd</sup> of the remaining casual leave + 2 day in a year. While casual leave is not carried over to the next year, earned leave can be accumulated to a maximum of 30 days. Earned leave can be encashed at a minimum interval of two years and the approval will be based on budget allocation.

6. Leave on medical grounds with full pay shall be granted to any Employee subject to (i) availability of casual and earned leaves at his credit and (ii) production of a medical certificate from a registered medical practitioner. Such a medical certificate should accompany the requisition for leave. At the time of rejoining duty, a certificate of fitness issued by a registered medical practitioner should be produced. KARE reserves the right to instruct that employee to appear before any medical practitioner for medical examination, before sanctioning the leave and for fitness verification to rejoin.
7. Employees with more than 5 years of service can apply for the earned leave for any unavoidable reasons other than sickness with prior permission. Members of the teaching faculty cannot avail the earned leave while the academic session is in progress. Earned leave can be availed at a maximum of one occasion in a year.
8. Generally circular for vacation leave is issued by the end of odd and even semesters. Faculty member attending to teaching work who have completed three years of services as on 30<sup>th</sup> June of the year are entitled to vacation leave which shall not exceed 30 days (20 days in summer and 10 days in winter) in an academic year. However, if duties assigned during vacation-leave should be given priority and attended. Faculty members who did not teach at KARE, and those who availed leave on loss of pay in any one or both of the immediate earlier semesters are not entitled for vacation. HoD need to submit and get approval of the vacation leave proposal of all faculty members of the department and ensure that at least 1/3 of the faculty members are available anytime.
9. Faculty members can be granted study leave and deputed for higher studies. Such a leave shall not exceed 36 months in the whole of the employee's career. In such cases, the employee has to execute an agreement, as prescribed by KARE, to serve KARE for a minimum period which will be not less than three times of the leave availed of from the date of re-joining.
10. Sabbatical leave for research work shall be granted for faculty members with more than 3 year of experience at KARE. The maximum period of sabbatical leave can be 2 weeks. Leave for postdoctoral fellowship shall be granted for a maximum of 1 year for faculty members with more than 1 year of experience at KARE. Once availed, the next sabbatical leave may be granted after a minimum period of 2 years considering the outcomes of previous sabbatical leave.

11. No employee shall remain absent after the expiry of his leave period without obtaining prior sanction for extension of leave. Such overstay will be treated as dereliction of duty and attract penalty.
12. All married female employees with more than 3 years of experience at KARE are eligible for maternity leave. Maternity leave with full pay for a maximum of 26 weeks at each instance can be availed by female employees with less than two surviving children.
13. Staff can avail a maximum of 5 days of compensation leave for 'Work on Holiday' (WH) in a year. If a staff is to be assigned WH beyond 5 days in a year, prior written permission should be obtained from Vice-Chancellor stating necessity and the history of WH of the staff in the year.

#### **8. Code of Conduct**

1. Employees should maintain absolute integrity and absolute devotion to duty at all times.
2. Those holding responsible posts should maintain independence, and impartiality in the discharge of their duties.
3. Report to superiors the fact of your arrest or conviction in a Criminal Court and the circumstances connected therewith, as soon as it is possible to do so.
4. If any legal proceedings are instituted for the recovery of any debt due from employee or for adjudging employee as an insolvent, is to be reported to the immediate authority.
5. Employees are expected to maintain high ethical standards and honesty; promote the principles of merit, fairness and impartiality in the discharge of duties; maintain accountability; and use resources efficiently, effectively and economically.
6. Employees are expected to refrain from doing anything which is or may be contrary to any law, rules, regulations and established practices.
7. Employees are expected to use the IT infrastructure and facilities for official use only.
8. Employees are expected not to engage in canvassing business of Life Insurance Agency, Commission Agency or Advertising Agency owned or managed by family members or others.
9. Employees are expected to keep away from demonstrations organized by political parties in the vicinity/neighborhood of Government offices and maintain political neutrality.
10. Employees are expected not to receive gifts from students, parents and subordinates.

**9. Seeking other employments, part time work etc.**

1. No employee shall accept a paid employment either on part time or advisory basis in any company, educational KARE, mutual benefit societies or any other society or firm or act as an agent either on salary or commission basis.
2. No employee shall, except with the prior sanction of KARE, own wholly or in part, conduct or participate in any business activities including private tuition.
3. Employees applying for higher education and employment in other KAREs should route their application through the proper channel.
4. In cases where applications have been routed through the proper channel, before attending any interview, employee should obtain prior permission from the Vice- Chancellor, through the proper channel. A photo copy of such call letter shall accompany his request.
5. In an academic year only 2 applications seeking employment elsewhere will be forwarded, with a ceiling of 6 applications in his service in this KARE.

**10. Publications, Public Utterances etc.**

1. Employee should not use official position or influence for publication or the sale of books and other publications (written, audio and video) that contain political or other aspersions, objectionable material and views against the policies of the Government.
2. No employee shall be a member of, or be associated with any political party or any organization which takes part in politics nor shall he take part or subscribe or associate or assist in any manner in political movements or activities.
3. No employee shall be a member, representative or office bearer of any association representing or purporting to represent the employee member unless the association shall not indulge in any activities detrimental to the interests, growth and functioning of KARE and the association shall not indulge in any activities defaming KARE or other colleagues or superiors.
4. No employee shall engage himself or participate in any activity that is anti-secular or which tends to create disharmony in any society, or in any demonstration which is prejudicial to the interest of the sovereignty and integrity of India, security of the State and the relationship between State and the Centre, relationship between KARE and the Government both at the Centre and the State.
5. Any employee involved in criminal or civil proceedings shall inform KARE of such proceedings.

6. No employee shall associate and / or participate in any strike or incitement thereto or in similar activities, which shall also include absence from work or instigating others or neglect of duties with the aim of getting a demand accepted by the superiors or KARE.
7. If any question arises, as to whether a membership or activity falls within the scope of this rule, the decision of KARE shall be final and binding.

### **11. Marriage and Morality**

1. No employee shall enter into or contract a marriage with a person having a living spouse. No employee, having a living spouse, shall enter into or contract a marriage with another person.
2. No employee shall engage himself in the activities of a tout.
3. Employees shall endeavour to avoid habitual indebtedness, loss or insolvency. No employee shall indulge in money lending business in KARE.
4. No employee shall involve himself in any act of moral turpitude on his/her part which may cause embarrassment or bring discredit to KARE.
5. As KARE is an educational institution, all employees are forbidden from consuming liquor or narcotics either in the campus or outside the campus while on duty or otherwise. Employee should be a role model to students.
6. Every employee shall maintain absolute integrity and attention to duty at all times and shall do nothing which is unbecoming of an employee of KARE.
7. Employees have a bounden responsibility to protect the dignity and modesty of the employees and students. Any act of moral turpitude reported on any employee shall entail summary termination, after an enquiry. The service certificate shall carry a due endorsement of such moral turpitude.

### **12. Disclosure of documents and information**

No employee shall in the performance of the duties assigned to him release or disclose, directly or indirectly, any official documents or any part thereof or information to any other person to whom he is not authorized to communicate such information or documents.

### **13. Plagiarism / Intellectual Property Rights**

Disciplinary proceedings will be initiated against an employee indulging in plagiarism, violation of intellectual property rights, copyrights and other unlawful activities. If found necessary, such case will be referred to the law-enforcing authority.

### **14. Strike and Demonstrations**

No employee shall associate and / or participate in any strike or incitement thereto or in similar

activities, which shall also include absence from work or instigating others or neglect of duties with the aim of getting a demand accepted by the superiors or KARE.

### **15. Age of Superannuation**

1. The age of superannuation shall be 65 years and the member will be relieved from the services at the end of that academic year.
2. KARE reserves its right to extend the service of a superannuated employee on yearly basis and / or appoint superannuated candidate on contract basis.

