BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

P B No. 6443, Avalahalli, Doddaballapur Main Road,

Yelahanka, Bengaluru, Karnataka-560064, INDIA

SELF-ASSESSMENT REPORT

(M. Tech. PROGRAM)

SUBMITTED BY

DEPARTMENT
OF
COMPUTER SCIENCE AND ENGINEERING

TO

NATIONAL BOARD OF ACCREDITATION

4th floor, East Tower, NBCC Place,
Bhisham Pitamah Marg Pragati Vihar,
New Delhi -110003, INDIA

PART- A

INSTITUTIONAL INFORMATION

A1. Name and address of the College	BMS Institute of Technology and Management Doddaballapura Main Road, Post Box: 6443 Avalahalli, Bangalore-560064 **City: Bengaluru** **State: Karnataka** Pin Code: 560064 Phone Number: 080-28561576 Fax : 080-28567186 Website: www.bmsit.ac.in E-mail: principal@bmsit.in

A2. Year of Establishment	**2002**

A3. First Approval Letter No.	**06\06\KTK\ENGG\2002\019 Date:06-06-2002**

A4. Head of the Institution	
Name	Dr. Mohan Babu G. N.
Designation	Principal
Nature of Appointment	Permanent
Phone	080-28561576
Mobile	91- 9632555300
E-mail	principal@bmsit.in
Fax No.	080-28567186

A5. Name and Address of the affiliating University	
Name	Visvesvaraya Technological University
City	Belagavi
State	Karnataka
PIN Code	590018
Web site	www.vtu.ac.in
Phone Number	0831 – 2405467
E-mail	registrar@vtu.ac.in
Fax No.	0831 - 2498225

A6. Type of the Institution			
Institute of National Importance	☐	Autonomous University	☐
Any other (Please specify) * **Private and Self-financing**	☑		
Deemed University	☐		

A7. Ownership Status			
Central Government	☐	**Trust**	☑
State Government	☐	Section 25 Company	☐
Society Government Aided	☐	Society	☐
Self-financing	☐	Any Other (Please specify)* *	☐

A8. Details of the programs offered by the Department

Sr. No.	Program Name	Year of Start
1	B.E in Computer Science and Engineering	2002
2	M.Tech. in Computer Science and Engineering	2014
3	M.Sc (Engg. By Research)	2014
4	Ph.D	2014

A9. Programs to be considered for accreditation vide this application

Sr. No.	Program Name
1	M.Tech in Computer Science and Engineering

PART B- DEPARTMENT INFORMATION

B1. State the Vision and Mission of the Department	
Vision	**To develop technical professionals acquainted with recent trends and technologies of Computer Science to serve as valuable resource for the nation/society**
Mission	**Facilitating and exposing the students to various learning opportunities through dedicated academic teaching, guidance and monitoring.**

B2. Justification of consistency of the Department Vision and Mission with the Institute Vision and Mission

The vision of the department is derived based on the vision of the institution in consultation with internal and external stakeholders. Table 1(a) depict the mapping and alignment of the vision statements.

Contemporary issues for arriving at the vision statement of institution are on broad perspective of meeting adequate human resource need in the industry. This drives the key factor of having engineers who are employable, ethical and imbibed with sufficient wisdom to create or use technologies that are environment friendly. Addressing the use of the technology for ethical purpose is key challenge. It is also important to create technology that is safe, sustainable and eco-friendly. Such awareness must be brought in the ambit of academic framework by setting scope for the engineer after graduation.

There has been persistent effort to address the gap between industry requirement and academia that attributes to the factor of employability in industry. There has been a small change in employability percentage over past years across the nation severely changing the pattern of hiring intents by employers. There is increasing trend of employers hiring postgraduate students across the nation as reported by the “India Skill Report 2019” – joint report by AICTE, CII, AIU and UNDP. Karnataka is one of the states with maximum hiring activity with Bengaluru being highest employability city.

Most of the reports detailed on improvement of employability to build strong core competency in graduates. The competency factor can be improved with exposure to new-age skills and technologies leading to strong fundamentals supported with experiential learning. These skills can be the topics aligned to the areas of AI, Machine learning, Data Science engineering, Security and Mobile technologies. Learning today is not just confined to regular classroom-based activity rather it is spread out.

Table 1(a): Department Vision and Institute Vision

Dept. Vision (DV) Institute Vision (IV)	DV1: Develop technical professionals	DV2: Recent trends and technologies	DV3: Valuable resource for the nation/society
IV1: Develop engineering professionals with technical competence			
IV2: Ethical and environment friendly			
IV3: Betterment of the society			

The factors considered for the mapping between Department Vision and the Institution vision are listed below –

- **IV1** mentions about developing engineers who are technically competent and in line to our **DV1** which mentions about developing technical professionals. This competence is built through technical exposure on latest trends and technologies in research and industry as mentioned in **DV2**.

- **IV2** mentions about ethical and environment friendliness envisioned in the department vision through **DV1, DV2 and DV3.** PG professionals are expected to incorporate ethical use of modern technology and present work ethically. The work carried out by them is individual mutually exclusive. Broad and deeper explorations in their topics aspires them to be valuable resource in society. This leads to the accomplishment of **DV3**.

- **IV3** mentions betterment of society which is envisioned in the department vision through **DV1** and **DV3**. PG professionals are technically sound and can liberally present ideas contributing towards research work, Industry and education.

The mission of the department is derived to achieve the vision of the department. The mission statement is framed in consultation with program faculty, alumni, employers and other stakeholders. The mission of the department is aligned with institution mission statement as depicted in the table 1(b).

Table 1(b): Department Mission and Institute Mission

Dept. Mission (DM) Institute Mission (IM)	DM1: Facilitating and exposing to various learning opportunities	DM2: Dedicated academic teaching, Research guidance and monitoring
IM1: Stimulating learning environment		
IM2: High quality academic instruction		
IM3: Innovation and industry-institute interface		

Considering the mapping shown in the table 1(b) following factors listed below-

- **IM1** mentions about the stimulating learning environment which nurtures young minds to enhance learning opportunities that maps to **DM1** of the department mission. Stimulative learning environment can be a foundation to spark innovative ideas leading to research, mentored and monitored by faculty members as mentioned in **DM2**.

- **IM2** illustrates on high quality academic instruction that mentions about delivering quality technical education empowering the students to learn advanced topics in the domain. This is supported by dedicated academic teaching in **DM2** of the department mission that mentions about dedicated academic teaching, research guidance and monitoring which is a key factor to achieve **IM2**.

- **IM3** mentions about industry-interface and innovation which is achieved through **DM1** where facilitation and exposure is vital aspects of any innovation. This exposure is through crossover learning where subject matter experts from industry, delivering key topics in niche technical areas.

Inference from the table 1(a) and 1(b) is that the Department vision and mission statement are in line and supportive of the Institution vision and mission statement.

B3. Details of all UG & PG Programs offered by the department

Table 2: Program Admission Details

S. No.	PG Program Name	Corresponding UG Program/Department Name	Current Academic Year (2020-21) Sanctioned Intake	Current Academic year Admission (2020-21) (in Nos.)
1	M.Tech Computer Science and Engineering	B.E Computer Science and Engineering	18	10
2	M.Tech Computer Science and Engineering	B.E Computer Science and Engineering	180	180

B4. State the Program Educational Objectives (PEOs) for the PG program(s) under consideration for accreditation

Table 3: Program Educational Objectives (PEOs):

PEO1	Apply analytical thinking to solve problems through research in the areas of Computer Science and Engineering.
PEO2	Adapt to changing technological trends through life-long learning by exhibiting professional ethics, integrity and career growth.
PEO3	Develop skills to facilitate in providing sustainable solutions by addressing the ever-growing challenges of the society.

Criteria Summary

Name of the program: M.Tech Computer Science and Engineering

Criteria No.	Criteria	Mark/Weightage
1.	Program Curriculum and Teaching –Learning Processes	125
2.	Program Outcomes	75
3.	Students' Performance	75
4.	Faculty Contributions	75
5.	Laboratories and Research Facilities	75
6.	Continuous Improvement	75
	Total	**500**

1 PROGRAM CURRICULUM AND TEACHING-LEARNING PROCESSES(125)

1.1 Program Curriculum (35)

1.1.1 State the process used to identify extent of compliance of the University curriculum for attaining the Program Outcomes (10)

BMS Institute of Technology and Management was started in the year 2002 and it offers various UG/PG Programs in Engineering, M.Tech. (Computer Science and Engineering) is one among them.

It commenced in the year 2014 with an intake of 18 students. The Post Graduate Program in Computer Science & Engineering is an affiliated program offered by Visvesvaraya Technological University (VTU), Belagavi. The curriculum is designed by the university and has been common across all the institutions affiliated to it. The PG curriculum is revised by the Board of Studies (BoS) of VTU once in *two* years.

VTU curriculum contains various domain specific Theory, Laboratory and Elective courses. The following table shows a comparison between the courses prescribed by the AICTE and the VTU curriculum.

The 2018 scheme has been divided into 7 program curriculum components

1. Program Core Subjects
2. Program electives
3. Open Electives
4. Laboratory
5. Industry Oriented Courses
6. Audit Courses
7. Project work

Table 1.1: Mapping of Subjects/ Courses on to the three modules of PG Curriculum (Scheme: 2018 and 2020)

Mapping of Courses/Subjects of Curriculum of VTU with the AICTE Model Curriculum (2018 scheme)

		Course Code	Subject	Semester	Count
Program Core	**Program Core I**	18SCS11	Mathematics	**First Semester**	
	Program Core II	18SCS12	Advances in Operating Systems	**First Semester**	
	Program Core II	18SCS13	Advances in Database Management System	**First Semester**	**05**
	Program core III	18SCS21	Managing Big Data	**Second Semester**	
	Program core IV	18SCS23	Cloud Computing	**Second Semester**	

Program Elective	**Program Elective I**	18SCS151	Advances in Computer Networks	**First Semester**	**05**
	Program Elective II	-	-		
	Program Elective III	18SCS244	Data Mining & Data Warehousing	**Second Semester**	
	Program Elective IV	18SCS252	Trends in Artificial Intelligence and Soft Computing	**Second Semester**	
	Program Elective V	18SCS321	Embedded Computing Systems	**Third Semester**	
	Program Elective V	18SCS334	Cyber Security And Cyber Law	**Third Semester**	
Open Elective	**Open Elective**	-	-	-	-
Laboratory	**Laboratory I**	18SCSL16	IOT and ADBMS Laboratory	**First Semester**	**02**
	Laboratory II	18SCSL26	Mini Project	**Second Semester**	
Audit Course	**Audit Course I**	18RMI17	Research Methodology and IPR	**First Semester**	**01**
Project	**Industrial Project**	18SCS27	Technical Seminar	**Second Semester**	**04**
		18SCS34	Evaluation of Project phase -1	**Third Semester**	
		18SCSI35	Internship	**Third Semester**	
		18SCS41	Project work phase -2	**Fourth Semester**	

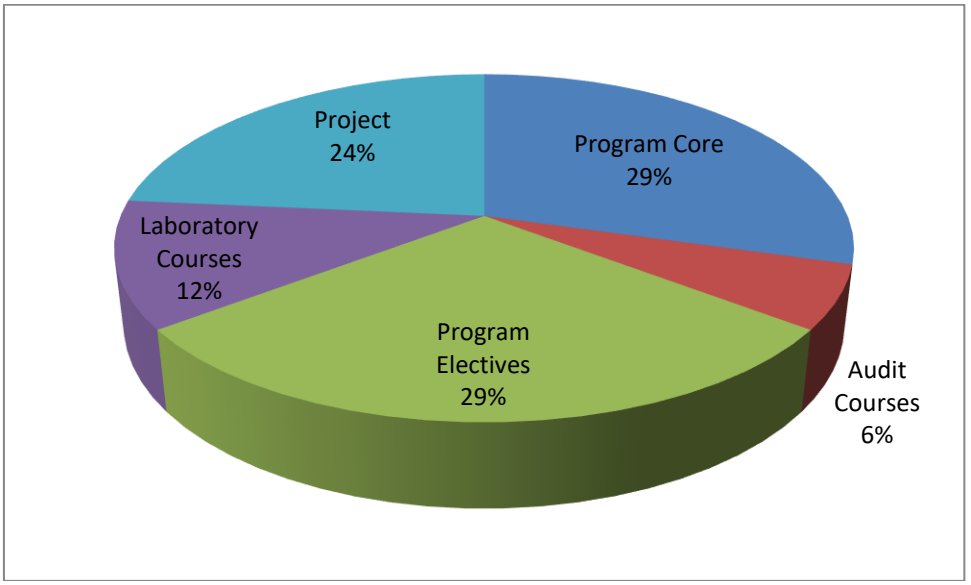


Figure -1.1: Course Scheme distribution for 2018 scheme

Table 1.2: Mapping of Courses/Subjects of Curriculum of VTU with the AICTE Model Curriculum (2020 scheme)

		Course Code	Subject	Semester	Count
Program Core	**Program Core I**	20SCS11	Mathematical Foundations of Computer Science	**First Semester**	**09**
	Program Core II	20SCS12	Artificial Intelligence and Machine Learning	**First Semester**	
	Program Core III	20SCS13	Advanced Database Management Systems	**First Semester**	
	Program Core IV	20SCS14	Advanced Algorithms	**First Semester**	
	Program Core V	20SCS15	Internet of Things and Applications	**First Semester**	
	Program Core VI	20SCS21	Data Science	**Second Semester**	
	Program Core VII	20SCS22	Semantic Web and Social Networks	**Second Semester**	
	Program core VIII	20SCS23	Blockchain Technology	**Second Semester**	
	Program core IX	20SCS31	Deep Learning	**Third Semester**	
Program Elective	**Program Elective I**	20SCS241	Advanced Cryptography	**Second Semester**	**04**
	Program Elective II	20SCS252	Object Oriented Design		
	Program Elective III	20SCS324	Multi Core Architecture and Programming	**Third**	
	Program Elective IV	20SCS334	Wireless Sensor Networks	**Semester**	
Open Elective	**Open Elective**	-	-	-	-

Laboratory	**Laboratory I**	20SCSL16	Algorithms and Database Management Systems Laboratory	**First Semester**	**02**
	Laboratory II	20SCSL26	Data Science Laboratory	**Second Semester**	
Audit Course	**Audit Course I**	20RMI17	Research Methodology and IPR	**First Semester**	**01**
Project	**Industrial Project**	20SCS27	Technical Seminar	**Second Semester**	**05**
		20SCS34	Project Work phase -1	**Third Semester**	
		20SCS35	Mini-Project	**Third Semester**	
		20SCSI36	Internship	**Third Semester**	
		20SCS41	Project work phase 2	**Fourth Semester**	

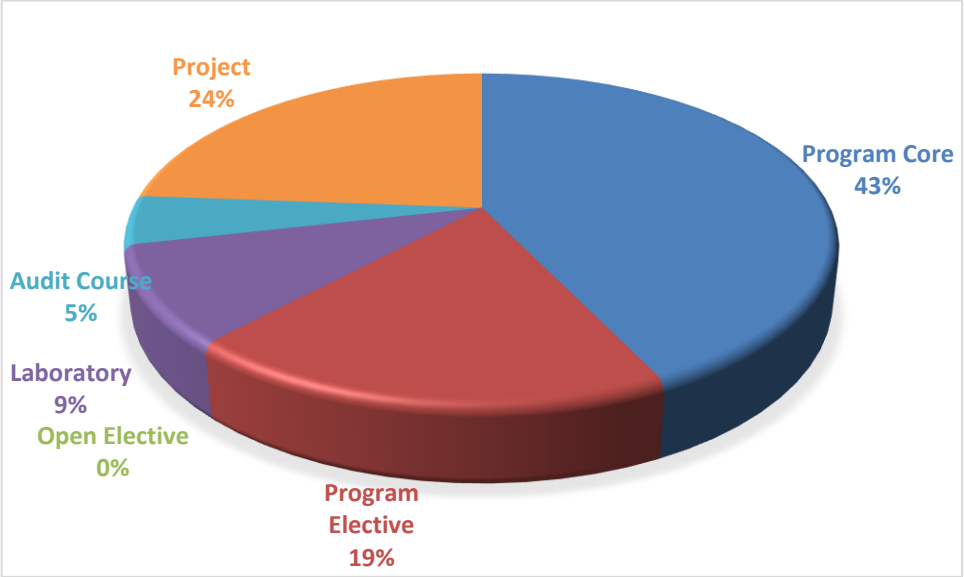


Figure -1.2: Course Scheme distribution for 2020 scheme

The Model Curriculum for Postgraduate degree courses in Engineering and Technology was released by the AICTE. Hence, to identify the curriculum gaps of 2020 scheme and 2018 scheme has been compared with the model curriculum. The university prescribed course distribution of curriculum evidences the coverage of AICTE model curriculum throughout the program. The knowledge acquisition and mastery to be gained in the course duration through the curriculum components is shown in the figure 1.2.

- Around 43% of the subjects/ courses belongs to the program core, 19% of the courses being offered are from the Program elective, 18% of the subjects amounts to industrial connect perspective, while Lab subject's amounts for close to 9% share of the course distribution offered by the university.
- One of the course prescribed course maps with the suggested Audit course by AICTE.

Though open elective belonging to the interdisciplinary category has been suggested by the model curriculum, but it is not part of the university curriculum.

The 2020 scheme has Skill development Activity (**SDA**) included, which focuses on skills and problem solving. The following activities are considered as SDA in 2020 scheme as per VTU.

1. Gain confidence in modelling of systems and algorithms.
2. Work on different software/s (tools) to simulate, analyze and authenticate the output to interpret and conclude.
3. Handle advanced instruments to enhance technical talent.
4. Involve in case studies and field visits/ field work.
5. Accustom with the use of standards/codes etc., to narrow the gap between academia and industry.

The Process used to identify the compliance of the VTU prescribed curriculum for attaining the Program Outcomes is as follows:-

1. The Course coordinator frames the Course Outcomes(COs) based on the contents of the curriculum for the respective course. These course outcomes are mapped on to the program outcomes(POs).
2. Module Coordinator reviews the CO –PO matrix done by the Course Coordinator.
3. Program coordinator identifies the gaps for the entire program in line with the review report given by the module coordinator.
4. The Program coordinator collates the identified gaps and submits to the Program Assessment Committee (PAC).
5. Subsequently a detailed review is conducted by PAC for its correctness of gap analysis and any revisions, if necessary.

The Program Outcomes of M. Tech (Computer Science and Engineering) are as follows:

Program Outcomes (POs)

The graduates of the Program will be able to:

PO1	Independently carry out research and development work to solve practical problems related to Computer Science and Engineering domain.
PO2	Write and present a substantial technical report/document.
PO3	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.
PO4	Analyze the acquired domain knowledge for providing feasible solution(s).
PO5	Relate the learning outcomes to build requisite competency in professional environment.
PO6	Appraise the need for engaging in lifelong learning.

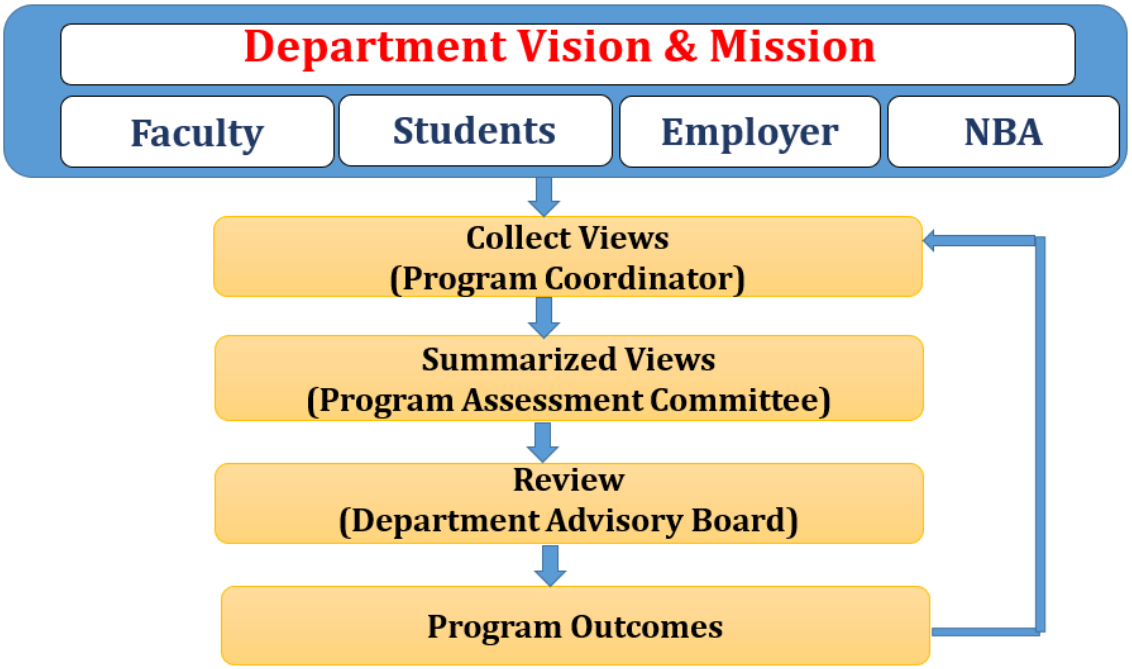


Figure - 1.3: Defining the Program Outcomes

List of Courses of VTU PG Curriculum

Table 1.3: List of courses in 2018 scheme

Sl. No	Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6
1	18SCS11	Mathematics			✓			✓
2	18SCS12	Advances in Operating Systems	✓	✓	✓	✓		✓
3	18SCS13	Advances in Data Base Management System			✓	✓		✓
4	18SCS14	Internet of Things		✓	✓	✓	✓	✓
5	18SCS151	Advances in Computer Networks		✓		✓	✓	✓
6	18SCSL16	IOT and ADBMS Laboratory		✓	✓	✓	✓	✓
7	18RMI17	Research Methodology and IPR	✓	✓	✓	✓	✓	✓
8	18SCS21	Managing Big Data	✓			✓	✓	✓
9	18SCS22	Advanced Algorithms	✓	✓	✓	✓	✓	✓
10	18SCS23	Cloud Computing	✓	✓	✓	✓	✓	✓
11	18SCS244	Data Mining & Data Warehousing		✓	✓	✓	✓	✓
12	18SCS252	Trends in Artificial Intelligence and Soft Computing	✓		✓	✓	✓	
13	18SCSL26	Mini Project	✓	✓	✓	✓	✓	✓
14	18SCS27	Technical Seminar	✓	✓	✓	✓	✓	✓
15	18SCS31	Machine Learning Techniques	✓		✓	✓		
16	18SCS322	Information and Network Security	✓	✓	✓	✓	✓	✓
17	18SCS334	Cyber Security And Cyber Law	✓			✓	✓	✓
18	18SCS34	Evaluation of Project phase -1	✓	✓	✓	✓	✓	✓

19	18SCSI35	Internship	✓	✓	✓	✓	✓	✓
20	18SCS41	Project work phase -2	✓	✓	✓	✓	✓	✓
Courses - PO mapping			**13**	**11**	**16**	**19**	**16**	**18**

The above mentioned table 1.3 illustrates the comprehensive mapping of the Curriculum Courses for 2018 scheme. Every course has been mapped on to the expected Program Outcome. The above table reveals the number of courses mapping onto a particular Program Outcome.

1.1.2 Appropriateness of the gaps identified (5)

The fundamental process to identify the gaps between the University prescribed curriculum and the Program Outcome has been defined in section 1.1.1. The table 1.4 gives the number of courses in 2018 scheme mapping to Program Outcomes (POs)

Table 1.4: Number of courses mapping to Program Outcomes (POs)

Program Outcomes		No. of Courses
PO1	Independently carry out research and development work to solve Practical problems related to Computer Science and Engineering domain.	13
PO2	Write and present a substantial technical report/document.	11
PO3	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.	16
PO4	Analyze the acquired domain knowledge for providing feasible Solution(S).	19
PO5	Relate the learning outcomes to build requisite competency in Professional environment.	16
PO6	Appraise the need for engaging in lifelong learning.	18

The mapping reveals that 65% of the courses are mapping to PO1, 50% of the courses are mapping to PO2, 80% of the courses are mapping to PO3, 95% of the courses are mapping to PO4, 80% of the courses are mapping to PO5, and 90% of the courses are mapped to PO6.

In conclusion, PO1 and PO2 have lesser number of subjects mapping to it. In addition, necessary inputs are obtained through course end survey and from the course files as mentioned in the figure 1.4.

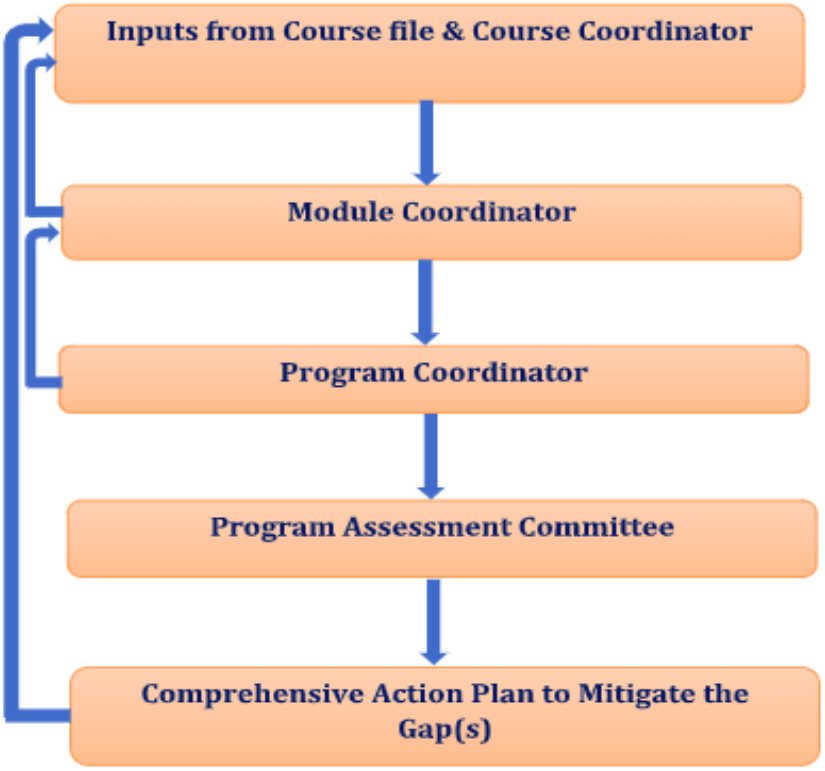


Figure – 1.4: Process to mitigate the gaps of Program Outcomes

The process used to identify the extent of compliance of the university curriculum for attaining the program outcomes reveals that in the 2018 scheme the number of courses mapping on to PO1, PO2 were on an average 65%. The inference from this indicated thatemphasis should be given more on the coverage of these POs through the various course delivery components. The inference from this indicates that better efforts were put towards improvement of the mapping of these POs compared to the previous year. Though the improvement is marginal over the previous year emphasis should be given more on the better coverage of these POs through the various course delivery components.

The several suggested course delivery components to mitigate the identified gaps are:

- Professional Body Activities
- Innovative teaching and Learning Process
- Interaction with External world and Internship
- Skill Development Program workshops/Conference
- Knowledge Sharing by Alumni
- Open Courses
- Technical talks/seminars

With the efforts being channelized towards improvement of the coverage of Program Outcomes, In the 2018 scheme the number of courses mapping on to PO1, PO2, PO5 and PO6 were on an average 78%.
It is evident from the year-on-year analysis that the initiatives adopted by the program are contributing towards better coverage of Program Outcomes.

1.1.3 Actions taken to bridge the gap (10)

To mitigate the gaps identified above, various initiatives have been taken to improve the TLP process. OBE activities like Blended Learning, Seminars, Poster design/Presentation, Paper Publications, student development programs and Online Courses (MOOCs) are being conducted. Additional activities like Industry institute interaction of varied nature are facilitated based on the requirements of the program. The activities are carried out at course level and program level to mitigate the gaps in curriculum.

Table 1.5: Sample of the activities carried out to mitigate the gap

Sl No	Activity		Date	PO1	PO2	PO3	PO4	PO5	PO6
1	Machine Learning with Big data Tools	Value Added Program	27th Oct 2018.	3	-	2	2	2	2
2	Design and Modelling using ER Model	Blended Learning Activity	21st Oct 2019	3	2	3	3	2	-
3	IPR workshop	Workshop	10th Oct 2019	3	-	2	2	2	2
4	Open Course	Value Added Program	22nd Oct 2019 to 26th Oct 2019	2	2	2	2	2	2
5	Global Summit, Carnegie India	Symposia	4th Dec 2019	-	-	-	-	2	2
6	Technical Talk Patentability of invention	Technical Talk	29th Nov 2019	3	-	2	2	2	2
7	Mi Smart Living 2020	Conclave	17th Sept 2019	-	-	-	-	2	2
8	Cyber Privacy and Security Engineering	Workshop	12th Oct 2019	2	-	2	2	2	2
9	Machine Learning Techniques	Poster Presentation	27th Dec 2019	3	2	3	2	-	2
10	IEEE Webinar on AI, Robotics and Autonomous Technologies	Webinar	10th Apr 2020	3	-	2	-	-	2
11	IEEE Webinar - How to bag your dream software engineering job?	Webinar	26th Apr 2020	3	-	2	-	-	2
12	IBM webinar on Graduate to Professional	Webinar	9th Jul 2020	3	-	2	-	-	2
13	IBM Webinar on Leadership in Technology to succeed	Webinar	15th Jul 2020	3	-	2	-	-	2
14	IBM webinar on Python	Webinar	17th Jul 2020	3	-	2	-	-	2
15	MOOCs/ FDP/ Webinar	Webinar	-	2	2	3	2	2	3
16	Open Course on Cognitive Security	Others	16th Jun 2020 to 20th Jun 2020	2	2	2	2	2	2
17	IEEE - A IoT for digital Transformation	Technical Talk	12th Sept 2020	3	-	2	-	-	2
18	IEEE Aerial Humanoid Robotics	Webinar	1st Oct 2020	3	-	2	-	-	2
19	FDP on Emerging Trends in Data Analytics	Workshop	10th May 2021 to 14th May 2021	2	-	2	2	2	2
20	Open Course on Cyber Security	Workshop	1st Jun 2021 to 5th Jun 2021	2	-	2	2	2	2
			Total	**18**	**5**	**18**	**11**	**12**	**19**

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

The Post Graduate Program is a university affiliated program. The program curriculum imparted to the students is in line with the defined program outcomes. Lot of features to reach the attainment of the Program Outcomes are imparted to the students. This is being channelized through the Blended Learning techniques adopted in the courses. Throughout the program students are encouraged to present papers in various research conferences covering the latest technical research issues. As part of the curriculum, they undergo internships in industries, hence enhancing their knowledge to different industrial practices.Students are encouraged to participate in the various technical events at Intra and Inter Institute level to gain multi-faceted exposure of learning outcomes.

Open Courses, Student Development Programs and Industrial Visits are the key components of Outcome Based Educational Practices. These initiatives are being observed and practiced recurrently from the quality perspective of the curriculum.The salient features of VTU curriculum and other efforts made by the program is listed below-

1. **Induction Programme:** There will be a week-long induction program for the PG students entering the institution. The incumbents learn about the institutional policies, processes, practices, culture and values.
2. **Post Graduate Program Outcomes (PO) Based Curriculum:** The curricula for the program is designed to meet the post graduate attributes (Program Outcomes) which are based on the knowledge, research, skill, ethics and higher learning.
3. **Emphasis on Practical Learning:** To impart the skills to the prospective researcher, the emphasis on practical sessions is extended in the curricula for all the programs. At each semester, the adequate amount of practical/laboratory courses are included.
4. **Industry exposure through Mini projects and Internships:** The curricula includes industry internships and mini projects for the students to expose them to the real-world experience at industrial environment. Mini projects expose to better technical articulation and project cycles.
5. **Self-Learning:** The curriculum provides with an opportunity for the students to take the initiative, with or without the assistance of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, and evaluating learning outcomes.
6. **Multiple avenues based on aspirations of the students**: The students will study the program specific courses for two years. There are three major avenues for the aspiring students to pursue:
    - **Industry/Placement:** The students who are aspiring to work as professional engineers in their core industrial domain have the option of studying the courses in the curriculum which are aligned towards the placement opportunities.

- **Research:** The curriculum provides an opportunity for the students to pursue the courses which are in support of higher learning enabling the learner to do research work in the desired domain of interest.
- **Presentation and Articulation:** The curriculum provides opportunities to present flexible assessment method for the course which improves communication and expect document this as report

The curriculum scheme of 2018 and 2020 is compared with the AICTE Model curriculum. The curriculum defined by the VTU is in compliance with AICTE model curriculum. Table 1.6 shows all the curriculum components are included in VTU scheme 2018 and 2020. More focus is given to practical courses in 2020 scheme. The table 1.3 shows the coverage of POs with various curriculum components of 2018 scheme.

Table1.6: Statistical Comparison Curriculum Components with of VTU with AICTE

Sl. No	Type of Course	AICTE Model Curriculum	VTU Curriculum 2020 scheme	VTU Curriculum 2018 Scheme
1.	Program Core I - Mathematics	1	1	1
2.	Program Core II- Domain Specific	8	8	8
3.	Audit Courses	2	1	1
4.	Program Electives	4	4	4
6.	Laboratory Courses	4	2	1
7	Mini Projects	1	1	1
8	Internships	1	1	1
9	Technical Seminar	1	1	1
10	Dissertation Work	1	1	1

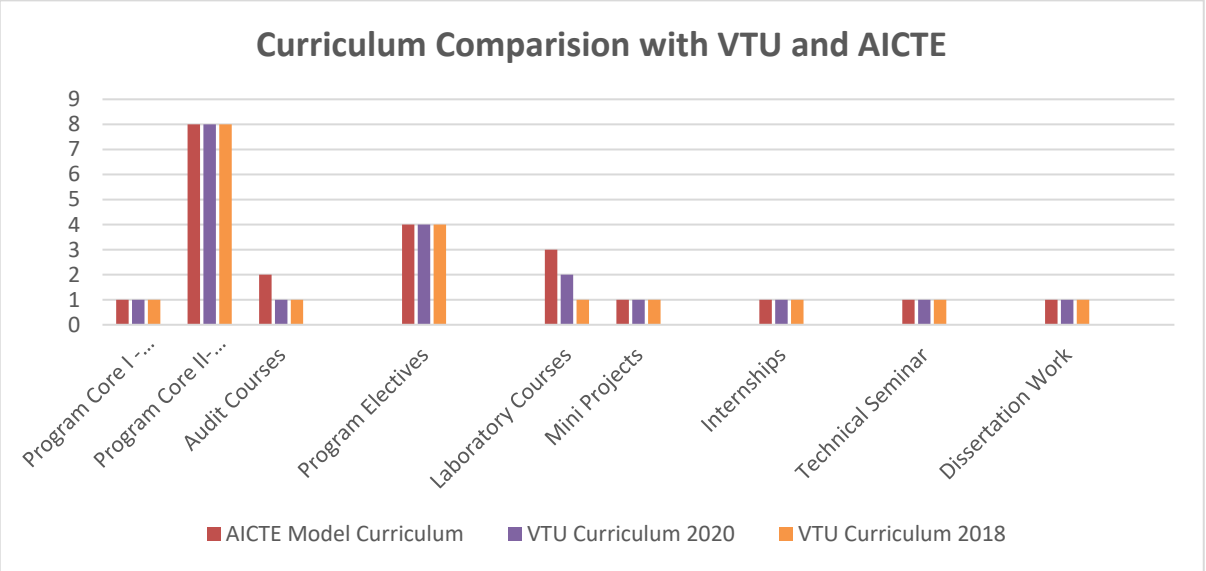


Figure 1.5: Curriculum Comparison of VTU with AICTE

1.2. Teaching-Learning Processes (90)

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

The Post Graduate Program is affiliated to Visvesvaraya Technological University (VTU), Belagavi. The Department of Computer Science and Engineering (CSE) program adheres to the rules and regulations provided by university.

Semester End Examination is conducted as per the guidelines of the university. The notifications regarding End Semester exam are sent by the University through its calendar of events. The Question Paper of SEE is provided by the University. Evaluation of the Question Paper is coordinated by the university.

Internal Semester Examination (CIE)

The University Regulations specifies to conduct three Continuous Internal Evaluation (CIE) Exams at 6th, 12th and 14th week respectively. It is suggested to cover one third of the syllabus for every Internal Semester Exam. The Internal Exams are conducted as prescribed by the norms of the university. The Internal Exam dates are scheduled in the college calendar of events in line with the university norms. An Institute level test committee is in place to oversee the **Internal Semester Examination** conduction process.

Question Paper Preparation and Scrutiny Process:

The question paper is prepared by the course coordinator. Blooms taxonomy is followed during the process. The question paper is submitted to the question paper scrutiny committee for review. Suggestions made by the committee are incorporated. A scheme of evaluation is prepared by the course coordinator and the same is discussed with the students to make them aware about the requirements of evaluation and division of marks. This ensures uniformity in the evaluation

process of the Internal Semester Question papers. A detailed process practiced in the program is depicted in the figure 1.6 and a sample question paper of Managing Big Data is show in the figure 1.7. The revised Question paper is shown in figure 1.8.