### **16. Suspension**

KARE has the absolute right to place any employee under suspension for any breach of rules. During the period of suspension, KARE shall pay him subsistence allowance every month at the rate of 1/4 of the basic pay which the employee was drawing at the time of suspension. The pay does not include DA or any other allowance payable to him.

### **17. Disciplinary Proceedings**

1. The Registrar shall be the Disciplinary Authority in respect of all employees and the Vice-Chancellor shall be the Appellate Authority.
2. In case of the Registrar, the Vice-Chancellor shall be the Disciplinary Authority and the Board of Management shall be the Appellate Authority.
3. Any employee aggrieved by the order of the Disciplinary Authority may prefer an appeal to the Appellate Authority within 30 days from the date of the order of the Disciplinary Authority. The Appellate Authority shall pass an order within 45 days on receipt of an appeal from the aggrieved employee. If in any case the delinquent employee seeks adjournment of personal hearing, the ceiling of 45 days shall not apply.
4. If an enquiry is found necessary, an Enquiry Officer shall be appointed by the Vice-Chancellor who shall conduct the proceedings of the enquiry in a venue chosen by the Enquiry Officer. If the venue is other than the campus the delinquent employee shall be entitled to TA as admissible. In the course of an enquiry, the employee has to defend himself. Enquiry Officer may be appointed either from among the members of staff or from outsiders.

### **18. Punishment**

Violation of any of the above rules or regulations in force and are to be framed and implemented from time to time, shall entail termination of service or dismissal without notice.

### **19. Resignation and Termination**

1. The notice given by any employee who intends to leave the service of KARE should be co-terminus with the end of a semester. The end of the semester is generally taken as 30<sup>th</sup> November or 30<sup>th</sup> April of every year. However, faculty member should carry out the work of the whole term during the semester to justify the allocation of the students or project.
2. During the first year of service at KARE, any member of staff can leave the service by giving 30 days notice or on payment of 30 days salary in lieu thereof to KARE. Similarly KARE shall also be at liberty to terminate the services of members of staff by serving 30 days notice or on payment of 30 days salary in lieu thereof.
3. After a service of one year, employee can get relieved from services by serving 3 months advance notice to KARE of his intention to leave the services, or by remitting 3 months salary in lieu thereof. The Appointing Authority may either reduce this period or call upon the employee concerned to continue till the end of the academic session in which the notice is received. Similarly KARE shall also be at liberty to terminate the services of members of staff by serving 3 month's notice or paying 3 months salary in lieu thereof.
4. Any employee who is desirous of leaving the services when the academic session is in progress (ie. before 30<sup>th</sup> November or 30<sup>th</sup> April) will have to pay to KARE an additional compensation of one month salary.
5. The employee who applied for relief from service shall not be granted any leave except casual leave during the notice period.
6. Any employee dismissed or terminated from services for gross misconduct or for inefficiency or insubordination or causing loss of reputation or monetary loss to KARE is not entitled to any Gratuity and / or Superannuation benefits.
7. The Appointing Authority has the power to dismiss or terminate the services of a member for reasons such as gross misconduct, repeated inefficiency records in discharging duties, insubordination, causing loss of reputation, causing monetary loss to KARE, retention in service is considered undesirable due to medical reasons, anytime without any notice and without any payment.
8. The Appointing Authority reserves the right to terminate the services of any employee at any time without giving prior notice and without assigning any reason thereto.



## **20. Saving Clause**

These rules framed for the conduct of KARE shall supersede the earlier rules if they are not in consonance with the rules presently framed. The rules in force shall be applicable to all the paid employees of KARE.

### **10.1.4 Decentralization in working and grievance Redressal mechanism (5)**

(List the names of the faculty members who have been delegated powers for taking administrative decisions. Mention details in respect of decentralization in working. Specify the mechanism and composition of grievance redressal cell including Anti Ragging Committee & Sexual Harassment Committee.)

#### **Response:**

1. KARE follows a decentralized and participative management in decision making.
2. A bottom-up approach is adopted including all stakeholders in planning and execution of activities. In its constant endeavor towards ensuring quality education, the Board of Management, provides valuable suggestions and advice towards holistic growth of the Institution.
3. There are 10 Schools and 27 Departments. Each school is headed by the Dean, while the Departments by the HoD. Schools and Departments are autonomous entities which are entitled to create/amend course curriculum, conduct PAB and BoS meetings, organize regular classes, continuous assessment, student progression, research workshops, guest lectures, approve staff/student leaves, collect feedback from various stakeholders, recommend purchase of required hardware/software and maintenance of Department Association Finances in a completely decentralized manner
4. ERP software modules developed in-house like Exam Administrative System (EASY), Faculty Information System (FIS), Smart SMS (SSMS), Parents Corner (PACO), Attendance Information and Maintenance System (AIMS), Staff Attendance and Leave Tracking (SALT) and Student Information System (SIS), helps the university in extending the autonomy further in administering various day to day activities seamlessly.
5. The hostel management committee, comprising of student members plays an active role in formulating various hostel policies leading to the comfort of inmates.

6. Class committee comprising of student members and faculty helps the department in efficient deployment and utilization of its resources and time. Students' council further strengthens the process of decision making by providing timely suggestions.
7. Alumni Association contributes its might in various policy making committees such as curriculum review, placement training, IQAC etc.,
8. Various statutory committees such as Anti-ragging, Grievance redressal, Gender equity cell, Women empowerment cell etc., contribute towards framing of policies as prescribed by AICTE/UGC. In addition to the above, Board of Management, Academic Council, Planning and Monitoring Board and Finance Committee comprises of members drawn out from various stakeholders and these committees take active role in nurturing the growth of the university as per its strategic plan.

Functions of Board

**Table 10.1.4.1 List the names of the faculty members who have been delegated powers for taking administrative decisions:**

S.No	Name of the Schools	Dean	Departments	Head of the Department
1	Kalasalingam School of Architecture (KSOA)	Dr. N. Lakshmi Thilagam	Architecture	Ar. H. Ahmed Fazeel Akram
2	School of Bio, Chemical and Processing Engineering (SBCE)	Dr. R. Rajam	Biotechnology	Dr. T. Kathiresan
			Chemical Engg	Dr. Vikranth Volli
			Food Tech.	Dr. R. Rajam (i/c)
			Agri Engineering	Dr. D.Sivakumar
3	Dean – School of Electronics, Electrical and Biomedical Technology (SEET)	Dr. Sivakumar Pothiraj	ECE	Dr. Sivakumar Pothiraj (i/c)
			EEE	Dr. A. Ramkumar
			EIE	Dr. Yogeshwar Chakrapani
			BME	Dr. G. Vishnuvarthanan

4	Dean – School of Computing (SoC)	Dr.P.Deepalakshmi	CSE	Dr. P. Deepalakshmi (i/c)
			<b>Stream Coordinators</b>	
			1	Dr. B. S. Murugan
			2	Dr. N. C. Brintha
			3	Mr. R.Rajasubramanian
			4	Dr. C. Balasubramaniam
			Information Tech	Dr. S. Dhanasekaran
			Computer Applications CS & IT	Dr. K. Kartheeban
5	Dean – School of Mechanical, Aero, Autoand Civil Engineering (SMACE)	Dr. Rajini Nagarajan	Mechanical	Dr. V. Arumugaprabhu
			Automobile	Dr. S. Thirumalaikumaran
			Aeronautical	Dr. S. Arunvinthan
			Civil	Dr. P. L. Meyappan
6	Kalasalingam School of Agriculture & Horticulture (KSAH)	Dr. Jesu Edward George	Horticulture	Dr. K. Selvarani
			Agriculture	Dr. S. Vasumathi
7	Dean – Kalasalingam Business School (KBS)	Dr. R. Viji	Business Administration	Dr. R. Viji (i/c)
			Commerce	Dr. S. Karthik
			Social Work	Dr. M. Maria Antony Raj
			SHIP	Dr. K. Karthiga Devi
8	Dean – School of Advanced Sciences (SAS)	Dr. Dattatri Nagesha	Mathematics	Dr. M. Kameshwari
			Physics	Dr. B. Selvakumar
			Chemistry	Dr. K.K. Praneeth
			Forensic Sc	Ms. A. V. Surabhi

9	Dean – School of Liberal Arts and Education (SLASE)	Dr. V. Pandiyarajan	English	Dr. S. Rema Devi
			Visual Communication	Mr. K. Prabakar
			Catering Science & Hotel Management	Mr. J. Prabhu
			Special Education	Mr. D. M. Rajan
10	Dean – School of Freshman Engineering	Dr. C. Ramalingam		

**Table 10.1.4.2. Administrative Portfolio:**

S.No	Portfolio	Position	Incharge
1	<b>Registrar Office</b>	Deputy Registrar (Public Relations)	Dr. P. G. Gurusamy Pandian
		Deputy Registrar (Nodal Officer)	Dr. B.S. Murugan
		Deputy Registrar (Legal)	Dr. S. R. Srikumar
2	<b>Academics</b>	Director	Dr. Koteswara Rao Anne
3	<b>Student Affairs</b>	Director	Dr. M. Muthukannan
		Deputy Director (Extn. Activities & CCE)	Dr. S. Rajesh (MECH)
4	<b>IQAC, Accreditations &amp; Rankings</b>	Director	Dr. T. R. Neelakantan
		Deputy Director	Dr. V. Pandiyarajan
5	<b>Research and Development</b>	Director	Dr. M. P. Rajasekaran
		Deputy Director	Dr. S. Karthikeyan
6	<b>FALT</b>	Director	Dr. C. Sivapragasam
		Deputy Director	Dr. K. Rajesh (EEE)

7	<b>Examinations</b>	Controller of Examinations	Dr. J.T. Winowlin Jappes
		Deputy CoE (Examinations)	Dr. E. V. Ramkumar
		Deputy CoE (Evaluation)	Dr. Jayato Nayak
8	<b>Corporate Relations</b>	Director	Dr. A. Alavudeen
9	<b>IRC</b>	Director	Dr. S. Seshadri Srinivasan
10	<b>Industry/International Relations/General Administration</b>	Director	Dr. P. Sarasu
		Deputy Director (Branding and Media)	Dr. S. Suprakash
		Deputy Director (Online Marketing)	Dr. T. Senthil Muthukumar
		Deputy Director (Innovation and Entrepreneurship Development Cell)	Dr. J. Deny
11	<b>Admissions</b>	Director	Mr. A. Lingusamy
12	<b>Centre for Distance and Online Education (CDOE)</b>	Director	Dr. R. Ramalakshmi
13	<b>Campus Residence</b>	Director	Dr. J. T. Winowlin Jappes
		Deputy Director (Boys)	Dr. S. P. Balakannan
		Deputy Director (Girls)	Dr. C. Sangeetha

### **Grievance and Redressal Mechanism:**

A Grievance Redressal Committee has been constituted for the redressal of the problems reported by the Students of the Institution with the following objectives:

- Upholding the dignity of the Institution by ensuring strife free atmosphere in the Institution through promoting cordial Student-Student relationship and Student teacher relationship etc.

- Encouraging the Students to express their grievances / problems freely and frankly, without any fear of being victimized.
- Suggestion / complaint Box have been installed in front of the various Blocks in which the Students, who want to remain anonymous, put in writing their grievances and their suggestions for improving the Academics / Administration in the Institution.
- Advising Students of the Institution to respect the right and dignity of one another and show utmost restraint and patience whenever any occasion of rift arises.

The Committee formally meets to review all cases, prepares a statistical reports about the number of cases received, attended to and the number of pending cases, if any, which require direction and guidance from the higher authorities.

In the case, the complainant not satisfied with the decision of the Committee, they may send their appeals to the “OMBUDSMAN” of the University. The OMBUDSMAN will fix a date for hearing the Complainant which shall be communicated to the Institute and the aggrieved person.

#### **ANTI-RAGGING COMMITTEE**

##### **RAGGING IN ANY FORM IS A CRIME**

Ragging is totally banned and punishable as per the government order. If any student is found indulging in any sort of ragging or harassment to juniors or other fellow students, inside or outside the campus, bus, hostel, he/she will be dismissed immediately from the university and criminal action will be taken against them as per the rules. Excerpts of TAMILNADU PROHIBITION OF RAGGING ACT 1997 for general

##### **Information**

This Act is called the Tamil Nadu Prohibition of Ragging Act 1997. It extends to the whole of the State of Tamil Nadu

##### **Definition**

In this Act, unless the context otherwise requires, “ragging” means display of noisy, disorderly conduct doing any act which cause or is likely to cause physical or psychological harm or raise apprehension or fear or shame or embarrassment to a student in any educational institution and includes

- a) Testing ,abusing of playing practical jokes ,on causing burt to such student
- Or
- b) Asking the students to do any act or perform something which such students will not in the ordinary course willingly do

### **Prohibition of ragging**

Ragging within or without any educational institutional is prohibited

### **Penalty for Ragging**

Whoever directly or indirectly commits, participates, in abets or propagates “ragging” within or without any educational institution, shall be punished with imprisonment for a term which may extend to two years any shall also be liable to a fine which may extend to ten thousand rupees.

### **Dismissal of student**

Any student convicted of an offence under section 4 shall be dismissed from the educational institution and such student shall not be admitted in any other educational institution.

### **Suspension of student**

- 1) Without prejudice to the foregoing provisions, whenever any student complains of ragging to the Hand of an Educational Institution, or to any other person responsible for the management of the educational institution he/she shall inquire in to the same immediately and if found true shall suspend the student who has committed the offence, from the educational institution.
- 2) The decision of the Head of the Educational institution or the person responsible for the management of the Educational Institution that any student has indulged in ragging under subsection (1) shall be final

### **DUTIES OF ANTI-RAGGING COMMITTEE**

Anti-ragging committee to take all necessary steps require to enforce provision of UGC regulations 2009 in this regard as well as the provision of any law for the time being in force concerning ragging, and also to monitor and oversee the performance of the anti-ragging squad in the prevention of ragging in the institution

### **DUTIES OF ANTI-RAGGING SQUAD**

1. To carryout surprise raids in the hostels and any other places vulnerable to incidents of ragging.
2. To conduct an on-the-spot enquiry into any incident of ragging referred to it by Head of the Institution, members of faculty, members of staff, any student, any parent or guardian, any employee of service provider or any other person. The enquiry report along with recommendations shall be submitted to anti-ragging committee. The anti-ragging squad shall conduct such an enquiry observing a fair and transparent procedure based on the

principles of natural justice and after giving adequate opportunity to the student or students accused of ragging and other witnesses to place before it the facts, documents and views concerning the incident of ragging, and considering such other relevant information as may be required.



Ref No: KARE/SA/GR/Circular/20-21/1

Date: 10.07.2020

**Circular**

An Anti-Ragging Committee consisting of the following is reconstituted for the academic year 2020 – 2021, to prevent the menace of ragging in the University premises.

Sl.No	Name of the Faculty	Designation	Role in ARC
1.	Dr. V. Vasudevan	Registrar	Convener
2.	Dr. P. Sivakumar	Director (Student Affairs)	Co-Convener
3.	Dr. K. Suthendran	Warden	Member
4.	Dr. C. Ramalingam	Dean/ SAS	Member
5.	Dr. S. P. Balakannan	Deputy Director (Campus Life)	Member
6.	Mrs. S. Kavitha	Deputy Director (Student Affairs)	Member
7.	Dr. V. Muneeswaran	Assistant Professor, ECE	Member
8.	Ms. S. Banupriya	Assistant Professor, English	Member
9.	Deputy Superintendent of Police	Srivilliputtur	Member
10.	Tahsildar	Srivilliputtur	Member
11.	Mr. M. Jeyaraj	Reporter, Thinakaran & Tamil Murasu, Srivilliputhur	Member
12.	Mr. D. Jagaveera Pandian	District Information and Public Relation Office Collectorate, Virudhunagar	Member
13.	P. Gokul	IV Year B. Tech / ECE	Member
14.	A. Ragasree	III Year B. Tech / Civil	Member
15.	R. Karthiga Chandran	IV Year B. Tech / Biotech	Member
16.	Gopu Siva Rama Reddy	III Year B. Tech / Mech	Member
17.	Saddikuti Jeevan Reddy	III Year B. Tech / CSE	Member
18.	R Bhuvhanesan	III Year B. Tech / EEE	Member
19.	Mr. R. Jeyakumar	Estate Engineer	Member
20.	Dr. B.S. Murugan	Associate prof, IT	KARE UGC Nodal Officer

To  
The Members concerned

cc: to KARE – website i/c. to update the above committee in our website immediately.