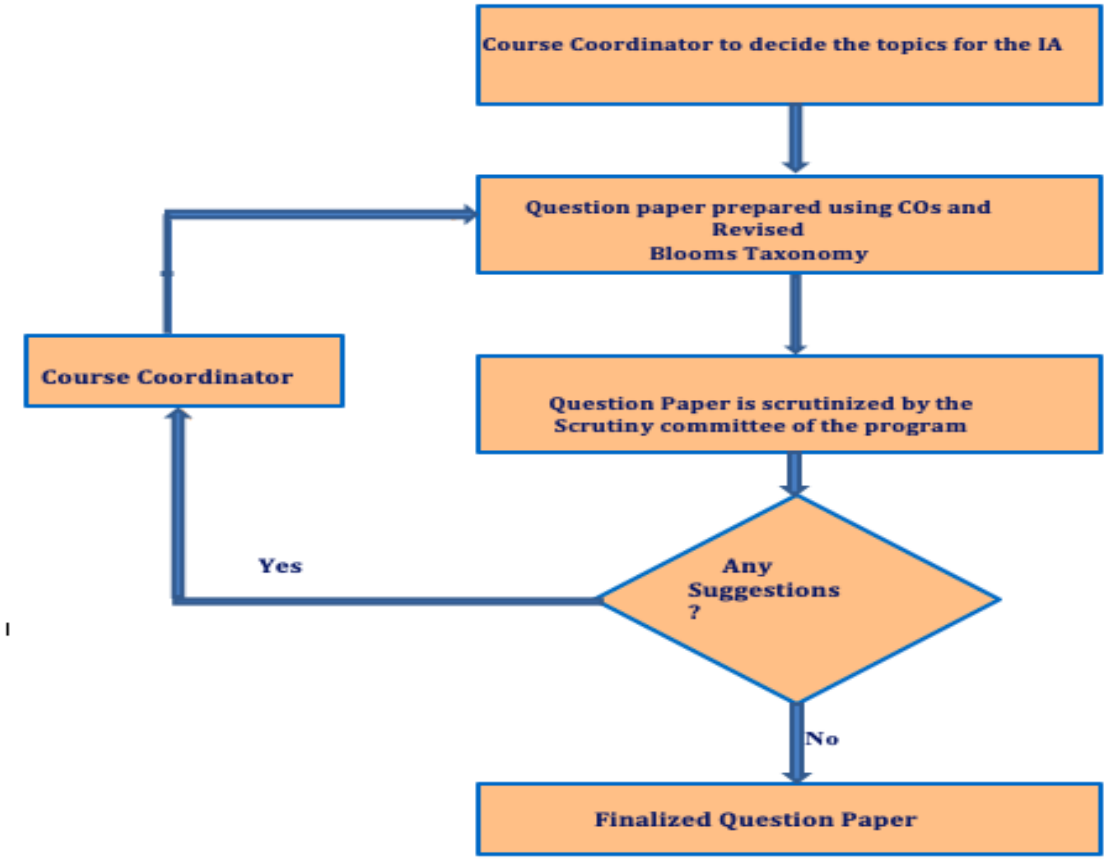
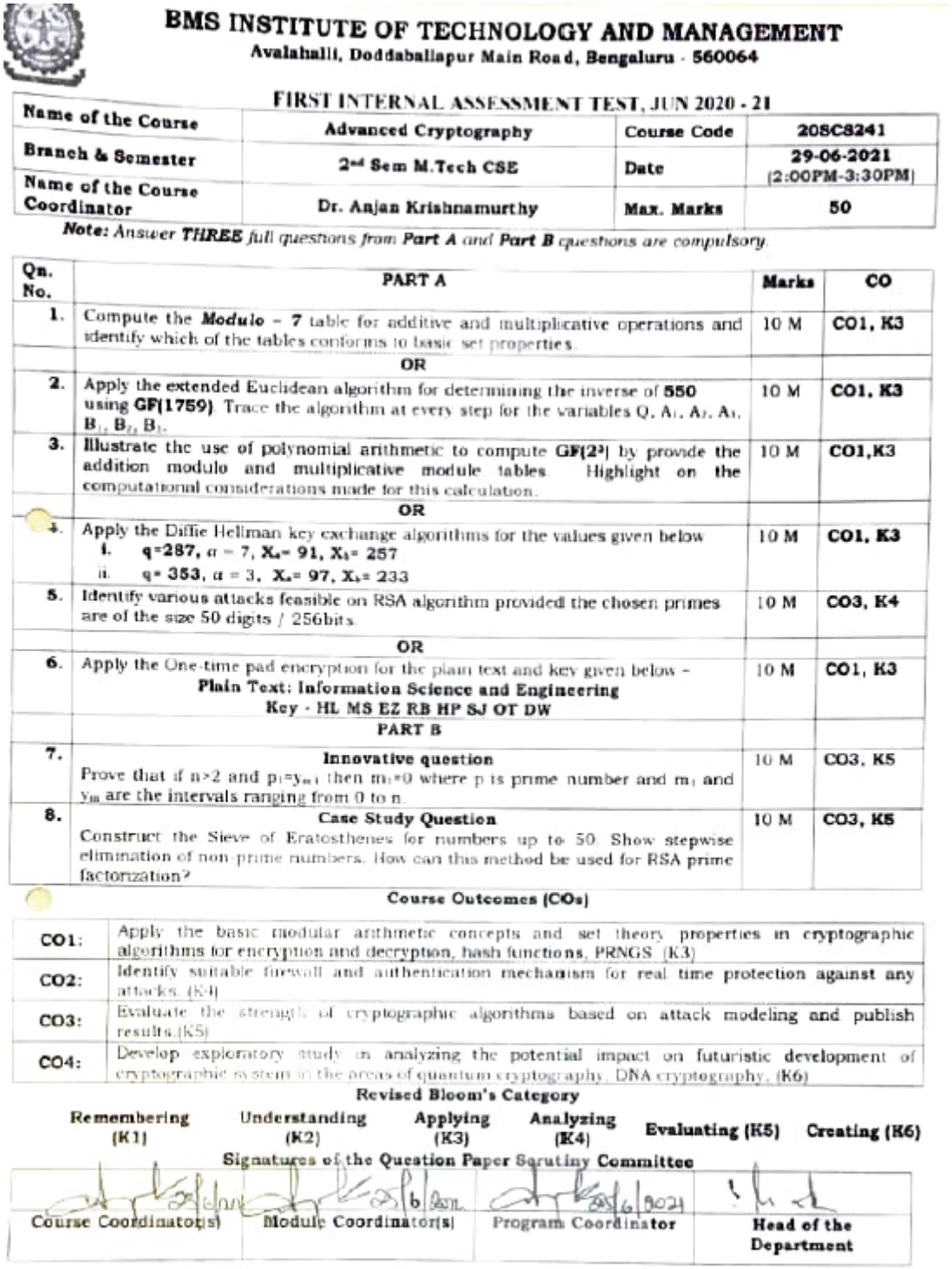


Figure 1.6: Process followed for Internal Question Paper scrutiny



BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
Avalahalli, Doddaballapur Main Road, Bengaluru - 560064

FIRST INTERNAL ASSESSMENT TEST, JUN 2020 - 21

Name of the Course	Advanced Cryptography	Course Code	20SCS241
Branch & Semester	2nd Sem M.Tech CSE	Date	29-06-2021 (2:00PM-3:30PM)
Name of the Course Coordinator	Dr. Anjan Krishnamurthy	Max. Marks	50

*Note: Answer **THREE** full questions from **Part A** and **Part B** questions are compulsory.*

Qn. No.	PART A	Marks	CO
1.	Compute the **Modulo – 7** table for additive and multiplicative operations and identify which of the tables conforms to basic set properties.	10 M	CO1, K3
	OR		
2.	Apply the extended Euclidean algorithm for determining the inverse of **550** using **GF(1759)**. Trace the algorithm at every step for the variables Q, A_1, A_2, A_3, B_1, B_2, B_3.	10 M	CO1, K3
3.	Illustrate the use of polynomial arithmetic to compute **GF(2^3)** by provide the addition modulo and multiplicative module tables. Highlight on the computational considerations made for this calculation.	10 M	CO1,K3
	OR		
4.	Apply the Diffie Hellman key exchange algorithms for the values given below i. **q=287, α = 7, X_A= 91, X_B= 257** ii. **q= 353, α = 3, X_A= 97, X_B= 233**	10 M	CO1, K3
5.	Identify various attacks feasible on RSA algorithm provided the chosen primes are of the size 50 digits / 256bits.	10 M	CO3, K4
	OR		
6.	Apply the One-time pad encryption for the plain text and key given below – **Plain Text: Information Science and Engineering** **Key - HL MS EZ RB HP SJ OT DW**	10 M	CO1, K3
	PART B		
7.	**Innovative question** Prove that if n>2 and $p_i=y_{m_i}$ then $m_i \neq 0$ where p is prime number and m_i and y_m are the intervals ranging from 0 to n.	10 M	CO3, K5
8.	**Case Study Question** Construct the Sieve of Eratosthenes for numbers up to 50. Show stepwise elimination of non-prime numbers. How can this method be used for RSA prime factorization?	10 M	CO3, K5

Course Outcomes (COs)

CO1:	Apply the basic modular arithmetic concepts and set theory properties in cryptographic algorithms for encryption and decryption, hash functions, PRNGS. (K3)
CO2:	Identify suitable firewall and authentication mechanism for real time protection against any attacks. (K4)
CO3:	Evaluate the strength of cryptographic algorithms based on attack modeling and publish results.(K5)
CO4:	Develop exploratory study in analyzing the potential impact on futuristic development of cryptographic system in the areas of quantum cryptography, DNA cryptography. (K6)

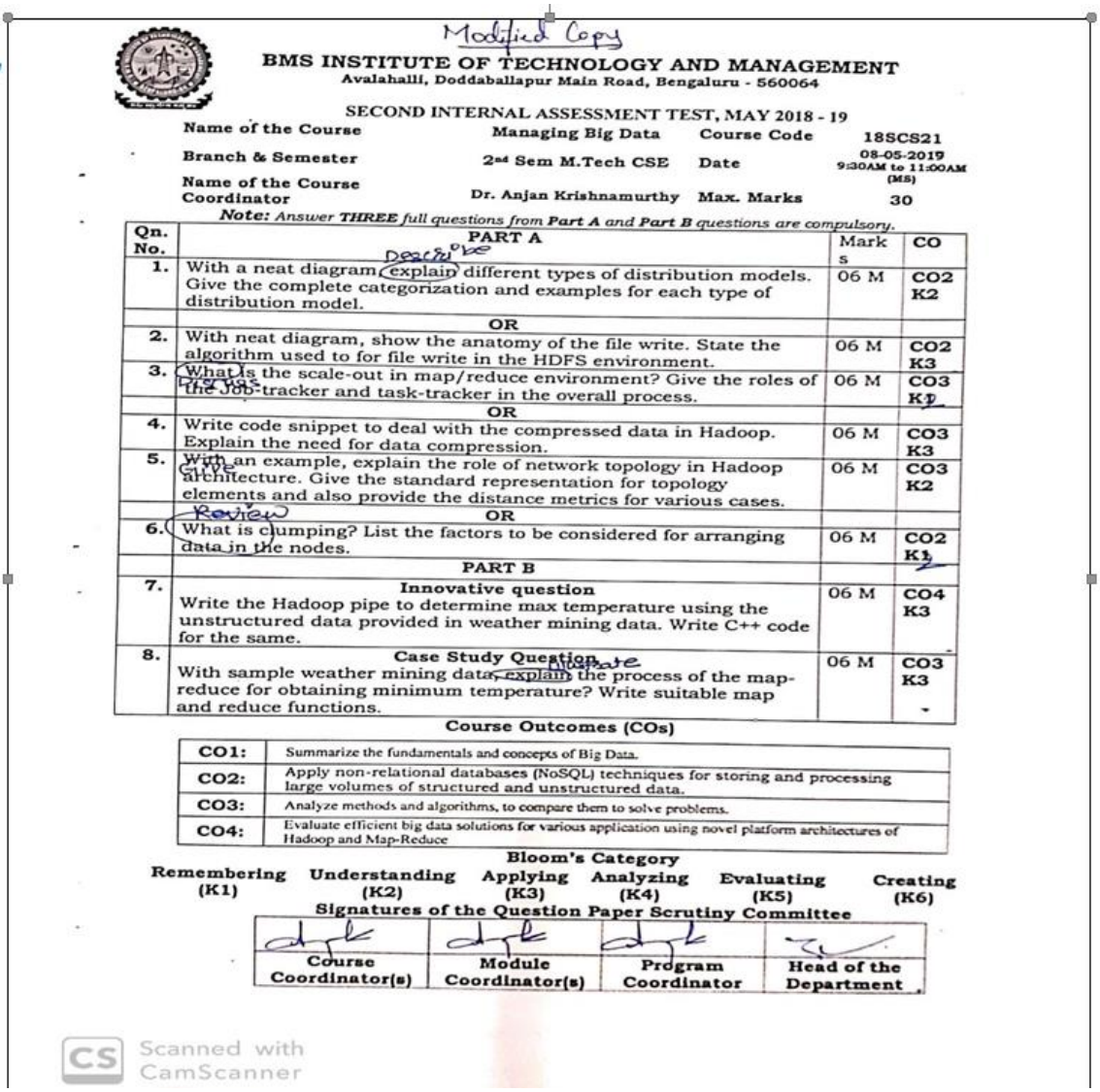
Revised Bloom's Category

Remembering (K1)	Understanding (K2)	Applying (K3)	Analyzing (K4)	Evaluating (K5)	Creating (K6)

Signatures of the Question Paper Scrutiny Committee

Course Coordinator(s)	Module Coordinator(s)	Program Coordinator	Head of the Department

Figure 1.7: Sample Question paper of Advanced Cryptography



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BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
Avalahalli, Doddaballapur Main Road, Bengaluru - 560064

SECOND INTERNAL ASSESSMENT TEST, MAY 2018 - 19

Name of the Course	Managing Big Data	Course Code	18SCS21
Branch & Semester	2nd Sem M.Tech CSE	Date	08-05-2019 9:30AM to 11:00AM (MS)
Name of the Course Coordinator	Dr. Anjan Krishnamurthy	Max. Marks	30

Note: *Answer **THREE** full questions from **Part A** and **Part B** questions are compulsory.*

Qn. No.	PART A	Marks	CO
1.	With a neat diagram explain different types of distribution models. Give the complete categorization and examples for each type of distribution model.	06 M	CO2 K2
	OR		
2.	With neat diagram, show the anatomy of the file write. State the algorithm used to for file write in the HDFS environment.	06 M	CO2 K3
3.	What is the scale-out in map/reduce environment? Give the roles of the job-tracker and task-tracker in the overall process.	06 M	CO3 K3
	OR		
4.	Write code snippet to deal with the compressed data in Hadoop. Explain the need for data compression.	06 M	CO3 K3
5.	With an example, explain the role of network topology in Hadoop architecture. Give the standard representation for topology elements and also provide the distance metrics for various cases.	06 M	CO3 K2
	OR		
6.	What is clumping? List the factors to be considered for arranging data in the nodes.	06 M	CO2 K1
	PART B		
7.	**Innovative question** Write the Hadoop pipe to determine max temperature using the unstructured data provided in weather mining data. Write C++ code for the same.	06 M	CO4 K3
8.	**Case Study Question** With sample weather mining data, explain the process of the map-reduce for obtaining minimum temperature? Write suitable map and reduce functions.	06 M	CO3 K3

Course Outcomes (COs)

CO1:	Summarize the fundamentals and concepts of Big Data.
CO2:	Apply non-relational databases (NoSQL) techniques for storing and processing large volumes of structured and unstructured data.
CO3:	Analyze methods and algorithms, to compare them to solve problems.
CO4:	Evaluate efficient big data solutions for various application using novel platform architectures of Hadoop and Map-Reduce

Bloom's Category

Remembering (K1)	Understanding (K2)	Applying (K3)	Analyzing (K4)	Evaluating (K5)	Creating (K6)

Signatures of the Question Paper Scrutiny Committee

Course Coordinator(s)	Module Coordinator(s)	Program Coordinator	Head of the Department

Figure 1.8: Sample Question paper of Managing Big Data

Revised Copy

BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT
Avalahalli, Doddaballapur Main Road, Bengaluru - 560064

SECOND INTERNAL ASSESSMENT TEST, MAY 2018 - 19

Name of the Course	**Managing Big Data**	**Course Code**	**18SCS21**
Branch & Semester	**2nd Sem M.Tech CSE**	**Date**	**08-05-2019 9:30AM to 11:00AM (MS)**
Name of the Course Coordinator	**Dr. Anjan Krishnamurthy**	**Max. Marks**	**30**

Note: *Answer **THREE** full questions from **Part A** and **Part B** questions are compulsory.*

Qn. No.	PART A	Marks	CO
1.	With a neat diagram, describe different types of distribution models. Give the complete categorization and examples for each type of distribution model.	06 M	CO2 K2
	OR		
2.	With neat diagram, show the anatomy of the file write. State the algorithm used to for file write in the HDFS environment.	06 M	CO2 K3
3.	Discuss the scale-out in map/reduce environment? Give the roles of the Job-tracker and task-tracker in the overall process.	06 M	CO3 K2
	OR		
4.	Write code snippet to deal with the compressed data in Hadoop. Explain the need for data compression.	06 M	CO3 K3
5.	Give an example, explain the role of network topology in Hadoop architecture. Give the standard representation for topology elements and also provide the distance metrics for various cases.	06 M	CO3 K2
	OR		
6.	Review clumping. List the factors to be considered for arranging data in the nodes.	06 M	CO2 K2
	PART B		
7.	**Innovative question** Write the Hadoop pipe to determine max temperature using the unstructured data provided in weather mining data. Write C++ code for the same.	06 M	CO4 K3
8.	**Case Study Question** With sample weather mining data, illustrate the process of the map-reduce for obtaining minimum temperature? Write suitable map and reduce functions.	06 M	CO3 K3

Course Outcomes (COs)

CO1:	Summarize the fundamentals and concepts of Big Data.
CO2:	Apply non-relational databases (NoSQL) techniques for storing and processing large volumes of structured and unstructured data.
CO3:	Analyze methods and algorithms, to compare them to solve problems.
CO4:	Evaluate efficient big data solutions for various application using novel platform architectures of Hadoop and Map-Reduce

Figure 1.9: Sample of Revised question paper

Assignments

Assignment is an integral part of the curriculum. Identified Program Outcome gaps can be mitigated through this valuable component. The topics of assignment are of varied nature. It may include problem solving, case studies and mini project in line with the course outcomes and beyond curriculum. The Course coordinator shall define the rubrics for evaluation of the assignment.The

assignment list for a course on Cyber Security and Cyber Laws (18SCS334) is given in the table 1.6 showing its mapping to Program Outcomes.

Table 1.6(a): Assignment list for Cyber Security and Cyber laws

Topic Name	PO1	PO2	PO3	PO4	PO5	PO6
Comparative study of various forensics tools and demo of the same					√	√
Phishing					√	√
Anti-forensics					√	√
Mobile forensics					√	√
Worms and viruses					√	√
Keyloggers					√	√
Digital Forensics In A Virtual Machine					√	√
Social Media Application Forensics					√	√
SQL injection					√	√
Trojans and backdoors					√	√
Attacks on wireless network					√	√
Digital Forensics: Focusing on Image Forensics					√	√
Evidence Data Collection with ANDROSICS Tool for Android Forensics					√	√
Forensics Analysis of E-Mail					√	√

The course coordinator defines the rubrics to evaluate the assignment. A sample rubric is as shown below.

Table 1.6 (b): Rubrics for Assignment - Cyber Security and Cyber laws

Dimension	Maximum Marks	High	Medium	Low
Introduction		Position and exceptions, if any, are clearly stated. Organization of the argument is completely and clearly outlined and implemented.	Position is Clearly stated. Organization of argument is clear in parts or only partially described and mostly implemented.	Position is vague. Organization of argument is missing, vague, or not consistently maintained.
	5	**4-5 pts**	**2-3 pts**	**0-1 pts**
Research		Research selected is highly relevant to the argument, is presented accurately and completely – the method, results, and implications are all presented accurately; Theory is relevant, accurately described and all relevant components are included; relationship between research and theory is clearly articulated and accurate.	Research is relevant to the argument and is mostly accurate and complete – there are some unclear components or some minor errors in the method, results or implications. Theory is relevant and accurately described, some components may not be present or are unclear. Connection to theory is mostly clear and complete, or has some minor errors.	Research selected is not relevant to the argument or is vague and incomplete – components are missing or inaccurate or unclear. Theory is not relevant or only relevant for some aspects; theory is not clearly articulated and/or has incorrect or incomplete components. Relationship between theory and research is unclear or inaccurate, major errors in the logic are present.
	5	**4-5 pts**	**2-3 pts**	**0-1 pts**

Conclusions		Conclusion is clearly stated and connections to the research and position are clear and relevant. The underlying logic is explicit. 4-5 pts	Conclusion is clearly stated and connections to research and position are mostly clear, some aspects may not be connected or minor errors in logic are present.	Conclusion may not be clear and the connections to the research are incorrect or unclear or just a repetition of the findings without explanation. Underlying logic has major flaws; connection to position is not clear.
	5	**4-5 pts**	**2-3 pts**	**0-1**
Writing		Paper is coherently organized and the logic is easy to follow. There is no spelling or grammatical errors and terminology is clearly defined. Writing is clear and concise and persuasive.	Paper is generally well organized and most of the argument is easy to follow. There is only a few minor spelling or grammatical errors, or terms are not clearly defined. Writing is mostly clear but may lack conciseness.	Paper is poorly organized and difficult to read – does not flow logically from one part to another. There are several spelling and/or grammatical errors; technical terms may not be defined or are poorly defined. Writing lacks clarity and conciseness.
	5	**4-5 pts**	**2-3 pts**	**0-1**

1.2.2. Quality of student projects (30)

Project for PG students gives an opportunity to build upon learning gained in the earlier years, and to broaden the scope of understanding. Students are required to take complete ownership of their project, and this necessitates a considerable time and effort beyond the exercise of knowledge and skills. They must be self-regulating and self-directed in their time management. It is expected that the students use the wide range of knowledge and skills that they have gathered over the course of their post graduate program.

All project proposals (Synopsis) submitted must be approved by the **Project Evaluation Committee (PEC)**. The role of PEC is to verify, approve and evaluate the projects submitted by students.

Students are motivated to focus on projects related to the following **area (Specialization)**:

- Computer Network Security.
- Artificial Intelligence
- Data Science

The project selection process involves the following steps:

1: The faculty members share their domain/area of interest with the students.
2: Students selects their interested domain to proceed with.
3: PEC assigns the guide for each project based on the domain selected by the student.
4: Students submit the synopsis after an extensive literature survey.
5: The synopsis is scrutinized and approved by the committee.
6: Review of implementation process is conducted in two phases.
7: Projects are Assessed and Evaluated by the committee based on the defined rubric.

The projects are evaluated by Project **Evaluation Committee** (PEC). The committee consists of HOD, guide and senior faculty members as shown in table 1.7 below

Table 1.7: Project Evaluation Committee (PEC)

Name	Role
Head of Department, Dept. of CSE	Chairman
Senior Faculty-1	Member
Senior Faculty -2	Member
Senior Faculty -3	Member
Guide	Member

Project Phase-1: Project phase-1 is carried out for Six-weeks in 3rd semester. Students in consultation with the guide shall carry out literature survey to finalize the topic of Project. Phase 1 in 3rd Semester is allocated with 100 marks for Internal Assessment. The rubric for the same is shown in the table 1.8.

Table 1.8: Evaluation Rubrics for Phase 1

Parameter	Allocated Marks	HIGH	MEDIUM	LOW
Literature Survey & Relevance in present context	**20**	Demonstration of proper understanding of the solution and also map the given problem with the Domain. Use available literature as a basis if possible/ Demonstration of proper understanding of the company sources, web repositories etc.	Demonstration of average understanding of the solution and also map the given problem with the domain specified / Demonstration of average understanding of products formed through the literature review/product study.	Poor/Inadequate survey carried
		High	**Medium**	**Low**
		(15-20)	**(09-14)**	**(0-8)**
Identifying the research gap in the Literature Review (3) / Product feature enhancements	**15**	Appropriately identifies the gap/features, limitations, and improvements with apparent recent papers /product reviews	Modestly identifies the gaps//product features with apparent reviews	Poor identification with no specific limitation
		High (11-15)	**Medium (06-10)**	**Low (0-05)**
Problem formulation & Objectives	**15**	Clear definition of Objectives & Problem Definition	Objectives & Problem Definition are specified but needs improvement	Objectives & Problem Definition are not clearly specified
		High (11-15)	**Medium (06-10)**	**Low (0-05)**

Proposed Methodology & Expected Outcomes	**10**	Clear definition of Methodology & Expected Outcomes	Methodology s & Expected Outcomes are specified but needs improvement	Objectives & Problem Definition are not clearly specified
		High (7-10)	**Medium (04-06)**	**Low (0-03)**
Work in Progress	**05**	Significant Progress	Moderate Progress	Poor Progress
		High (04-05)	**Medium (02-03)**	**Low (0-01)**
Presentation Skills	**05**	Excellent	Good	Poor
		High (04-05)	**Medium (02-03)**	**Low (0-01)**

Project Phase-2: It is conducted for 16-weeks during 4th semester. The evaluation will be done by the committee for 50 marks. The evaluation rubric for Phase-2 is shown in the table 1.9 which defines the following attributes.

Table 1.9: Evaluation Rubrics for Phase 2

Parameter	Marks	HIGH	MEDIUM	LOW
Relevance of the subject and domain identification	**05**	Clarity in understanding the problem and relevance to the domain.	No better understanding of the problem and its relevance.	Poor relevance & Understanding.
		High (04-05)	**Medium (02-03)**	**Low (0-01)**
Problem Identification	**05**	Clear and concise definition of Objectives & Problem Definition	Objectives & Problem Definition are specified but needs improvement	Objectives & Problem Definition are not clearly specified
		High (04-05)	**Medium (02-03)**	**Low (0-01)**
Originality & Novelty	**05**	High level of originality and novelty in the idea.	Innovativeness and originality is less	No innovativeness and originality
		High (04-05)	**Medium (02-03)**	**Low (0-01)**
Scope and Objectives set for the Topic	**10**	Clear definition of Objectives & Scope of the project.	Objectives & Scope are specified but needs improvement	Objectives & Scope are not clearly specified
		High (07-10)	**Medium (04-06)**	**Low (0-03)**
Initial Literature Survey	**15**	Demonstration of proper understanding of the solution space and also map the given problem with the Domain. Use available literature as a basis if possible/ Demonstration of proper understanding of the company sources, web repositories etc.,	Demonstration of average understanding of the solution space and also map the given problem with the domain specified / Demonstration of average understanding of products formed	Poor/Inadequate survey carried

			through the literature review/product study.	
		High (11-15)	**Medium (06-10)**	**Low (0-05)**
Synopsis Report	**10**	Report in format, content is clearly written, submitted in time.	Report in format, content is not clearly written, submitted in time.	Report not in format, content not in order, language mistakes, not submitted in time.
		High (07-10)	**Medium (04-06)**	**Low (0-03)**

Project Evaluation Phase-3: Project evaluation and Viva-Voce examination shall be conducted in fourth (Final) semester.

- Internal Examiner carries out the evaluation for 100 marks.
- External Examiner carries out the evaluation for 100 marks.
- Average of both Internal and external examiner marks are considered as the final marks for project evaluation.
- Viva-Voce examination of Project work is conducted jointly by Internal and External examiner for 100 marks.

The candidate should submit a soft copy (CD) of the dissertation work to the University. The CD should contain the entire Dissertation in monolithic form as a PDF file. The guide checks for the completeness of the report, plagiarism must be verified, and the similarity index must be less than 25%. The report will then be uploaded along with student details as prescribed in the form available on online dissertation evaluation portal. The guide submits a panel of four Examiners for evaluation of dissertation which is been approved by the university. Then university will notify the date of conduction viva voce examination. The table 1.10 is the criteria for the dissertation evaluation defined by the university.

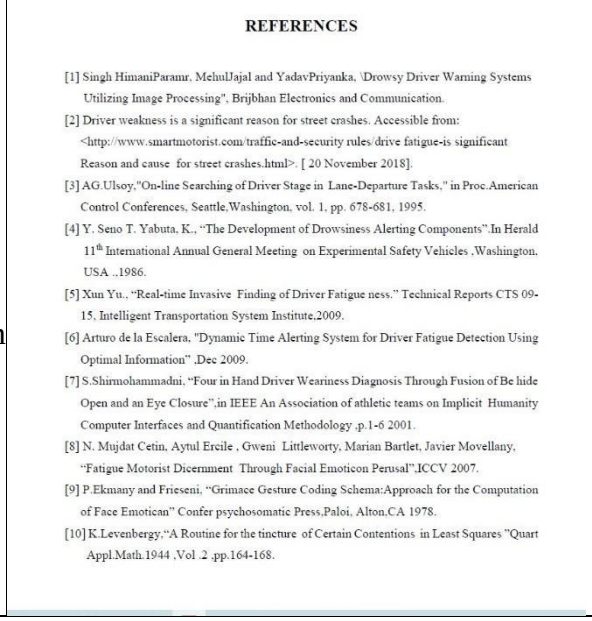
Table 1.10: Criteria for dissertation evaluation as defined by VTU

Parameters	Marks (100)
Relevance of the subject in the present context	**10**
Originality	**05**
Literature Survey	**10**
Problem Formulation	**10**
Analysis, Experimentation and Optimization	**10**
Results- Presentation & Discussion	**20**
Conclusion & Future Scope	**05**
Overall presentation of the thesis	**25**
Outcome of the dissertation resulting in article	**05**

CO-PO mapping of projects

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6
CO1: Identify and formulate the research Problem	3					
CO2: Conduct literature survey on topics related to project		3			2	
CO3: Develop a methodology using advanced tools/techniques for solving the problem including project management and finances.			3	2		2
CO4: Develop Analytical models, Perform Numerical Analysis and interpret the results.	3			3	3	3
CO5: Prepare quality document of project work for publications, patenting and final thesis.		3				3

Quality of literature survey of the project conducted for 2017 -19

Guide Name	Project title	Literature Survey Done
Prof. Radhika K R	IoT Based Groggy Driving Alerting and an Traffic Collision Information System	

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[8] N. Mujdat Cetin, Aytul Ercile , Gweni Littleworty, Marian Bartlet, Javier Movellany, "Fatigue Motorist Dicernment Through Facial Emoticon Perusal",ICCV 2007.

[9] P.Ekmany and Frieseni, "Grimace Gesture Coding Schema:Approach for the Computation of Face Emotican" Confer psychosomatic Press,Paloi, Alton,CA 1978.

[10] K.Levenbergy,"A Routine for the tincture of Certain Contentions in Least Squares "Quart Appl.Math.1944 ,Vol .2 ,pp.164-168.

Table 1.11: Project List of 2017 batch with PO mappings

Sl. No	Project title	PO1	PO2	PO3	PO4	PO5	PO6
1	Military IOT System Air Pollution Detection And Power Management	**2**	**3**	**3**	**3**	**3**	**3**
2	Implementation & Testing Of Soil Analysis In Cultivation Land Using IOT	**2**	**3**	**3**	**3**	**3**	**3**
3	Cyber Attack Detection Using Machine Learning	**3**	**3**	**3**	**3**	**2**	**3**
4	Expression Invariant Face Recognition Using Convolutional Neural Networks	**3**	**3**	**3**	**3**	**2**	**3**
5	Comparison Study Of Machine Learning Algorithms For Spam Detection In Twitter	**3**	**3**	**3**	**3**	**2**	**3**
6	Age Invariant Recognition.	**2**	**3**	**3**	**3**	**3**	**3**
7	An IOT Based Smart Health Monitoring System For Animal	**2**	**3**	**3**	**3**	**3**	**3**
8	IOT Based Groggy Driving Alerting And An Traffic Collision	**2**	**3**	**3**	**3**	**3**	**3**

9	Smart Washroom Cleaning System Using Image Processing And IOT	**2**	**3**	**3**	**3**	**3**	**3**
10	Secure Patient E -Health Record Using Block chain Technology.	**3**	**3**	**3**	**3**	**2**	**3**
		2	**3**	**3**	**3**	**3**	**3**

The Gaps observed

It is observed from the above table there is gap in PO1, where 3 out of 10 projects are addressing to Artificial Intelligence, 5 out of 10 are on Computer Networks and 2 out of 10 project are on Data Science.

The solution planned to bridge the gap

Plan is to promote students to choose projects on the area of Artificial Intelligence and Data Science and encourage students to conduct good literature survey in near future.

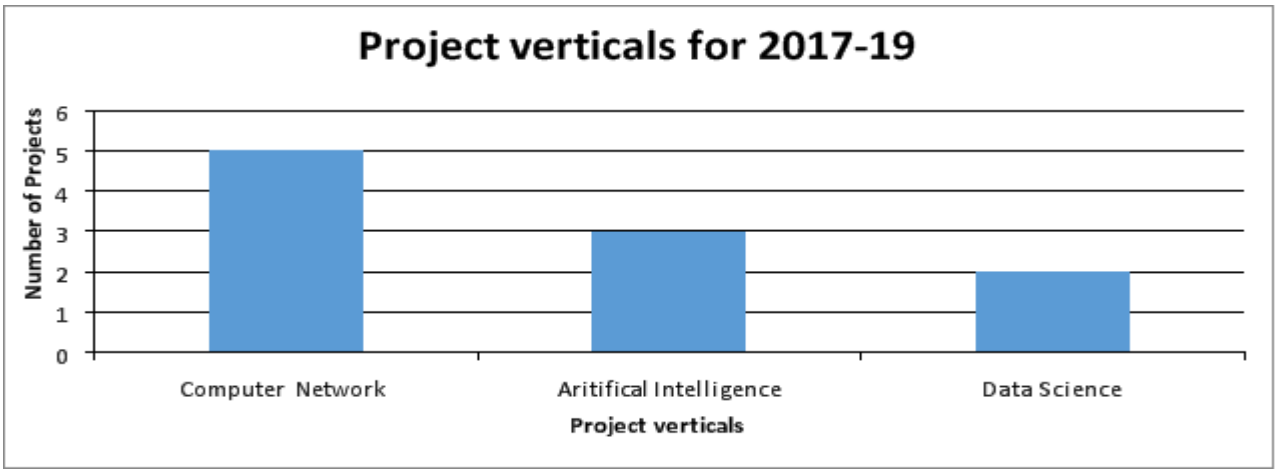


Figure 1.10: Project Verticals 2017-2019

Table 1.12: Quality of literature survey of the project conducted for 2018 -20

Guide Name	Project title	Literature Survey done
Dr. Anjan K	Detection of phishing websites using machine learning techniques	Bibliography [1] Reid G. Smith and Joshua Eckroth. Building ai applications: Yesterday, today, and tomorrow. *AI Magazine*, 38(1):6–22, Mar. 2017. [2] Panos Louridas and Christof Ebert. Machine learning. *IEEE Software*, 33:110–115, 09 2016. [3] Michael Jordan and T.M. Mitchell. Machine learning: Trends, perspectives, and prospects. *Science (New York, N.Y.)*, 349:255–60, 07 2015. [4] Steven Aftergood. Cybersecurity: The cold war online. *Nature*, 547:30+, Jul 2017. 7661. [5] Aleksandar Milenkoski, Marco Vieira, Samuel Kounev, Alberto Avritzer, and Bryan Payne. Evaluating computer intrusion detection systems: A survey of common practices. *ACM Computing Surveys*, 48:12:1–, 09 2015. [6] Chirag N. Modi and Kamatchi Acha. Virtualization layer security challenges and intrusion detection/prevention systems in cloud computing: a comprehensive review. *The Journal of Supercomputing*, 73(3):1192–1234, Mar 2017. [7] Eduardo Viegas, Altair Santin, Andre Fanca, Ricardo Jasinski, Volnei Pedroni, and Luiz Soares de Oliveira. Towards an energy-efficient anomaly-based intrusion detection engine for embedded systems. *IEEE Transactions on Computers*, 66:1–1, Jan 2016.

Table 1.13: Project list with PO mapping 2018-20 batch

SL No	Project Title	PO1	PO2	PO3	PO4	PO5	PO6
1	Detection of phishing websites using machine learning techniques	**3**	**3**	**3**	**3**	**2**	**3**
2	A keyless Anti-Theft security system for automobiles using face recognition and Embedded technology	**3**	**3**	**3**	**3**	**2**	**3**
3	DGTD Modelling of Mie Scattering Phenomenon of Gold Nano particles for Bio Sensing applications	**3**	**3**	**3**	**3**	**2**	**3**
4	Drone control through Machine learning algorithm	**3**	**3**	**3**	**3**	**2**	**3**

5	Efficient subspace Clustering of High Dimensional data using FG-K means Algorithm	**3**	**3**	**3**	**3**	**2**	**3**
6	Extracting Twitter Data, Pre-processing and sentiment Analysis using Python	**3**	**3**	**3**	**3**	**3**	**3**
7	Prediction of Epilepsy Seizure using Machine learning Algorithms	**3**	**3**	**3**	**3**	**2**	**3**
8	Narrowband (NB)-IOT Based Soil Quality Monitoring System to Enhance Crop Yield	**3**	**3**	**3**	**3**	**2**	**3**
9	Portable spirometer for Chronic Pulmonary Obstructive Disease using Machine learning Techniques	**3**	**3**	**3**	**3**	**2**	**3**
10	Artificial intelligence driven web firewall-security system for cloud application	**3**	**3**	**3**	**3**	**3**	**3**
11	Using Keystroke authentication Typing errors pattern as non-repudiation in computing Forensics	**3**	**3**	**3**	**3**	**2**	**3**
12	Machine learning model for Detecting Breast Cancer using Mammography	**3**	**3**	**3**	**3**	**2**	**3**
13	Flood forecasting & detection using random forest learning technique	**3**	**3**	**3**	**3**	**2**	**3**
14	Detection of Fraud application using sentimental analysis	**3**	**3**	**3**	**3**	**2**	**3**

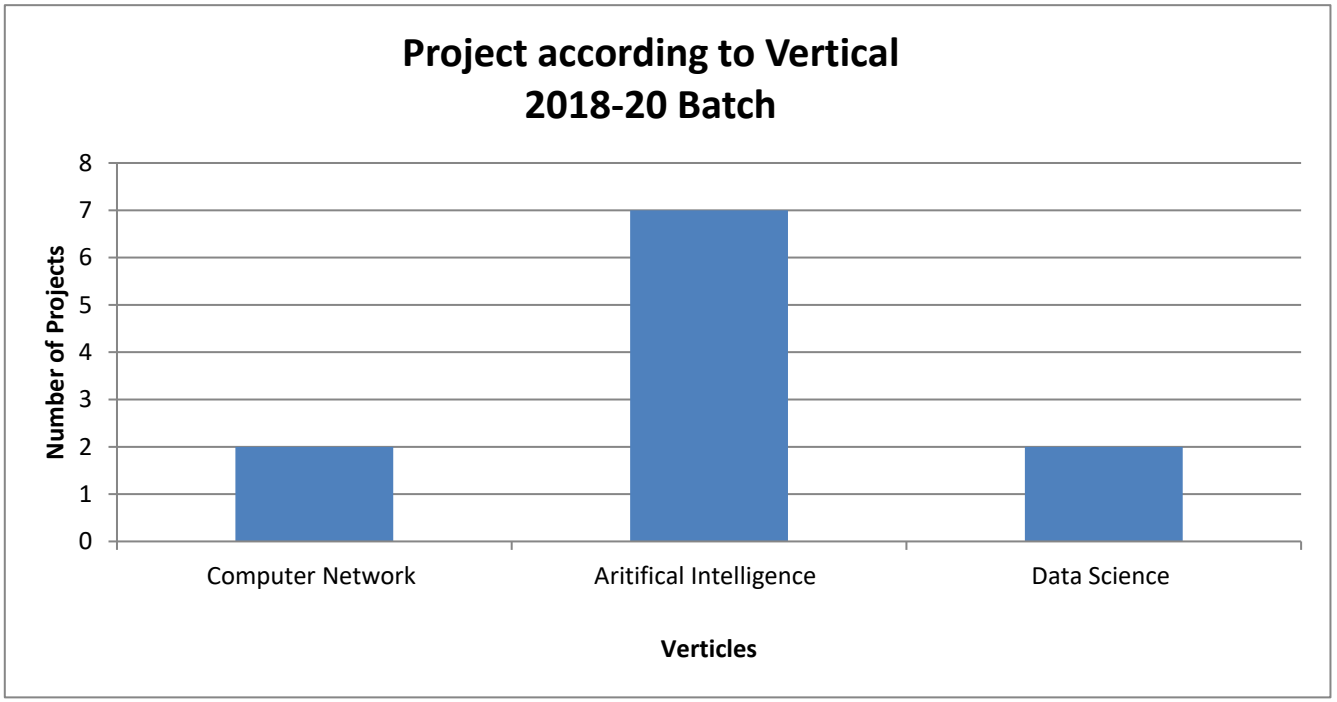
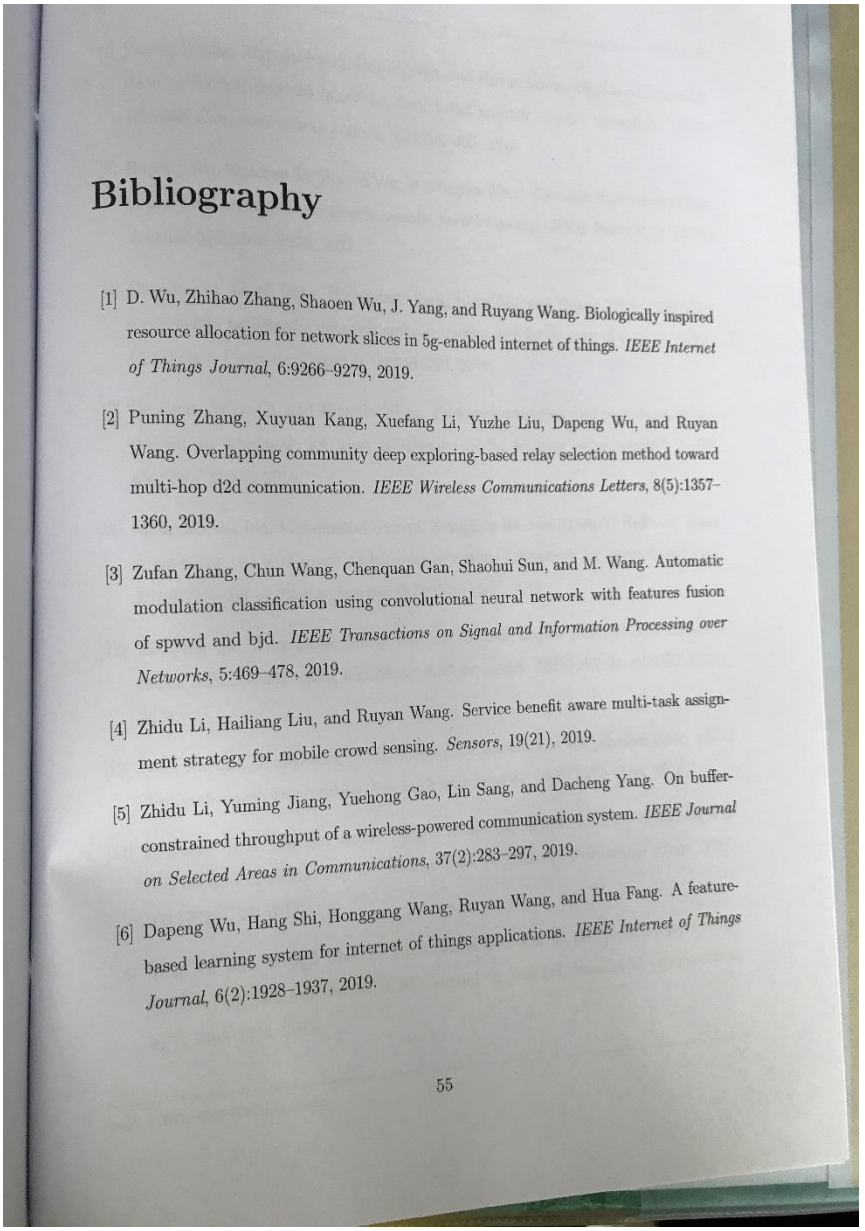


Figure 1.11: Project Verticals 2018-2020

The Gaps observed
It is observed from the above table 2 out of 14 projects are mapped to Computer Network Security, 7 out of 14 projects are mapped to Artificial Intelligence and 2 out of 14 projects are mapped to Data Science.
The solution planned
As the domains considered are the upcoming areas in research and current industries, more such research projects related to these areas can be encouraged.