VICE CHANCELLOR

Figure10.1.4.1 Composition of Anti Ragging Committee





Ref No: KARE/SA/GR/Circular/20-21/2

Date: 10.07.2020

**Circular**

An Anti-Ragging Squad Committee consisting of the following is reconstituted for the academic year 2020 – 2021, to prevent the menace of ragging in the University premises.

Sl.No	Name of the Faculty	Designation	Role in ASC
1.	Dr. V. Vasudevan	Registrar	Convener
2.	Dr. P. Sivakumar	Director (Student Affairs)	Co-Convener
3.	Dr. S. P. Bala kannan	Deputy Director (Campus Life)	Member
4.	Mrs. S. Kavitha	Deputy Director (Student Affairs)	Member
5.	Dr. Viji	HoD/ MBA	Member
6.	Dr. K. Suthendran	Warden	Member
7.	Dr. M. Sivasubramanian	Dy. Warden – Bhagath Singh Hostel	Member
8.	Dr. P. Aruna Jayanthi	Dy. Warden – Sarojini Naidu Ladies Hostel	Member

To

The Members concerned

cc: to KLU – website i/c. to update the above committee in our website immediately.

VICE CHANCELLOR

**Figure 10.1.4.2 : Composition of Anti Ragging Squad:**



# KALASALINGAM

## ACADEMY OF RESEARCH & EDUCATION

### (DEEMED TO BE UNIVERSITY)



Under sec. 3 of UGC Act 1956. Accredited by NAAC with "A" Grade  
Anand Nagar, Krishnankoil - 626126, Srivilliputtur (Via), Virudhunagar (Dt), Tamil Nadu | info@kalasalingam.ac.in | www.kalasalingam.ac.in

### Anti-Ragging Cell (ARC)

No. KARE/SA/ARC/Minutes/2019-20/1

Date: 17.7.2019

#### Minutes of the meeting of Anti-Ragging Committee

The meeting of Anti-Ragging Committee of Kalasalingam Academy of Research and Education was held on 16.7.2019 at Admin Block Meeting hall. Dr.V.Vasudevan, Registrar, Convener of the committee chaired the meeting to review and strengthen the measures to reduce the threat of ragging in the university for the odd semester 2019-20. In this regard, the ARC has been reconstituted for implementing the same with the following institutions, press media, parents and students as members. The following members attended the meeting.

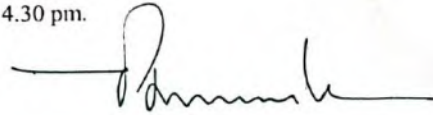
S.No	Name	Designation	
1	Dr. V. Vasudevan	Registrar	Convener
2	Dr. P. Sivakumar	Director (Student Affairs)	Member
3	Dr. C. Ramalingam	Dean / SAS	Member
4	Dr. S. P. Balakannan	Deputy Director (Student Affairs)	Member
5	Mrs. S. Kavitha	Deputy Director (Student Affairs)	Member
6	Dr. K. Suthendran	Deputy Warden	Member
7	Deputy Superintendent of Police	Virudhunagar	Special invitee
8	Tahsildar	Virudhunagar	Member
9	Mr. M. Jeyaraj	Reporter, Thinakaran & Tamil Murasu, Srivilliputhur	Member
10	Mr. R. Jaya Arulpathi	District Information and Public Relation Office Collectorate, Virudhunagar	Member
11	Mr. K. Balasubramanian	Member, Executive Committee, Parents Teachers Association, KARE	Member
12	Mrs. R. Rajalaksmi	Member, Executive Committee, Parents Teachers Association, KARE	Member
13	Mr.M.Prakash	IV Year B.Tech /ECE	Member
14	Ms.M. Vijayadharsini	II Year B.Tech /ECE	Member
15	Ms.R.GuruPreya	III Year B.Tech / Biotech	Member
16	Mr.R.Rajesh Kanna	IV Year B.Tech /Mech	Member
17	Ms.P.Shruthi	IV Year B.Tech / CSE	Member
18	Mr.S.Srinivas	IV Year B.Tech / EEE	Member
19	Mr. R. Jeyakumar	Estate Engineer	Member
20	Dr. B.S. Murugan	Associate prof (IT)	Nodal Officer

The committee was noticeable that UGC regulations on curbing the menace of ragging in higher educational institutions 2019. And other instructions issued as per the directions of the Honorable Supreme Court of India and the Regulations of State Govt. have already been implemented. UGC and State regulations along with measures to be taken for curbing the menace of ragging were circulated to all the UTDs/institutes. Instructions in this regard were also issued to the affiliated/maintained colleges by the Dean of Colleges.

Important points discussed in this meeting are summarized below:

1. To display Flex Boards carrying anti-ragging message along with relevant Telephone Nos at various prominent places on the University Campus. And steps to be taken in our university for curbing the menace of ragging.
2. All Heads, Deans, and Director on the campus of the university will be the responsibilities and take the self-declaration from the enrolled students and their parents during the time of admission.
3. Heads and senior faculty members of the university will address their students and to create the awareness of the anti-ragging mechanism and preventive measures in the university.
4. ARC keep a continuous watch and vigil over ragging to prevent its occurrence and recurrence. And to provide students with the information of contact address and telephone numbers of the person(s) identified to receive complaints/distress calls;
5. ARC consider the complaints received from the students and conduct enquiry and submit a report to the Anti- Ragging Committee along with punishment recommended for the lawbreakers. Oversee the procedure of obtaining an undertaking from the students in accordance with the provisions
6. ARC will periodically review the situation and the information supplied by the ARS and recommended actions as per UGC regulations.
7. Nodal officer will take all necessary measures for prevention of ragging inside the Campus/ Hostels from time to time are properly implemented.
8. Chief warden convenes the meeting to the deputy wardens/ assistant wardens of all the hostels and bring to their notice the necessity of their active involvement in "No Ragging" Programme and put them on 24 hours visit to ensure that no incident of ragging takes place on the campus.

9. CSO will have periodical meetings with their staff to review the position from time to time and to put the information to the Anti-Ragging Committee.
10. With a vote of thanks to the chair, the meeting ended at 4.30 pm.



Convener

Anti-Ragging Committee (ARC)

Copy of the minutes, duly approved by the Vice Chancellor is forwarded to the following for the information and further necessary action:-

- All the members of the committee
- Deans and Directors
- COE and HODs
- Chief Warden and Chief Security Officer

3

3

**Figure 10.1.4.3: Sample Minutes on Anti Ragging Committee(Action Taken Report):**



**KALASALINGAM**  
**ACADEMY OF RESEARCH & EDUCATION**  
**(DEEMED TO BE UNIVERSITY)**



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Ref No: KARE/SA/GR/Circular/20-21/6

Date: 10.07.2020

**Circular**

The Student Grievances Redressal Committee is reconstituted with the following faculty members for the academic year 2020-2021.