Table 1.14: Quality of literature survey of the project conducted for 2019 -21

Guide Name	Project title	Literature Survey done
Dr Anjan Krishnamurthy	CNN Based security authentication for wireless multimedia network.	

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[2] Puning Zhang, Xuyuan Kang, Xuefang Li, Yuzhe Liu, Dapeng Wu, and Ruyan Wang. Overlapping community deep exploring-based relay selection method toward multi-hop d2d communication. *IEEE Wireless Communications Letters*, 8(5):1357–1360, 2019.

[3] Zufan Zhang, Chun Wang, Chenquan Gan, Shaohui Sun, and M. Wang. Automatic modulation classification using convolutional neural network with features fusion of spwvd and bjd. *IEEE Transactions on Signal and Information Processing over Networks*, 5:469–478, 2019.

[4] Zhidu Li, Hailiang Liu, and Ruyan Wang. Service benefit aware multi-task assignment strategy for mobile crowd sensing. *Sensors*, 19(21), 2019.

[5] Zhidu Li, Yuming Jiang, Yuehong Gao, Lin Sang, and Dacheng Yang. On buffer-constrained throughput of a wireless-powered communication system. *IEEE Journal on Selected Areas in Communications*, 37(2):283–297, 2019.

[6] Dapeng Wu, Hang Shi, Honggang Wang, Ruyan Wang, and Hua Fang. A feature-based learning system for internet of things applications. *IEEE Internet of Things Journal*, 6(2):1928–1937, 2019.

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Table 1.15: Project list with PO mapping with 2019-21 batch

SL No	Project Title	PO1	PO2	PO3	PO4	PO5	PO6
1	Ethnicity Identification	3	3	3	3	2	3

2	CNN Based security authentication for wireless multimedia network	**3**	**3**	**3**	**3**	**2**	**3**
3	Analysis of soil and leaf texture using machine learning Technique	**3**	**3**	**3**	**3**	**3**	**3**
4	Predication of COVID 19 severity using patients PHR	**3**	**3**	**3**	**3**	**3**	**3**
5	Stock Market Prediction	**3**	**3**	**3**	**3**	**3**	**3**
6	Myocardial blood flow quantification for evaluation of coronary artery disease using CNN Algorithm	**3**	**3**	**3**	**3**	**2**	**3**
7	IoT Enabled Real time aquarium monitoring system	**3**	**3**	**3**	**3**	**2**	**3**
		3	**3**	**3**	**3**	**2**	**3**

The Gaps observed
It is observed from the above table there is a gap in PO5, where 2 out of 14 projects are mapped to Computer Network Security, 7 out of 14 projects are mapped to Artificial Intelligence and 2 out of 14 projects are mapped to Data Science.
The solution planned
More projects on social concern can be planned.

Observation(s)

It is observed from the above tables and graphs that 2018 and 2019 batch projects have better mapping for PO2, PO3, PO4 and PO6.The project batches are suggested to carry out rigorous literature survey by referring quality publications like Scopus, Web of Science, ACM, Springer etc. Students are advised to focus on addressing the challenges of interdisciplinary problems related to societal concerns.

1.2.3 Initiatives related to Industry Interaction including Industry Internship/Summer Training (10)

The goal of any technical institution is to produce skilled, globally competent professionals through quality technical education and to prepare them for immediate employment. Industries engross these knowledgeable professionals and enhance its production capabilities by contributing the latest technologies. To produce proficient graduates ready for the industry, it is necessary to know the requirements of the industries through industry-institute interaction. Hence, a good and vibrant industry institute interaction to promote education and entrepreneurship is definitely required.

To solve their engineering problems they look up now to engineering institutions. There is an urgent need to prepare engineering students for jobs in multinational companies, by exposing them to newer technologies and engineering methodologies. These objectives can only be achieved well by bridging the gap between industry and the academic institute. Qikpod is one Industry attached Lab with a goodwill consultancy where students were encouraged to take up real time projects.

To Promote Industry - Institute Interaction following actions have been taken:

- Industry Supported Lab
- Partial Delivery by Industry Experts.
- Industry Visits
- Industry Training/Internship
- M Tech projects/dissertation work in industries under joint guidance of the faculty and experts from industry

A. Industry Supported Laboratory

About Indian Tech Keys: Indian Tech Keys is an Indian startup that provides services like; Printed Circuit Board(PCBs) design and fabrication, 3-D printing services, Embedded product development, industry interaction programs, hands-on sessions or workshops, E-store supply and innovation labs. It is headquartered in Baiyappanahalli extension road, Near Swami Vivekananda Road metro, Bengaluru, Karnataka 560038. It was started in the year 2016 and is growing till date. There are two major departments or wings in the company: R&D (Research and Development) in the field of industrial automation and smart city products and also has Service Sector (SS) in which the team is involved in providing the technical support for small scale industries along with educational institutions and different universities in Karnataka. Indian Tech Keys mainly focuses on providing hands-on experience to students of graduation and post-graduation cadre and faculties. The company's motive is to bridge the gap between student community and current technologies by conducting workshops on recent technological advancements like that of PCB, ARM, Arduino, Robotics, Copters and Android tools.

Inauguration of Indian TechKeys Lab with Dept of CSE, BMSIT&M
Dr. Usha B A, Associate Professor, Department of CSE is working as Faculty Coordinator in bridging the gap of Industry and academia requirements by establishing the lab.

Figure 1.12: Inauguration by Principal, BMSIT&M and Director of Indian TechKeys Lab

Table 1.16: Details of Equipment/Facilities

1	IR Sensor	13	Embedded system kit	25	Hall Sensor
2	Temperature Sensor (DHT11)	14	RF Receiver and Transmitter kit	26	Single Channel Relay
3	4-Channel Relay	15	RTC Module	27	Metal Sensor
4	2-Channel Relay	16	4-channel push button	28	Lead Acid battery 12V 4200mAH
5	Motion Sensor (PIR)	17	RPI Camera	29	Lead Acid battery 12V 2000mAH
6	16X2 LCD Display	18	RFID Reader +TAG	30	Lead Acid battery 6V 2A
7	Fan	19	8051 Development Kit	31	Soil Moisture Sensor
8	Touch sensor	20	DTMF	32	LiPo Battery Charger
9	9V battery	21	Receiver Module	33	Lithium Ion Battery Charger
10	4digit 7-Seg	22	Dot Matrix Display	34	Transformer 15-0-15 V 2A
11	Soil Sensor	23	XBEE Trans Receiver	35	CNC 2D Plotter Machine
12	Joystick	24	Accelometer	36	Robotic Pick & Place ARM

Desirable Outcomes (learning that students would be getting):

- Concept to Product development skill.
- Exposure to Analogue and Digital ICs.
- Schematics capture, PCB foot print design skill using Design spark (Open Source) software.
- Unit testing, Quality Check and Circuit debugging skill development.
- Clear understating of PCB fabrication process.
- Exposure to methodology of innovative product development.
- Customized Case designing for the product.
- Exposure to Industry Graded Embedded system coding
- Logic Gates implementation in Embedded system programming.
- AVR Controller/Raspberry Pi software.
- Unit testing, Quality Check and Circuit debugging skill development.
- Exposure to methodology of innovative embedded product development.

- Multiple sensors introduction and integration with AVR/Raspberry Boards.
- Driver circuits introduction and integration with AVR/Raspberry Boards.
- Interfacing DTMF, Bluetooth & Wi-Fi Modules with microcontroller/processor.
- Exposure to Embedded Python and Embedded C Programming.

B. Industry Involvement in Partial Delivery of the Course

The Cos have been identified and PO mapping has been done for partial delivery of the Course and is shown in the below table 1.17

Table 1.17: CO-PO mapping for Partial Delivery

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6
CO1:Could you acquire the requisite knowledge related to Industrial practice				3		3
CO2: Could you gain significant insight between theoretical and practical perspectives				3		3
CO3: Could you get an exposure to real life practices from the industry expert and comply it in projects					3	3

Sl. No.	Name	Program	Course	Date
1.	Mr Parameswaran Selvan, Blockchain Technology Specialist & Nalini Kannan, Senior Technical Architect, IBM	II M.Tech CSE	Cyber Security and Blockchain	June 1st to 5th 2021

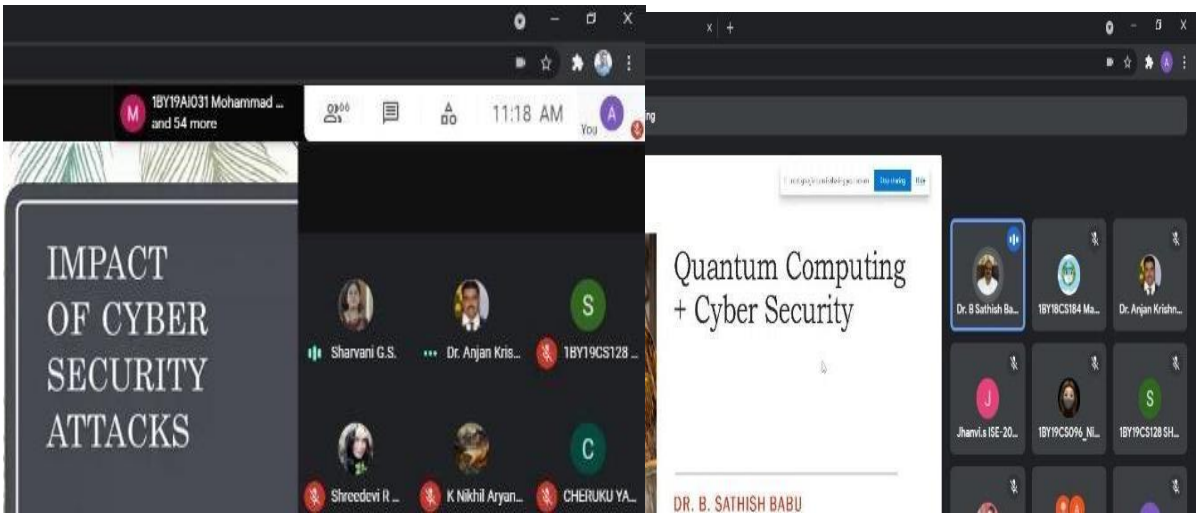


Figure 1.13: Partial Delivery on Cyber Security

C. Impact analysis of industry institute interaction and actions taken thereof

Feedback on Initiative

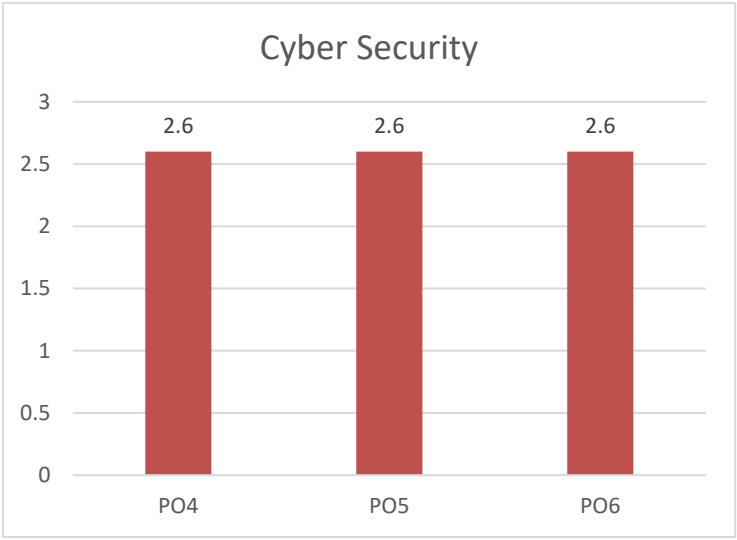


Figure 1.14: Feedback on Cyber Security

Impact Analysis:

Industry involvement in partial delivery of the course would help students in attaining POs (PO6 in particular) with respect to learning outcomes more practically and enhance the competency in the outside world in professional environment. This focuses on blended learning approach that optimizes the accomplishment of learning objectives with the application of suitable learning skills and tools.

D. Industrial training/tours for students

Industry Visit

Impact Analysis

Industry visits provide the students an insight about corporate culture, working environment and practical perspective on professionalism. The visit also provides an excellent opportunity to interact with industry experts, gain awareness regarding working methods and employment practices. The students had got a prospect to visit few companies like Aprameya, Netenzaa Innovations, Qikpod, etc.

The visit also bridges the gap between Industry and academia which contributes essential learning outcomes through outside classroom interactions.

The CO-PO mapping is shown in table 1.18. The details of visit is depicted in table 1.19.

Table 1.18: CO-PO Mapping of Industry Visit

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
CO1: Relate the learning outcomes to outlook and build competency in professional environment					**3**	
CO2: Improve and engage in active learning experience						**3**

Details of Industry Visit

Table 1.19: Details of Industry Visit

Sl No	Date	Faculty In charge	Company Name	Semester
1	23rd February 2017	Dr Bharathi M A	Qikpod	I Sem
2	4th March 2017	Dr Bharathi M A	Qikpod	I Sem
3	6th February 2020	Mr Muneeswara M S	Aprameya Technologies Pvt Ltd	III Sem
4	8th February 2020	Mr Muneeswara M S	Netenzaa Innovations Pvt Ltd	III Sem

Interaction with Netenzaa Pvt Ltd

Netenzaa Innovations Pvt Ltd

Aprameya Technologies Pvt Ltd

Interaction with Qikpod

Fig 1.15: Photos of Industry Visit

Student Feedback Questionnaire on Industry Visit

After the Industrial Visit, students give their feedback on the outcomes and questionnaire is shown in below table 1.20. These questions are mapped to learning outcomes.

Table 1.20: Feedback Questionnaire on Industry Visit

Sl No	Questionnaire	POs mapped
1	Were you able to relate the learning outcomes to outlook and build competency in professional environment	PO5
2	Were you able to improve and engage in active learning experience	PO6
3	Overall Experience	-

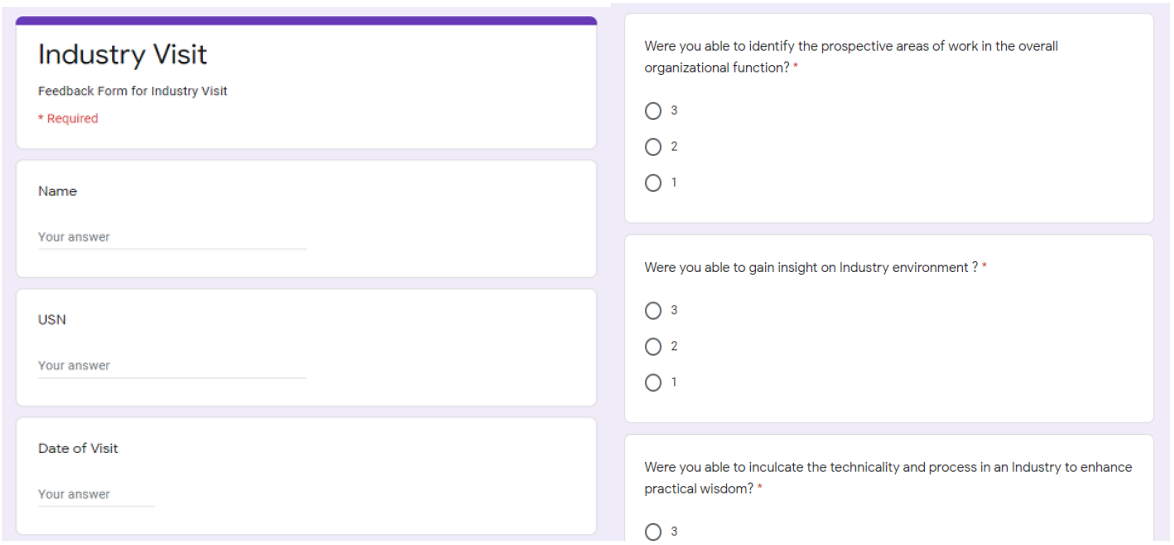


Figure 1.16: Google Form Sample on Industry Visit

Feedback Analysis of Industry Visits

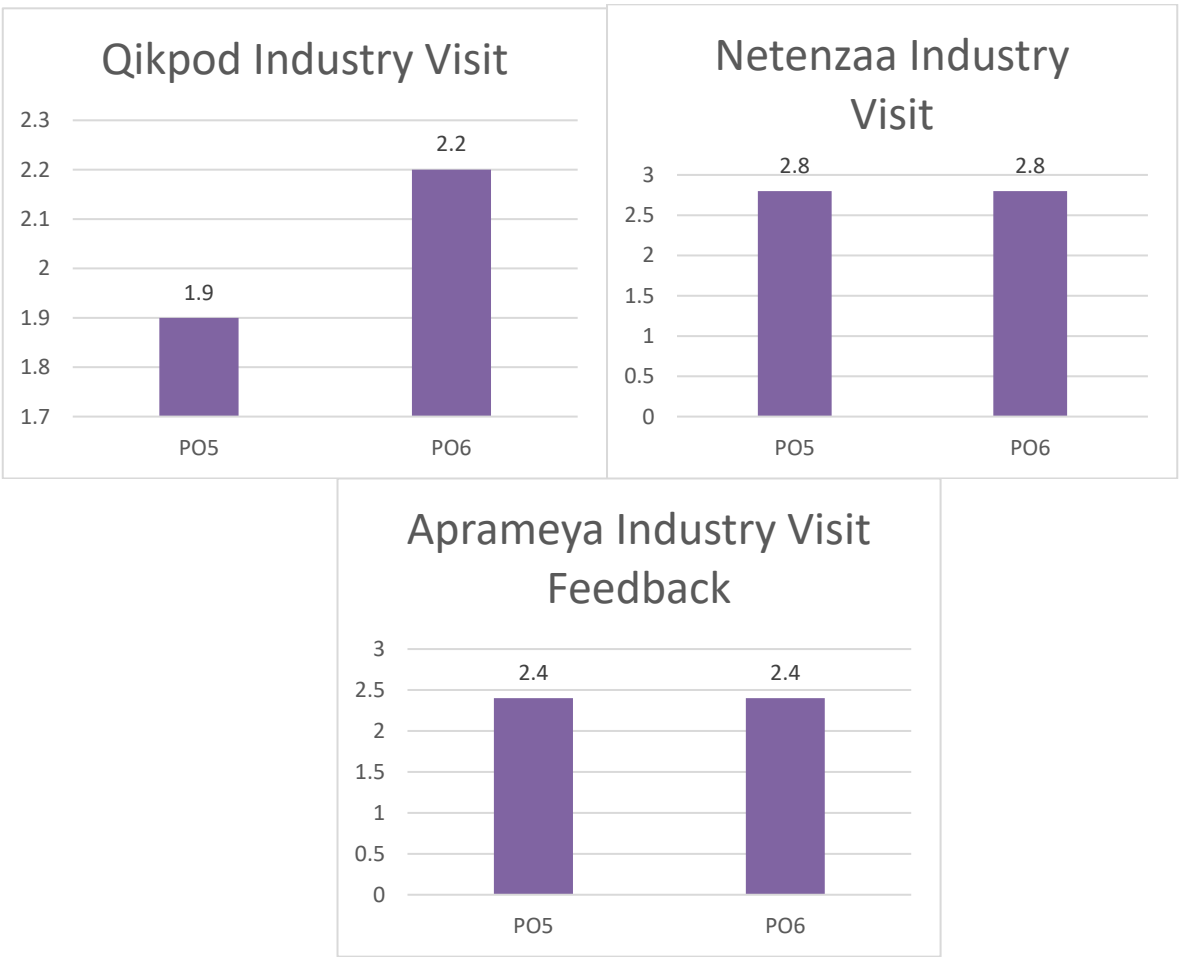


Figure 1.17: Feedback Analysis on Industry Visits

Observations:

The students get more Practical Awareness of various Industrial Sectors and Industrial environment. More number of Industry visits have to be organized to achieve the learning outcomes.

E. Industrial /internship /summer training of more than two weeks and post training Assessment (2)

Internship Training

The Industry Institute Interaction is accomplished through Internship training which is carried out in 3rd Semester. The students get exposure to corporate culture, atmosphere and work on real world projects. Experts from the Industry guide the students in these projects and in turn are evaluated by the Department Co-supervisors. This facilitates the engagement between the teaching faculty and Industry personnel.

Each student undergoes an internship in the 3rd Semester as per the University norms. Internal and External evaluation will be done based on their performance. The students undergo Internship for 16 weeks as per University Norms. After completion of Internship, students submit a report to the Head of the Department with the approval of PG Coordinator, internal and external guides from the Industry.

There will be 50 marks for CIE (Seminar: 25, Internship report: 25) and 50 marks for Viva – Voce conducted during SEE. An evaluation criterion for Internship is shown in table 1.21.

Criteria for internship evaluation (Internal Assessment)

Table 1.21: Evaluation rubrics for Internship (Internal)

Criteria	Marks (50)
Domain Knowledge: Engineering Knowledge/ Problem Analysis	**10**
Analysis, Design, Development and Optimization (Modern Tool Usage)	**10**
Soft Skills (Communication, Project & Resource Management)	**5**
Report Writing	**25**

Criteria for internship evaluation (External Assessment)

The external guide from the industry has to be an examiner for the viva voce on Internship. Viva-Voce on internship shall be conducted at the college and the date of Viva-Voce shall be fixed in consultation with the external Guide. The Examiners shall jointly award the Viva - Voce marks. The rubrics have been defined as shown in table 1.22.

Table 1.22: Evaluation rubrics for Internship (External)

Criteria	Marks (100)
Domain Knowledge: Engineering Knowledge/ Problem Analysis	**20**
Analysis, Design, Development and Optimization (Modern Tool Usage)	**20**

Soft Skills (Communication, Project & Resource Management)	**30**
Report Writing	**30**

The CO-PO mapping of Internship is shown in the below table 1.23.

Table 1.23: CO-PO Mapping for Internship

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6
CO1: Apply appropriate engineering principles and techniques to suit the needs and arrive at the feasible solution.	**3**					
CO2: Analyse a given engineering problem and showcase creative thinking ability				**3**	**3**	
CO3: Design a hardware/software prototypes or systems for real time applications.			**3**		**3**	**3**
CO4: Present the results from the work comprehensively and write a report		**3**				**3**

Internship Details

2019-20

Sl. No	STUDENT NAME	Company Name	PO1	PO2	PO3	PO4	PO5	PO6
1	1BY19SCS01 DEEPTHI M	Infidata Technologies	3	3	2	2	2	3
2	1BY19SCS02 GAUTHAM SK	Infidata Technologies	3	3	2	2	2	3
3	1BY19SCS03 MADEHA KAUSER	Infidata Technologies	3	3	2	2	2	3
4	1BY19SCS04 MEGHANA KUMAR K J	Infidata Technologies	3	3	2	2	2	3
5	1BY19SCS05 PUJITHA J	Spirent Communications	3	3	2	2	2	3
6	1BY19SCS06 TEJASWINI A KANTANAVAR	Infidata Technogies	3	3	2	2	2	3
7	1BY19SCS07 VARSHINI N	AiRobotica services Pvt. Ltd.	3	3	2	2	2	3

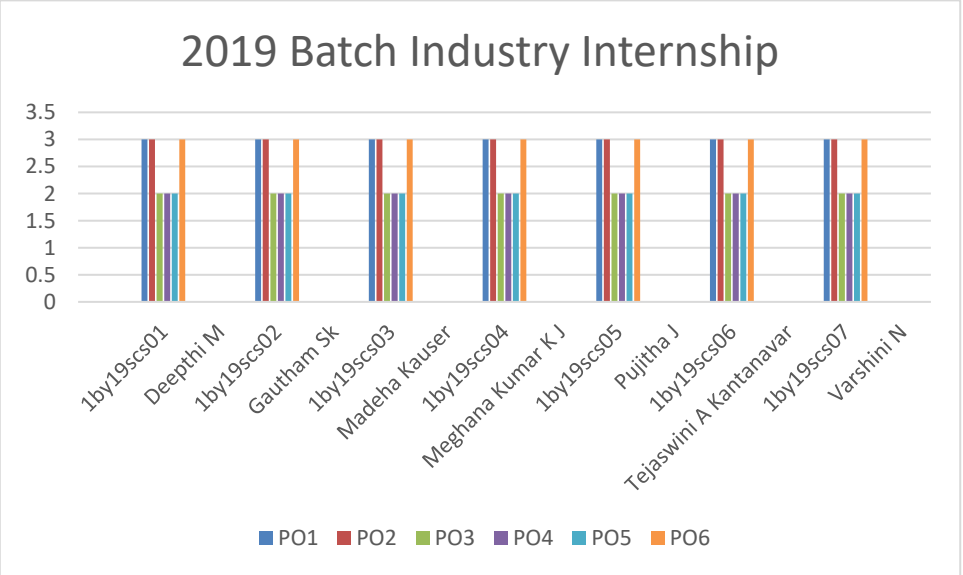


Figure 1.19: PO attainments for Internship Project 2019 batch

Internship Details

2018-19

Sl. No	Student Name	Company Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
1	1BY18SCS01 Bhagyashree A V	Robert Bosch	3	3	2	2	2	3
2	1BY18SCS02 Chaitrashree H S	Infidata solutions	3	3	2	2	2	3
3	1BY18SCS03 Divyashree S	IISC	3	3	2	2	2	3
4	1BY18SCS04 Fasiha Kausar	Infidata solutions	3	3	2	2	2	3
5	1BY18SCS05 Kaveri T Hombal	Nokia	3	3	2	2	2	3
6	1BY18SCS06 Naveen Kumar K V	Infidata solutions	3	3	2	2	2	3
7	1BY18SCS07 P Prajwala	SOA IT Solutions Ltd.	3	3	2	2	2	3
8	1BY18SCS08 Purushotham Naidu V	Nokia	3	3	2	2	2	3
9	1BY18SCS09 Rajeshwari N	Infidata solutions	3	3	2	2	2	3
10	1BY18SCS10 Ramya PL	Devexis India	3	3	2	2	2	3
11	1BY18SCS11	Infidata solutions	3	3	2	2	2	3

	Ranjini N							
12	1BY18SCS12 Sneha S	Sprient Communications	3	3	2	2	2	3
13	1BY18SCS13 Srivatsa Raju S	Nokia	3	3	2	2	2	3
14	1BY18SCS14 Sudhanshu Gupta	Infidata solutions	3	3	2	2	2	3

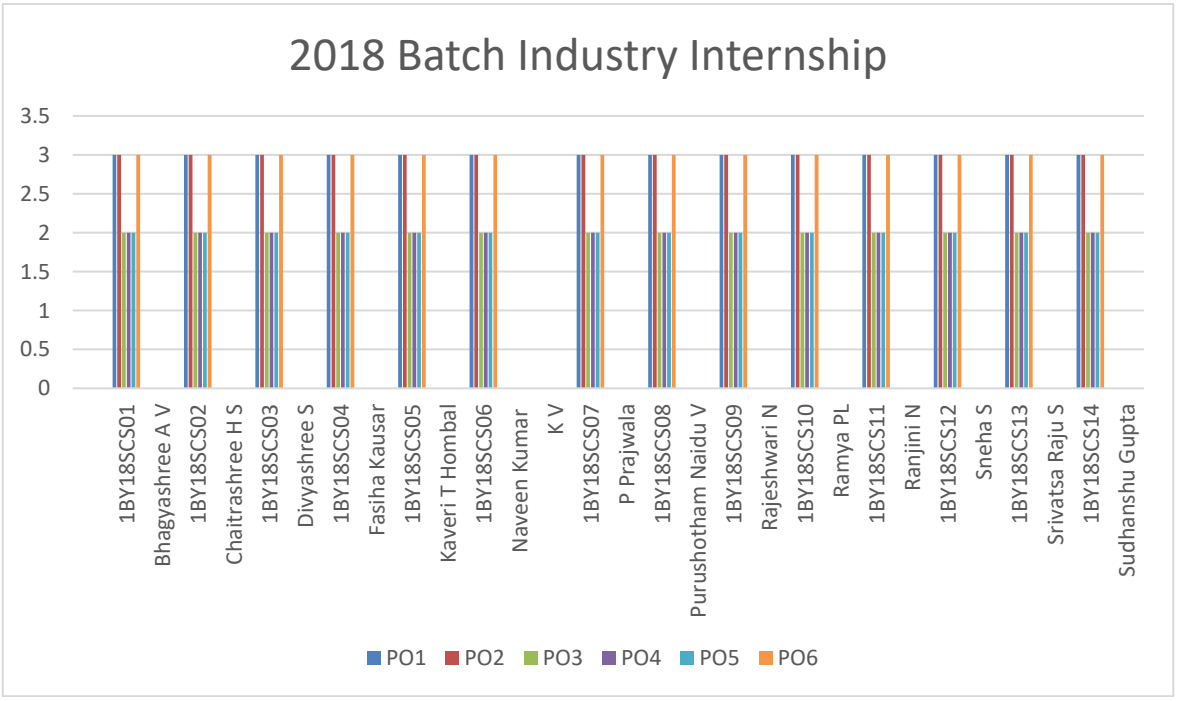


Figure 1.20: PO attainments for Internship Project 2018 batch

F. Impact Analysis of Industrial Training

The students' experiences hands-on training during visits, get more employment opportunities and also fills the gap between theoretical and practical courses. The students get exposure to corporate culture, team building ability, interactive learning experience and usage of modern tools and technology inculcated in the Organization. With this knowledge the students have gained problem solving skills and face placements in a better way. The feedback questionnaire is shown in the below table 5.

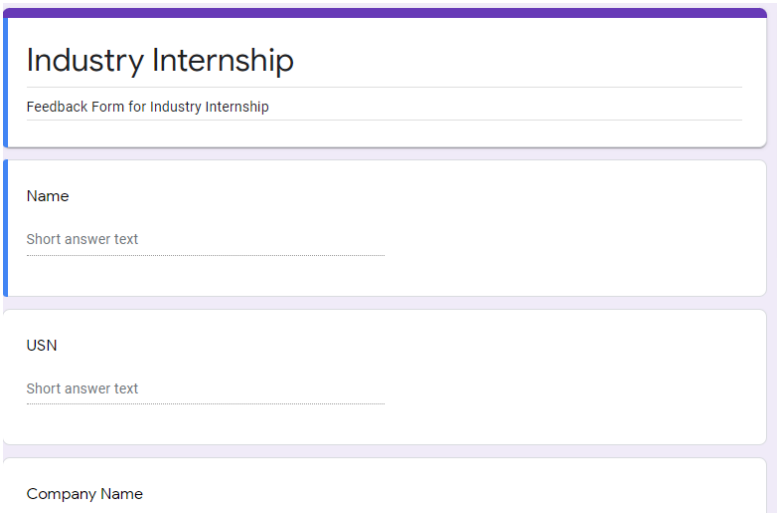


Figure 1.21: Google Form for Industry Internship

Questionnaire for Student's feedback on Initiative

Table 1.24: Feedback Questionnaire on initiative

Sl No	Questionnaire	POs mapped
1	Were you able to apply knowledge on practical problems related to Computer Science and Engineering domain to arrive at a feasible solution?	PO1
2	Were you able to analyse the given engineering problem and showcase creative thinking ability?	PO4,PO5
3	Were you able to design a hardware/software prototypes or systems for real time applications?	PO3,PO5,PO6
4	Were you able to enhance your communication and technical writing skills?	PO2,PO6

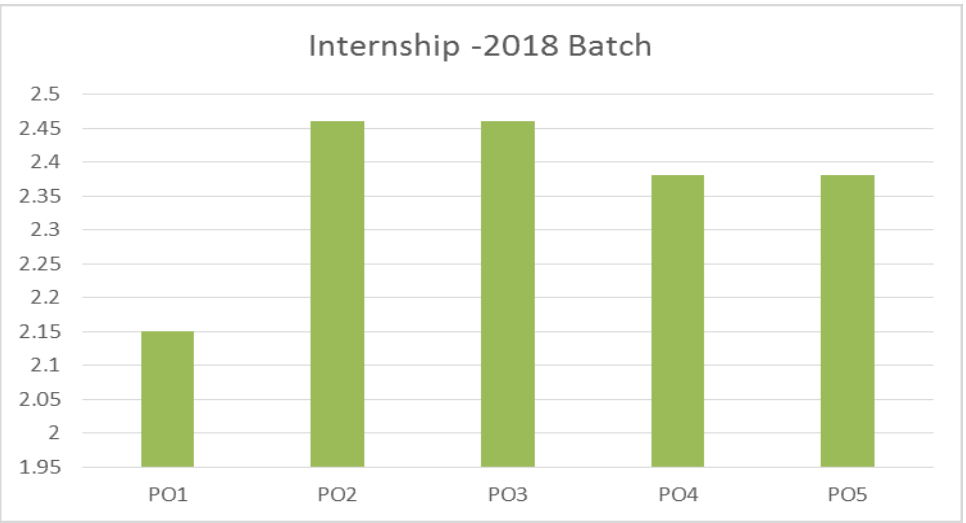


Figure 1.22: Feedback on Industry Internship-2018 Batch

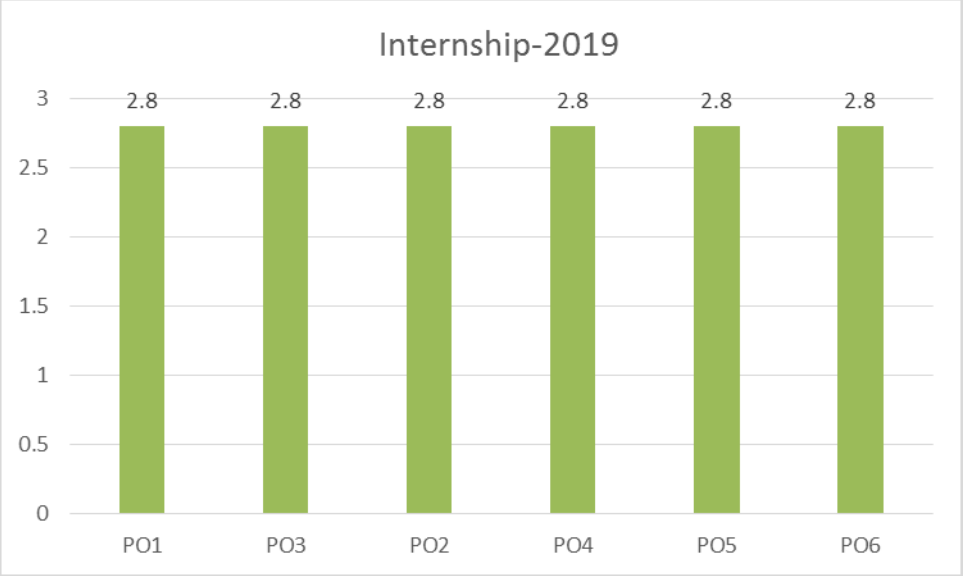


Figure 1.23: Feedback on Industry Internship-2019 Batch

Observations:

The students should be motivated and encouraged to perform analysis by comparing with several existing technology/tool/methodology to provide optimal solution to increase higher level of PO4 attainment. The students should also focus on solving societal concern projects. The students should get mastery over the domain knowledge and undergo Internships in every semester. The projects have to be converted to research publications in good and standard journals/conferences. This together will improve the attainments with respect to lifelong learning, enhancing outcomes in the competent professional world.