- |   |            |
|---|------------|
| 1. Dr. V. Vasudevan, Registrar                            | - Chairman |
| 2. Dr. P. Sivakumar, Director - Student Affairs           | - Convener |
| 3. Dr. M. Pallikonda Rajasekar, Controller of Examination | - Member   |
| 4. Dr.N. Rajini, Director – Academic                      | - Member   |
| 5. Dr.V. Muneeswaran, Assistant Professor, ECE            | - Member   |
| 6. Ms.S. Banupriya, Assistant Professor, English          | - Member   |
| 7. Mr. Lingusamy, Admission                               | - Member   |
| 8. Dr. M. Sivasubramanian, Asso. Prof, Auto, Dy.Warden    | - Member   |
| 9. Mr. Ramharish, Administrative Staff                    | - Member   |
| 10. Mr. R. Jeyakumar, Estate Officer                      | - Member   |
| 11. Dr.B.S. Murugan, KARE UGC Nodal Officer               | - Member   |
| 12. S. Madhavan, Food Technology, Student                 | - Member   |
| 13. S. Sathyashree, Civil Engineering, Student            | - Member   |

To  
The Members concerned  
cc: to KLU – website i/c. to update the above committee in our website immediately


  
VICE CHANCELLOR

Figure 10.1.4. 4. Composition of Grievance Redressal Committee:



# KALASALINGAM

ACADEMY OF RESEARCH & EDUCATION  
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OFFICE OF THE STUDENT AFFAIRS

STUDENTS GRIEVANCES REDRESSAL COMMITTEE

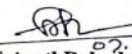
Ref: KLU/SA/SGRC/2018-19/ Circular/004

Date: 7.1.2019

**Circular**

As per VC instructions, the following committee members are requested to attend SGRC meeting regarding grievances received from the students dated on 8.1.2019. The HODs and Deans are requested to inform the faculty and Student members of their department to attend the SGRC meeting without fail.

Sl.No	Name of the Faculty	Designation	Role in SGRC
1	Dr.P.Venkumar	Professor, Mechanical, Nodal Officer	Member
2	Mr.Jeyakumar	Estate Officer	Member
3	Dr. S. Balasubramanian	Warden, Hostel	Member
4	Tadiboina Chandra Sekhar (9918028029)	I Year B. Tech / AGRI	Student Representative
5	Rasik Ranvir Ramana V (9918001037)	I Year B. Tech / BIO	Student Representative
6	Shaik Astubaigari Sohel Basha (9917005158)	II Year B. Tech / ECE	Student Representative

  
07.01.2019  
**Dr.S.AsathBahadur**  
Convener - SGRC

Copy Submitted to the Chancellor & Director – for Kind Information  
CC: to Registrar and Academic – for Kind information  
CC: to all Deans, Directors and Head of Departments – for Information  
CC: to Committee Members



**KALASALINGAM**  
ACADEMY OF RESEARCH & EDUCATION  
(DEEMED TO BE UNIVERSITY)



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OFFICE OF THE STUDENT AFFAIRS

STUDENTS GRIEVANCES REDRESSAL COMMITTEE

Ref: KLU/SA/SGRC/2018-19/ Minutes/004

Date: 9.1.2019

**Minutes of Student Grievances Redressal Committee**

The fourth SGRC meeting of the academic year 2018-19, held on 8.1.2019 at 4.10 pm in Director Student affairs office, First floor, Administrative Block, to discuss the grievances received from students regarding availability of north Indian food inside university premises. The following members of the SGRC attended the meeting.

Sl.No.	Name of the Member	Designation	Role of the SGRC
1	Dr.S.AsathBahadur	Director - Student Affairs	Convener
2	Dr.P.Venkumar	Professor, Mechanical, Nodal Officer	Member
3	Mr.Jeyakumar	Estate Officer	Member
4	Dr. S. Balasubramanian	Warden, Hostel	Member
5	Tadiboina Chandra Sekhar (9918028029)	I Year B. Tech / AGRI	Student Representative
6	Rasik Ranvir Ramana V (9918001037)	I Year B. Tech / BIO	Student Representative
7	Shaik Astubaigari Sohel Basha (9917005158)	II Year B. Tech / ECE	Student Representative

Initially the convener welcomed all the members. Afterwards the nature of the grievance received from students was briefed by the chair to the committee members of the SGRC.

**Nature of the Grievance:** Students requested to provide north Indian food menu in our university mess. Grievance mail received from students dated: 4.1.2019.

The chair put forth the grievance raised by students before SGRC members for open discussion.

- Warden briefed about the day by day North Indian food menu in our university mess and the issue of food to the North Indian inmates.
- Student requested to revise the menu of the North Indian food.
- The chair informed to the hostel wardens and student members to form a mess committee in all hostels and conduct a meeting with group members and come out with


the new North Indian food menu. The food menu must accommodate the food items represented and agreed by the majority of members in the group.

- The dead line for the submission of the revised menu is two weeks from the date of this meeting.
- Hostel warden consented to be the in-charge for conducting meeting and prepare the new North Indian food menu in details.
- Other members of the committee also accepted for the proposed to implement the north Indian food menu in our university hostel.

**Resolution:**

From the open discussion in the SGRC meeting it is resolved that to provide the North Indian menu food for our hostel students those who are adopted north Indian menu. Breakfast, lunch and dinner menu and timing also be displayed on every hostel mess. The Chair informed the student members that they have to take responsibility on individual hostels and proper mess timing must be followed.

Finally the meeting ended with vote of thanks.

  
Dr.S.AsathBahadur  
Convener - SGRC

**Figure 10.1.4.5. Sample Minutes on Grievance Redressal Committee:**



**10.1.5 Delegation of financial powers (5)**

(Institution should explicitly mention financial powers delegated to the Principal, Heads of Departments and relevant in-charges. Demonstrate the utilization of financial powers for each of the assessment years.)

**Response:**

The Board of Management of Kalasalingam Academy of Research and Education is empowered to delegate any of its powers to the Vice-Chancellor, Registrar, Directors and Controller of Examination, Deans of Schools and Faculty Members.

The Finance Committee of the Institution had approved the delegation of financial powers in its meeting held on 23.12.2016 and the same was ratified by the Board of Management.

The exercise of these powers shall be subject to observance of the prevailing rules and regulations and general or special, conditions prescribed or which may be issued by the Competent Authority.

1. No expenditure on a 'New Item' can be sanctioned without prior approval of the competent authority
2. All purchases exceeding Rs.25000 shall be made through Registrar.
3. All purchase proposals would be processed as per the procedure prescribed in the Purchase Procedures.
4. The Deans of Schools and Heads of Departments will submit the proposals to the Vice-Chancellor/Registrar for administrative approval.

**Table 10.1.5 .General Powers of Authorities:**

S.No	Authority	Extent of Power
1	Vice Chancellor	Upto Rs.5,00,000
2	Registrar	Upto Rs.2,00,000
3	Directors of Various offices	Upto Rs.50,000
4	Deans of Various Schools	Upto Rs.25,000
5	Head of the Departments	Upto Rs 10,000

**10.1.6 Transparency and availability of correct/unambiguous information in public domain**  
(5)

(Information on policies, rules, processes and dissemination of this information to stakeholders is to be made available on the web site)

**Response:**

The effective governance, leadership and management are evident from its long history of disturbance-free performance in imparting quality technical education. It is mainly because of the highly responsive compact management which gets constant inputs and feedback from the administrative and academic heads, external experts, alumni, faculty, students, and supporting staff.

The Institution has its own website, URL is: [www.kalasalingam.ac.in](http://www.kalasalingam.ac.in). The Institution ensures to publish their Vision, Mission and various Quality policy rules, achievements, Mandatory Disclosure as per AICTE etc., in the website.

The Student details such as intake and admitted details and details of Teaching and Non Teaching also published in the website.

The Below table gives the information about various policies published in the website.