G. Overall Student Feedback on Industry Institute Interaction

Overall feedback on Industry Institute Interaction like Industry Internship Training, Industry visit, Industry Expert talk through Partial delivery has been taken and the questions are shown in below table 1.25.

Table 1.25: Questionnaire on overall feedback

Sl No	Questionnaire	POs mapped
1	Were you made aware of significance about Industry practices	PO1
2	Were you able to apply the acquired skills in solving real time practical problems	PO3
3	Were you able to enhance communication and writing skills	PO2
4	Were you able to analyse the given engineering problem and showcase creative thinking ability?	PO4
5	Were you able to enhance your interpersonal skills and relate the outcomes to build requisite competency in professional environment.	PO5

6	Overall self-learning experience with Industry Institute Interaction	PO6

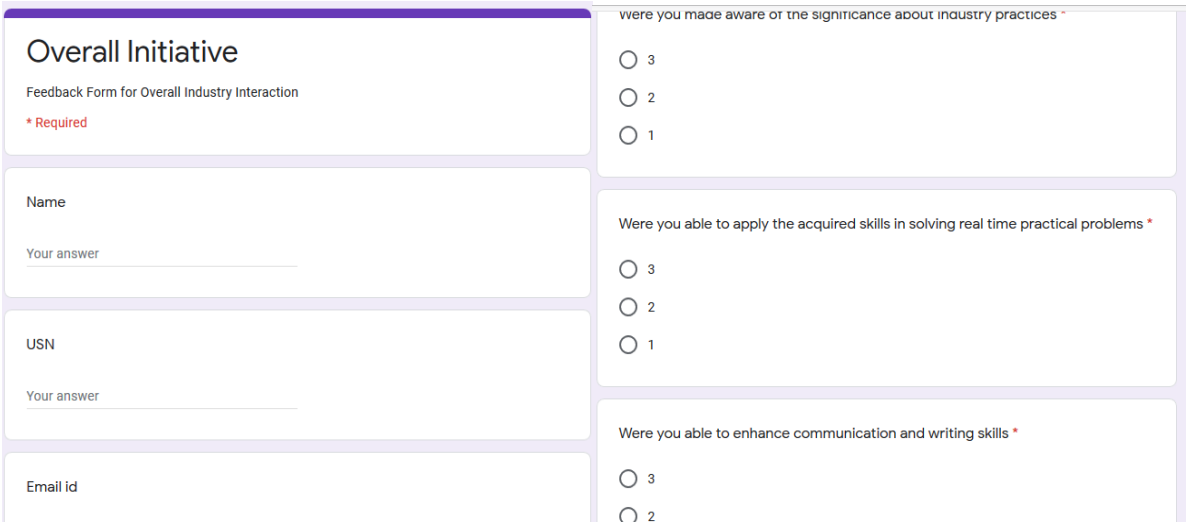


Figure 1.24: Google Form Sample on Overall Initiative

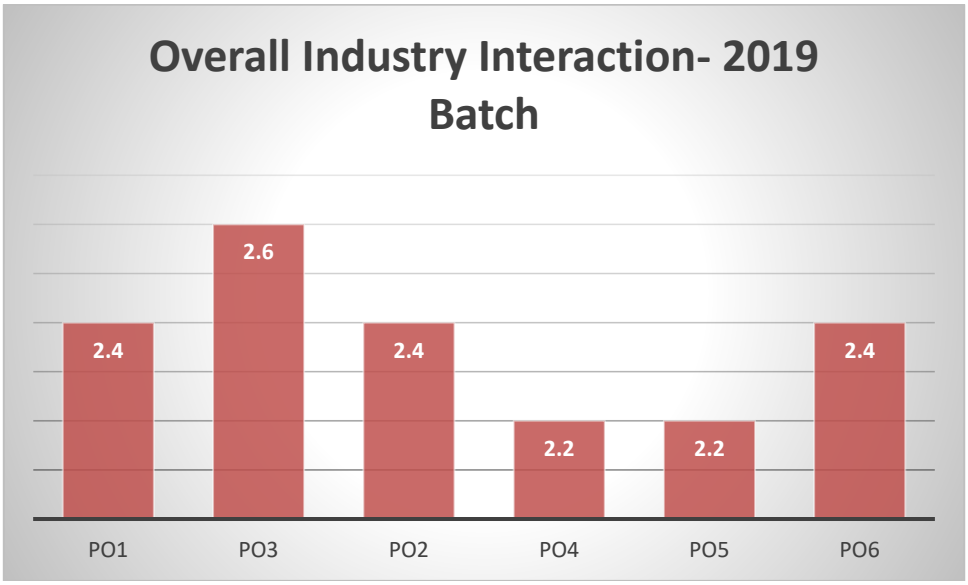


Figure 1.25: Feedback on overall Industry Institute interaction-2019 Batch

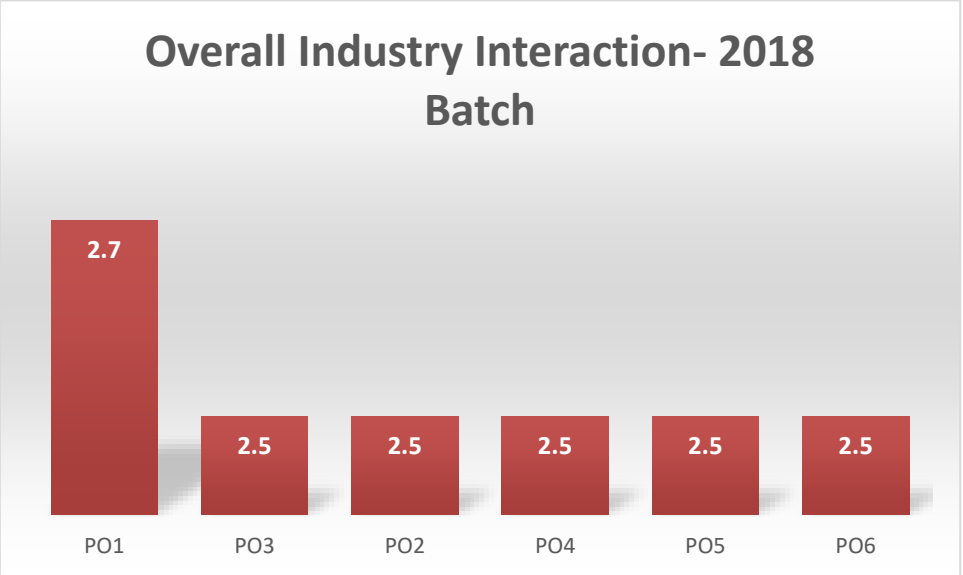


Figure 1.26: Feedback on overall Industry Institute interaction-2018 Batch

Observations:

The overall industry institute interactions have helped the students in gaining more insights on Industry environment, practices and real time projects. The students should get involved in industry real time projects to get the mastery over the domain knowledge.
The students get more Practical Awareness of various Industrial Sectors and Industrial environment.
More number of Industry visits have to be organized to achieve the learning outcomes.

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

Participation of industry professionals in the curriculum are achieved in various ways in an affiliated institution. The participation may be as an academic member of department, committee and as examiners for the evaluation of the project or internship carried out.

Participation of Industry professionals in Curriculum development

An affiliated institution contributes in the university's curriculum development process as per the direction of Board of studies. The academic advisory and suggestions are sought from the industry professionals at department level through Department Advisory Board (DAB) and later communicated to university through proper channels. The table 1.26 below provides the information of the industry professionals as DAB members in Dept. of CSE, BMSIT&M.

Table 1.26: Industry professionals as DAB members

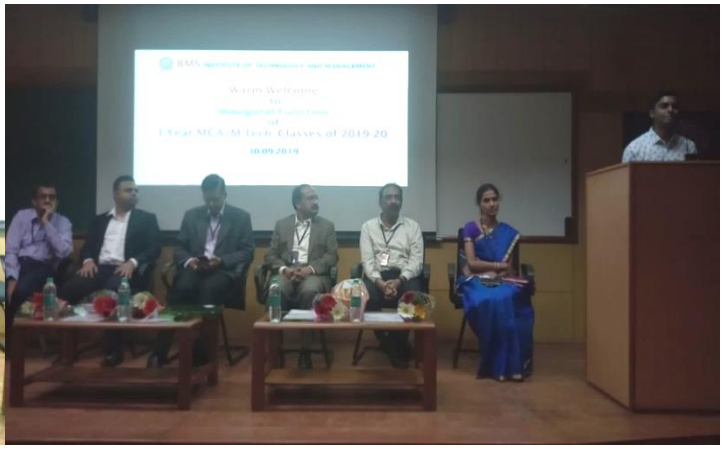
Industry Professionals representing DAB			
Sl. No.	**Name and Affiliation**	**Year**	**Program**

			(UG/PG)
1	Dr. Dinesh Ramegowda, Chief Engineer, Samsung India Ltd.	2016, 2017, 2018	UG and PG
2	Dr. Punitha Swamy, HCL Technologies, Bangalore	2016, 2017, 2018	UG and PG
3	Mr. Prahlad Teggi, HP Micro Focus	2016, 2017, 2018	PG
4.	Dr. Dinesh M S, Principal Scientist, Phillips India, Member – BoS, VTU (Industry)	2019-2021	UG and PG

Inauguration of I Semester PG

Inauguration for I Semester M.Tech was organized on 30th September 2019. Mr Sreenivasa Ramanujam from TCS was the chief guest. He spoke about human behavior, emotional intelligence and various technological trends which were very useful for the students.

I year PG Inauguration



Dignitaries on the Dias

Industry professional can participate to handle the industry relevant courses, well within the framework of the university rules.

Participation of Industry professionals as Examiners

The PG program has industrial projects or internship carried out for a period of 6 to 8 weeks in company. The mentor in company guiding for internship is an external guide from the company, as per the university norms. Viva-Voce on internship shall be conducted at the college / in industry and the date of Viva-Voce shall be fixed in consultation with the external Guide. The Examiners shall jointly award the Viva - Voce marks. The details of Industry Professionals who had been a part of Internship Evaluation as examiners are shown in the Table 1.27.

Table 1.27: Details of Industry Professionals Mentor

Industry Internship Mentor		
Sl. No.	**Name and Affiliation**	**Year**
1	Mr.Vinay Bharadwaj CISCO, India.	2019
2	Mr. Adarsh M Davanageri, Lowe's Services Pvt. Ltd.	2019
3	Mr. H C Ramaprasad 10 Seconds	2019
4	Mr. Vinith Kumar G.P	2019
5	Mr. Krishna V Infidata technologies	2019
Industry Internship Mentor		
1	Mr. Vivek Chikkahanumaiah Senior Manager, ALE India Pvt. Ltd.,	2018
2	Mr. G Satish Senior Manager, ALE India Pvt. Ltd.,	2018
3	Mr. D Alok Reddy Verification Architect, Nokia India Pvt. Ltd.,	2018
Industry Internship Mentor		
1	Mrs. Rajeshwari K, Chief Manager, Siemens	2017
2	Mr. Arun Pradeep M, Product Manager, Neutrinos Solutions Pvt. Ltd.	2017
3	Mr. ByraReddy M V, Product Manager, E-Solutions Business and Education Pvt. Ltd.,	2017

4	Mr. Hari Kumar Appureddy, Senior Manager, Software, Altare Engineering Pvt. Ltd.,	2017

There will be 50 marks for CIE (Seminar: 25, Internship report: 25) and 50 marks for Viva – Voce conducted during SEE. An evaluation criterion for Internship is shown in table 1.28.

Criteria for internship evaluation (Internal Assessment)

Table 1.28: Evaluation rubrics for Internship (Internal)

Criteria	Marks (50)
Domain Knowledge: Engineering Knowledge/ Problem Analysis	**10**
Analysis, Design, Development and Optimization (Modern Tool sage)	**10**
Soft Skills (Communication, Project & Resource Management)	**5**
Report Writing	**25**

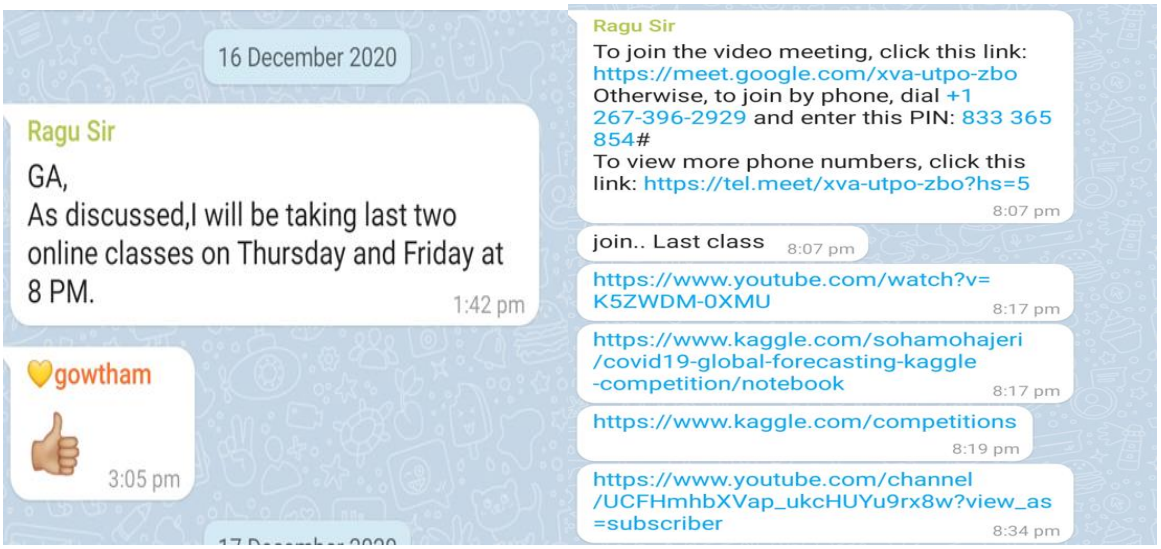
Criteria for internship evaluation (External Assessment)

The table 1.29 provides evaluation rubrics for Internship (External). The external guide from the industry has to be an examiner for the viva voce on Internship. Viva-Voce on internship shall be conducted at the college and the date of Viva-Voce shall be fixed in consultation with the external Guide. The Examiners shall jointly award the Viva - Voce marks.

Table 1.29: Evaluation rubrics for Internship (External)

Criteria	Marks (50)
Domain Knowledge: Engineering Knowledge/ Problem Analysis	**20**
Analysis, Design, Development and Optimization (Modern Tool Usage)	**20**
Soft Skills (Communication, Project & Resource Management)	**30**
Report Writing	**30**

The Sample communication between external guide from the industry and the student is shown below in the figure 1.27.



---------- Forwarded message ---------
From: **Nautiyal, Akriti** <anautiyal@cebglobal.com>
Date: Fri, Nov 11, 2016 at 12:08 PM
Subject: FW: JORA_PHILIPPINES
To: Punith B N <punithbn56@gmail.com>

Thanks and Regards

Akriti Nautiyal
Research Analyst
Mobile: +91-9731577998

From: Saha, Payal
Sent: Friday, November 11, 2016 11:56 AM
To: Nautiyal, Akriti
Subject: JORA_PHILIPPINES

Hi,

Worked on Jora (Philippines location). Please find the attachment and review the data.

Thanks & Regards,
Payal

--
punith

Figure 1.27: Email Communication between student and the external guide from the industry.

Participation of Industry professionals in Expert Talk/Workshop

The various activities conducted through industry persons as a resource persons are as shown in the Table 1.30

Table 1.30: Details of industry persons as a resource person

Sl.No	Activity Details
1	Expert Talk on "Machine Learning with Big Data Tools" by Mr. Nasser Ebrahim and Mr. Bhaktavatsal R Maram, IBM ISL for 5th Semester B.E and 1st Semester M.Tech students. Organized by Dr Anupama H S and Dr Anjan Krishnamurthy, Associate Professors, dept. of CSE, BMSIT&M, on 27th Oct 2018.
2	Partial Delivery was conducted in the department under Computer Society of India student branch on 4th May 2019 from 8:30 – 1:00 p.m. The talk was delivered by Mr Chandrashekaran Senior Telecom Professional with 30 years of wide Industrial experience. The partial delivery was organized for the students of 4th sem. Topics covered were IPv4, IPv6 and wireless networks, part of Module 5 for the subject Data Communication (17CS46). The event was organized by Dr. Vishwakiran and Coordinated by Dr.Anil G N, Mrs Mari Kirthima, Mrs Vidya R.
3	Department of CSE has organized a guest lecture for CSE students "Based on recent trends and technologies in IT industries. How Big data and Hadoop technologies are evolved in industries" on 27th April 2019 by Ms.Tanuja S, Software Engineer Dell Bengaluru.
4	Mr.Mubashir Mohammed Team Lead, Autodesk India Pvt. LTD. Bengaluru & Mr. Darshan B S (Senior Software Engineer, Fidelity Pvt. LTD, Benagaluru has given the "**Career Guidance"** session for the current trends in IT Companies to be success in career for the First sem CSE during 10th August 2019.
5	Ms.Neelakshi Naik, HR, MUSIGMA, Bengaluru delivered the Talk on "**Tips and Tricks to crack an Interview**" for the first semester CSE Students on 31st August 2019.
6	"Webinar on AI, Robotics and Autonomous Technologies" was coordinated by Dr. Anjan Krishnamurthy from IEEE SB, BMSIT&M, on 10/04/2020. **Speaker**: Prof. William Lee, Strategic Innovation Associate Director of Advanced Robotics Centre (ARC), National University of Singapore (NUS)
7	"Webinar on How to Bag your Dream Software Engineering Job", by Sandeep Jain, Founder GeeksforGeeks. The event was coordinated by Dr. Anjan Krishnamurthy & Dr. Sunanda Dixit on 25/04/2020

8	Mr. Mekala V Reddy, IBM**,** , Bengaluru, delivered the Talk on **"Graduate to Professional"** A total of **123** participants had joined from UG and PG programs of Dept. of CSE, BMSIT&M,on **9th Jul 2020**
9	Mrs. Latha R, Program Director, IBM, Bengaluru delivered the Talk on,"**Leadership in technology to succeed".** A total of **45** participants had joined from UG and PG programs of Dept. of CSE, BMSIT&M on 15th Jul 2020
10	Mr. Nisarg from IBM**,** Bengaluru ,delivered the talk on**" Python",** A total of **44** participants had joined from UG and PG programs of Dept. of CSE, BMSIT&M on on 17th Jul 2020
11	The AI, Robotics and Autonomous Technology Webinar were hosted by Prof. William Lee on 10/04/2020
12	IBM talk on Leadership in technology to succeed by Mrs. Latha R, Program Director, and IBM on 15th Jul 2020 (4 PM to 5 PM) was conducted.
13	IBM talk on Graduate to professional by Mr. Mekala V Reddy, IBM on 9th July 2020 (4 PM to 5 PM) was conducted.
14	IBM talk on Python by Mr. Nisarg, IBM on 17 th Jul 2020 (3:00 PM to 4:30 PM) was conducted.
15	Open course on Cognitive Security from 16 /06/2020 – 20/06/2020 was organized by IEEE CS Chapter BMSIT&M and Department of Computer Science and Engineering. The coordinators were Dr Anjan Krishnamurthy, Dr. Anil G N
16	AIOT for Digital Transformation an event was organized by IEEE CS CHAPTER BMSIT&M on 12/08/2020.The The session was addressed by Mr. Vishwas Lakkundi, Chair, IEEE CS Chapter Bangalore Section.
17	An webinar on Aerial Humanoid Robotics was Organized by IEEE Student Branch BMSIT&M on 01/10/2020. The webinar was conducted by Professor Daniele Pucci, head of the Dynamic Interaction Control (DIC) lab at the Istituto Italiano di Tecnologia (IIT).
18	An National level five days faculty development program was organized from 10/05/2021 to 14/05/2021 by the department of computer science and engineering , BMSIT&M.
19	An webinar on "Huawei Developers Mobile App Development Foundation Course" delivered by Mr.Rebanta Dutta and organized by BRAINIUM, the technological forum of

	the Department of Artificial Intelligence and Machine Learning, BMSIT&M in collaboration with Huawei Technologies, India, on May 2021.
20	Ms. Nalini Kanan, Senior Technical Architect , IBM ISL , Mr. Parameswaran Selvam , Block chain Technology Specialist , IBM India Ltd., have delivered a talk on “Cyber Security & Block Chain” from 1/06/2021 to 5/06/2021.

1.2.5. Quality of Laboratory work given (20)

Preamble: The Laboratory work for PG students is in 1st Semester of the curriculum. The University has prescribed the experiments and the Course Coordinator after having a meeting with Program Assessment Committee, formulates the COs and identifies the Gap. After identifying the gap, the action plan for bridging the gap chalked out. .

For 2018-19 and 2019-20 batch, students study ADBMS AND IOT LABORATORY (18SCSL16) course which is an integrated course (combining both Advanced Database Management System and Internet of Things courses).

For 2020-21 batch, students study ALGORITHMS AND DBMS LABORATORY (20SCSL16) course which is an integrated course (combining both Algorithms and Database Management System courses).

Initiatives for improving Quality of Laboratory Experience

- Initially a preparatory session is conducted in which, related theory and algorithm or flowchart of concept which needs to be conducted are explained to students.
- After better understanding of the concepts, the student analyses the logic and (or) algorithm of the program to be conducted.
- Then students write the complete program in concerned programming language and then code/debug/execute the program on the system and interpret the results for different inputs.
- The executed program with output, related theory and Algorithm or flowchart is documented in the record book by the students later.

Implementation for improving Quality of Laboratory Experience

The Experiments are evaluated by the faculties for 40 marks at three levels as shown in the Table 1.31

Table 1.31: Lab Internals Marks Information

Batch	Level	Evaluation Type	
2018-19, 2019-20	**1.**	Continuous Evaluation in every lab session	**10** marks
	2.	Open Ended Experiment	**10** marks
	3.	Internal Examination	**20** marks
		Total Marks	**40 marks**
2020-21	**1.**	Continuous Evaluation in every lab session	**10** marks
	2.	Open Ended Experiment	**10** marks
	3.	Internal Examination	**20** marks
		Total Marks	**40 marks**

Rubrics followed to evaluate the Lab Sessions

Level 1: Continuous Evaluation in every lab session (10 marks)

The Continuous Evaluation is done by the faculty in every lab session for 10 marks based on rubrics defined in the table 1.32 (2018-19, 2019-20 batch) and 1.33 (2020-21 batch) and the average marks of all sessions will be considered for awarding final internal assessment marks.

Students shall carry out laboratory work and are encouraged to use modern tools for executing the experiments. It is also supported with designed manual developed by the faculty handling the theory course. The students are expected to implement the algorithm in prescribed timeline and demonstrate the same to faculty. This is documented in laboratory record.

Table 1.32: Rubrics used for Continuous Evaluation in every lab session for 2018-19, 2019-20 batch

Parameter	Allocated Marks	LOW	MEDIUM	HIGH
Viva-voce	**02**	The student did not answered any viva questions asked	The student answered few viva questions asked	The student answered all viva questions asked
		0 mark	**1 mark**	**02 marks**
Record writing	**08**	The record was not submitted in the lab session	The record was submitted in the lab session but was incomplete(no Algorithm / wrong Algorithm & no Flowchart / wrong Flowchart)	Completed record was submitted in the lab session
		0 mark	**1-4 marks**	**5-8 marks**

Table 1.33: Rubrics used for Continuous Evaluation in every lab session for 2020-21 batch

Parameter	Allocated Marks	LOW	MEDIUM	HIGH
Viva-voce	**03**	The student did not answered any viva questions asked	The student answered few viva questions asked	The student answered all viva questions asked
		0 mark	**1-2 mark**	**03 marks**
Record writing	**07**	The record was not submitted in the lab session	The record was submitted in the lab session but was incomplete(no Algorithm / wrong Algorithm & no Flowchart / wrong Flowchart)	Completed record was submitted in the lab session
		0 mark	**1-4 marks**	**5-7 marks**

Level 2: Open Ended Experiment (10 marks)

For 2018-19, 2019-20 and 2020-21 Batches, Open Ended Experiment was conducted and evaluated for 10 marks. The Table 1.34 shows the Rubric for Assessment of Open Ended Lab Experiment for

2018-19, 2019-20 batch and the Table 1.35 shows the Rubric for Assessment of Open Ended Lab Experiment for 2020-21 batch.

Table 1.34: Rubric for Assessment of Open Ended Lab Experiment for 2018-19, 2019-20 batch

Parameter	Allocated Marks	LOW	MEDIUM	HIGH
Background Knowledge	02	Sufficient study and half of the questions have been answered correctly.	Adequate study and more than half of the questions have been answered correctly.	Thorough study and all the questions have been answered correctly.
		0 marks	**1 mark**	**2 marks**
Select Appropriate Equipment & Tools	02	Satisfactory selection of equipments and tools to achieve desired objective without proper reasoning.	Satisfactory selection of equipments and tools to achieve desired objective along with proper reasoning.	Relevant and smart selection of equipments and tools to achieve desired objective along with proper reasoning.
		0 marks	**1 mark**	**2 marks**
Design	02	Inappropriate Design and contains few technical errors.	Design documentation is appropriately detailed and structured for the intended Purpose with less information	Design documentation is appropriately detailed and structured for the intended Purpose.
		0 marks	**1 mark**	**2 marks**
Logic Construction	02	Significant findings are summarized. Acceptable conclusion. Acceptable suggestion for further research.	Significant findings are summarized. Good conclusion. Good suggestion for further research.	Significant findings are summarized. Precisely concluded. Excellent suggestion for further research.
		0 marks	**1 mark**	**2 marks**
Documentation	02	The requirements of document writing	Document meets all prescribed requirements.	Document meets all requirements

		are not properly addressed.		and it is prepared in original and creative way to engage readers.
		0 marks	**1 mark**	**2 marks**

Table 1.35: Rubric for Assessment of Open-Ended Lab Experiment for 2020-21 Batch

Parameter	**Allocated Marks**	**LOW**	**MEDIUM**	**HIGH**
Background Knowledge	02	Sufficient study and half of the questions have been answered correctly.	Adequate study and more than half of the questions have been answered correctly.	Thorough study and all the questions have been answered correctly.
		0 marks	**1 mark**	**2 marks**
Select Appropriate Equipment & Tools	02	Satisfactory selection of equipment's and tools to achieve desired objective without proper reasoning.	Satisfactory selection of equipment's and tools to achieve desired objective along with proper reasoning.	Relevant and smart selection of equipment's and tools to achieve desired objective along with proper reasoning.
		0 marks	**1 mark**	**2 marks**
Design	02	Inappropriate Design and contains few technical errors.	Design documentation is appropriately detailed and structured for the intended Purpose with less information	Design documentation is appropriately detailed and structured for the intended Purpose.
		0 marks	**1 mark**	**2 marks**
Documentation	01	The requirements of document writing are not properly addressed.	Document meets all requirements and it is prepared in original and creative way to engage readers.	
		0 marks		**1 mark**

Viva-voce	**03**	The student did not answered any viva questions asked	The student answered few viva questions asked	The student answered all viva questions asked
		0 mark	**1-2 mark**	**03 marks**

Level 3: Lab Internal

The Lab Internals are conducted as per the prescribed guidelines of University. The Evaluation is carried out based on the rubrics defined in Table 1.36 for 2018-19, 2019-20 Batch respectively.

Table 1.36: Rubrics used for Lab Internal 2018-19, 2019-20 & 2020-21 Batch (20 marks)

Parameter	**Allocated Marks**	**LOW**	**MEDIUM**	**HIGH**
Program Write-up	06	The Student was not able to write the program & Algorithm or flowchart	The Student was able to write the program & Algorithm or flowchart with mistakes	The Student was able to write the program& Algorithm or flowchart correctly
		0 marks	**2-4 marks**	**6 marks**
Execution	10	The Student was not able to code/debug/execute the program	The Student was partially able to code/debug/execute the program	The Student was able to code/debug/execute the program
		0 marks	**3-6 marks**	**10 marks**
Viva-voce	04	The student did not answered any viva - voce asked	The student answered few viva-voce asked	The student answered all viva-voce questions asked
		0 marks	**2 marks**	**4 marks**

Course Information - ADBMS AND IOT LABORATORY (18SCSL16)

Course Objectives:

- To provide students with contemporary knowledge in Data Compression and Coding.
- To equip students with skills to analyse and evaluate different Data Compression and Coding methods
- To be instrumental to handle multi dimension data compression
- To acquire practical knowledge on advanced databases and its applications.
- To analyse and work on areas like Storage, Retrieval, Multi valued attributes, Triggers and other complex objects, Algorithms etc. related to ADBMS.
- To design and implement recent applications database for better interoperability

The laboratory syllabus and its CO - PO mapping for ADBMS AND IOT LABORATORY (18SCSL16) course is shown in the below

PART A - ADBMS LABORATORY WORK:

1. Develop a database application to demonstrate storing and retrieving of BLOB and CLOB objects.
    - Write a binary large object (BLOB) to a database as either binary or character (CLOB) data, depending on the type of the field in your data source. To write a BLOB value to the database, issue the appropriate INSERT or UPDATE statement and pass the BLOB value as an input parameter. If your BLOB is stored as text, such as a SQL Server text field, pass the BLOB as a string parameter. If the BLOB is stored in binary format, such as a SQL Server image field, pass an array of type byte as a binary parameter.
    - Once storing of BLOB and CLOB objects is done, retrieve them and display the results accordingly
2. Develop a database application to demonstrate the representation of multi valued attributes, and the use of nested tables to represent complex objects. Write suitable queries to demonstrate their use.

   Consider Purchase Order Example: This example is based on a typical business activity: managing customer orders. Need to demonstrate how the application might evolve from relational to object-relational, and how you could write it from scratch using a pure object-oriented approach.
    - Show how to implement the schema -- Implementing the Application under the Relational Model -- using only Oracle's built-in data types. Build an object-oriented application on top of this relational schema using object views
3. Design and develop a suitable Student Database application by considering appropriate attributes. Couple of attributes to be maintained is the Attendance of a student in each subject for which he/she has enrolled and Internal Assessment Using TRIGGERS, write active rules to do the following:
    - Whenever the attendance is updated, check if the attendance is less than 85%; if so, notify the Head of the Department concerned.
    - Whenever, the marks in an Internal Assessment Test are entered, check if the marks are less than 40%; if so, notify the Head of the Department concerned.
4. Design, develop, and execute a program to implement specific Apriori algorithm for mining association rules. Run the program against any large database available in the public domain and discuss the results.

PART B - IOT LABORATORY WORK

1. Transmit a string using UART
2. Point-to-Point communication of two Motes over the radio frequency.
3. Multi-point to single point communication of Motes over the radio frequency. LAN (Sub-netting).
4. I2C protocol study

Course Outcomes:

CO1 - Show how communication happens between two objects within a LAN

CO2 - Build an IoT solution to control an object through Internet.
CO3 - Develop a database application to demonstrate triggers representation of multi valued attributes and retrieving of BLOB and CLOB.
CO4 - Test the Apriori Algorithm against any large database available in the public domain and discuss the results.

Conduction of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Students are allowed to pick one experiment from each part and execute both
3. Strictly follow the instructions as printed on the cover page of answer script for breakup of marks
4. Change of experiment is allowed only once and marks allotted to the procedure part to be made zero.

CO PO mapping table – 18SCSL16:

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6
CO1:Demonstrate how communication happens between two objects within a LAN		**2**	**3**			
CO2: Examine how an IoT solution can be used to control an object through Internet				**2**		**2**
CO3: Write a database application to represent triggers, multi valued attributes and retrieving of BLOB and CLOB		**2**	**3**			
CO4: Test the Apriori Algorithm against any large database available in the public domain and discuss the results				**2**	**2**	**2**
C_{iii}		**2**	**3**	**2**	**2**	**2**

Course Information - ALGORITHMS AND DATABASE MANAGEMENT SYSTEMS LABORATORY (20SCSL16)

Course Objectives:

- Work on the concepts of Software Testing and ADBMS at the practical level
- Compare and pick out the right type of software testing process for any given real-world problem
- Carry out the software testing process in efficient way
- Establish a quality environment as specified in standards for developing quality software
- Model and represent the real-world data using object-oriented database
- Embed the rules set in the database to implement various features of ADBMS
- Choose, design and implement recent applications database for better interoperability

The laboratory syllabus and its CO - PO mapping for ALGORITHMS AND DATABASE MANAGEMENT SYSTEMS LABORATORY (20SCSL16) course is shown in the below

PART A: Algorithms Laboratory

1. Program to implement Ford-Fulkerson method.
2. Program to implement Naïve
3. Program to implement Rabin - Karp algorithm.
4. Program to implement Boyer – Moore algorithm.
5. Program to implement Monte Carlo algorithm

PART B: DBMS Laboratory

1. Develop a database application to demonstrate storing and retrieving of BLOB and CLOB objects.
    - Write a binary large object (BLOB) to a database as either binary or character (CLOB) data, depending on the type of the field in your data source. To write a BLOB value to the database, issue the appropriate INSERT or UPDATE statement and pass the BLOB value as an input parameter. If your BLOB is stored as text, such as a SQL Server text field, pass the BLOB as a string parameter. If the BLOB is stored in binary format, such as a SQL Server image field, pass an array of type byte as a binary parameter.
    - Once storing of BLOB and CLOB objects is done, retrieve them and display the results accordingly
2. Develop a database application to demonstrate the representation of multi valued attributes, and the use of nested tables to represent complex objects. Write suitable queries to demonstrate their use.

   Consider Purchase Order Example: This example is based on a typical business activity: managing customer orders. Need to demonstrate how the application might evolve from relational to object-relational, and how you could write it from scratch using a pure object-oriented approach.
    - Show how to implement the schema -- Implementing the Application under the Relational Model -- using only Oracle's built-in data types. Build an object-oriented application on top of this relational schema using object views
3. Design and develop a suitable Student Database application by considering appropriate attributes. Couple of attributes to be maintained is the Attendance of a student in each subject for which he/she has enrolled and Internal Assessment Using TRIGGERS, write active rules to do the following:
    - Whenever the attendance is updated, check if the attendance is less than 85%; if so, notify the Head of the Department concerned.
    - Whenever, the marks in an Internal Assessment Test are entered, check if the marks are less than 40%; if so, notify the Head of the Department concerned.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6
CO1: Identify appropriate data structure as applied to specific problem domain and examine computational complexities.		**2**	**3**			
CO2: Examine various algorithms and their complexities.				**2**		**2**
CO3: Write a database application to represent triggers, multi valued attributes and retrieving of BLOB and CLOB		**2**	**3**			
CO4: Test the Apriori Algorithm against any large database available in the public domain and discuss the results				**2**	**2**	**2**

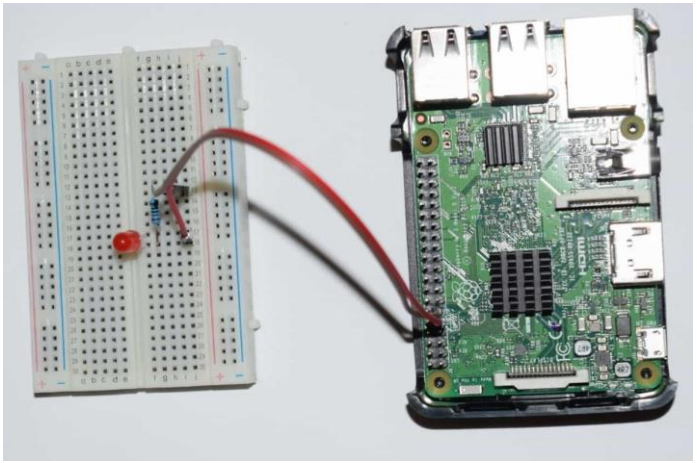
OPEN ENDED EXPERIMENT

Batch: 2018-19, 2019-20

Title: Controlling LED from anywhere in the world

The cathode connected to the Raspberry Pi GPIO. Here is the schematic connecting the cathode of the LED to the Raspberry Pi GPIO. Using the Pinout website for reference, we can see that we connected the LED cathode to the physical pin 11(BCM pin 17, Wiring Pi pin 0)

Step 1: connect the components as shown



```
ngPi failed, print message
```

```
                printf("setup wiringPi failed !\n");
                return -1;
        }

        pinMode(LedPin, OUTPUT);
        while(1) {
                digitalWrite(LedPin, LOW);   //led on
                printf("led on\n");
                delay(1000);                              // wait 1 sec
                digitalWrite(LedPin, HIGH);  //led off
                printf("led off\n");
                delay(1000);                 // wait 1 sec
        }
        return 0;
}
```

Test

To compile the application run the following command:

```
$ gcc blinkingLed.c -o led -lwiringPi
```

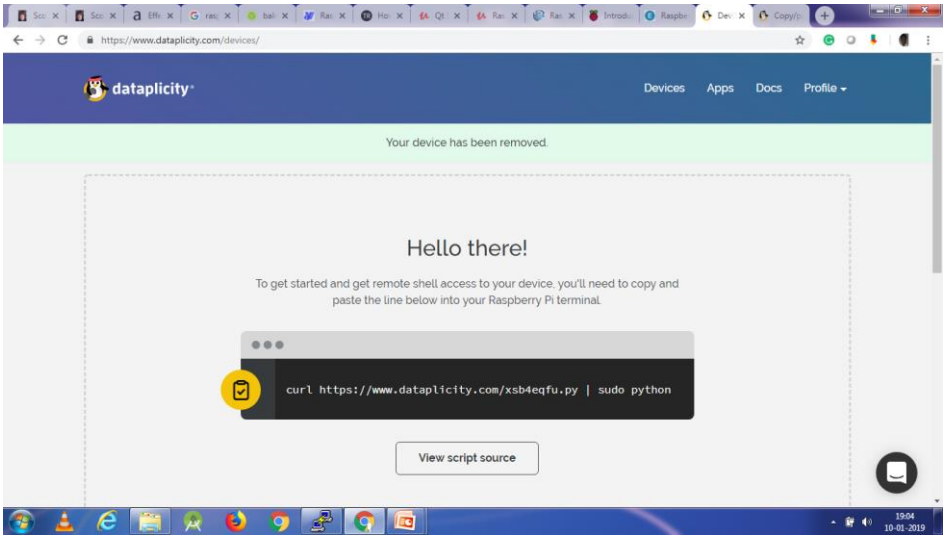
The parameter "-o" is to specify a file name for the compiled executable program.