**Table 10.1.6 Policies and its Links**

S.No.	Policy	Link
1.	Admission policy	<a href="http://admissions.kalasalingam.ac.in/">http://admissions.kalasalingam.ac.in/</a>
2.	Reservation policy	<a href="http://kalasalingam.ac.in/site/reservation-policy/">http://kalasalingam.ac.in/site/reservation-policy/</a>
3.	Cancellation of admission and refund policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2020/08/REFUND_UGC-NOTI.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2020/08/REFUND_UGC-NOTI.pdf</a>
4.	Document retention policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2018/03/DOCUMENT-RETENTION-POLICY.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2018/03/DOCUMENT-RETENTION-POLICY.pdf</a>
5.	Quality policy	<a href="http://kalasalingam.ac.in/site/quality-policy/">http://kalasalingam.ac.in/site/quality-policy/</a>
6.	Energy Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Energy-Policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Energy-Policy.pdf</a>

7.	Sustainability Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Sustainability-Policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Sustainability-Policy.pdf</a>
8.	Water Conservation Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Water-Conservation-Policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Water-Conservation-Policy.pdf</a>
9.	Recycle Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Recycle-Policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Recycle-Policy.pdf</a>
10.	Transportation Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Transportation-Policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/Transportation-Policy.pdf</a>
11.	IPR Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/IPR-Policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/IPR-Policy.pdf</a>
12.	Research policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/06/KARE_Research-Policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/06/KARE_Research-Policy.pdf</a>
13.	Consultancy Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/ConsultancyPolicy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/01/ConsultancyPolicy.pdf</a>
14.	IT Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2020/02/KARE_IT_POLICY.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2020/02/KARE_IT_POLICY.pdf</a>
15.	Rules and regulations – hostels	<a href="http://kalasalingam.ac.in/site/photo-gallery/hostels/">http://kalasalingam.ac.in/site/photo-gallery/hostels/</a>
16.	E-Waste Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/05/e-waste_policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/05/e-waste_policy.pdf</a>
17.	Maintenance Policy	<a href="http://kalasalingam.ac.in/site/wp-content/uploads/2019/12/Maintenance-Policy.pdf">http://kalasalingam.ac.in/site/wp-content/uploads/2019/12/Maintenance-Policy.pdf</a>

**10.2 Budget Allocation, Utilization, and Public Accounting at Institute level (15)**

**CFY 2021-22**

<b>Total Income:</b>				<b>Actual Expenditure (Till):</b>			<b>Total no of Students:</b> <b>6465</b>
Fee:	Govt:	Grant s	Other Sources:	Recurring including Salaries:	Non Recurring	Special Projects/Any other, specify	Expenditure per student:
702738015	Nil	Nil	98073102	643710072	229136877	Nil	135011

**CFYm1 2020-21**

<b>Total Income:</b>				<b>Actual Expenditure (Till):</b>			<b>Total no of Students:</b> <b>6465</b>
Fee:	Govt :	Grant s	Other Sources:	Recurring including Salaries:	Non Recurring	Special Projects/Any other, specify	Expenditure per student:
643354128	Nil	Nil	8084692	600676890	195175378	Nil	123101

**CFYm2 2019-20**

<b>Total Income:</b>				<b>Actual Expenditure (Till):</b>			<b>Total no of Students:</b> <b>6639</b>
Fee:	Govt :	Grant s	Other Sources:	Recurring including Salaries:	Non Recurring	Special Projects/Any other, specify	Expenditure per student:
592238539	Nil	Nil	19486277	587390685	136537715.5	Nil	109042

**CFYm3 2018-19**

<b>Total Income:</b>				<b>Actual Expenditure (Till):</b>			<b>Total no of Students: 6500</b>
Fee:	Govt :	Grant s	Other Sources:	Recurring including Salaries:	Non Recurring	Special Projects/An y other, specify	Expenditure per student:
635508341	Nil	Nil	8226771	589827337	148050247.8	Nil	113519

**CFYm4 2017-18**

<b>Total Income:</b>				<b>Actual Expenditure (Till):</b>			<b>Total no of Students: 6670</b>
Fee:	Govt :	Grant s	Other Sources:	Recurring including Salaries:	Non Recurring	Special Projects/An y other, specify	Expenditure per student:
621272213	Nil	Nil	9533547	627991460	168513452.5	Nil	119416

Items	Bud gete d in 2021 -22	Act ual Exp ense s in 202 1-22 till	Budg eted in 2020- 21	Actua l Expe nses in 2020- 21 till	Budg eted in 2019- 20	Actua l Expe nses in 2019- 20 till	Budg eted in 2018- 19	Actua l Expe nses in 2018- 19 till	Budg eted in 2017- 18	Actua l Expe nses in 2017- 18 till
Infrastruct ure Built- Up	1025 0000 0	101 923 755	86000 000	85877 166	89000 000	88749 515	10000 0000	94752 159	97500 000	10110 8072

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Library	8150 0000	809 438 22	79000 000	79585 227	73000 000	79632 124	75000 000	77477 146	79000 000	81243 501
Laborator y equipment	7000 0000	705 192 70	60000 000	58552 613	37500 000	34134 429	45000 000	44415 074	55000 000	58979 708
Laborator y consumab les	6500 000	640 189 5	60000 00	57425 30	45000 00	45940 24	70000 00	61253 65	35000 00	33097 60
Teaching and non- teaching staff salary	4400 0000 0	451 821 066	40000 0000	39729 2358	37000 0000	36690 1144	33900 0000	33165 8742	36500 0000	36331 8972
Maintena nce and spares	1750 0000	182 905 47	27000 000	27345 307	30000 000	28439 913	49500 000	49718 740	37500 000	35581 880
R&D	1300 0000 0	129 904 877	11925 0000	12335 7102	10950 0000	10424 5690	11250 0000	11363 3148	13430 0000	13540 5835
Training and Travel	1000 0000	101 298 63	14500 000	14656 797	14500 000	14338 171	16000 000	15931 301	14500 000	13386 122
Miscellan eous Expenses *	2000 000	291 185 4	32500 00	34431 68	20000 00	28933 91	60000 00	41659 09	37000 00	41710 62
Others, specify	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	8600 0000 0	872 846 949	79500 0000	79585 2268	73000 0000	72392 8401	75000 0000	73787 7585	79000 0000	79650 4912

**10.2.1 Adequacy of budget allocation (5)**

(The institution needs to justify that the budget allocated over the years was adequate)

<b>Year</b>	<b>Budget</b>	<b>Sanctioned</b>	<b>Utilized</b>
2021-2022	860000000	860000000	872846949
2020-2021	795000000	795000000	795852268
2019-2020	730000000	730000000	723928401
2018-2019	750000000	750000000	737877585
2017-2018	790000000	790000000	796504912

**10.2.2 Utilization of allocated funds (5)**

(The institution needs to state how the budget was utilized during the last three years)

The overall budget for the Institution is approved by the Finance Committee and Ratified by Board of Management at the end of each financial year. The budget includes the recurring and non-recurring expenses of various section and departments for the whole year. Finance office takes care of Preparation of purchase orders for purchase of laboratory equipments, teaching aids, furniture, payment of bills and maintaining the various section/ department budget allocation and expenditure etc.,

**10.2.3 Availability of the audited statements on the institute's website (5)**

(The institution needs to make audited statements available on its website)

The Institution conducts internal and external audits regularly. KARE has qualified Auditors to supervise the Internal Audit Functions and they ensure that all the functions and procedures decided in the Finance Committee/ Board of Management are strictly adhered.

KARE also has qualified external auditors to audit in terms of, transaction audit and compliance audit and submit their reports annually. The reports of both internal and external Auditors are discussed at length in the Finance Committee meeting and recommendations submitted to the perusal of the Board of Management for ratification.

A Compliance report will be prepared based on the Objections and Comments given by the External Auditors. This report will be ratified in the Board of Management every year.

The Audited Statements are displayed on the institution website.