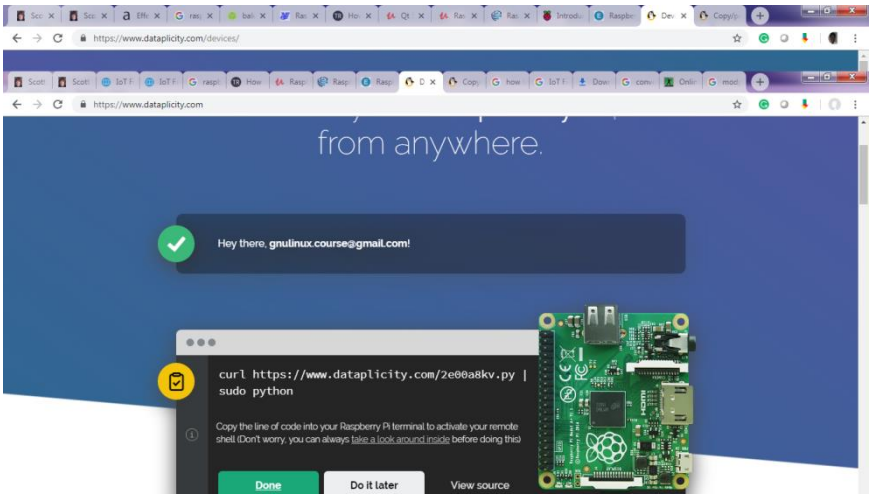
To run the application execute the following command:

```
$ sudo ./led
```

Step 2: Register the raspberry by signing up at www.dataplicity.com

After registering, sign in and control the device through terminal





OPEN ENDED EXPERIMENT

Batch: 2020-21

Title: Implementing K-Means Clustering for Mining Association rule

Design, develop and execute a program to implement K-Means clustering for mining association rule. Run the program against any large database available in public domain and discuss the results.

Step-1: Select the number K to decide the number of clusters.

Step-2: Select random K points or centroids. (It can be other from the input dataset).

Step-3: Assign each data point to their closest centroid, which will form the predefined K clusters.

Title: Implementing Apriori Clustering for Mining Association rule

Design, develop and execute a program to implement Apriori Clustering for Mining Association rule. Run the program against any large database available in public domain and discuss the results.

1.Set a minimum value for support and confidence. This means that we are only interested in finding rules for the items that have certain default existence (e.g. support) and have a minimum value for co-occurrence with other items (e.g. confidence).

2.Extract all the subsets having higher value of support than minimum threshold.

3.Select all the rules from the subsets with confidence value higher than minimum threshold.

4.Order the rules by descending order of Lift.

2 PROGRAM OUTCOME(75)

2.1: Establishing the connect between the course and POs

Process of defining Course Outcomes for every course

The Course Outcomes (CO) for each course is defined by the course coordinators, and scrutinized by the module coordinator for further improvements to the PAC.

Course Coordinators:
The key role of course coordinator is to plan the course, deliver the course contents and evaluate the students against learning outcomes and program outcomes.
The responsibilities of Course coordinator:

- Prepare detailed course delivery plan/lesson plan in line with COE of the department and institution including the course delivery and evaluation methods, OBE practices and activities planned for PO attainment.
- Prepare the test question paper with proper mapping to COs and blooms taxonomy.
- Evaluate the bluebooks, lab records, assignments and projects.
- Compute the PO attainment of the course.
- Maintain the course file including all necessary details along with the PO attainment computation, OBE activity feedback, course end survey evaluation and conclusion of the course.

Module Coordinators:
The courses of the Program are divided into set of domains based on the relevance of technical aspect. Each domain is allocated with a module coordinator and each course is assigned with one or more course coordinators. The key role of module coordinator is to coordinate the planning, delivery and assessment of the courses under the domain and strive for the attainment of POs through various means.

The responsibilities of Module coordinator:

- Review the course objectives and course outcomes defined by the course coordinators
- Review the mapping of COs to POs and the level of mapping.
- Review the course delivery plan prepared by course coordinators.
- Suggest OBE activities for the course coordinators for attaining the POs.
- Review the quality of test question paper with regard to mapping of questions to COs and blooms taxonomy.
- Review the PO attainments calculated by the course coordinators.
- Review the course files prepared by the course coordinators.

P**rogram Coordinator:**

The responsibilities of Program Coordinator are:

- Reviews the requirement of the program.
- Establishes the necessary policies/procedures concerning the attainment of Program Outcomes.
- Periodically review the progress of the program.

Program Assessment Committee:

Roles and responsibilities:

- The Program coordinator collates the requisite details from the Module Coordinators
- Collated data is reviewed by the PAC committee members.
- Necessary changes are proposed, if any for effective attainment of Program Outcomes.
- Submits the findings to the DAB for their suggestions.

The members of the PAC are program coordinator, HOD and Senior Faculty member(s). Here, the committee members deliberate on the action plan related to the attainment of POs.

The defined Course Outcomes are maintained in the Course file by the course coordinator. The template of the Internal Semester Question paper consists of the course outcomes and its mapping onto the concerned questions.

The following tables give the CO-PO mapping of sample subjects for the batches 2018-20, 2017-19 and 2016-18.

2018-20 Batch

18SCS13: Advances in Database Management System						
Course Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
CO1: Summarize parallel and distributed databases and its applications. (K2)			**2**			
CO2: Illustrate basic concepts, principles of intelligent databases. (K3)			**1**			
CO3: Use the advanced topics of data warehousing and mining.(K3)			**2**			
CO4: Discover knowledge in research topics of databases(K3)			**2**			
CO5: Analyze the given problem and solve using the concepts of ADBMS (K4)		**2**	**3**	**3**	**2**	**3**
Ciii	**0**	**2**	**2**	**3**	**2**	**3**

18SCSL16: ADBMS and IOT Lab						
Course Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
CO1:Demonstrate how communication happens between two objects within a LAN		2	3			
CO2: Examine how an IoT solution can be used to control an object through Internet.				2		2
CO3: Write a database application to represent triggers, multi valued attributes and retrieving of BLOB and CLOB.		2	3			
CO4: Test the Apriori Algorithm against any large database available in the public domain and discuss the results.				2	2	2
Ciii	**0**	**2**	**3**	**2**	**2**	**2**

18SCS22: Advanced Algorithm						
Course Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
CO1: Analyze the computational complexity for various algorithms.			2			
CO2: Design and implement graph and number theoretic algorithms.				3		
CO3: Design and implement string matching algorithms.				3		
CO4: Design probabilistic and randomized algorithms.		3	3			2
Ciii		**3**	**2.5**	**3**		**2**

18SCS31: Machine Learning Techniques						
Course Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
CO1: Apply the fundamentals of Machine Learning Techniques		**2**	**3**		**2**	**2**
CO2: Make use of machine learning techniques to solve real world problems.			**3**	**2**		
CO3: Analyse complex problems independently using supervised or unsupervised learning methods.			**3**	**2**		
Ciii	**0**	**2**	**3**	**2**	**2**	**2**

Course relevant to the POs:

The tables 2.1 and 2.2 shows the course mapping to the POs for 2019-21, 2018-20batches.

Table 2.1: Course relevant to the PO (Batch 2019-21)

Slno:	Course-code	PO1	PO2	PO3	PO4	PO5	PO6
1	18SCS11	-	-	3	-	-	1
2	18SCS12	1	3	1.5	2	-	3
3	18SCS13	-	-	3	2	-	2
4	18SCS14	-	3	3	3	3	3
5	18SCS151	-	2	-	2	2	2
6	18SCSL16	-	2	3	2	2	2
7	18RMI17	2	2	2	1.5	2	2
8	18SCS21	1	-	-	3	1	1.7
9	18SCS22	2	3	2	2	2	3
10	18SCS23	2	2	2	2	3	2
11	18SCS252	2	-	3	2	2	-
12	18SCL26	2	3	3	2	2	2
13	18SCS27	2	3	3	2	2	2
14	18SCS31	2	-	3	2	-	-
15	18SCS322	2	2	2	2	3	2
16	18SCS34	2	3	3	2	2	2
17	18SCSI35	1	2	3	1	2	3
18	18SCS41	2	3	3	2	2	2
19	Open Course -1 (Cognitive Security)	3	-	3	3	3	3
20	Open Course-2 (Cyber Security and Block Chain)	2	-	2	3	3	3

Table 2.2: Course relevant to the PO (Batch 2018-20)

Slno:	Course-code	PO1	PO2	PO3	PO4	PO5	PO6
1	18SCS11	-	-	3	-	-	1
2	18SCS12	1	3	3	2	-	3
3	18SCS13	-	2	2	3	2	3
4	18SCS14	2	2	2	2	2	3
5	18SCS151	-	-	2.5	2	-	-
6	18SCSL16	-	2	3	2	2	2
7	18RMI17	2	3	3	2	3	3
8	18SCS21	1	-	-	3	1	2
9	18SCS22	-	3	2.5	3	-	2
10	18SCS23	-	1	2	2	2	1
11	18SCS244	-	1	2	3	2	1
12	18SCS252	-	2	2	3	2	3
13	18SCS27	2	3	3	2	2	2
14	18SCS31	-	2	3	2	2	2
15	18SCS321	2	2	2	2	1	1
16	18SCS334	2	2	-	2	1	2
17	18SCS34	2	3	3	2	2	2
18	18SCSI35	1	2	3	1	2	3
19	18SCS41	2	3	3	2	2	2

Table 2.3: Program Articulation Matrix

Courses	PO1	PO2	PO3	PO4	PO5	PO6
2018 scheme	**2**	**2**	**3**	**3**	**2**	**2**

The above table indicates the cumulative mapping of the course outcomes to the program outcomes on the scale of 1, 2 and 3.

2.2. Attainment of Program Outcomes (60)

2.2.1. Describe the assessment tools and processes used to gather the data upon which the evaluation of program Outcome is based (20)

The various assessment tools used to gather the data about the evaluation of program outcome are as follows:

Direct Assessment Tools:

- Internal Semester Exam - This assessment is carried out thrice a semester. Best two sessional averages are picked for internal marks evaluation. Every question paper is focused on attaining the course outcomes.
- University Semester End Examination - University Semester End examination is a metric for assessing whether all the POs are attained or not. Examination is more focused on attainment of course outcomes and program outcomes using a descriptive and subjective exam.
- Blended learning Activities – Assignment has been prescribed by the University from the 2017 scheme onwards as one of the integral component for evaluation.

Indirect Assessment Tools:

- **Survey**: Regular feedback is collected at the end of a course from the students.
  The course-end survey and blended learning activity-based feedback is collected. The graduate survey is conducted at the end of the program.

Survey	Frequency
Course-End Survey	At the end of the course
Graduate Survey	At the time of graduation
Blended Learning Activity	At the end of the course

These surveys help in the indirect assessment of the program outcomes.

Procedure for calculating the PO attainment value for each Course using Direct attainment method:

- All the three CIE marks are entered into the mapping sheet.
- The following target is set for assessing each CO.

Attainment Level 1	50% of students scoring more that 50% marks
Attainment Level 2	50% of students scoring more that 55% marks
Attainment Level 3	50% of students scoring more that 60% marks

- Once the percentage of attainment of each CO is calculated the levels are assigned to each CO based on the set target.
- SEE marks are also considered for the direct attainment with an appropriate weightage.
- The levels of attainment are obtained for both CIE and SEE.
- Based on the weightage given to CIE & SEE, the overall attainment for each CO is calculated.
- The mapping of COs v/s POs is done.

- From the obtained CO and assigned PO, the attainment of each PO is calculated.

- Final attainment of each PO is calculated based on CO-PO attainment levels.

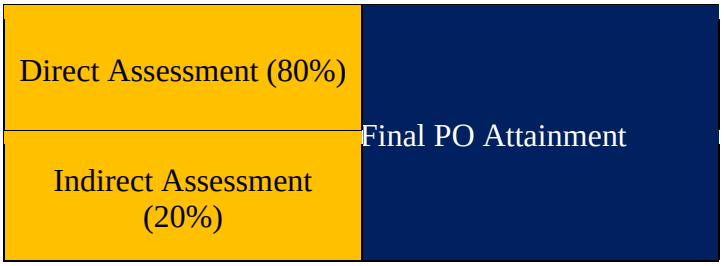
The Process followed for the aggregation of Program Outcome:

At the end of the semester the overall attainment value is calculated. The Rubrics have been assigned:

I. Direct assessment 80% weightage is given 20% for indirect survey. The formula used for direct attainment calculation is:
   a. Total value of the corresponding PO from all courses/Total number of courses.
   b. The value obtained in step (a) is multiplied with 0.8.

II. The formula used for indirect attainment calculation is
   a. At the end of graduation the graduate exit survey is taken.
   b. At the end of the course, the course end survey is taken.
   c. During the course delivery, if any activity is conducted, the feedback for such activity is also considered for indirect attainment.
   d. From these surveys the PO attainment is calculated.
   e. The formula is (3*no of students given grade 3 + 2* no of students given grade 2 + 1 * number of students given grade 1) / (Total number of students given the response) * maximum weightage.
   f. The obtained value is multiplied with 0.2.

Then both values i.e., **Direct** and **In-direct** value is added and averaged to get the final attainment value of the corresponding PO. The program outcomes are obtained from cumulative aggregation of all the course attainments. The distribution of various assessment items is as shown below:



To conclude the final attainment of the program outcome ,80% of the weightage is given to the direct assessment and 20% of the weightage is given for the indirect assessment.

2.2.2 POs attainment levels with observations

The tables 2.4 (a),(b) show the POs attainments of the courses for 2019-21, 2018-20 batches.

Table 2.4(a): POs attainment levels of 2019-21 Batch

2019-21 Batch													
		POs attained for the courses						POs set for the courses					
Slno:	Course-code	PO1	PO2	PO3	PO4	PO5	PO6	PO1	PO2	PO3	PO4	PO5	PO6
1	18SCS11	2	2	-	1.8	0.9	-	2	2	-	2	1	-
2	18SCS12	1	1	2	1.5	2	2	1	1	2	1.5	2	2
3	18SCS13	-	-	2.4	1.3	-	2	-	-	3	2	-	2
4	18SCS14	-	1.5	1.2	1.4	3	1.5	-	3	3	3	3	3
5	18SCS151	-	1.33	-	1.33	1.33	1.33	-	2	-	2	2	2
6	18SCSL16	-	2	3	2	2	2	-	2	3	2	2	2
7	18RMI17	1.87	1.87	0.93	1.4	0.93	0.7	2	2	2	1.5	2	2
8	18SCS21	1	-	-	3	1	1.7	1	-	-	3	1	1.7
9	18SCS22	0.8	1.2	0.8	0.8	0.8	1.2	2	3	2	2	2	3
10	18SCS23	2	2	2	2	3	2	2	2	2	2	3	2
11	18SCS252	0.8	-	1.2	1.2	-	0.8	2	-	3	2	2	-
12	18SCL26	2	2.25	2	2	1.8	2	2	3	3	2	2	2
13	18SCS27	1.8	2.6	2.2	1.8	1.8	1.8	2	3	3	2	2	2
14	18SCS31	0.8	0.4	1.2	0.8	0.4	0.4	2	1	3	2	1	1
15	18SCS322	2	2	2	2	3	2	2	2	2	2	3	2
16	18SCS334	1	-	-	2	1	2	1	-	-	2	1	2

17	18SCS34	2	2.25	2.8	2.5	1.8	2	2	3	3	2	2	2
18	18SCSI35	1	1.8	2.5	1	1.8	2.47	1	2	3	1	2	3
19	18SCS41	1.67	2.33	2.67	2	2	2	2	3	3	2	2	2
20	Open Course	3	-	3	3	2.5	3	3	-	3	3	3	3
21	Open Course	2	-	2	3	2.5	3	2	-	2	3	3	3

Table 2.4(b): POs attainment levels of 2018-20 Batch

2018-20 Batch													
		POs attained for the courses						POs set for the courses					
Slno:	**Course-code**	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**
1	18SCS11	-	-	2.2	-	-	0.76	-	-	3	-	-	1
2	18SCS12	0.6	0.8	1.1	2	-	0.8	1	2	1.5	2	-	2
3	18SCS13	-	0.8	0.8	1.2	0.8	1.2	-	2	2	3	2	3
4	18SCS14	1.2	1.4	1.8	2	1.8	2.6	2	2	2	2	2	3
5	18SCS151	-	-	2	1.6	-	-	-	-	2.5	2	-	-
6	18SCSL16	-	2	3	2	2	2	-	2	3	2	2	2
7	18RMI17	2	3	3	2	3	3	2	3	3	2	3	3
8	18SCS21	1	-	-	3	1	2	1	-	-	3	1	2
9	18SCS22	2.2	3	3	1	-	1	3	3	3	1	-	1
10	18SCS23	-	1	2	2	2	1	-	1	2	2	2	1
11	18SCS244	-	1	1.2	1.8	1.2	0.6	-	1	2	3	2	1
12	18SCS252	-	2	2	3	2	3	-	2	2	3	2	3
13	18SCS27	0	0	3	2	2	2	2	3	3	2	2	2
14	18SCS31	-	1.6	2.4	1.6	2	1.6	-	2	3	2	2	2
15	18SCS321	1.2	1.4	1.6	1.41	1	1	2	2	2	2	1	1
16	18SCS334	1	0	-	2	1	2	2	2	-	2	1	2
17	18SCS34	2	2.33	2.67	2	1.67	2	2	3	3	2	2	2
18	18SCSI35	1	1.75	2.5	1	1.75	2.5	1	2	3	1	2	3
19	18SCS41	2	2.33	2.67	2	1.67	2	2	3	3	2	2	2

Graduate Exit Survey:

The graduate survey is like a virtual exit interview with the program, offered to the graduating students each year. The aim of the survey is to gather information regarding the experience of graduates in the program. The survey asks graduating students about their experiences, estimated gains in knowledge and skills acquired through the program and future contact information. The survey is offered to graduating students electronically (through google forms) during the last term of their two year program. This survey is administered every year. Fig. 2.1 shows the graduate end survey statistics for four batches. Fig. 2.3 shows the sample survey questions.

Table 2.5: Attainment of program outcomes

Sl no.	Program Outcomes	2018-2020	2019-21
1	PO1	2.62	2.5
2	PO2	2.24	2.43
3	PO3	2.33	2.57
4	PO4	2.33	2.57
5	PO5	2.5	2.71
6	PO6	2.33	2.50

Average PO Attainments Year wise based on Indirect Survey

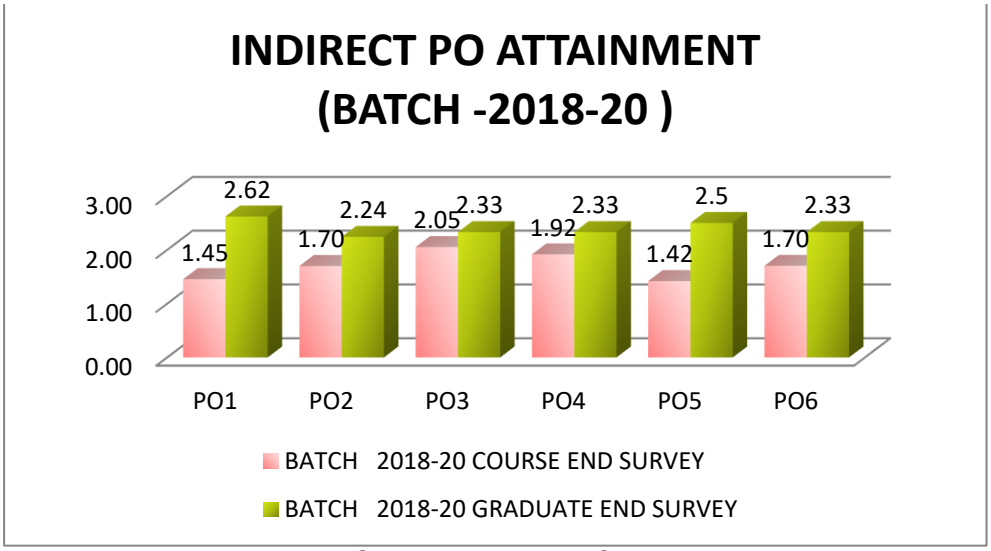


Figure 2.1: Comparison of PO attainments for 2018-20 and 2019-21 Batches

Course End Survey:

The course end survey is taken at the end of the semester. The feedback is taken to know whether the level of attainments met for each course based on High (3), Medium (2) and Low (1). The course end survey questions are prepared by the respective course coordinators. The survey questions are designed based on the course outcomes which are mapped to specific Programme outcomes. The survey questions are shared through Google forms to students' semester wise. Feedback forms are customized to levels 1, 2 & 3. The Fig. 2.2 shows the course end survey statistics for 2016-18 and 2017-19 batches. Further, PO attainments are computed and level of attainments reached respect to specific POs are analyzed. The assessment of COs with respect to POs are done. Fig. 2.4 shows the sample course end survey questions.

Table 2.6: Attainment of program outcomes

Sl no.	Program Outcomes	2018-20	2019-21
1	PO1	1.45	1.53
2	PO2	1.70	2.30
3	PO3	2.05	2.02
4	PO4	1.92	1.72
5	PO5	1.42	1.59
6	PO6	1.70	1.56

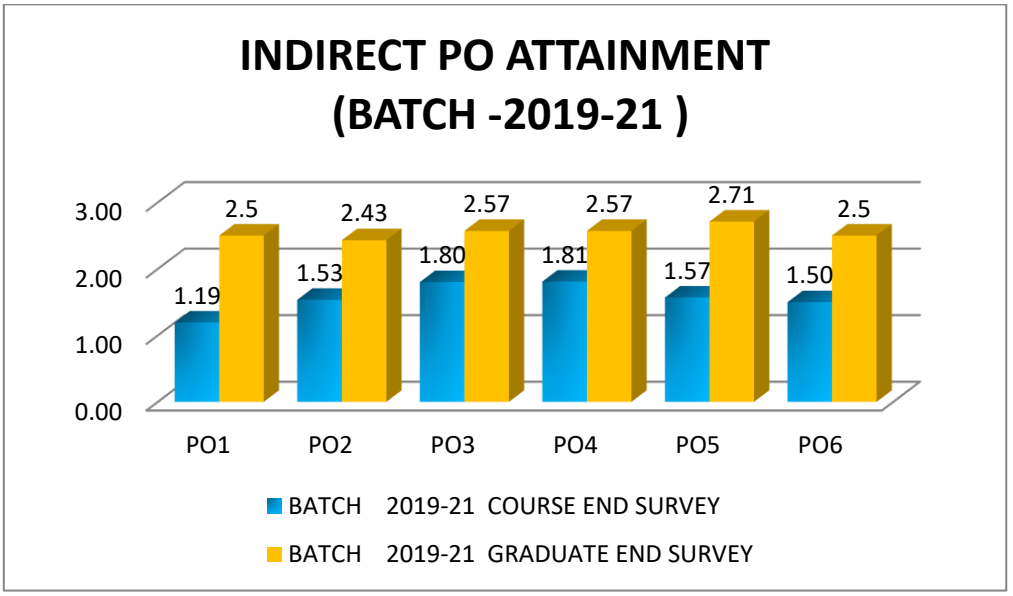
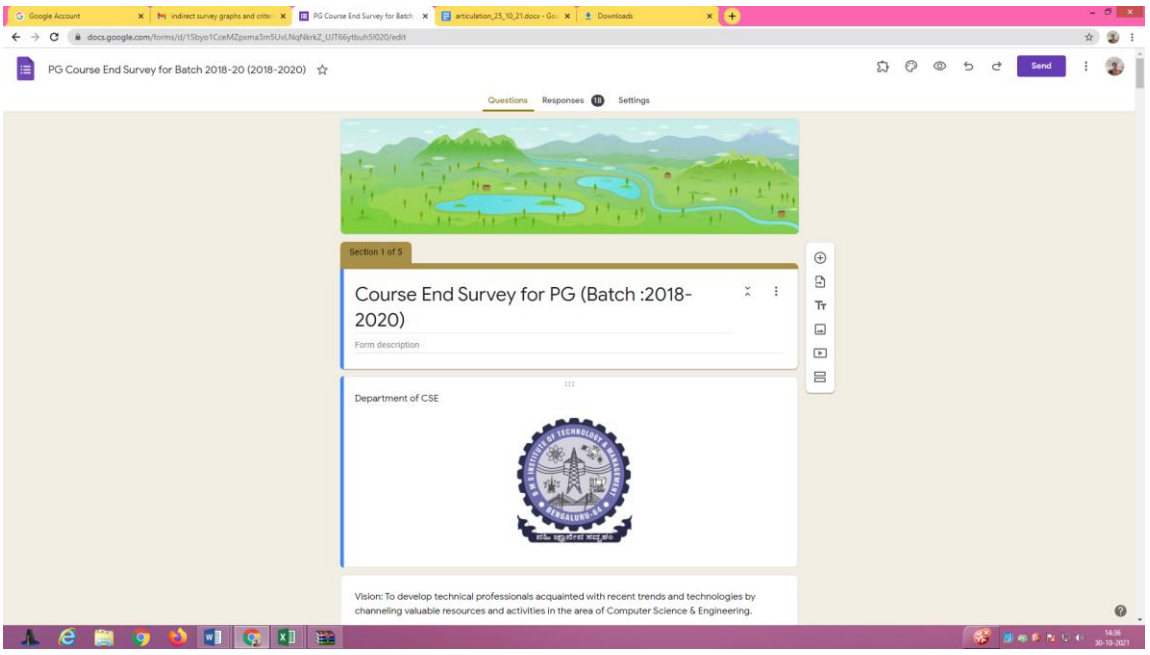


Figure 2.2 : Comparison of PO attainments for 2018-20 and 2019-21 Batches



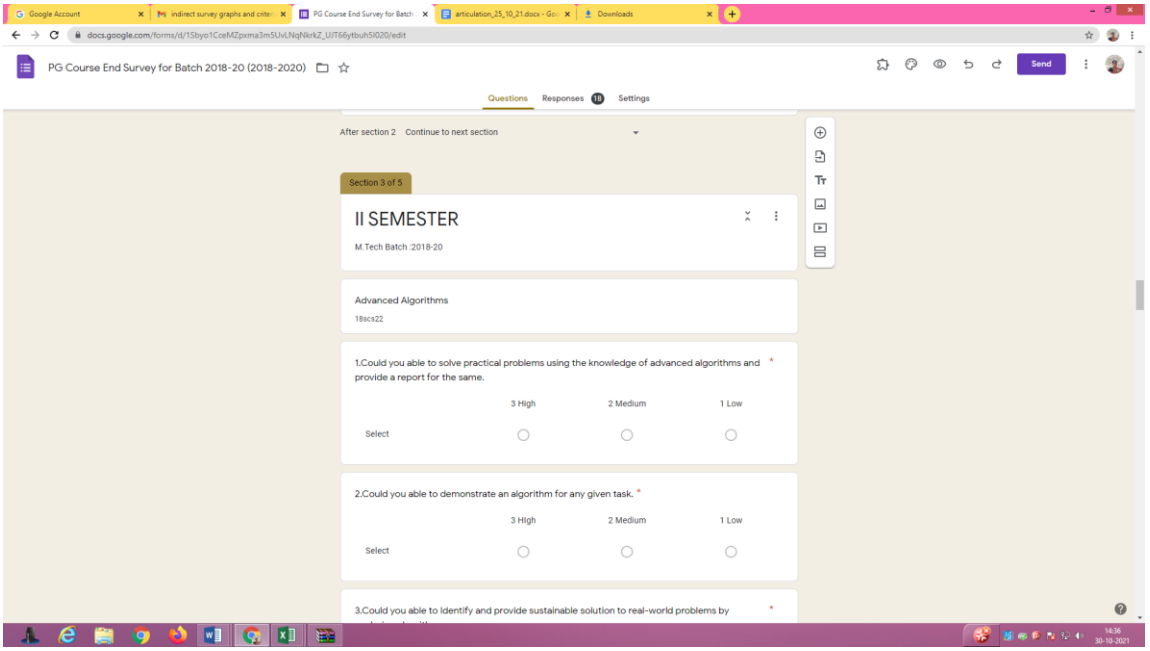


Figure 2.2 (a): Samples of Surveys – Course End and Graduate Exit Survey

Graduate exit survey sample:

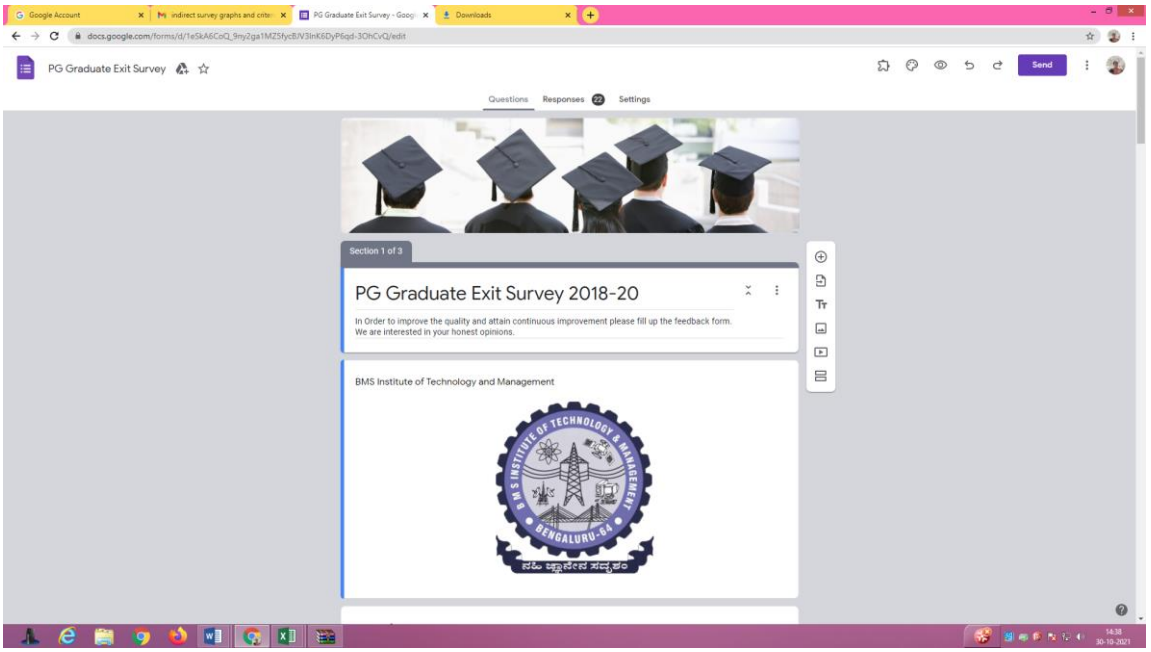
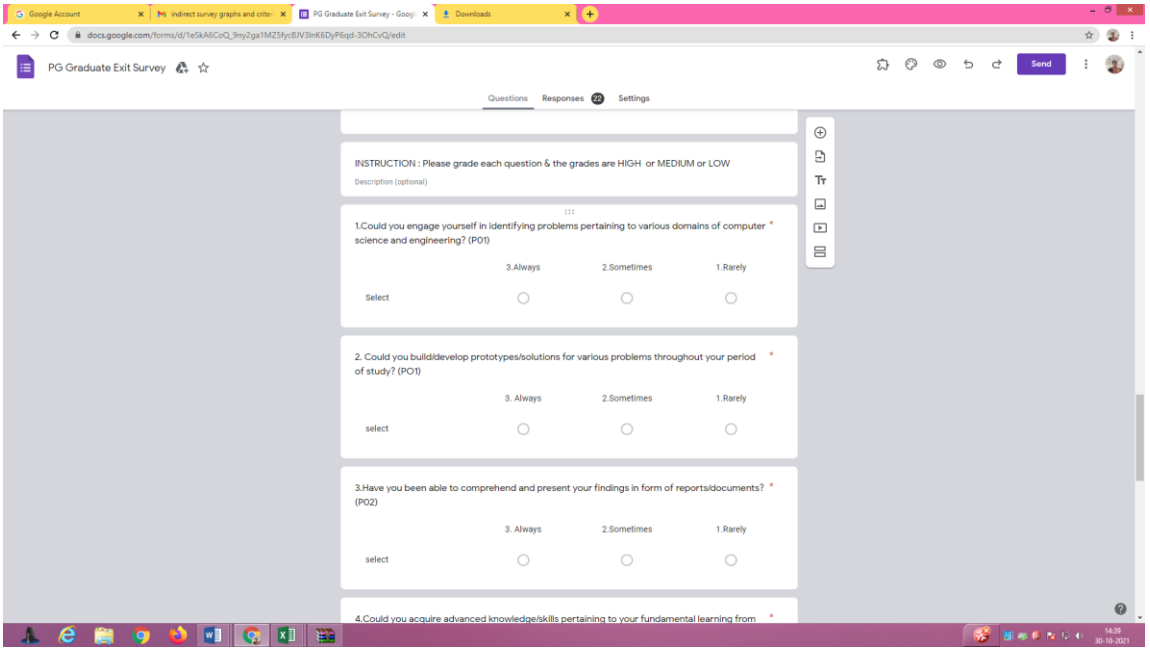


Figure 2.2: Sample Graduate Survey Questions


PG Graduate Exit Survey
docs.google.com/forms/d/1eSkA6CoQ_9my2ga1MZ5fycBJV3InK6DyP6qd-3OhCvQ/edit
Send
Questions
Responses 22
Settings
INSTRUCTION : Please grade each question & the grades are HIGH or MEDIUM or LOW
Description (optional)
1.Could you engage yourself in identifying problems pertaining to various domains of computer science and engineering? (PO1) *
3.Always
2.Sometimes
1.Rarely
Select
2. Could you build/develop prototypes/solutions for various problems throughout your period of study? (PO1) *
3. Always
2.Sometimes
1.Rarely
select
3.Have you been able to comprehend and present your findings in form of reports\documents? (PO2) *
3. Always
2.Sometimes
1.Rarely
select
4.Could you acquire advanced knowledge/skills pertaining to your fundamental learning from *

Overall Attainment

The tables 2.7 and 2.8 show the final POs attainment values of 2018-20 & 2019-21 batches.

Table 2.7: Final POs attainment levels values, 2019-21 Batch

Direct Attainment	1.57	1.77	1.99	1.80	1.77	1.80
Indirect Attainment	2.01	2.37	2.29	2.14	2.15	2.03
Final Attainment	**1.66**	**1.89**	**2.05**	**1.87**	**1.84**	**1.84**

Table 2.8: Final POs attainment levels values, 2018-20 Batch

Direct Attainment	1.42	1.74	2.17	1.87	1.66	1.73
Indirect Attainment	2.04	1.97	2.19	2.12	1.96	2.02
Final Attainment	***1.54***	***1.79***	***2.18***	***1.92***	***1.72***	***1.78***

3. STUDENT'S PERFORMANCE (75)

Table 3.1 Students Admission Details

Item: (Information to be provided cumulatively for all the shifts with explicit headings, wherever applicable)	**CAY 2020-2021**	**CAYm1 2019-20**	**CAYm2 2018-19 (LYG)**	**CAYm3 2017-18 (LYGm1)**	**CAYm4 2016-17 (LYGm2)**
Sanctioned intake of the program (*N*)	18	18	18	18	18
Total number of students admitted through GATE (*N*1)	0	0	0	0	0
Total number of students admitted through PG Entrance and others(*N2)*	10	7	14	11	13
Total number of students admitted in the Program (*N*1 + *N*2)	10	7	14	11	13

CAY – Current Academic Year
CAY m1– Current Academic Year minus 1 = Current Assessment Year
CAY m2– Current Academic Year minus 1 = Current Assessment Year minus 1
LYG – Last Year Graduate
LYGm1 – Last Year Graduate minus 1
LYGm2 – Last Year Graduate minus 2

Table 3.2 Number of Students who have successfully graduated

Year of entry	***N*1+*N*2 (As defined above)**	**Number of students who have successfully Graduated**	
		I Year	II Year
CAY 2020-21	10		
CAYm1 2019-20	7	7	
CAYm2 2018-19(LGY)	14	14	13
CAYm3 2017-18 (LYGm1)	11	10	10
CAYm4 2016-17 (LYGm2)	13	13	12

3.1. Enrolment Ratio through GATE (20)

Enrolment Ratio= N1 /N; N is sanctioned intake; N1 is the number of students admitted through GATE.

Table 3.3 Enrolment Ratio

Year	N (Sanctioned intake of program)	N1 (Total number of students admitted through GATE)	Enrolment Ratio (N1/N)*100
2020-21	18	0	0
2019-20	18	0	0
2018-19	18	0	0
2017-18	18	0	0
2016-17	18	0	0
Average			0

Enrolment Ratio through PG-CET(20)

Enrolment Ratio= N1 /N; N is sanctioned intake; N1 is number of students admitted through PG-CET

Year	N (Sanctioned intake of program)	N1 (Total number of students admitted through PG-CET)	Enrolment Ratio (N1/N)*100
2020-21	18	10	55.5
2019-20	18	07	38.8
2018-19	18	14	77.7
2017-18	18	11	61.1
2016-17	18	13	72.2
Average			61.06

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

S.I. = Number of students completing program in stipulated duration/ Number of students admitted in the first year of the same batch.
Average S.I. = Mean of SI for past 3 Batches
Assessment points = 20 X Average S.I.