### 10.3 Program Specific Budget Allocation, Utilization (30)

Year	Budget		Actual		No. of students	Expenditure per student
	Recurring	Non - Recurring	Recurring	Non - Recurring		
2017-2018	5100000	1400000	5051000	1380156	702	9161.190883
2018-2019	4400000	2800000	4089047	2733000	702	9718.01567
2019-2020	5900000	2000000	5844000	1165000	669	10476.83109
2020-2021	5720000	3800000	5621000	3890000	720	13209.72222
2021-2022	6050000	38,00,000	5929047	38,57,879	700	13981.3

	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022	
	Bud get	Actu al	Bud get	Actu al	Bud get	Act ual	Bud get	Actu al	Bud get	Actu al
Laboratory equipment's	1400000	1380156	2800000	2733000	2000000	1165000	3800000	3890000	38,00,000	38,57,879
Software	500000	450000	500000	450000	500000	450000	500000	450000	450000	4,46,387
Laboratory consumables	300000	350000	300000	320000	500000	500000	300000	200400	2,00,000	1,90,900
Maintenance and spares	300000	250000	300000	250000	500000	558000	320000	322000	2,00,000	2,00,000
Training and	300000	250000	300000	157000	180000	200000	200000	200000	20,00,000	20,000



<b>Travel</b>	00	00	00	47	00	000	00	000	000	0,000
<b>Research and Development</b>	3300 000	3401 000	2800 000	2732 000	24000 00	2136 000	25200 00	2598 600	30,00, 000	28,8 0,88 0
<b>Miscellaneous</b>	4000 00	3500 00	2000 00	1800 00	20000 0	2000 00	80000	5000 0	2,00,0 00	2,10, 880
<b>Total</b>	6500 000	6431 156	7200 000	6822 047	79000 00	7009 000	95200 00	9511 000	98,50, 000	97,8 6,92 6

### 10.3.1 Adequacy of budget allocation

Every year, a significant amount is planned and allocated to the CSE department towards research and development in the following categories.

**Research award:** To encourage and motivate the faculty for publishing papers in reputed journals, this initiative is introduced. For the faculty who have more than 10 years of experience in the campus with consistent research contribution, a fixed sum, called professional development allowance (PDA) is given every month as part of the salary depending on the cadre. For others, based on the quality of publications, as per university norms, every year, research incentive is given yearly once.

**Full time Scholar:** To promote the research in the department, full time scholars are admitted under the university research fellowship. During the admission, an amount of Rs.10,000/- is offered as stipend and once confirmation meeting is done after completing the comprehensive viva, stipend is increased to Rs.14,000/-. Additionally, upon publishing a paper in either SCOPUS or SCI level, Rs.2000/- is incremented in the stipend. In this way, a research scholar can increase his stipend up to Rs.20, 000/- during this study period.

As part of the budget component, Training and Travel, to gain industry exposure, faculty members are motivated to attend workshops, certification courses, faculty development programs, conferences. The institute reimburse the registration amount of these events to the faculty members after ensuring the participation and the quality of the events.

Similarly, towards software renewal, consumables, maintenance and spares, a consistent amount was planned. Also, various department level activities like Coding Competition, Workshops,

**Guest Lecture, One credit course and value added courses were identified and the activity plan was submitted to student's affairs for further approval.**

In 2021-2022, IoT Sensor Technology Lab and Data Science and Visualization lab were established to meet the requirements of the elective stream, Internet of things and Data Analytics. Many research scholars and PG students have started to utilize the lab for projects and research works. . Considering the demand, both lab was proposed to establish at a worth of Rs.38,00,000/- As a part of the IBM MoU, training programs were conducted for faculty members for the next level of courses in the concerned elective streams. An amount of Rs.20,00,000/-was planned. Apart from R and D, major expenditure planned in this academic year was towards the establishment of an Artificial Intelligence Lab so as to offer industry based faculty training programs.

In 2020-2021, the Artificial Intelligence laboratory was established to meet the requirements of the elective stream, Artificial Intelligence and Machine Learning. Many students from PG, Ph.D., and faculty members have started to use the AI and ML techniques in their scholarly work. Considering the demand, the lab was proposed to establish at a worth of Rs.38,00,000/- Also, as a part of the IBM MoU, training programs were conducted for faculty members for the next level of courses in the concerned elective streams. Again, an amount of Rs.20,00,000/-was planned.

In 2019-2020, CSE department has signed the MoU with IBM to make the students professionals skilled in IT Solutions and Industry vertical domain technologies. As a part of MOU, faculty members are provided the training by the industry experts. Rs.20,00,000/- was planned for conducting training programs for faculty members. To extend the existing laboratory equipment's of Programming Language Lab, a budget of Rs.11, 65,000/- was proposed. This amount quoted was further spent to purchase 40 computers additionally, to meet the laboratory requirements of programming courses. To do the maintenance of the existing laboratory, additional amount of Rs.5, 00,000/- was planned.

In 2018-2019, Network and Cyber Security Lab was established with an amount of Rs.28, 00,000/- for enriching cyber security related research and also to meet the requirements of cyber security elective courses. To promote research and development, Rs.28,00,000/- was proposed to meet the requirement of Research and Development in terms of awards, PDA and stipend for full time research scholar.

## **2017-2018**

To modernize the laboratory establishment, Rs.14,00,000/- was proposed to purchase 150 thin client computer systems with the necessary configuration. The UG and PG students utilize these laboratories to perform their regular experiment based learning activities. Major expenditure of Rs.33,00,000/- was proposed to provoke research and development to encourage research scholar in terms of research awards and stipend for full time research scholar

### **10.3.2 Utilization of allocated funds (20)**

(Institution needs to state how the budget was utilized during the last three assessment years)

As per the academic requirement, all the allocated funds were efficiently utilized. For Microsoft license renewal, every year an amount of Rs.4,50,000/- was spent for the above expenses.

In the year 2021-2022 an amount of 38,57,589/- was spent for establishing IoT Sensor Technology Lab and Data Science and Visualization lab. An amount of Rs.20,00,000 was spent for various IBM training programmes which was conducted for faculty members to enrich technical aspects through latest tools. The following FDP trainings were conducted.

- Descriptive Analytics
- Cloud Architecture and deployment model
- Data Visualization for analytics
- Big data
- Algorithm for intelligence system and robotics
- Computational Linguistics and Natural Language Processing
- Digital Forensics
- IT Data Security

In the year 2020-2021, an amount of Rs.38,90,000/- was spent for purchasing major lab equipment's for Artificial Intelligence lab. An amount of Rs.20,00,000 was spent for various IBM training programmes which was conducted for faculty members to enrich technical aspects through latest tools. The following FDP trainings were conducted.

- Data Warehousing & Multidimensional Modelling
- Wireless Sensor Networks & Iot Standards
- Predictive Analytics
- IT Application Security

- Digital Forensics

In 2019-2020, Rs.20,00,000/- fund was spent for IBM training programme which was conducted for faculty members. The following FDP training was organized by the IBM experts.

- Sensor Technology and Instrumentation
- IT Infrastructure Landscape
- Python Programming
- Machine Learning

To meet the latest industry technologies, additional computers were sanctioned with an amount Rs.11, 65,000/- which were utilized for the additional professional electives like

- CSE18R257: Predictive Analytics
- CSE18R258: Descriptive Analytics
- CSE18R260: Data Warehousing & Multidimensional Modeling
- CSE18R381: Data Visualization and Analytics
- CSE18R467: Social, Web and Mobile Analytics
- CSE18R360: Internet of Things
- CSE18R263: Analytics for IoT
- CSE18R210: Introduction to Sensor Technology & Instrumentation

An amount of Rs.5,58,000/- was spent for lab maintenance and for various laboratories like Distributed Computing and Internet Programming lab.

In the year 2018-2019, a major amount of Rs.27,33,000 /- was spent for the Network and Cyber security lab for equipment purchase. This lab correlates with the following courses.

- CSE18R352–NETWORK AND INFORMATION SECURITY
- CSE18R353–ADHOC AND SENSOR NETWORKS
- CSE18R453–APPLIED CRYPTOGRAPHY AND ITS APPLICATIONS
- CSE18R454–CYBER SECURITY AND FORENSICS
- CSE18R455–MOBILE AND WIRELESS SECURITY

An amount of Rs.1,57,047/- was spent for Travel and Training for various activities like attending and organizing workshop and faculty development programme. An amount of 27, 32,000 was spend for Research and Development and it was efficiently utilized with awards, PDA and stipend etc.