Table: 3.4 Success Rate in Stipulated Period of the program

Item	(LYG) 2018-19 Batch (2018-20)	(LYGm1) 2017-18 Batch (2017-19)	(LYGm2) 2016-17 Batch (2016-18)
Number of students admitted in first year	14	11	13
Number of students completing program in stipulated duration	13	10	12
Success Index (SI)	0.93	0.909	0.923
Average Success Index	0.92		

Assessment points = 20 X Average S.I. = 20 x 0.92 = 18.41

3.3. Placement, Higher Studies and Entrepreneurship (20)

Assessment Points = 20 × average placement; N is the total no. of students admitted in first year

Table: 3.5 Placements, Higher Studies and Entrepreneurship

Item	CAYm1 2020-21	CAYm1 2019-20	CAYm2 2018-19	CAYm3 2017-18
No. of students placed in companies or Government Sector (X)	4	3	7	6
No. of students pursuing (Y)	0	0	0	0
No. of students turned entrepreneur in engineering/technology (Z)	0	0	0	0
X + Y + Z =	4	3	7	6
Placement Index :(x + y + z)/N	0.57	0.14	0.63	0.5
Average placement	0.477			

3.3.1a. Provide the placement data in the below mentioned format with the name of the program and the assessment year:

Table 3.6 Placement Details

Programs Name and Assessment Year: M.Tech. CSE 2020-21				
S.No	**Name of the student placed**	**Enrolment no.**	**Name of the Employer**	**Appointment letter date**
1	Gautham S K	1BY19SCS02	CapGemini	15-09-2021
2	Meghana kumar K J	1BY19SCS04	CapGemini	15-09-2021
3	Tejaswini A kantanavar	1BY19SCS06	Aditi Consulting	20-09-2021
4	Yarshini N	1BY19SCS07	Intercrowd India Pvt Ltd	01-12-2021
Programs Name and Assessment Year: M.Tech. CSE 2019-20				
S.No	**Name of the student placed**	**Enrolment no.**	**Name of the Employer**	**Appointment letter date**
1	Bhagyashree A V	1BY18SCS01	LEADICS	24-03-2021
2	Kaveri	1BY18SCS05	Nokia Networks	02-07-2020
3	Srivatsa Raju S	1BY18SCS13	Nokia Networks	02-07-2020
Programs Name and Assessment Year: M.Tech. CSE 2018-19				
S.No	**Name of the student placed**	**Enrolment no.**	**Name of the Employer**	**Appointment letter date**
1	Kusuma S S	1BY17SCS02	Nokia Networks	22-05-2019
2	Minu Correya	1BY17SCS05	Nokia Networks	22-05-2019
3	Nikhil K S	1BY17SCS06	Mindtree	06-07-2019
4	Prathama V	1BY17SCS07	TeamLease services Ltd.	15-07-2019
5	Priyanka P	1BY17SCS08	TeamLease services Ltd.	15-07-2019

6	Rakshitha K S	1BY17SCS09	Sri Venkateswara College of Engineering	01-08-2019
7	Shivaleela P	1BY17SCS10	KPIT Technologies Ltd.	24-10-2018
Programs Name and Assessment Year: M.Tech CSE 2017-18				
S.No.	**Name of the student placed**	**Enrolment no.**	**Name of the Employer**	**Appointment letter date**
1	Guruprasad Hiremath	1BY16SCS05	ArisGlobal Software Pvt.Ltd.	26-09-2018
2	Nayana R	1BY16SCS08	Simplilearn Solutions Pvt.Ltd	02-05-2019
3	Pramila A	1BY16SCS10	Cerner	25-06-2019
4	Sarika C G	1BY16SCS11	CBIT, Kolar	22.07.2019
5	Teja Reddy	1BY16SCS12	BOSCH	09-07-2018
6	Vibha Vinod	1BY16SCS13	UST Global	26-02-2019

3.4. Professional Activities (15)

3.4.1. Student's participation in Professional societies/chapters and organizing engineering events (5)

CSI CHAPTER

CSI - Computer Society of India is the first and largest body of computer professionals in India. It was started on 6th March 1965 by a few computer professionals and has now grown to be the national body representing computer professionals. It has 72 chapters across India, 511 student branches, and 100,000 members.

The Computer Society of India is a non-profit professional body to exchange views, learn the latest information and to share ideas. The Society also encourages and assists professionals to maintain integrity and competence of the profession and fosters a sense of partnership amongst members. Besides the activities held at the Chapters and Student Branches, the Society also conducts periodic conferences, seminars.

CSI recognized BMSIT&M as an Educational Institution member in the year 2014.

Institution Membership No: IO2129

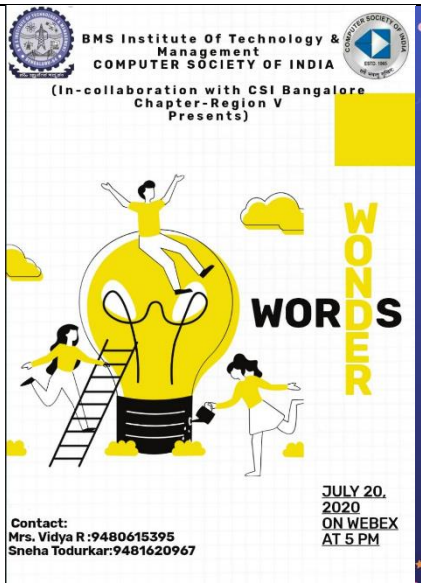
Table 3.7 CSI Events Conducted in the Academic year 2020 – 21

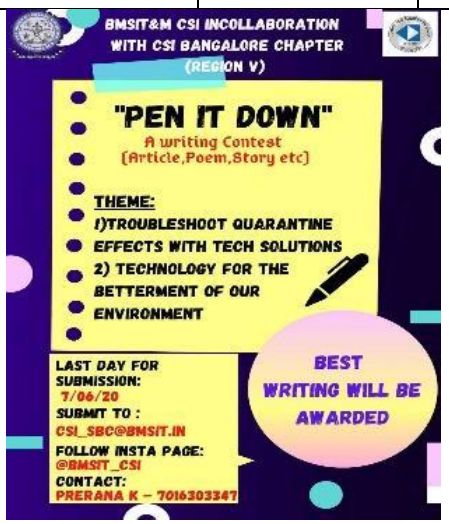
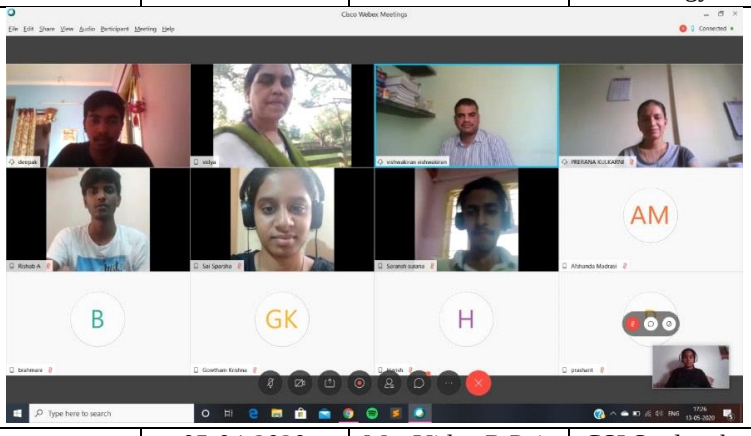
Sl. No	Name of the event & Resource Person	Date	Coordinator	Summary of the event
1	**Ecode words**	**23-02-2021**	Mrs Vidya R Pai	CSI Student activity "Ecode words" was conducted on 23.2.2021 at 3:30. Around 19 students participated in the event.CSI Student Coordinator Mr.Pratham from 1st year B Section arranged a few technical activities like A talk on Computers, decode the words and a brief introduction to CSI was given to the students. The students who actively participated in the game called ecode words were given prizes (1st, 2nd and 3rd) from the CSI club. Dr. Arunakumari B.N and Dr.Lakshmi B.N distributed the prizes.

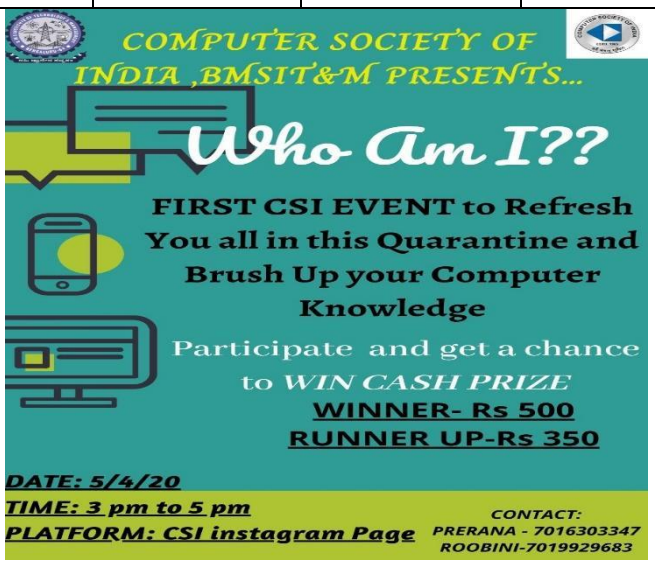
				
2	**CSI Membership Drive**	**22-04-2021**	Mrs Vidya R Pai	A session was conducted to give brief information about the benefits of CSI and the activities organized in BMSIT & M. Motivated the students to register under CSI.
				

Table 3.8 CSI Events Conducted in the Academic year 2019 – 20

Sl. No	Name of the event & Resource Person	Date	Coordinator	Summary of the event
1	Wonder Words Ms. Sneha Todurkar, Mr. Harish, Ms. Roobini, Ms. Prerana, Ms. Sai Sparsha	20-07-2020	Mrs Vidya R Pai	An exciting fun game - Wonder Words. This fun game is to know how good you are as an interpreter. Students will be given a word through private chat in WebEx. You have to describe the word and make the audience guess the word without using the given word .The one who makes the audience guess that word faster by describing it in a best ways will be declared as the Winner

	 			
2	Coding wars Mr. Harish, Ms. Roobini, Ms. Prerana, Ms. Sai Sparsha	11-07-2020	Mrs Vidya R Pai	Coding competition was organized in association with CSI. 25 students from different colleges like MSRIT, St. Joseph Engineering college, BMSIT&M had participated in the competition. The winners of the event were Winston Sebastin from St. Joseph Engineering college, Drupal K from BMSIT&M, and Ayush Seth from BMSIT&M
	 			
3	PEN IT DOWN Ms. Roobini, Ms. Prerana, Ms. Sai Sparsha, and Mr. Harish	07-06-2020	Mrs Vidya R Pai	Pen It Down was an online writing competition organised by CSI team during the quarantine time. It was an open event for entire Bangalore chapter with no registration fees. We did get few responses which were articles and poems. The topics given for the competition were- 1) Troubleshoot quarantine effects with tech solutions 2) Technology for the betterment of our environment The participants were given two days' time to submit their writings to the official account of BMSIT_CSI. They were free to submit any kind of writings which included poem, story, articles, quotes etc.

				Winner: Richa Kumari 3rd year, BMS Institute of Technology.
				
4	Group Discussion: Battle of Programming Languages Ms.Roobini, Ms. Prerana	13-05-2020	Mrs Vidya R Pai	The event intended in providing students an opportunity to share their insights regarding the most preferred programming languages C and Java. Ms. Sai Sparsha E, Content lead addressed the gathering and introduced Dr. Vishwa Kiran, Professor and Corporate Trainee the judge for the day to the session and welcomed him. Students participated actively and stated their points confidently. The session proceeded interactively and students participated enthusiastically.In the end, Ms. Prerana Kulkarni, Student Coordinator and design lead, proposed the vote of thanks announcing the winner of the day. Winner: Deepak Biradar, BMS Institute of Technology.
				
5	Riddles/Quiz on computers	05-04-2020	Mrs Vidya R Pai	CSI Student branch event was organized in this Quarantine to brush up the computer knowledge on 5th April 2020 on Instagram page between 3 pm to 5 pm. The event was open to all the students of BMSIT&M,

				around 10 Riddles on computers were asked in the social media (Instagram). The winners of the event are Sai Pranav and Rakhi from 4th semester computer science and Engineering department. Winner and runner up will be given a prize amount of Rs. 500/- and Rs.350/-.
					
6	Coding Competition Ms Anjana Maddi	05-11-2019	Mr Ravi Kumar Mrs Vidya R Pai	Code-O-Fiesta is a coding competition with two rounds, testing the student's logic building skills in any language of their choice. This is both a fun and Technical event for testing the efficiency in coding of the participant, using various rounds.
				

7	Project Exhibition **Judges for the event** 1. Mr. Vijaya Kumar A S – Consultant, Aprameyah Technologies 2.Mr. Pradeep – Technical Head, SunSoft Technologies 3.Dr. Sunanda Dixit 4.Dr. Satish Kumar T 5.Mrs. Bharathi R	04-11-2019	Mr Shankar R	Department of Computer Science & Engineering in association with IEEE student chapter and Computer Society of India hosted 2019-20 Odd Semester's Project Based Learning encompassing 145 projects in various fields of Computer Science. PBL theme: SMART CAMPUS PBL focused on topics like: Data Structures, Computer Networks, Web Technologies.
				
8	Open Course Mr Prashant G Aprameyah Technologies Pvt Ltd. Ms Payal Mehta Entertainment India Ltd	22-10-2019 to 26-10-2019	Mr Guru Prasad	Department offered 5 open value added courses to bridge the Curriculum gap. The courses were taught by the Industry and academic experts. The following are the open courses offered: ● Machine Learning and Data Science using Python ● Programming for Placement ● Data Science using R Programming ● Cyber Security with Block-chain Technology ● Project and Finance Management

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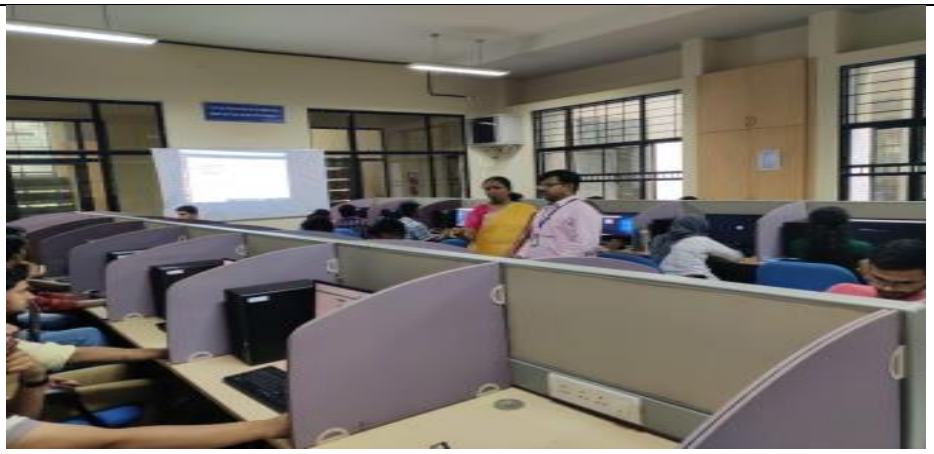
<tr><td colspan="5">  </td></tr>
<tr><td>9</td><td>Problem solving analysis with basics of C

Ms. Anjana
Ms. Srihitha</td><td>13-08-2019</td><td>Mrs Vidya R</td><td>Team Hackslash handled sessions for beginners about C coding. Despite seeking the Improvement, it was a session meant for sharing the basics of all kinds.</td></tr>
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Table 3.9 CSI Events Conducted in the Academic year 2018 – 19

Sl. No	Name of the Event & Resource Person	Date	Coordinator	Summary of the event
1	Project Exhibition **Judges for the event** Mr Vijaya Kumar A S Consultant, Aprameyah Technologies Dr. Elangovan – Consultant, elanzlogic.com	13-05-2019	Mr Shankar	Department of Computer Science & Engineering in association with IEEE student chapter and Computer Society of India hosted even Semester's Project Based Learning encompassing 210 projects in various fields of Computer Science on 13-05-2019. This edition of PBL focused on topics like: Design and Analysis of Algorithms, Data Communications, Microprocessors, Computer Graphics, Python Java, C Programming Projects etc. Around 20 best projects were selected in the exhibition.
				
2	Expert talk Mr Chandrasekharan Senior Telecom Professional	04-05-2019	Dr. Vishwa Kiran Dr.Anil GN Mrs Kirthima Mrs Vidya	The expert talk was organized for the students of 4th semester under Computer Society of India student branch. Topics covered were IPv4, IPv6 and wireless

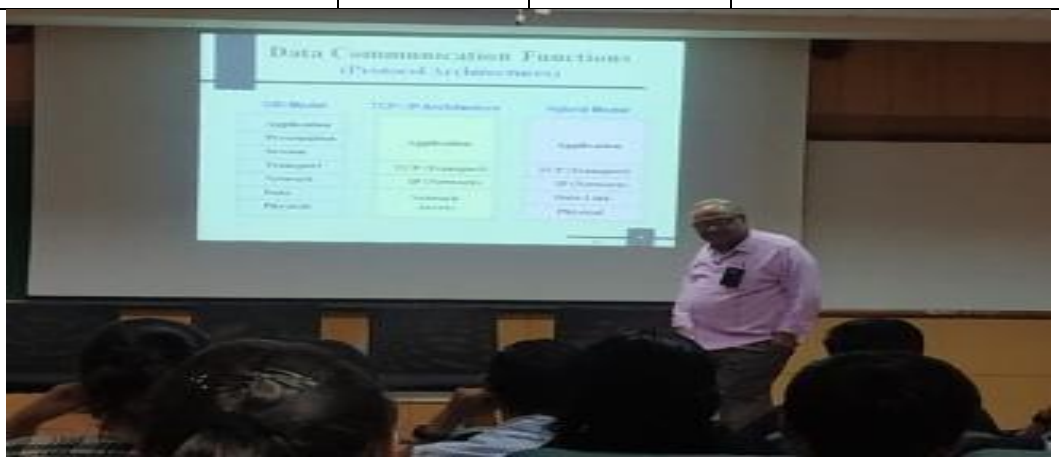
				networks and part of Module 5 for the subject Data Communication.
				
3	National Level Five Day FDP on Machine Learning for IoT Applications Mr. Buddhadeb Das, Senior Vice President, JMRinfoTech	28-01-2019 to 01-02-2019	Department coordinators	A National Level Faculty Development Programme on Machine Learning for IoT Applications was organized from 28th January 2019 to 1st February 2019 under CSI student branch. Around 30 faculties from various colleges have participated.
				

Table 3.10 CSI events conducted in the academic year 2017 – 18

Sl. No	Name of the Event & Resource Person	Date	Coordinator	Summary of the event
1	Student Development Program on PYTHON. Mr. Suresh Senior software Engineer IBM	05-02-2018	Mrs.Hemamilini	An SDP was conducted in the department of CSE on Python and its applications from 5th to 8th Feb.


IEEE CHAPTER

IEEE – Begin the networking for students in their area of interest and future profession. It connects IEEE with local sections and volunteer leadership. Students learn about Scholarships, Grants and Fellowships for IEEE student members.
IEEE recognized BMSIT & M as an Educational Institution member in the year 2018.

Institution Membership No: STB14611

Table 3.11 IEEE events conducted in the academic year 2020– 21

2020-21			
Sl. No	**Name of the Event & Resource Person**	**Date**	**Summary of the event**
1	Aerial Humanoid Robotics Prof. Daniele Pucci,	**1-10-2020**	The webinar was conducted by Professor Daniele Pucci, head of the Dynamic Interaction Control (DIC) lab at the Istituto Italiano di Tecnologia (IIT). DIC Lab is pioneering Aerial Humanoid Robotics, a new branch of Robotics envisioning jet-powered flying humanoid robots. The speaker gave insights about how robots are modeled at the lab and the principles behind them. We had a fun session in between where the participants were asked to guess the technical robotic term presented in a hidden phrase. Following this, we had the Q/A session where the participants got their queries clarified. It was a super interesting and engaging session, to say the least
2	AIOT for Digital Transformation Mr. Vishwas Lakkundi,	**12-09-2020**	The session was addressed by Mr. Vishwas Lakkundi, Chair, IEEE CS Chapter Bangalore Section. It was a very insightful session where students were introduced to the world of AI in IoT. The speaker explained briefly the benefits of imparting AI In IoT. The webinar co-ordination group came up with a new initiative of including crossword puzzles to keep the audience engaged additionally along with the rapid-fire questions. The speaker enjoyed taking up rapid-fire questions. The audience posed questions at the end of the session which was answered by the speaker.

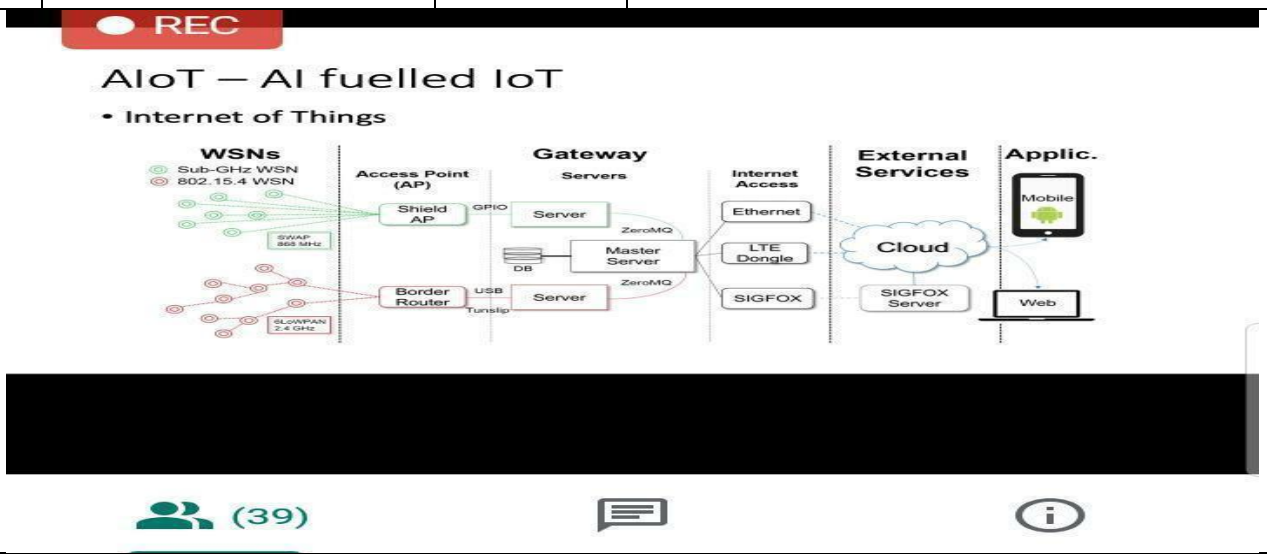
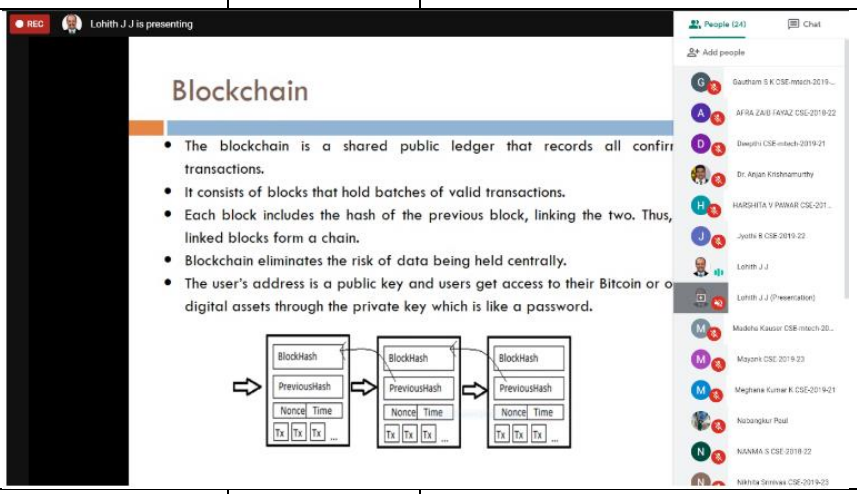


Table 3.12 IEEE events conducted in the academic year 2019 – 20

2019-20			
Sl. No	**Name of the Event & Resource Person**	**Date**	**Summary of the event**
1	Webinar: How to Bag Your Dream Software Engineering Job	**26-4-2020**	Geeks for Geeks is a well-known site for all the tech enthusiasts as it is one of the best sites to clarify doubts and learn many computational concepts. Mr. Sandeep Jain, the founder of the page was the speaker of the day. He turned the webinar into an interactive and interesting session by sharing great insights about questions like when to get into a job, what kind of skills to be adapted for getting a successful job, and many more of such important points. Students were motivated and inspired by his thoughts and ideas. The session lasted for 1.5hrs.
			
1	Open Course: Cognitive Security	16-20th June 2020	Department of Computer Science and Engineering in association with the IEEE BMSIT&M CS Chapter conducted a workshop on Cognitive Security. The open course lasted for 5 days delivering effective topics of cybersecurity. Topics like the difference between traditional

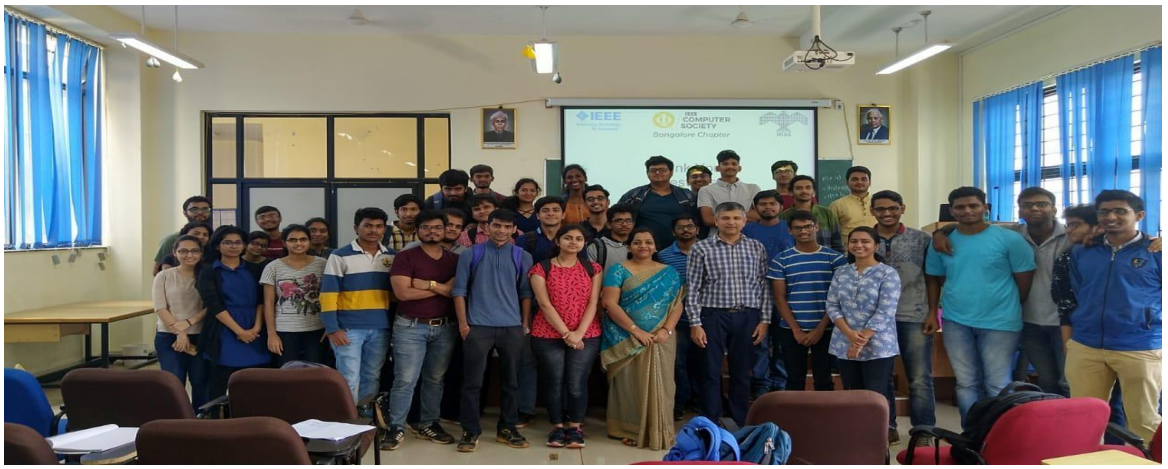
			database, blockchain, bitcoin, miner and hash function, threat analysis, etc were taught to students. There was a hands-on lab session on Nmap, S-MIME, and other topics.
			
	AI Robotics and AutomationTechnology Prof. William Lee	10-4-2020	The AI, Robotics and Autonomous Technology Webinar were hosted by Prof. William Lee on 10/04/2020 with a motive to give deeper insights about present-day technological advancements on the same. Prof Lee is an experienced Research Engineer who has worked for companies like Panasonic and HP. On the Research translational front, he is the Strategic Innovation Associate Director of Advanced Robotics Centre (ARC) at the National University of Singapore (NUS). Mr.Lee is also the co-founder of AImatix Pte Ltd, an NUS Enterprise-enabled Startup, into space for high-density pedestrian pathway with autonomous devices. The Webinar was an interactive session and at the end of the session, a few queries posed by the participants were clarified. Nearly 70 participants from all over the globe attended the webinar and reaped its benefits.
			
1	Girl Geeks 1 Ms. Adarsha, Mr. Shakeel	24-8-2019	This event is about real world applications of Machine Learning and Neural Networks.

2	Girl Geeks 2 Dr. Snehanshu Saha, Ms. Archana Mathur	31-8-2019	This event introduces the basic concepts of Machine Learning and Neural Networks from scratch without using any library files.

3	Industrial Visit - Nokia	5-9-2019	Organized technical sessions on topics like 5G, IoT, AR/VR etc, A panel discussion on future work in 5G and introduction 6G was also organised.

4	Girl Geeks 3	7-9-2019	Brief introduction about Deep Learning for Natural Language Processing. Speakers shared few resources to learn more about the topics covered and few use case studies.

5	Girl Geeks 4 Dr. Nithin Nagaraj	14-9-2019	Implementation of the basic neural network, a single layer perceptron, and discussed its drawbacks.



6	IEEE Membership Drive Mr. Gautama Bharadwaj Ms. Deepa Ms. Swati Sandhya	11-10-2019	Discussed various topics on the hierarchy of IEEE organization around the globe, the importance of IEEE membership and its benefits.

7	IEEE Day	12-10-2019	Briefed to students about IEEE's membership benefits including access to technical innovation, cutting-edge information, networking opportunities. The aspiring members were informed about different societies that could be started within the student branch itself.

Table 3.13 IEEE events conducted in the academic year 2018 – 19

Sl. No	Name of the Event & Resource Person	Date	Summary of the event
1	IEEE Computer Society Chapter Inauguration Dr. Snehanshu Saha, Mrs. Archana Mathur, Mr. Yathindranath T, Mr. Pramod	16-2-2019	Dr. Snehanshu Saha talked briefly about IEEE Bangalore Section and gave valuable insights to the Student Branch. He delivered a keynote speech on Particle Swarm Optimization. He gave a detailed insight into this optimization techniques.
			
2	IEEE Membership Drive Mr.Gautama Bharadwaj	1-3-2019	Discussed various topics on the hierarchy of IEEE organization around the globe, the importance of IEEE membership and its benefits.

3	Talk on Finance and Investment Mr. Aranya Khinvasara	2-3-2019	The talk explains in detail about the rise, fall and saturation of gold as an investment over the years and advantages/ disadvantages of real estate investment.

4	Website Development Workshop. Mr.Gautama Bharadwaj	15-3-2019	The workshop integrated a hands on session on HTML, CSS and Javascript, the three major front end web development tools.

5	Talk on Radio Communication and 5G. Mr. Anand M	27-4-2019	The talk is about Wireless communication topics like MIMO, Satellite communication, and spectrums followed by an overview of 5G technology both a commercial and development point of view.

6	Cyber Security Workshop Mr. Gururaja H S Mr. Vijay Shankar Naavi Mr. Sulakshan	29-4-2019 to 30-4-2019	The workshop highlighted network security, cyber security, vulnerabilities of the wireless LAN and the necessary precautions to be taken. It also focused on digital signatures, hashing, and adjudication.

Events organized under Innovation Centre

Anveshana-3.0

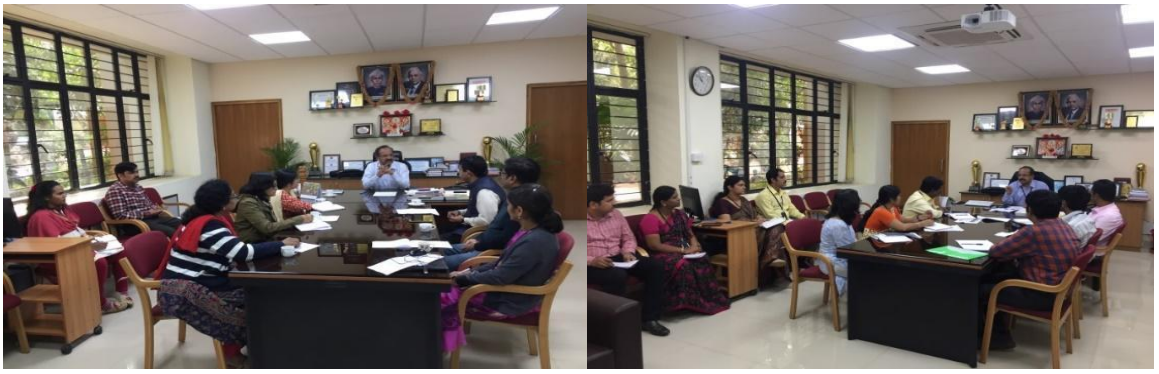
Anveshana, an innovative idea contest, was launched in the month of October, 2019 for the students of BMSIT & M. As many as 50 innovative ideas were submitted by students.

Smart India Hackathon 2020

Innovation Centre promoted SIH 2020 in the campus to make sure students actively participate in SIH conducted by AICTE in association with MSME and various industries. First round of competition was held in college during the month of January. Software and Hardware intra-college hackathon was conducted on 18th January and 25th of Jan respectively. 7 teams were nominated for the next round.

MHRD IIC 2.0

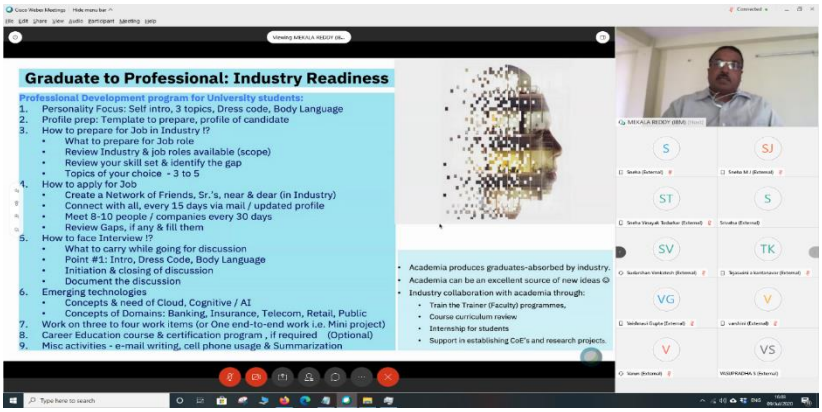
Innovation Centre registered to MHRD's Institute Innovation Council 2.0.A set of external and internal expert committee was formed and student coordinators from all the departments were nominated. Various innovative, entrepreneurial, patent activities from college have been uploaded to MHRD IIC website to promote innovation.



- VTU TEQIP Cell called for project competition 'Avishkar' during April 2020 and 2 teams from BMSIT & M were recognized by Innovation Centre are successfully sent across and qualified to exhibit their work at VTU.

Events organized by the Department

- Conducted IBM talk on "Graduate to Professional" by Mr. Mekala V Reddy, IBM for UG and PG programs of Dept. of CSE, BMSIT&M on 9th Jul 2020 (4 PM to 5 PM).



- Department of Computer Science and Engineering, BMSIT&M organized an Entrepreneurship Awareness (EAC) Camp from 10th to 12th of February 2020. EAC was sponsored by DST-NIMAT.
- **NPTEL Local Chapter Inauguration** was done by Dr. L Umanand, Professor at Electronic Systems Engineering, IISC, Bengaluru on Tuesday, 4th May, 2019 at Department of CSE, BMSIT&M.

- Conducted an **Expert Talk on "Machine Learning with Big Data Tools"** by Mr. Nasser Ebrahim and Mr. Bhaktavatsal R Maram, IBM ISL for 5th Semester B.E and **1st Semester M.Tech** students on 27th Oct 2018.

- Organized an **Entrepreneurship Awareness (EAC) Camp** from 27th to 29th of September 2018. EAC was sponsored by DST-NIMAT. The 3 day camp was conducted for budding entrepreneurs to gain knowledge about the procedure and the struggles an entrepreneur goes through in starting a start-up and after the company is established. The main

motto of the program was to create awareness amongst the students about various facets of Entrepreneurship and the highlights of it.

Technical Fests

Departmental techno-cultural fest Semaphore was organized on 6th October 2018. The fest was organized with the objective to provide a platform for the students to showcase their talent with a competitive spirit. The event was successful enough to attract as many as 400 registrations for one day fest which includes all the following events: Blind Coding, Arcadia, Hogathon, 5 in 1 Shows Quiz, Selfie Le Lo, PubG, Fifa etc.

Tech-Transform

TechTransform (Technology for Transformation of the Society) is an annual technical convention of BMSIT. The event started in 2016-17. The event was conceived with an objective of providing a rich opportunity for students and staff to understand and appreciate the magnitude, multiplicity and pace with which technological changes are impacting our society.

Tech-Transform 2019 was organized on 4th Nov 2019.

Tech-Transform 2018 was organized on 2-11-2018 and 03-11-2018.

3.4.2. Student's publications (10)

Table 3.13 Student's Publications in Technical Magazine

Sl No	Name	USN	Magazine	Title Of The Article	Year of Publication
1	Amaresh Naik	1BY15SCS01	Manthana	No Artificial Intelligence Isn't Coming For Your Job	August 2019
2	Purushottam V Naidu	1BY18SCS08	Student Editor for Departmental Newsletter.	--	February to July 2019
3	Tejaswini A Kantavanur	1BY19SCS06	Student Editor for Departmental Newsletter.	--	August to January 2020

Participation of Students from the program

- An **Industrial Field trip** was organized by EDC (Entrepreneurship Development Cell) under the programme EAC (Entrepreneurship Awareness Camp) Sponsored by Department of Science and technology, Govt. of India and EDII, Ahmedabad to Cognizant technical services offices in Manyata tech park, Bengaluru on 12th February,2020. Almost 85 Students attended the trip and were introduced to cyber security and Cognizant work culture by Mrs. Shanti, Director (Cyber Security).

- An industrial visit was arranged by the Department of CSE for Third semester students at HMT Museum on 4th November 2019 by Mrs Chethana C and Mr Anand R.

- An industrial visit was arranged by the Department of CSE for the First Semester students to Muddenahalli on 8th August 2019, by Mrs Hemamalini B.H, Mr Anand R & Mr. Muneshwara M S.

Table 3.14 Student's Achievements

S.no	Name of the Student & USN	Event	Venue	Date
1	Akshatha T	Secured **THIRD position** in **"ANVESHAN"** - South Zone Student Research Convention	VIGNAN'S Foundation for Science , Technology and Research	22-23 February,2019
				
2	Akshatha T Prajwala	Secured **THIRD Place** in Student Innovator Award for the project titled "Agricultural Bot"	Alliance University-Karnataka	23rd March, 2019
				

3	Mehebub Rahman	Participated in Makeathon IESA Vision Summit	Leela Palace, Bangalore	27th & 28th February,2018
				
4	Akshatha T	Anveshan: National Student Research Convention organized by Association of Indian Universities, NewDelhi	Ganpat University, Gujarat	12th -14th March, 2019.

List of publications along with the names of the authors and publishers, etc

Table 3.15 Publications in International Conference 2020-21

S.no	Name of the Student & USN	Paper title	Name of the Journal/Conference
1	Deepthi M, 1BY19SCS01	Ethnicity Identification	International Journal of Research and Analytical Reviews (IJRAR), ISSN 2348-1269, Volume 8, Issue 3, August 2021
2	Gautham S. K, 1BY19SCS02	Machine Learning Based Security Authentication for Wireless Multimedia Network	Fifth International Conference on Information and Communication Technology for Competitive Strategies (ICTCS 2020) held during December 11-12, 2020.
3	Gautham S. K, 1BY19SCS02	Two-Layer Encryption based on Paillier and ElGamal Cryptosystem for Privacy Violation	I.J. Wireless and Microwave Technologies, 2021, 3, 9-15 Published Online June 2021 in MECS
4	Gautham S. K, 1BY19SCS02	CNN-based Security Authentication for Wireless Multimedia Devices	I.J. Wireless and Microwave Technologies, 2021, 4, 1-10 Published Online August 2021 in MECS
5	Tejaswini A Kantanavar, 1BY19SCS06	Cloud Based IOT Applications, challenges	International Conference on Recent Trends in Electrical, Electronics, Telecommunications, Medical Electronics Engg.&Physics
6	Srivatsa Raju S 1BY18SCS13	Gathering Evidence from Android OS for Mobile Forensics	International Journal of Computer Science and Network, Volume 9, Issue 4, August 2020 ISSN: 2277-5420
7	Divya Shree S 1BY18SCS03	Anti-Forensics of Data in Classical and Quantum Systems Over the Classical Communication Channels	International Journal of Computer Science and Network, Volume 9, Issue 4, August 2020 ISSN 2277-5420

Table 3.16 Publications in International Journals 2019-20

S.no	Name of the Student & USN	Paper title	Name of the Journal

1	Sudhanshu Gupta 1BY18SCS14	Forensic Technical Process by E-Mail	International Journal of Innovative Technology and Exploring Engineering, Volume-9 Issue-4, February 2020
2	Kaveri T Hombal 1BY18SCS06	A Deep Dive Into Load Balancing Tools For Hadoop Application Management	International Journal of Engineering Applied Sciences and Technology, 2019, Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 119-122
3	Sneha S 1BY18SCS05	Emerging Real Time Streaming Analytics Processing Using Hadoop Framework.	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 213-216
4	Srivatsa Raju S 1BY18SCS11	Structural Analysis Of Hpc's For Big Data Analytics	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 168-170
5	Purushotham Naidu V 1BY18SCS04	Enhancing Performance And Efficiency For Big Data Analytics Application In Hadoop Mapreduce Environment	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 221-223
6	Bhagyashree A V 1BY18SCS01	Convergent Analytical Tools For Big Data Applications In Hadoop Environment	International Journal of Engineering Applied Sciences and Technology,2020, Vol. 4, Issue 9, ISSN No. 2455-2143, Pages 283-285
7	Bhagyashree A V 1BY18SCS14	Detection of phishing websites using Machine Learning Techniques	International Journal of Computer Science and Information Security (IJCSIS), Vol. 18, No. 7, July 2020
8	Purushotham Naidu V 1BY18SCS04	Narrowband Internet of Things (NB-IoT) Based Soil Quality Monitoring System to Enhance Crop Yield	Journal of Seybold Report, ISSN NO: 1533-9211, Journal of Seybold Report ISSN NO: 1533-9211 Volume 15 Issue 8 2020, pp 592-596
9	Kaveri T Hombal 1BY18SCS05	Efficient Subspace-Clustering of High-Dimensional Data Using FGK-Means Algorithm	Journal of Seybold Report, ISSN NO: 1533-9211, Journal of Seybold Report ISSN NO: 1533-9211 Volume 15 Issue 9 2020,
10	Srivatsa Raju S 1BY18SCS11	Forecasting and Detection of flood using Random Forest Learning Method	Third International Conference on Emerging trends in Science and Technologies for Engineering systems, July 2020

Table 3.17 Publications in International Journals 2018-19

S.no	Name of the Student & USN	Paper title	Name of the Journal
1	Laxmi Jadhav 1BY17SCS03	Implementation and Testing of soil analysis in cultivation land using IoT.	International Research Journal of Engineering and Technology, Volume:6,Issue:6, June 2019 ISSN: 2385-0058
2	Nikhil K S 1BY17SCS06	Comparative study of Spam Detection in Twitter by different approaches of Sentimental Analysis and MachineLearning Algorithm	International Journal of Engineering Science and Computing, Vol:9,Issue:6,June 2019 ISSN: 2321-3361
3	Prathama V 1BY17SCS07	Age Invariant Face recognition	International Journal of Trend in Scientific Research and Development (IJTSRD) Volume: 3 | Issue: 4 | May-Jun 2019 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470
4	Megha. S. M 1BY17SCS04	Cyber Attack Prevention using Machine Learning	International Journal of Engineering Science and Computing, Volume 9 Issue No. 5, May 2019 ISSN 2321 3361
5	Rakshitha K S 1BY17SCS09	IoT based Groggy driving alerting and Traffic collision information System	International Journal of Scientific Research in Computer Science applications and Management Studies, Vol:8, Issue:2, March 2019 ISSN: 2319-1953.
6	Minu Correya 1BY17SCS05	Expression Invariant Face Recognition Using Convolutional Neural Networks	International Journal of Advanced Research in Computer and Communication Engineering, vol.8, Issue.5, May-2019

Table 3.18 Publications in International Journals 2017-18

S.no	Name of the Student & USN	Paper title	Name of the Journal
1	Sowmya C S 1BY15SCS13	Noise removal in Hyper spectral images using spectral spatial adaptive Sparse representation	International Journal of innovative research in Science, Engineering and Technology Vol:6,Issue:11,November 2017 ISSN(online): 2319-8753
2	Aishwarya S 1BY16SCS01	Implementation of Privacy preserving Decision Control System for Photo publishing in online social media	International Journal of Creative Research Thoughts, Volume: 6, Issue:2 , April 2018 ISSN: 2320-2882
3	Akshata T 1BY16SCS02	Solar energy based Iot based embedded multipurpose agricultural BOT	International Journal of innovations in Engineering and Technology, May 2018, ISSN:2319-1058
4	Anuradha V 1BY16SCS04	Framework Enhancement for Common public ration Interface in SBTS	International Journal of Engineering and Technology, Volume:7, 2018
5	Hindu Sindhura Y 1BY16SCS06	Data Processing using Clustering Algorithm	International Journal of Computer Science and Network, Volume:7, Issue:2,April 2018 ISSN (ONLINE): 2277-5420

6	Nayana R 1BY16SCS08	IoT based passenger Count System in public transport	International Journal of innovations in Engineering and Technology, May 2018 ISSN:2319-1058
7	Sarika C G 1BY16SCS011	Survey on Socially Intelligent Robots by using NLP.	International Journal of Computer Applications, Volume:171, No.1,August 2017 ISSN:0975-8887
8	Vibha Vinod 1BY16SCS13	Spam Detection framework using Sentimental Analysis	International Journal of Advanced Research in Computer Science, ISSN: 0976-5687, Vol:9, Issue:3 May-June 2018
9	Kusuma S S 1BY17SCS02	An IoT based water supply monitoring and Controlling System	International Research Journal of Engineering and Technology, Vol: 5, Issue:2, February 2018 e-ISSN: 2395-0056
10	Laxmi Jadhav 1BY17SCS03	Smart Home Security using Internet of Things	International Research Journal of Engineering and Technology, Volume:5,Issue:2, February 2018 e-ISSN: 2395-0056
11	Megha S M 1BY17SCS04	Study of 3D Barcode with Steganography for Data Hiding	International Research Journal of Engineering and Technology, Volume:5,Issue:6,June 2018 e-ISSN: 2395-0056
12	Rakshitha K S 1BY17SCS09	CAR STREAM – An industrial system of Big Data processing for Internet of Vehicles	International Journal of Trend in Scientific Research and Development, Volume:2,Issue:4, June 2018 ISSN: 2456-6470
13	Sruthi Krishnan 1BY17SCS11	Agricultural drone using IoT	International Journal of Trend in Scientific Research and Development, Vol:2, Issue:4, May 2018 ISSN: 2456-6470
14	Prathama V 1BY17SCS07	Food safety Control using Hyperspectral Imaging	International Journal of Trend in Scientific Research and Development, Vol:2, Issue:3, March-April 2018 ISSN: 2456-6470
15	Sruthi Krishnan 1BY17SCS11	An Introduction to Z-Cash- How Z-cash a better crypto currency than bitcoin.	International Research Journal of Engineering and Technology, Volume:5,Issue:2, February 2018 e-ISSN: 2395-0056
16	Minu Correya 1BY17SCS05	Face BioMetric Antispoofing	International Journal of Advanced Research in Computer and Communication Engineering, vol.7, Issue.3, March-2018

4. FACULTY CONTRIBUTIONS (75)

LIST OF FACULTIES FOR 2020-21

Table 4.1: List of Faculty for 2020-21.

LIST OF FACULTIES FOR 2020-21														
Name of the Faculty Member	**Qualification**			**Association with the Institution**	**Designation**	**Date on which Designated as Professor/ Associate Professor**	**Date of Joining the Institution**	**Department**	**Specialization**	**Academic Research**			**Currently Associated (Y/N) Date of Leaving (In case Currently Associated is ("No")**	**Nature of Association (Regular/Contract)**
	Degree (highest degree)	**University**	**Year of Graduation**							**Research Paper Publications**	**Ph.D. Guidance**	**Faculty Receiving Ph.D. during the Assessment Years**		
Dr. Anil G.N	DSc	Rani Chennamma University	2014	Yes	HOD & Professor	01/08/2018	25/07/2002	CSE	Adhoc Networks	01	-	-	Y	Regular
Dr. Thippeswamy G	Ph.D	Mangalore University-	2012	Yes	Professor	01/08/2013	01/08/2013	CSE	Image Processing	01	Yes	-	Y	
Dr. Hemamalini B.H	Ph.D	VTU	2020	Yes	Associate Professor	01/07/2013	23/07/2010	CSE	Data Mining	-	-	-	Y	Regular
Mrs. Bharathi R.	M.Tech (PhD)	VTU	2007	Yes	Associate Professor	01/07/2013	12/08/2009	CSE	Security in IoT	-	-	-	Y	Regular
Dr. Usha B A	Ph.D	VTU	2017		Associate Professor	01/06/2018	01/06/2018	CSE	Network security		-	-	Y	Regular
Dr. Mahesh G	Ph.D	VTU	2019	Yes	Associate Professor	06/08/2018	06/08/2018	CSE	Wireless Networks	01	-	-	Y	Regular
Dr. Anjan Krishnamurthy	Ph.D	VTU	2018	Yes	Associate Professor	14/08/2018	14/08/2018	CSE	Network Security & Forensics		-	-	Y	Regular
Dr. Sunanda Dixit	M.Tech & Ph.D	VTU	2015	Yes	Associate Professor	08/07/2019	08/07/2019	CSE	Image Processing		Yes	-	Y	Regular

Mrs. VishakhaYadav	MSc Research Engineering	VTU	2020	Yes	Assistant Professor	-	11/02/2005	CSE	Computer Vision		-	-	Y	Regular
Mr. Muneshwara M.S	M.Tech (PhD)	VTU	2012	Yes	Assistant Professor	-	13/09/2006	CSE	Network and Cloud Computing	02	-	-	Y	Regular
Mr. Anand R	M.Tech (PhD)	VTU	2012	Yes	Assistant Professor	-	03/10/2006	CSE	Networks & Data Mining		-	-	Y	Regular
Mrs. Durga Devi G Y	M.Tech (PhD)	VTU	2013	Yes	Assistant Professor	-	06/02/2008	CSE	Network Security	-	-	-	Y	Regular
Mrs. Shruthi J.	M.Tech (PhD)	VTU	2008	Yes	Assistant Professor	-	12/02/2009	CSE	Natural Language Processing	03	-	-	Y	Regular
Mr. Jagadish P	M.Tech (PhD)	VTU	2007	Yes	Assistant Professor	-	06/02/2010	CSE	Image Processing	-	-	-	Y	Regular
Mrs. DurgaBhavani A	M.Tech (PhD)	VTU	2009	Yes	Assistant Professor	-	14/03/2011	CSE	Internet of Things	-	-	-	Y	Regular
Mr. Rajesh N.V	M.Tech	VTU	2009	Yes	Assistant Professor	-	18/04/2011	CSE	Medical Imaging	-	-	-	Y	Regular
Mrs. Chethana C	M.Tech	VTU	2010	Yes	Assistant Professor	-	07/03/2012	CSE	Artificial Intelligence	-	-	-	Y	Regular
Mrs. Ambika G.N	M.Tech (PhD)	VTU	2012	Yes	Assistant Professor	-	07/03/2012	CSE	Artificial Intelligence	-	-	-	Y	Regular
Mrs. Vidya R Pai	M.Tech (PhD)	VTU	2009	Yes	Assistant Professor	-	07/03/2012	CSE	Computer Network Security		-	-	Y	Regular
Mrs Ashwini N	M.Tech (PhD)	VTU	2004	Yes	Assistant Professor		11/08/2012		Data Science	-	-	-	Y	Regular
Mrs. A. Mari Kirthima	M.Tech (PhD)	Anna University	2005	Yes	Assistant Professor	-	16/08/2012	CSE	Computer Networks	-	-	-	Y	Regular
Dr. Radhika K.R	M.Tech PhD	Bangalore University	2020	Yes	Assistant Professor	-	21/01/2013	CSE	Data Mining	-	-	Yes	Y	Regular
Mr. Guruprasad R	M.Tech (PhD)	VTU	2007	Yes	Assistant Professor	-	02/07/2014	CSE	Data Science	-	-	-	Y	Regular
Mrs. Srivani P	M.Tech (PhD)	Jain University	2014	Yes	Assistant Professor	-	15/07/2014	CSE	Machine Learning	-	-	-	Y	Regular
Mr. Ravi Kumar B.N	M.Tech (PhD)	VTU	2013	Yes	Assistant Professor	-	03/07/2014	CSE	Artificial Intelligence	-	-	-	Y	Regular

Mr. Shankar	M.Tech (PhD)	VTU	2014	Yes	Assistant Professor	-	16/02/2015	CSE	Machine Learning		-	-	Y	Regular
Dr. Satish	P.hD	Anna University	2015	Yes	Assistant Professor	-	28/08/2018	CSE	Compiler Optimization	01	Yes	-	Y	Regular
Dr. Aruna Kumari B.N	M.Tech PhD	VTU	2020	Yes	Assistant Professor	-	06/08/2018	CSE	Software Engineering	02	-	-	Y	Regular
Dr. Manoj H M	P.hD	Jain	2018		Assistant Professor	-	31/01/2020	CSE	Software Engineering	01	-	-	Y	Regular
Dr. Lakshmi B N	P.hD	VTU	2019		Assistant Professor	-	12/02/2020	CSE	Mahine Learning	01	-	-	Y	Regular

LIST OF FACULTIES FOR 2020-21														
Name of the Faculty Member	**Qualification**			**Association with the Institution**	**Designation**	**Date on which Designated as Professor/ Associate Professor**	**Date of Joining the Institution**	**Department**	**Specialization**	**Academic Research**			**Currently Associated (Y/N) Date of Leaving (In case Currently Associated is ("No")**	**Nature of Association (Regular/Contract)**
	Degree (highest degree)	**University**	**Year of Graduation**							**Research Paper Publications**	**Ph.D. Guidance**	**Faculty Receiving Ph.D. during the Assessment Years**		
Dr.Bhuveneshwari C M	M.Tech PhD	Central University of Hyderabad	2016	Yes	Professor & HoD	01/04/2021	01/04/2021	CSE	Natural Language Processing		-	-	Y	Regular
Dr. Arun Kumar B R	M.Tech PhD	Dravidian University	2012	Yes	Professor	17/02/2021	01/08/2013	CSE	Cyber Security	02	yes	-	Y	Regular
Dr. Dhanalakshmi	M.Tech PhD	VTU	2020	Yes	Assistant Professor	-	01/03/2021	CSE	Cloud Computing		-	-	Y	Regular
Dr. Archana R A	M.Tech PhD	Bharathiar University	2019	Yes	Assistant Professor	-	25/03/21	CSE	Big Data Security	01	-	-	Y	Regular

LIST OF FACULTIES FOR 2019-20

Table 4.2: List of Faculty for 2019-20.

Name of the Faculty Member	Qualification			Association with the Institution	Designation	Date on which Designated as Professor/ Associate Professor	Date of Joining the Institution	Department	Specialization	Academic Research			Currently Associated (Y/N) Date of Leaving (In case Currently Associated is ("No")	Nature of Association (Regular/Contract)
	Degree (highest degree)	University	Year of Graduation							Research Paper Publications	Ph.D. Guidance	Faculty Receiving Ph.D. during the Assessment Years		
Dr. Anil G.N	D.Sc.	Rani Channamma University, Belagavi	2014	Yes	Professor & HOD	01/08/2018 (Professor)	25/07/2002	CSE	Adhoc Networks	01	-	-	Y	Regular
Dr. Thippeswamy .G	Ph.D.	Mangalore University	2012	Yes	Professor & Dean Academics	19/08/2013	19/08/2013	CSE	Image Processing	04	Yes	-	Y	Regular
Dr. Hemamalini B.H	Ph.D.	VTU	2020	Yes	Associate Professor	01/07/2013 (Associate Professor)	23/07/2010	CSE	Data Mining	02	-	Yes	Y	Regular
Mrs. Bharathi R.	M.Tech. (Ph.D.)	VTU	2007	Yes	Associate Professor	01/07/2013	21/07/2010	CSE	Security in IoT	01	-	-	Y	Regular

Dr. Mahesh G	Ph.D.	VTU	2019	Yes	Associate Professor	06/08/2018	06/08/2018	CSE	Wireless Networks	02	-	-	Y	Regular
Dr. Anjan .K	Ph.D.	VTU	2018	Yes	Associate Professor	14/08/2018	14/08/2018	CSE	Network Security & Forensics	04	-	-	Y	Regular
Dr. Sunanda Dixit	Ph.D.	VTU	2015	Yes	Associate Professor	08/07/2019	08/07/2019	CSE	Image Processing	02	Yes	-	Y	Regular
Mrs. VishakhaYadav	M.Sc.(Engg.) by Research	VTU	2020	Yes	Assistant Professor	-	11/03/2005	CSE	Computer Vision	01	-	-	Y	Regular
Mr. Muneshwara M.S	M.Tech. (Ph.D.)	VTU	2012	Yes	Assistant Professor	-	14/09/2006	CSE	Network and Cloud Computing	-	-	-	Y	Regular
Mr. Anand .R	M.Tech. (Ph.D.)	VTU	2012	Yes	Assistant Professor	-	30/03/2007	CSE	Computer Networks & Data Mining	01	-	-	Y	Regular
Mrs. Durga Devi G Y	M.Tech. (Ph.D.)	VTU	2013	Yes	Assistant Professor	-	06/02/2008	CSE	Network Security	-	-	-	Y	Regular
Mrs. Shruthi .J	M.Tech. (Ph.D.)	VTU	2008	Yes	Assistant Professor	-	12/02/2009	CSE	Natural Language Processing	02	-	-	Y	Regular
Mr. Jagadish .P	M.Tech. (Ph.D.)	VTU	2007	Yes	Assistant Professor	-	08/02/2010	CSE	Image Processing	-	-	-	Y	Regular
Mrs. DurgaBhavani A	M.Tech. (Ph.D.)	Andhra University	2009	Yes	Assistant Professor	-	14/03/2011	CSE	Internet of Things	-	-	-	Y	Regular
Mr. Rajesh N.V	M.Tech.	VTU	2009	Yes	Assistant Professor	-	18/04/2011	CSE	Medical Image Processing	-	-	-	Y	Regular
Mrs. Chethana .C	M.Tech.	VTU	2010	Yes	Assistant Professor	-	07/03/2012	CSE	Artificial Intelligence	-	-	-	Y	Regular
Mrs. Ambika G.N	M.Tech. (Ph.D.)	VTU	2012	Yes	Assistant Professor	-	07/03/2012	CSE	Artificial Intelligence	-	-	-	Y	Regular
Mrs. Vidya R Pai	M.Tech. (Ph.D.	VTU	2009	Yes	Assistant Professor	-	07/03/2012	CSE	Computer Network Security	02	-	-	Y	Regular
Mrs. A. Mari Kirthima	M.E. (Ph.D.)	Anna University	2005	Yes	Assistant Professor	-	16/08/2012	CSE	Computer Networks	-	-	-	Y	Regular
Mrs. Radhika K.R	M.Tech. (Ph.D.)	Bangalore University	2007	Yes	Assistant Professor	-	23/01/2013	CSE	Data Mining	01	-	-	Y	Regular

Mr. Guruprasad S	M.Tech. (Ph.D.)	VTU	2007	Yes	Assistant Professor	-	02/07/2014	CSE	Data Science	02	-	-	Y	Regular
Mrs. Srivani P	M.Tech. (Ph.D.)	Jain University	2014	Yes	Assistant Professor	-	16/07/2014	CSE	Machine Learning	01	-	-	Y	Regular
Mr. Ravi Kumar B.N	M.Tech. (Ph.D.)	VTU	2013	Yes	Assistant Professor	-	03/07/2014	CSE	Artificial Intelligence	-	-	-	Y	Regular
Mr. Shankar .R	M.Tech. (Ph.D.	VTU	2014	Yes	Assistant Professor	-	31/07/2015	CSE	Machine Learning	01	-	-	Y	Regular
Dr. Satish Kumar T	Ph.D.	Anna University	2015	Yes	Assistant Professor	-	28/08/2018	CSE	Compiler Optimization	03	Yes	-	Y	Regular
Dr. ArunaKumari B.N	Ph.D.	VTU	2020	Yes	Assistant Professor	-	06/08/2018	CSE	Software Engineering	-	-	Yes	Y	Regular

LIST OF FACULTIES FOR 2019-20											
Name of the Faculty Member	**Qualification**	**Association with the Institution**	**Designation**	**Date on which Designated as Professor/ Associate Professor**	**Date of Joining the Institution**	**Department**	**Specialization**	**Academic Research**	**Currently Associated (Y/N) Date of Leaving (In case Currently Associated is ("No")**	**Nature of Association (Regular/Contract)**	
Dr. Manoj H M	P.hD	Jain	2008		Assistant Professor	-	31/01/2020	CSE	Software Engineering	01	-
Dr. Lakshmi B N	P.hD	VTU	2011		Assistant Professor	-	12/02/2020	CSE	Mahine Learning	01	-

LIST OF FACULTIES FOR 2018-19

Table 4.3: List of Faculty for 2018-19.

Name of the Faculty Member	**Qualification**			**Association with the Institution**	**Designation**	Date on which Designated as Professor/ Associate Professor	**Date of Joining the Institution**	**Department**	**Specialization**	**Academic Research**			**Currently Associated (Y/N) Date of Leaving (In case Currently Associated is ("No")**	**Nature of Association (Regular/ Contract)**
	Degree (highest degree)	University	Year of Graduation							Research Paper Publications	Ph.D. Guidance	Faculty Receiving Ph.D. during the Assessment Years		
Dr. Anil G.N	DSc	Rani Chennamma University, Belagavi	2014	Yes	Professor & HOD	01/08/2018 (Professor)	25/07/2002	CSE	Adhoc Networks	02	-	-	Y	Regular
Dr. Thippeswamy G	Ph.D.	Mangalore University-	2012	Yes	Professor	19/08/2013	19/08/2013	CSE	Image Processing	02	Yes	-	Y	Regular
Dr. Bharathi Malaka Reddy A	Ph.D.	JNTU	2015	Yes	Professor	22/04/2016	22/04/2016	CSE	Wireless Sensor Networks	06	Yes	-	Y	Regular
Mrs. Hemamalini B.H	M.Tech. (Ph.D.)	VTU	2005	Yes	Associate Professor	01/07/2013 (Associate Professor)	23/07/2010	CSE	Educational Data Mining	01	-	-	Y	Regular
Mrs. Bharathi R.	M.Tech. (Ph.D.)	VTU	2007	Yes	Associate Professor	01/07/2013 (Associate Professor)	21/07/2010	CSE	Security in IoT	01	-	-	Y	Regular
Dr. Mahesh G	Ph.D.	VTU	2019	Yes	Associate Professor	06/08/2018	06/08/2018	CSE	Wireless Networks	02	-	-	Y	Regular
Dr. Anjan K	Ph.D.	VTU	2018	Yes	Associate Professor	14/08/2018	14/08/2018	CSE	Network Security & Forensics	04	-	-	Y	Regular

Dr. Anupama H.S	Ph.D.	VTU	2018	Yes	Associate Professor	06/08/2018	06/08/2018	CSE	Human Computer Interaction	01	-	-	Y	Regular
Mrs. VishakhaYadav	M.B.A, (M.Sc.(Engg.by research)	Mumbai University	2001	Yes	Assistant Professor	-	11/03/2005	CSE	Computer Vision	02	-	-	Y	Regular
Mr. Muneshwara M.S	M.Tech. (Ph.D.)	VTU	2012	Yes	Assistant Professor	-	14/09/2006	CSE	Network and Cloud Computing	04	-	-	Y	Regular
Mr. Anand R	M.Tech. (Ph.D.)	VTU	2012	Yes	Assistant Professor	-	30/03/2007	CSE	Computer Networks & Data Mining	02	-	-	Y	Regular
Mrs. Durga Devi G Y	M.Tech. (Ph.D.)	VTU	2013	Yes	Assistant Professor	-	06/02/2008	CSE	Network Security	01	-	-	Y	Regular
Mrs. Shruthi J.	M.Tech. (Ph.D.)	VTU	2008	Yes	Assistant Professor	-	12/02/2009	CSE	Natural Language Processing	02	-	-	Y	Regular
Mr. Jagadish P	M.Tech. (Ph.D.)	VTU	2008	Yes	Assistant Professor	-	08/02/2010	CSE	Image Processing	02	-	-	Y	Regular
Mrs. DurgaBhavani A	M.Tech. (Ph.D.)	Andhra University	2010	Yes	Assistant Professor	-	14/03/2011	CSE	Internet of Things	-	-	-	Y	Regular
Mr. Rajesh N.V	M.Tech.	VTU	2009	Yes	Assistant Professor	-	18/04/2011	CSE	Medical Image Processing	-	-	-	Y	Regular
Mrs. Chethana C	M.Tech.	VTU	2010	Yes	Assistant Professor	-	07/03/2012	CSE	Artificial Intelligence	-	-	-	Y	Regular
Mrs. Ambika G.N	M.Tech. (Ph.D.)	VTU	2012	Yes	Assistant Professor	-	07/03/2012	CSE	Artificial Intelligence	03	-	-	Y	Regular
Mrs. Vidya R Pai	M.Tech. (Ph.D.)	VTU	2009	Yes	Assistant Professor	-	07/03/2012	CSE	Computer Network Security	01	-	-	Y	Regular
Mrs. A. Mari Kirthima	M.E. (Ph.D.)	Anna University	2005	Yes	Assistant Professor	-	16/08/2012	CSE	Computer Networks	01	-	-	Y	Regular
Mrs. Radhika K.R	M.Tech. (Ph.D.)	Bangalore Univ ersity	2007	Yes	Assistant Professor	-	23/01/2013	CSE	Data Mining	01	-	-	Y	Regular
Mr. Guruprasad S	M.Tech. (Ph.D.)	VTU	2007	Yes	Assistant Professor	-	02/07/2014	CSE	Data Science	-	-	-	Y	Regular
Mrs. Srivani P	M.Tech. (Ph.D.)	Jain University	2014	Yes	Assistant Professor	-	16/07/2014	CSE	Machine Learning	-	-	-	Y	Regular

Mr. Ravi Kumar B.N	M.Tech. (Ph.D.)	VTU	2013	Yes	Assistant Professor	-	03/07/2014	CSE	Artificial Intelligence	01	-	-	Y	Regular
Mr. Shankar .R	M.Tech. (Ph.D.)	VTU	2014	Yes	Assistant Professor	-	31/07/2015	CSE	Machine Learning	-	-	-	Y	Regular
Dr. Satish Kumar T	Ph.D.	Anna University	2015	Yes	Assistant Professor	-	28/08/2018	CSE	Compiler Optimization	03	Yes	-	Y	Regular
Dr. Vishwa Kiran S	Ph.D.	Bangalore University	2019	Yes	Assistant Professor	-	30/08/2018	CSE	Mobile Cloud computing	01	-	Yes	Y	Regular
Ms. Aruna Kumari B.N	M.Tech. (Ph.D.)	VTU	2013	Yes	Assistant Professor	-	06/08/2018	CSE	Software Engineering	02	-	-	Y	Regular

4.1 Student-Faculty Ratio (SFR) (10)

Student-Faculty Ratio (SFR) (10)
(To be calculated at Department Level)

No. of UG Programs in the Department (n): 01
No. of PG Programs in the Department (m): 01
No. of Students in UG 2nd Year=u1
No. of Students in UG 3rdYear= u2
No. of Students in UG 4thYear= u3
No. of Students in PG 1stYear= p1
No. of Students in PG 2ndYear=p2
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 +.. +UGn + PG1 + …PGm
F = Total Number of Regular Faculty Members in the Department (excluding first year faculty)

Student Teacher Ratio (STR) = S/F

Table 4.4: Student Teacher Ratio (STR).

(To be calculated at Department Level)

No. of UG Programs in the Department (n)	**1**
No. of PG Programs in the Department (m)	**1**
No. of Students in UG 2nd Year	**198**
No. of Students in UG 3rd Year	**198**
No. of Students in UG 4th Year	**216**
No. of Students in PG 1st Year	**18**
No. of Students in PG 2nd Year	**18**

No. of Students = Sanctioned Intake + applicable lateral entry, if any
(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 + PG+ PG2 = **556**
F = Total Number of Faculty Members in the Department **= 28**
Student Faculty Ratio (SFR) = S / F

Year	CAY : 2020-21	CAY : 2019-20	CAYm1: 2018-19
u1.1	**198**	**198**	**216**
u1.2	**198**	**216**	**108**

u1.3	**216**	**108**	**108**
UG1	u1.1+u1.2+u1.3	u1.1+u1.2+u1.3	u1.1+u1.2+u1.3
un.1	**612**	**522**	**432**
Ugn	un.1+un.2+un.3	un.1+un.2+un.3	un.1+un.2+un.3
p1.1	**18**	**18**	**18**
p1.2	18	18	18
PG1	p1.1+p1.2	p1.1+p1.2	p1.1+p1.2
…..	**36**	**36**	**36**
Total No. of Students in the Department (S)	**UG1 + UG2 +.. +Ugn + PG1 + …PGm = S1=648**	**UG1 + UG2 +.. +Ugn + PG1 + …PGm = S2 = 558**	**UG1 + UG2 +.. +Ugn + PG1+… + PGm = S3 = 468**
No. of Faculty in the Department (F)	**F1=27**	**F2 = 23**	**F3=25**
Student Faculty Ratio (SFR)	**SFR1=S1/F1=24**	**SFR2=S2/F2=**24.26	**SFR3= S3/F3=**18.72
Average SFR	**SFR=(SFR1+SFR2+SFR3)/3=22.32**		

Academic Year	**No of Faculty**	**2^{nd}yr +3^{rd}yr +4^{th}yr+PG**	**No of Students 2^{nd}yr +3^{rd}yr +4^{th}yr+PG)**	**SFR**
2020-21	30	198+198+216+36	648	646/27=24
2019-20	28	198+214+108+36	558	558/23= 24.26
2018-19	27	216+108+108+36	468	468/25= 18.72
			Average	**22.32**

Table 4.5. Information about the regular and contractual faculty.

Year	**Total number of regular faculty in the department**	**Total number of contractual faculty in the department**
CAY	**30**	**NIL**
CAYm1	**26**	**NIL**
CAYm2	**28**	**NIL**

4.2 Faculty Competencies in the area of Program Specialization (20 Marks)

Faculty name and specialization for the program under consideration

Table 4.6.Faculty Competencies.

Sl. No.	Faculty Name	Computer Networks and Security	Artificial Intelligence	Software Engineering	Data Science
1.	Dr. Anil G.N	✓			
2.	Dr. Thippeswamy .G		✓		
3.	Dr. Bharathi Malaka Reddy .A		✓		
4.	Dr. Hemamalini B.H				✓
5.	Mrs. Bharathi R.	✓			
6.	Dr. Usha B A	✓			
7.	Dr. Anupama H.S		✓		
8.	Dr. Mahesh G	✓			
9.	Dr. Anjan .K	✓			✓
10.	Dr. Sunanda Dixit		✓		
11.	Mrs. VishakhaYadav		✓		
12.	Mr. Muneshwara M.S	✓			✓
13.	Mr. Anand .R				✓
14.	Mrs. Durga Devi G Y	✓			
15.	Mrs. Shruthi .J		✓		
16.	Mr. Jagadish .P		✓		
17.	Mrs. DurgaBhavani A	✓			
18.	Mr. Rajesh N.V		✓		
19.	Mrs. Chethana .C		✓		

20.	Mrs. Ambika G.N		✔		
21	Mrs. Vidya R Pai	✔			
22	Mrs Ashwini N				✔
23.	Mrs. A. Mari Kirthima	✔			
24.	Mrs. Radhika K.R				✔
23.	Mr. Guruprasad S				✔
25.	Mrs. Srivani P		✔		
26.	Mr. Ravi Kumar B.N		✔		
27.	Mr. Shankar .R		✔		
28.	Dr. Satish Kumar T	✔			
29.	Dr. Vishwa Kiran S		✔		
30	Dr. ArunaKumari B.N			✔	
31	Dr. Manoj			✔	
32	Dr. Lakshmi B N				✔

4.2.1 Faculty Competency in the Domain Area (10 Marks)

Table 4.7. Faculty Specialization.

Sl. No.	Faculty Name	Specialization	Courses Handled
1	Dr. Anil G.N	Computer Networks and Security	Data Communication, Advanced Computer Networks, Computer Networks, etc.
2	Dr. Thippeswamy .G	Artificial Intelligence	Compiler design, Formal Languages & Automata Theory
3	Dr. Bharathi Malaka Reddy .A	Artificial Intelligence	Internet of Things, Artificial Intelligence, Advanced Computer Networks
4	Dr. Hemamalini B.H	Data Science	Automata Theory & Computability, Design & Analysis of Algorithms, Data Structures, etc.
5	Prof. Bharathi R.	Computer Networks and Security	Microcontroller and Microprocessor, Computer Networks.
6	Dr. Usha B A	Computer Networks and Security	Software Eng. Compiler Design.
7	Dr. Anupama H.S	Artificial Intelligence	Analog & Digital Electronics, Microprocessor and Microcontroller,
8	Dr. Mahesh G	Computer Networks and Security	Data Structures using C, C Programming for Problem Solving.
9	Dr. Anjan .K	Computer Networks and Security	Cyber Crime and Digital Forensics, Information & Network Security.
10	Dr. Sunanda Dixit	Artificial Intelligence	Big Data & Analytics, Machine Learning Techniques, Image Processing.
11	Mrs. VishakhaYadav	Artificial Intelligence	Digital Image Processing, Artificial Intelligence, Python Programming.
12	Mr. Muneshwara M.S	Computer Networks and Security	Operations Research, Advanced Java & J2EE.

13	Mr. Anand .R	Data Science	Operating System , Data structure in C.
14	Mrs. Durga Devi G Y	Computer Networks and Security	Design and Analysis of Algorithms, Block chain
15	Mrs. Shruthi .J	Artificial Intelligence	Operation Research, Discrete Mathematics and Structure,
16	Mr. Jagadish .P	Artificial Intelligence	Java & J2EE,
17	Mrs. DurgaBhavani A	Computer Networks and Security	Analog & Digital Electronics, Microprocessor & Micro Controller,
18	Mr. Rajesh N.V	Artificial Intelligence	Research Methodology, Software Engineering, Entrepreneurship & management.
19	Mrs. Chethana .C	Artificial Intelligence	Neural Network, Data Mining & Data Warehousing, Machine Learning Techniques, Artificial Intelligence.
20	Mrs. Ambika G.N	Artificial Intelligence	Trends in Artificial Intelligence & Soft Computing, Computer Graphics & Visualization.
21	Mrs. Vidya R Pai	Computer Networks and Security	Computer Network, Data Communication, Advanced Computer Architecture, Advances in Computer Network.
22	Mrs. Ashwini N	Data Science	Analog & Digital Electronics, Microprocessor & Micro Controller, Operating Systems.
23	Mrs. A. Mari Kirthima	Computer Networks and Security	Computer Network, Data Communication,, Advances in Computer Networks.
24	Dr. Radhika K.R	Data Science	Managing Big Data, Advanced Database Management Systems, Data Mining & Data Ware Housing, etc.
25	Mr. Guruprasad S	Data Science	Compiler design, System Software, Operating System.

26	Mrs. Srivani P	Artificial Intelligence	Computer Organization, C programming for Problem Solving, Object Oriented Concepts.
27	Mr. Ravi Kumar B.N	Artificial Intelligence	Artificial Intelligence, Python Programming, C programming for Problem Solving, Analog & Digital Electronics.
28	Mr. Shankar .R	Artificial Intelligence	Web Technology, Computer Graphics, Microprocessor, C programming for Problem Solving.
29	Dr. Satish Kumar T	Computer Networks and Security	Design & Analysis Algorithms Compiler Design Multi-core programming System Software Operating Systems.
30	Dr. Vishwa Kiran S	Artificial Intelligence	Linux, Free RTOS, Embedded Systems.
31	Dr. Aruna Kumari B.N	Software Engineering	Discrete Mathematical Structures, Advanced Algorithms, C programming for Problem Solving.
32	Dr. Manoj H M	Software Engineering	OOMD, Software Engineering, Artificial Intelligence and Agent technology.
33	Dr. Lakshmi B N	Data Science	Automata Theory & Computability, Software Engineering

4.2.2 Faculty Research Publication (10)

Incentives for faculty for Indexed publication

The Board of Governors (BOG) of BMSIT&M has approved implementation of incentive scheme to faculty members who fare better and improve their performance in terms of research publications. An incentive of Rs.10,000/- per publication will be awarded to a faculty member once his/ her research paper is published in reputed journal indexed in Scopus/ Thomson Reuters / Web of science.

Financial assistance for filing copyright and IPR

Financial assistance for filing copyright and IPR is provided by the Institution
Faculty has published the papers in National, International Conferences and Journals in their respective area of specialization and patents. Publications are indexed in Scopus.

Table 4.8. (a) Faculty Publication.

Academic Year	International Journals	International Conferences	Book Chapters	Total
2020-21	12	30	4	46
2019-20	06	15	3	24
2018-19	04	11	1	16
Total	22	56	08	86

Table 4.8. (b) MoUs signed with institutions of national, international importance, other universities, industries, corporate houses etc. during the year

Department	Organization	Date of MoU signed	Purpose and Activities (please list the activities that were conducted)	Number of students/teachers participated under MoUs
CSE	Indian Tech Keys	Signed 23/09/2019	● Education and R& D Services in the field of electronics product Manufacturing ● Collaboration for research articles, joint projects, proposals, patents etc. ● Using their expertise for FDPs/workshops, Expert talks etc. ● Opportunity for Faculty/students to carry out their internship.	Dr. Usha B. A
CSE	Nihon Communications Solutions	Signed 23/11/2020	● NCS facilities and expertise for helping the faculty and the students. ● Collaboration for research articles, joint projects, proposals, patents etc. ● Using their expertise for FDPs/workshops, Expert talks etc.	Dr. Usha B. A.

			• Opportunity for Faculty/students to carry out their internship	
CSE	PVH Software Solutions Pvt. Ltd.	Signed on 31/08/2021	• To provide internship to the studnets	Dr. Radhika K R Prof. Shruthi J

Table 4.8. (c) List of Patents Granted year wise

Academic Year: 2020-21			
Sl. No.	**Title**	**Date**	**Faculty**
1.	Automated Location Identification system using Text and Image Data	31/03/21	Dr. Sunanda Dixit
2.	Ball Projecting Apparatus	24/08/2021	Dr. Satish Kumar T

Table 4.9. List of Patents Published year wise

Academic Year: 2020-21			
Sl.No.	**Title**	**Date**	**Faculty**
1	Covid-19 Thermal Screening Using Smart Helmet	11/09/2020	
2	Catastrophe Detection and Smart Rescue System Utilizing Android Smartphone with Real-Time Location Tracking	12/11/2020	Prof. Vishakha Yadav
3	An Apparatus for Interactive Information Exchange Through Machine Learning	24/11/2020	
4	Effective Feedback System of Managements of Educational Institutions Using Artificial Intelligence and Methods Thereof	01/11/2020	Dr. Satish Kumar T
5	Animal treatment kit using artificial Intelligence & Method thereof	06/11/2020	
6	Shabdkosh Device for Women Safety in Public Inventors	09-10-2020	Dr.Usha B A
7	Occupational stress model and coping strategies thereof	25-09-2020	Dr.Sunanda Dixit

8	Design and Fabrication of Low Cost Breath Monitoring System Using Arduino Uno in IOT Platform	01/03/2021	R Bharathi
9	A Novel System for Controlling Employees Attrition Rate	27-05-2021	Dr. Manoj H M
10	Trespassers Detection System Fort Agriculture Fields Using Artificial Intelligence & Methods Thereof	30-10-2020	Dr.Anjan Krishnamurthy
11	Design and method for Automatic Pet Watering and Food Feeding System Using IOT	20/12/2019	Dr. Satish Kumar T
Academic Year: 2021-22			
1	Fruit Classification and Identification Using Advanced Machine Learning Techniques	12/08/2021	Dr. Arunakumari B N
2	IOT enabled real-time aquarium monitoring system	02/09/2021	Dr. Radhika K R Prof. Vidya R Pai Dr. Aruna kumari B N
3	Design and Fabrication of Low Cost Breath Monitoring System Using Arduino Uno in IOT Platform	01/03/2021	Prof. R Bharathi
4	A Novel System for Controlling Employees Attrition Rate	27/05/2021	Dr. Manoj H M
5	Smart Ticketing System for Smart Cities	14/06/2021	Dr. Hema Malini B H
6	Interpersonal Skill Score Card for Students Using Artificial Intelligence and Method	16/10/2021	Dr Usha B A

Table 4.8. (d) List of Books published

Sl.No.	Title	Year	Faculty
1	Characterization and Behavioral Analysis of Hybrid Covert Channel	2018	Dr. Anjan Krishnamurthy
2	Big Data Security and Hadoop: Principles and Programming	2020	Dr. Anjan Krishnamurthy
3	Fundamentals of Cryptography and Network Security	2021	Dr. Hemamalini B H

4.2.3 Faculty Development work (10 marks)

Faculty Awarded Ph.D.