In 2017-2018, Rs.13,80,156/- was spent for the lab equipment's with 150 thin client systems. For

training and travel, Rs.2,50,000/- was spent for attending conference, FDP and workshops. An amount of Rs.34,01,000/- was spent for research and development which includes research awards for publishing SCI journals, Scopus indexed publications, Book/Book Chapter publications, PDA and stipend for full time scholars.

## **10.4 Library and Internet (20)**

### 10.4.1 Quality of learning resources (hard/soft) (10)

- Relevance of available learning resources including e-resources
- Accessibility to students
- Support to students for self-learning activities

#### **RESPONSE:**

The Central Library is a two storied building with a built-up area of more than one lakh square feet and fully air-conditioned with a seating capacity for 1000 users. It functions between 9.00 a.m. to 9.00 p.m. A well-equipped stacking of books in various domains to meet the institution's objective of providing high quality education is available. Library services have been automated using the Open-Source Integrated Library Management Software *Koha*. The library is providing an evolving technology environment with effective tools and services for the discovery and delivery of information to our users and comfortable space for individual study and learning, equipped with appropriate infrastructure. Also, CCTV security system and a fire alarm system for protection against fire are available.

The library provides 37800 sq. ft space for reading area, 3150 sq. ft. space for E-Library and Media Resource Centre, 2800 sq. ft. for Video conferencing Hall, 560 sq. ft for printing and reprography, 360 sq. ft. for Discussion room and the remaining space for stack of reading materials and other sections for the effective functioning of the library.

The faculty members can borrow 10 books (5 books for 14 days with 2 renewals and 5 books for 180 days without renewal), UG students can borrow 4 books for 14 days with one renewal, PG students, Research scholars are allowed to borrow 5 books for 14 days with one renewal and non-teaching staff are allowed to borrow 4 books with one renewal.

## **Facilities and Services**

### **Print resources**

- Stacking more than 99000 volumes of books in engineering, management, advanced sciences, agriculture, architecture, arts, humanities and general.
- 282 national and international print journals and magazines are subscribed.
- For reference of research scholars, 255 Ph.D. theses, 3900 bound volumes of periodicals and 5708 Project Reports are available.
- Newspapers in English and Tamil languages to keep our users abreast with the news and current affairs of national and international importance are subscribed.
- Resource cell for competitive examinations.

### **E-Resources**

- E-resources comprising of 4700+ e-journals from IEEE, Science Direct, DLINE, SAGE etc and 71000+ e-books from ProQuest, Springer and ScienceDirect are subscribed.
- Access to Scopus, India Business Insight database (IBID), RAXter Research Assistant (Literature review and analysis tool) and DELNET discovery portal is facilitated.
- Access to the free resources provided through National Digital Library of India.
- Video and web courses developed by IITs under NPTEL have been procured and access to the contents is provided over the campus network.
- 32 DTH Channels under Swayam Prabha for MOOC Courses.
- E-Library and Media Resource Centre for accessing online resources.

### **Access to E-Resources**

- IP based unrestricted access is given to the e-resources though intranet so that the content can be accessed by the users from anywhere in the campus.

- Remote access facility is provided to the e-resources through *Shibboleth* authentication to access them outside the campus.

### **Digital Library**

- The library has 67 computers to support the users to search and read documents.
- Institutional Digital Repository – has been created using Open-Source Software ‘DSpace’ for disseminating the scholarly contents created at our institution and access is given through intranet.
- The digital versions of the Ph.D. theses submitted to the institution are uploaded in the INFLIBNET *Shodhganga* repository, a reservoir of Indian theses, to provide seamless access to the research community.
- Bulk registration of faculties and students as members of National Digital Library of India.
- Universal Digital Library (UDL) Project - Our institution is one of the partners of the UDL project led by Carnegie-Mellon University (CMU), USA. Under this project, we digitised more than 4000 rare-books and palm leaves ([click here for list](#)) which are now available online for free in the UDL website (<http://ulib.isri.cmu.edu/ULIBAboutUs.htm#partnersBkMark>).

### **Institutional Memberships**

- DELNET membership for resource sharing under Inter Library Loan and access to the free e-resources available at its portal.
- Shodhganga membership for uploading theses submitted by the research scholars in the Shodhganga thesis repository for supporting open access initiative.
- eShodhSindhu membership for subscribing e-resources in the prices negotiated by the consortium.
- National Digital Library of India (NDLI) membership for having access to the free resources available at NDLI.

### **Automation**

- Library services have been automated using Koha ILMS.
- The books have been barcoded due to its speed, accuracy and reliability in the circulation system.
- WebOPAC (Online Public Access Catalogue) facility for accessing the availability of the books, renewing books online and submitting purchase suggestions through ILMS.
- Alert services for new arrivals of books and journal issues.
- Online Renewal
- Koha OPAC provides other details such as links to e-resources, memberships, details of borrowing facility, borrowing rules, etc.

### **Plagiarism Detection System**

- Plagiarism detection systems such as URKUND and iThenticate are made available for promoting authentic, genuine and quality research works.

### **Reprography facilities**

- Printing, reprography and document scanning.

### **Other facilities**

- Discussion room
- Own book reading
- Video conferencing cum virtual learning hall

### **10.4.2 Internet (10)**

- Name of the Internet provider: JIO and BSNL
- Available bandwidth: 2GBPS
- Wi Fi availability: Whole Campus is enabled with Wi-Fi including Hostel and Library.
- Internet access is available in labs, classrooms, library and offices of all Departments
- Security arrangements:

### **Firewall:**

1. The campus network of KARE is protected by the state of the art SOPHOS firmware system to protect our network traffic.
2. Every user of network is provided with username and password so as to have privacy and



security while accessing data.

3. Content filtering is enabled through firewall to protect students from accessing illegal and malicious contents thereby securing the system.

4. Students and employees who are doing projects which needs a bypass from firewall are given access through proper channel.

5. Dynamic Host Configuration (DHCP) is enabled inside KARE for addressing majority of internet users. Sensitive users are given with Static IP addresses. Backup of rules and policies in firewall is automatically taken on daily basis thereby providing disaster recovery.

6. The network traffic and bandwidth inside the sensitive centers inside KARE is managed through firewall. Dedicated personnel are available to maintain Firewall firmware.

### **Security through Software Usage**

1. Pirated Softwares bring the risk of data insecurity. So KARE encourages to go for Standard proven Open source technologies and Freeware.

2. In cases where there is a need to purchase proprietary softwares, licensed software purchase is encouraged for all department specific softwares.

3. SOPHOS antivirus software is available in KARE to protect the standalone systems.

4. Piracy in operating system is prohibited in KARE, so that every system has an updated version of state of the art OS, thereby secures the data and reduces the risk of failure.

5. KARE provides official email to all students and employees. KARE email uses Google email server GMAIL, which is very much secured and proven email server, thereby email communication and recovery of email content is made easy and secure.

6. KARE encourages extensive use of proven software products from Google such as forms, classroom, and drives for storing sensitive information and sharing information. Information sharing through whatsapp is also encouraged inside campus since it comes with highly secured encryption technology.

### **Disaster Prevention and Recovery**

1. Servers, Firewall firmware, network switches and other IT hardware of KARE are periodically serviced.

2. RAID backup and needed cloud back up is enabled in servers so that recovery is made easy in case of any disasters. Firewall rules and policies are also backed up periodically.

### **Power Backup for IT Infrastructure**

1. Entire academic area of KARE campus is supported by total 7 Diesel Generators with capacity

(380kVA – 1no, 250kVA – 2nos,180kVA – 3nos and 125kVA– 1no)

2. All IT infrastructure of campus comes under dedicated power backup supported by Diesel generators and Battery Powered Uninterrupted Power Supply Systems (UPS).
3. Estate personnel of campus maintain the power backup infrastructure of the campus.