2020-21

Sl.no	Name	University
1	Dr. Radhika K R	Bangalore

2019-20

Sl.no	Name	University
1.	Dr. Hemamalini B.H	VTU
2.	Dr. Aruna Kumari	VTU

2018-19

Sl.no	Name	University
1	Dr. Vishwakiran	Bengaluru

Faculty Members pursuing Ph.D.

Table 4.9. Faculty Members Pursuing Ph.D.

Sl. No.	Faculty Name	University	Status
1.	Mrs. Bharathi R.	Priest University.	Completed Comprehensive Viva
2.	Mrs. Vishakha Yadav	VTU, Belagavi.	Completed M.Sc.(Engg.by research)
3.	Mr. Muneshwara M.S.	VTU, Belagavi.	Completed Comprehensive Viva
4.	Mr. Anand R	Presidency, Bangalore.	Completed Course work
5.	Mrs. Durga Devi G.Y.	VTU, Belagavi.	Completed Course work
6.	Mrs. Shruthi J.	VTU, Belagavi.	Completed Comprehensive Viva
7.	Mrs. Durga Bhavani A.	VTU, Belagavi.	Completed Course work
8.	Mrs. Ambika G.N.	VTU, Belagavi.	Completed Course work
9.	Mrs. Vidya R. Pai	VTU, Belagavi.	Completed Comprehensive Viva
10.	Mrs. Ashwini N	VTU, Belagavi	Submitted
11.	Mrs. A. Mari Kirthima	VTU, Belagavi.	Completed Course work
12.	Mr. Guruprasad S.	VTU, Belagavi.	Completed Comprehensive Viva
13.	Mrs. Srivani P.	VTU, Belagavi.	Submitted
14.	Mr. Ravi Kumar B.N.	VTU, Belagavi.	Completed Comprehensive Viva
15.	Mr. Shankar R.	VTU, Belagavi.	Completed Comprehensive Viva

Faculty Achievements

Table 4.10 Faculty Achievements 2020-21		
Sl. No.	**Name of faculty**	**Significant Achievement (Reviewers, Keynote speakers, Session Chairs, Patents filed, - -)**
1.	**Dr. Thippeswamy G**	• AICTE has invited the project proposals during May - 2021 from well-established engineering colleges to handhold and mentor other ten engineering colleges towards academic excellence which in turn leads to accreditation under the Margdarshan Initiative. The application was submitted by Dr. Thippeswamy G, Professor, CSE to AICTE by BMSIT&M during May 2021, the expert committee of AICTE has selected and approved BMSIT&M as a Mentor/Margdarshan Institute. • As per the scheme, AICTE will support Mentor Institute (BMSIT&M) by grant-in-aid of Rs. 5,00,000 per Institute for conducting the activities which are leading to NBA accreditation (academic excellence). With this BMSIT&M is intended to make its efforts towards sustenance of rural and government colleges. • Presently, the following are the Mentee Beneficiary (MBI) Institutes for the duration (2021-2023): • Government SKSJT Institute K.R. Circle, Bangalore • Government Engineering College Ramanagaram • School of Engineering, Reva University Kattigenahalli, Bangalore. • Government Engineering College, Hassan (Approval Awaited). • Coordinator, Curriculum development Committee (in line with National Educational Policy-2020). • As a member, Research Review Committee, VTU Belagavi, participated in the meeting of Pre-registration for PhD. 11.6.2021 and 12.7.2021. • As a Member, Board of Studies CSE/ISE/AIML. Visvesvaraya Technological University Belagavi, participated in curriculum review meeting / NEP implementation meeting on 7.8.2021 and 4.9.2021. • Conducted Viva-voce for PG (M Tech) students of

		PES University, Bangalore: 18-22 June 2021 • As a member of Doctoral Committee, participated in Pre-submission synopsis meeting in the department of CSE, Presidency University, Bangalore- 21.6.2021 • As a member of Board of Studies (BoS) department of CSE, Adichunchanagiri University, B.G. Nagar participated in the curriculum review meeting: 16.6.2021. • As a member of Board of Studies (BoS), School of Computing, SET, Jain University, participated in the curriculum review meeting: 11.6.2021. • Adjudicated the PhD thesis of the department of CSE, Christ University 21.6.2021. • Nominated by VTU as Member, Board of Studies, Departments of Computer Science and Engineering/ Computer Science and Engineering, Global Academy of Technology, Bangalore and participated in the curriculum review meeting – 30.6.2021 • As a member of Doctoral Committee for research scholar of NMAMIT, Nitte, participated in the Open Seminar – 3.7.2021. • Nominated by the VTU as a member of Board of Studies in Computer Science and Engineering, BNM Institute of Technology. • External Examiner for one of the Research Scholar of Reva University, Bangalore participated in the Pre-submission Colloquium – 12.7.2021
2.	**Dr. Anjan Krishnamurthy**	• IEEE Research Award 2020 by IEEE Bangalore Section. • Shortlisted for CySecK research funded project as PI. • Patent Published: Trespasser detection system. • NHCE BOS member. • IEEE Research Award 2020. • BookPublished: Title: Big Data Security and Hadoop • BookPublished: Title: Characterization and Behavioral Analysis of Hybrid Covert Channel.

3.	**Dr. Radhika K.R**	• The Memorandum of Understanding (MoU) is made and entered into on 31st August 2021 between BMS Institute of Technology and management located at Bengaluru and PVH Software Solutions PVT Ltd. Located at Bangalore to facilitate internships for students. • Patent applied Title: IOT enabled real-time aquarium monitoring system Filing Date-02/09/2021 -Indian Patent Office.
4	**Dr. Bhuvaneshwari C. M**	• Convener for online National Level Five Days Faculty Development Program on "Emerging Trends in Data Analytics" held from 10th to 14th May 2021, organized by Computer Science & Engineering. BMS Institute of Technology and Management. • Coordinator for online National Level Two Days Virtual Lecture Workshop on Diversified Applications of Machine Learning Algorithms "held on 21st and 22nd Sept 2021 jointly organized by Department of Computer ○ Science and Engineering, BMSIT and Indian Academy of Science, Bengaluru. • Participated in online National Level Two Days Virtual Lecture Workshop on "Diversified Applications of Machine Learning Algorithms" held on 21st and 22nd Sept 2021 jointly organized by the Department of Computer Science and Engineering. BMSIT and Indian Academy of Sciences, Bengaluru.
3	**Dr.Anil G N**	• Patent applied to Patent office, Intellectual Property on the topic" An Effective Protocol Design Implementation for Requirement Engineering Process Model" on 28.10.2020. • Participated in the National Education conclave on 'Re-Imagining University Education with a Heart-Centered Approach' held on 12th and 13th January 2021.

4	**Dr. Arun kumar B.R**	• Dr. Arun kumar B.R, Professor, CSE, has delivered an expert talk on "OBE principles and implementation for engineering and postgraduate programmes" organised by Bangalore Institute of Technology, on 09.02.2021. • Dr. Arun kumar B.R, Professor, CSE, has extended his support as Resource person for ATAL online FDP by Jawaharlal Nehru National College of Engineering (JNNCE) from 01.02.2021 to 05.02.2021, at JNNCE, Shimoga. • Dr. Arun Kumar B.R, Professor, CSE was a reviewer for Journal of Education (Scopus indexed), Boston University USA during Feb 2021. • Attended joint BoS meeting in VTU, Belgavi on 05.02.2021. • Attended joint BoS meeting in VTU, Belgavi on 05.02.2021. • Chaired the session in 2021 7th International Conference on Advanced Computing and Communication Systems (ICACCS) held on 19th -20th March 2021, Organized by Sri Eshwar College of Engineering, Coimbatore, Tamilnadu, India, Technically Sponsored by IEEE and IEEE Madras Section.
5.	**Dr. HemaMalini B H**	• Patent Published: Smart Ticketing System for Smart Cities Application number: 202141026348A Publication Date: 25/06/2021 • Book Published: Title: Fundamentals of Cryptography and Network Security Publisher:South Asian Academic Publications, Year: 2021, ISBN: 78-81-953693-3-1 Authors: Dr. Bhagyashree, Dr. Suresh L'Dr. HemaMalini B H • Centre of Excellence by HoneyWell under CSR Initiative under the membership of ICT Academy. • Cash prize of Rs. 5000 for IEEE Bangalore Section -Humanitarian Technology Project Funding 2020 (IEEE BS-SHTPF 2020).

		International Award: • Received the "Teaching Excellence Award" in "International Research and Academic Excellence Awards 2021 (IRAEA-2021)" by the Foundation of Innovative Research in association with Noval Research Foundation in recognition of the exceptional caliber and outstanding performance in the chosen area of Academic Excellence. Received the prestigious award in the "IRAEA Awards-2021" ceremony on 28th August 2021 in Malaysia. **National Award:** • Received the "Best Academician of the Year 2021 Award", at CEGR 15th Rashtriya Shiksha Gaurav Puraskar Ceremony 2021 on 7th September, 2021 .Centre for Education Growth and Research (CEGR)
6	**Dr. Sunanda Dixit**	• Excom Member - IEEE Computer Society Bangalore chapter. • Project selected for KSCST Project funding. • Proposal shortlisted for Cyber Security, Government of Karnataka funding. • Presented and Published Research papers in Scopus index Journal and Conferences. • Patents Filed and published and one Australian patent granted. • Participated in the National Education Conclave on "Re-Imaging University Education with a Heart-cantered Approach' • Held on 12th and 13th January 2021. • Appreciation on contribution in the Webinar Organized by Research and Innovative Cell, East West college of Engineering, Bengaluru.
8	**Prof. Shruthi J.**	• The Memorandum of Understanding(MoU) is made and entered into on 31st August 2021 between BMS Institute of Technology and management located at Bengaluru and PVH Software Solutions PVT Ltd. Located at Bangalore to facilitate internships for

		students
9	**Prof. Vidya R**	• Patent applied Title: IOT enabled real-time aquarium monitoring system Filing Date-02/09/2021 -Indian Patent Office
10	**Prof. Ashwini N**	• Wipro certified Faculty (JAVA Programming-PBL Based Learning) • Patent Applied • Conference reviewer
11	**Dr. Aruna Kumari**	• Patent applied Title: Fruit classification and identification using advanced machine learning techniques. Filing Date-12.08.21, Application number 202141036457 • Patent applied Title: IOT enabled real-time aquarium monitoring system Filing Date-02/09/2021 -Indian Patent Office. • Reviewed paper in IEEE, International conference and IJCSE, IJISAE.

Table 4.11. Faculty Achievements 2019-20.

Sl. No.		**Significant Achievement (Reviewers, Keynote speakers, Session Chairs, Patents filed, - -)**
1	Dr. Arunakumari B.N	• Session Chair for IEEE Global Conference for Advancement in Technology, at Nagarjuna College of Engineering and Technology, Bengaluru, 18th to 20th October 2019. • Awarded PhD from Visvesvaraya Technological University, Belagavi.

2	Dr. Sunanda Dixit	**Award:** ● **Adarsh Vidya Saraswati Rashtriya Puraskar**, National Award of Excellence from Global Management Council August 2019. ● Reviewer for "**IEEE International Conference on Computational Systems and Information Technology for Sustainable Solutions (CSITSS-2019)**", R V College of Engineering, Bangalore, India, December 20th to 21st, 2019. ● Reviewer for Journal Advances in Science, Technology and Engineering Systems Journal (**ASTESJ)**, ISSN: 2415-6698. ● Reviewer for **IETE Journal of Research**, December 2019. ● Participated in the symposium on "**Affordable Health Care**" 14th to 16th November 2019, at Dayananda Sagar College of Engineering, Bangalore. ● IEEE Conference Attended and presented papers on "**3D Reconstruction of 2D X-Ray Images**", 4th IEEE International Conference on Computational Systems and Information Technology for Sustainable Solutions [CSITSS- 2019]. RV College of Engineering, 22nd to 23rd December 2019. ● "**Prediction of Breast Cancer Using Find-S and Candidate Elimination Algorithm**", 4th IEEE International Conference on Computational Systems and Information Technology for Sustainable Solutions [CSITSS- 2019]. RV College of Engineering, 22nd to 23rd December 2019. ● **Doctoral Committee Member** for VTU – 7 Students Board of Examination member at Dr. Ambedkar Institute of Technology, Bangalore.

Faculty Achievements 2018-19

Table 4.12.Faculty Achievements 2018-19.

Sl. No.	Name of faculty	Significant Achievement (Reviewers, Keynote speakers, Session Chairs, Patents filed, - -)
1.	Dr.Thippeswamy G, Dr.Bharathi Malakreddy A, Mrs.Vishaka Yadav	● Discussed about Projects with Dr. Basavaraj Girennavar Chairman and Managing Director Criyagen Agriculture & Biotech Pvt Ltd. That would be of help in our Agriculture Sector.
2.	Dr.Bharathi Malakreddy. A	● Guest for "**Republic Day Celebration**" on 26th Jan 2018 Felicitated for contributions towards Rural Education by Basaveshwara Educational and Rural Welfare Trust. ● Project titled "**Remote Access based Multipurpose Bot**" working model presented by Ms. Prajwala P and Ms. Akshatha T, M.Tech. (CSE) won Third prize at ICT Academy Student Innovator Award, an Initiative of Government of India on 23rd March 2019. Guided by: Dr.Bharathi Malakreddy A, Professor and PG Co-ordinator, Computer Science and Engineering. ● Mentoring batches of NITK Surathkal on projects related to "**Artificial Intelligence**" on 2nd March 2019 to 30th April 2019.
3.	Dr. Mahesh G.	● Session Chair for International Conference on "**Topical Transcends in Science, Technology & Management**", at Sai Vidya Institute of Technology, Bangalore, on 17th August 2018. ● Session Chair for Second International Conference on "**Green Computing & Internet of Things**" on 18th August, 2018, at Global Academy of Technology, Bangalore.
4.	Dr. Anjan K.	● Session Chair to 1st International Conference on "**Intelligent Computing 2018**" held at Amrita Vishwa Vidyapeetham on 26th October 2018. ● Session Chair for Special Session on "**Software and its Application in Interdisciplinary Domain** "at 3rd International Conference On Smart Computing & Informatics (SCI-2018) (SPRINGER Conference) , KIIT University Bhubaneswar, held on 21st and 22nd December 2018. ● Best Ph.D. Thesis award for the academic year 2016-17 by BITES on the thesis titled "**Implementation of Effective**

		Detection Mechanism and Behavioral Analysis of Hybrid Convert Channel in Secured Communication "awarded in 2018. ● **Board of Studies Member** of Department Of ISE, Dr. Ambedkar Institute of Technology, Bangalore. ● Mentor for PG Program CFIS, Department of ISE, Dr. Ambedkar Institute of Technology, and Bangalore. ● **Board of Studies** Member, Department of CSE, RIT (Formerly MSRIT), Bangalore. Mentor for PG program CFIS (**Cyber Forensic and Internet Security**), Department of ISE, Dr. Ambedkar Institute of Technology.
5.	Mr. Muneshwara M.S	● Conducted an activity for First year Civil students "**Working of C Programming on Smart Devices**" using the D-Coder application on 11th November 2018. ● Expert talk on "**Python Programming**" for M.Sc. Geo Informatics Students, organized at Kuvempu University, Shankaraghatta, Shimoga during 25th and 26th November 2018.
6.	Dr. Thippeswamy G. Mr. Guruprasad S Mr. Shankar R Mr.Ravikumar B.N.	● Organized "**Entrepreneurship Awareness Camp (EAC)**", sponsored by DST-NIMAT on 27th to 29th of September 2018.
7.	Mrs. Shruthi J	● Expert talk on "**One Day Student Development Programme on Machine Learning**" on 16th November 2018. ● Interdisciplinary Project "**Smart Lid: Food Spoilage Detection System**" has won 2nd prize in KSTA project exhibition conducted in Sri Venkateshwara College of Engineering on 13th March 2019. The students were Ms. Laalithya A, Mr.Saurav Karthikeya & Mr.Anup Kumar Shetty under the guidance of Prof. Sumathi M S, Assistant. Professor. TCE Department. And Prof. Shruthi J Assistant. Professor. CSE Department.
8.	Mr. Shankar R Mr. Harinath H N	● Developed "**Open Course Online Registration System**" for students which helps them in registering any of the 23 Open Courses conducted by all the departments.

9.	Dr. Vishwa Kiran S	● Corporate Training for 3 Days on "**Advanced C++ Training for Cisco Employees**" during 9th to 11th Oct 2018. ● Conducted 4 days training for the employees of "**Hitachi storage Group**", a Western Digital in Japan, 11th April 2019 to 4th April 2019. ● Received Ph.D. From Bangalore University. ● Consultancy: **CISCO** (Through Aprameyah Technologies, Bangalore), **L&T** (Through Aprameyah Technologies, Bangalore), **VOLVO** (Through Aprameyah Technologies, Bangalore), **SanDisk** (Through ● Aprameyah Technologies, Bangalore).
10.	Dr. Vishwa Kiran, Mr. Guruprasad Dr. Mahesh G, Dr. Satish Kumar,	● Train the Trainer: Programme on "**Embedded C Programming**" in L&T CTEA Mysore from 28th Jan 2019 to 2nd Feb 2019.
11.	Mrs. Vidya R Pai	● A Talk on "**Network Security Issues in Future Internet Architecture**" in GKVK Bangalore on 18/06/2019.
12.	Mrs. Chethana .C	● Represented OIKOS (**Eco-Club**, BMSIT&M) in the tree plantation program on 23rd June 2019 at Benniganahalli, ● K R, Puram, Bangalore- Massive plantation of about 500 samplings.

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

(5 marks)

(Mention details such as program title, description, duration, resource person, type of training, training methodology, participants, etc.). Mention details separately for the programs organized and the programs participated outside the institution)

Faculty development program

The faculty members are encouraged to attend various programs conducted outside of BMSIT & M, where the standard of Knowledge acquired will add to the existing ones. Faculty members should plan to participate in programs conducted by institutions which are outstanding. Faculty members are permitted to attend only those FDP'S/ Symposia/ Workshops/ STTPs etc., conducted by engineering programs accredited by NBA, faculty members are motivated to participate in the programs conducted by MHRD/ IIT/IISC/AICTE/UGC are supported.

Faculty Development Programs Organized in the Department

Table 4.13.Faculty Development Program Organized.

Sl. No.	FDP Title	Date	No of Days
1	Workshop on Diversified applications of machine learning algorithms (Sponsored by Indian Academy of Sciences, Bengaluru)	21st and 22nd Sept 2021	02 days
2	Emerging Trends in Data Analytics	10th to 14th May 2021.	5 Days
3.	Cyber Security (In association with Supraja Technologies)	11th to 16th June 2020	6 days
4.	Engineering Research: Avenues, Challenges and Opportunities.	24th to 28th July 2018	5 Days

FACULTY DETAILS OF FDP/WORKSHOP/STTP ATTENDED FOR THE ACADEMIC YEAR 2020-21

Table 4.14: (From August 2020 to July 2021)

Sl. No.	Name of the Faculty	Title of FDP/Workshop/STTP/Webinars	Date and Venue	No of Days
1	**Dr. Anil G N**	1.Two days National Education Enclave on " Re Imaging university Education with a Heart Centered Approach	12.01.2021 to 13.01.2021	2 Days
		2.National FDP on "Computational Biology"	01.02.2021 to 05.02.2021, School of Computer Science & Engineering, Reva University, Bengaluru.	5 Days
		Emerging Trends in Data Analytics	10th May to 14th May 2021, Dept of CSE, BMSIT & Mgmt	5 Days
		One Week National Level Online FDP on "Innovation in Teaching, Research and Challenges in Accreditation process for Higher Educational Institutions(ITRCA)"	17.05.2021 to 22.5.2021, St. Peter's Engineering College, Hyderabad	6 days
2	**Dr. Hemamalini B H**	Emerging Trends in Data Analytics	10th May to 14th May 2021, Dept of CSE, BMSIT & Mgmt	5 Days
3	**Dr. Usha B A**	Emerging Trends in Data Analytics	10th May to 14th May 2021, Dept of CSE, BMSIT & Mgmt	5 Days
4	**Dr. Mahesh G**	ATAL Online FDP on "Wearable Devices"	18th Jan to 22nd Jan at University Visvesvaraya College of Engineering	5 Days
		Advance Computing and Allied Technologies in Computer Science	3rd August 2020 to 8th August 2020 EWIT, Bangalore	1 Week
		BlockChain Technology and Its Applications	12th October 2020 to 17th October 2020 EWIT, Bangalore	6 Days

5	**Dr. Anjan Krishnamurthy**	Cyber Security	9th Nov 2020 to 13th Nov 2020, SIT Tumkur	5 Days
6	**Dr. Sunanda Dixit**	1. ATAL Online FDP on "BlockChain" 2. Emerging Trends in Data Analytics 3. "Online Workshop On Intellectual Property Rights" 4. Highlights and Implementation of NEP 2020	18th Jan to 22nd Jan at JSS Academy of Technical Education 10th May to 14th May 2021, Dept of CSE, BMSIT 7th and 8th Jan 2021 At Acharya Institute of Technology 24th to 28th August 2020 at Bangalore University	5 Days 5 Days 2 Days 5 Days
7	**Mr. Muneshwara M S**	One Week online FDPAcademia Industry Interaction, Avenues in Funded Project and Entrepreneurship "	08.01.2021 to 13.01.2021 ,School of C&IT, REVA University, Bangalore,	1 Week
		6 Days AICTE Sponsored online Short Term Training Programme (STTP Phase III) on **"Demystifying Block chain Technology & Cyber Security Threats: Issues and Challenges"**	14-12-2020 to 19-12-2020. Organized by Department of Computer Science and Engineering , S.A. ENGINEERING COLLEGE (AN AUTONOMOUS INSTITUTION, AFFILIATED TO ANNA UNIVERSITY), Chennai - 600 077.	6 Days
		One Week National Level Online FDP on "Innovation in Teaching, Research and Challenges in Accreditation process for Higher Educational Institutions(ITRCA)"	17.05.2021 to 22.5.2021 ,St. Peter's Engineering College, Hyderbad	1 Week

		5 days FDP on “Impact of Covid on Higher Education and Research Initiatives”	24.05.2021 to 28.5.2021, 2021Sri Venkateshwaraa College of Engineering & Technology, Ariyur, Puducherry - 605 102.	5 Days
		10 Days National Level FDP on “Pedagogy of Teaching and Tools on E-Content Development for Effective Teaching”	05.07.2021 to 14.07.2021, CHRISTOPHER ARTS AND SCIENCE COLLEGE (WOMEN) Soorangudi, Via-Nanguneri, Tirunelveli-627 108, Tamil Nadu, India	10 Days
8	**Mr. Anand R**	10 Days National Level FDP on “Pedagogy of Teaching and Tools on E-Content Development for Effective Teaching”	05.07.2021 to 14.07.2021, CHRISTOPHER ARTS AND SCIENCE COLLEGE (WOMEN) Soorangudi, Via-Nanguneri, Tirunelveli-627 108, Tamil Nadu, India	10 Days
		One week online National level Faculty Development Program on “ROLE OF MATHEMATICS IN LATEST ENGINEERING TRENDS”	Lords Institute of Engineering & Technology Himayathsagar, Golconda Post, Near TSPA Junction, Hyderabad-500 091, Telangana, India.	1 Week
9	**Mr. Jagadish P**	Computational Biology	1st Feb 2021to 5th Feb 2021, CSE,Reva University,Bengaluru	5 Days
		ATAL Online FDP on “Green Communication”	24th to 28th at BMSIT&M	5 Days
		Research New Avenues for budding researchers	1st &2nd August 2020,ME,UVCE, Bangalore	2days

10	**Mrs. Durga Bhavani**	A Real time Practical approach of Deep Learning with keras using colab	25.06.2021 to 27.06.2021 ,Dept. of ISE, Sir. MVIT, Bengaluru.	3 Days
11	**Mrs. Ambika G N**	Artificial Intelligence and Machine Learning	24.05.2021 to 28.05.2021, Dept of CSE, NIT, Warangal	5 Days
12		Exemplary Practices in technology learning and Evaluation of purses in computer science and Information Technology	03.08.2020 to 07.08.2020 **V**TU centre for Postgraduate, kalaburagi and IIT Allahabad	5 Days
	Mrs. Vidya R Pai	AICTE Training And Learning (ATAL) Academy Online FDP on "Internet of Things (IoT)"	30.11.2020 to 4.12.2020 at Sri Sairam Engineering College.	5 Days
		Webinar: Role of Startups in Atmanirbhar Bharat	26.8.2020 to 28.8.2020, BMSIT and AIC NITTE Incubation center	3 days
13	**Mrs. Ashwini N**	**A Real time Practical approach of Deep Learning with keras using colab**	25.06.2021 to 27.06.2021 ,Dept. of ISE, Sir. MVIT, Bengaluru.	3 Days
		Emerging trends and Applications of Artificial Intelligence	10.08.2020 to 14.08.2020 1. at Dr.Ambedkar Institute of Technology, Bangalore	5 Days
14	**Dr. Radhika K R**	**Deep Learning for Visual Computing, ATAL FDP**	021-7-12 to 2021-7-16 at Sri Krishna College of Engineering and Technology.	5 Days
		FDP on "IoT Applications with Blockchain Techniques" ATAL FDP	2021-7-17 to 2021-7-21 at National Institute of Technology Meghalaya.	5 Days
15	**Mr. Shankar R**	Data Mining & Analytics	17-02-2021 - 23-02-2021, Reva University	5 Days

16	**Srivani P**	Artificial Intelligence- ATAL FDP	2020-10-5 to 2020-10-9 , INDIAN INSTITUTE OF PLANTATION MANAGEMENT, Bengaluru	5
		Latex and its Applications for Research	20-7-2020 to 24-7-2020 Vidhyavardhak College of Engineering, Mysuru	
17	**Dr. Arunakumari**	ATAL FDP on Data Sciences	15th Feb -19th Feb 2021, Institute of Aeronautical Engineering	5 Days
18	**Dr. Manoj H M**	Data Analytics using Artificial Intelligence and Machine Learning	12th April to 17th April 2021, HKBK College of Engineering, Bengaluru	6 Days
19	**Dr. Lakshmi B N**	Emerging Trends in Data Analytics	10th May to 14th May 2021, Dept of CSE, BMSIT	5 Days

Faculty Development Program Attended by faculty Members (2019-20)

Table 4.15. Faculty Development Program Attended.

Sl. No.	NAME	Title of FDP/ workshop	No of Days
1.	Dr. Anil G.N	● FDP on **Predictive Analytics a gateway to Business Excellence** from 13th to 18th January 2020, MSRIT, Bengaluru.	6 Days
2.	Mrs. Vishakha Yadav	● FDP on **Digital Forensics** from 13th to 18th January 2020 MS Ramaiah Institute of Technology, Bengaluru.	6 Days
3.	Mr. Shankar R	● FDP on **Modern Web Application development** using MEAN stack from 06thto10th2020 at MS Ramaiah Institute of Technology, Bengaluru.	5 Days
4.	Mr. Jagadish.P	● FDP on **Edge Computing and Intelligence** on 20th to 24th 2020 at MS Ramaiah Institute of Technology, Bengaluru.	5 Days
5.	Mrs. Bharathi R	● FDP on **Techo Workshop Series on Cyber Security** on 25th to 26th 2020 at IISc, Bengaluru.	2 Days
6.	Dr. Mahesh G	● FDP on "**Engineering statistics & Linear Algebra"** from 22nd to 26th January 2020 at Global Academy of Technology, Bengaluru	5 Days
7.	Mr. Muneshwara M S	● One week FDP on "**Application of optimization Techniques & Number Theory in Engineering Sciences**", on 17th to 22nd January 2020 at MS Ramaiah Institute of Technology, Bengaluru.	6 Days

8.	Mr. Anand R	● One week FDP on "**Application of optimization Techniques & Number Theory in Engineering Sciences**", 17th to 22nd January 2020, MS Ramaiah Institute of Technology, Bengaluru.	6 Days
9.	Mrs. Durgabhavani A	● FDP on **Predictive Analytics a gateway to Business Excellence** 13th to 18th January 2020, MS Ramaiah Institute of Technology, Bengaluru.	6 Days
10.	Mrs. Srivani P	● FDP on **Predictive Analytics a gateway to Business Excellence** 13th to 18th January 2020, MS Ramaiah Institute of Technology, Bengaluru.	6 Days
11.	Mrs. Shruthi J	● FDP on **Predictive Analytics a gateway to Business Excellence** 13th to to 18th January 2020, MS Ramaiah Institute of Technology, Bengaluru.	6 Days
12.	Mr. Rajesh N.V	● FDP on **Predictive Analytics a gateway to Business Excellence** 13th to 18th January 2020, MS Ramaiah Institute of Technology, Bengaluru.	6 Days
13.	Mrs. Mari Kirthima A	● FDP on **Predictive Analytics a gateway to Business Excellence** 13th to 18th January 2020, MS Ramaiah Institute of Technology, Bengaluru.	6 Days
14.	Mrs. Chethana C	● FDP on **Digital Forensics** from 13th to 18th January 2020 MS Ramaiah Institute of Technology, Bengaluru.	6 Days
15	Mrs. Vidya R	● FDP on **5G Communication Networks and its Future Perspective** in MS Ramaiah Institute of Technology, Bengaluru.	6 Days
16	Dr. Satish Kumar T	● FDP on **Engineering statistics and Linear Algebra** from 22nd to 26th January 2020 at Global Academy of Technology, Bengaluru	5 Days

Faculty Development Program Attended by faculty Members (2018 -19)

Table 4.16. Faculty Development Program Attended.

Sl.No.	FDP 2018-19		
	Name of the faculty	**Title**	**Days**
1.	Dr. Thippeswamy G	● FDP on **Advances in Deep Architectures** for signal image and Vision Applications, IIIT, Allahabad from 24th to June 30th 2019.	7 Days
2.	Dr. Bharathi Malakareddy A	● FDP on **Data Science**, 24th January 31st January 2019, Rajarajeshwari College of engineering, Bengaluru. ● Workshop on **Artificial intelligence and Deep Learning**, 11th to 13th august 2018 KLE, Technological University, Bengaluru. ● FDP on **Computational Machine Learning and Artificial Intelligence**, 18th to 23rd January 2018, MS Ramaiah Institute of Technology, Bengaluru.	8 Days 3 Days 5 Days
3.	Mrs. Hemamalini	● FDP on Artificial intelligence using Deep Learning, 26th to 30th November 2018,NIT, Tiruchirappalli.	5 Days
4.	Mrs. Bharathi R	● FDP on Advanced Data Science From 17th to 21st June JSS science and Technology University, Mysore.	6 Days
5.	Dr. Mahesh. G	● FDP on **Mathematics for Machine Learning** from 15th to 19th July 2019 in Dr. Ambedkar Institute of Technology, Bengaluru.	5 Days

6.	Dr. Anjan Krishnamurthy	● Workshop on **DevOps** was conducted in association with IEEE Computational Intelligence Chapter from 21st to 25th January 2019 at Department of ISE, MS Ramaiah Institute of Technology, Bengaluru. ● FDP on **Internet of Things and Artificial Intelligence** at BNM Institute of Technology, 24th to 28th June2019.	5 Days 5 Days
7.	Dr. Anupama. H. S.	● Workshop on DevOps was conducted in association with IEEE Computational Intelligence Chapter from 21st to 25th January 2019 at Department of ISE, MS Ramaiah Institute of Technology, Bengaluru.	5 Days
8.	Mrs. Vishakha. Yadav	● FDP on Frontiers in Machine Learning and Soft Computing 10th to15th June 2019 Reva University, Bengaluru.	6 Days
9.	Mr. Muneshwar M.S	● Workshop on DevOps was conducted in association with IEEE Computational Intelligence Chapter from 21st to 25th January 2019 at Department of ISE, MS Ramaiah Institute of Technology, and Bengaluru.	5 Days
10.	Mr. Anand R	● FDP on "Data Science & IoT Applications" conducted by Department of ISE between 29th to 31st January 2019,East Point College of Engineering, Bengaluru.	3 Days
11.	Mrs. G.Y.Durgadevi	● FDP on Frontiers in Machine Learning and Soft Computing 10th to15th June 2019 Reva University, Bengaluru.	6 Days
12.	Mrs. Shruthi J	● FDP on **Machine Learning for IOT Applications** from 28th January to 1st February in BMSIT&M. ● TEQIP – III sponsored FDP on **Wireless Network a Smart City Perspective** from 17th to 21st June BMSCE, Bengaluru.	5 Days 5 Days

13.	Mr. Rajesh N V	• FDP on "Data Science & IoT Applications" conducted by Department of ISE between 29th to 31st January 2019, East Point College of Engineering, Bengaluru.	3 Days
14.	Mrs. Chethana C	• National workshop on predictive modelling with R programming 27th to 29th May 2019 at CHRIST University. • FDP on **Applied Mathematics in Engineering** from 29th July to 2nd Aug in BMSIT&M.	3 Days 5 Days
15.	Mrs. Durga Bhavani A	• **Internet of Things based Project Design and Development** from 24th to 29th June 2019 at BNMIT College of Engineering, Bengaluru. • FDP on **Software Applications in Civil Engineering** from 15th to 19th July 2019 in BMSIT&M.	5 Days 5 Days
16.	Mrs. Ambika.G.N	• Workshop on DevOps was conducted in association with IEEE Computational Intelligence Chapter from 21st to 25th January 2019 at Department of ISE, MS Ramaiah Institute of Technology, Bengaluru.	5 Days
17.	Mrs. Vidya. R Pai	• Workshop on **DevOps** was conducted in association with IEEE Computational Intelligence Chapter from 21st to 25th January 2019 at Department of ISE, MS Ramaiah Institute of Technology, Bengaluru. • **Internet of Things based Project Design and Development** from 24th to 29th June 2019 at BNMIT College of Engineering, Bengaluru.	5 Days 6 Days
18.	Mrs. Mari Kirthima	• FDP on Advanced Data Science From 17th to 21st June, JSS science and Technology University Mysore.	6 Days
19.	Mrs. Radhika K.R	• FDP on **Frontiers in Machine Learning and Soft Computing** 10th to15th June 2019 Reva University, Bengaluru. • FDP on **Data Science** from 24th to 31st January 2019 at Rajarajeshwari college of Engineering Bengaluru.	6 Days 7 Days

		• FDP on **SAP Leonardo** at SAP LABS on 12th July 2017.	1 Day
20.	Mrs. Srivani	• Internet of Things based Project Design and Development from 24th to 29th June 2019 at BNMIT College of Engineering, Bengaluru.	6 Days
21.	Mr. Guruprasad	• C Programming organized by Aprameyah Technologies L & T Mysore from 28th January to 2nd February 2019.	6 Days
22.	Mr. Ravi Kumar B N	• **Internet of Things based Project Design and Development** from 24th to 29th June 2019 at BNMIT College of Engineering, Bengaluru.	6 Days
23.	Dr. Satish Kumar T	• **C Programming** organized by Aprameyah • Technologies L & T Mysore from 28th January to 2nd February 2019.	6 Days
24.	Ms. Arunakumari B. N.	• FDP on TEQIP Sponsored Workshop on "**Deep Learning for Big Data and Cyber Security Applications**" 1st to 5th July 2019 Department of Information Technology NITK Surathkal Mangalore. • FDP on **Advanced Communication and Networking Technologies** 8th to 12th2019 at Indian Institute of Information Technology, Dharwad.	5 Days 5 Days
25.	Mr. Jagadish P	• National level FDP on **Data Science and IOT** applications in East Point college of Engineering. Bengaluru from 29th to 31st January 2019. • FDP on **Applied Mathematics in Engineering** from 29th July to 2nd Aug in BMSIT&M, Bengaluru.	3 Days 5 Days
26.	Dr. Vishwa Kiran	• **C Programming** organized by Aprameyah Technologies L & T Mysore from 28th January to 2nd February 2019.	6 Days

4.4 Research and Development (30 marks)

4.4.1 Sponsored Research

Seed Money for research Proposals

Faculty members are encouraged to write the research proposals. The institution also provides seed money for excellent research proposals.

SCL for research work

Around 19 faculty members are pursuing Ph.D. in various universities. Special casual leave and permissions are sanctioned for their research work. Five faculty members have completed comprehensive viva.

Research proposals Granted (2020-21):

Table 4.17 Research proposals Granted /Selected

Sl. No.	Title	Principal Investigator	Funding Agency	Amount in lakhs
1.	Study and Analysis of Hybrid Covert Channels Using Entropy Analytics for Detection **(Shortlisted)**	Dr. Anjan Krishnamurthy	CySecK	11 Lakhs
2.	Margadarshan Scheme	Dr.Thippeswamy G	AICTE	15 Lakhs

Table 4.18 Research proposals Granted (2018-19):

Sl. No.	Title	Principal Investigator	Funding Agency	Amount in lakhs
1.	Establishment of Centre for design and research of health care applications using artificial intelligence.	Dr.Bharathi Malaka Reddy	VGST (K-FIST L1)	20 Lakhs

Research Proposals Submitted AICTE/VGST for 2019-20

Table 4.19 Research Proposals Submitted.

Sl. No.	Title	Principal Investigator	Funding Agency	Amount in lakhs
1.	Design and implementation of web based social networking system	Mrs. Bharathi R	AQIS	06 Lakhs
2.	Resuscitation of DBMS's with Object oriented features	Dr. Arunakumari B N	AICTE AQIS	06 Lakhs
3	Artificial intelligence, machine learning and data science Techniques with applications	Dr. Sunanda Dixit	VGST	02 Lakhs
4	Design and development of an Ameliorated activity chart to be amenable for cost benefit duration analysis	Dr. Arunakumari B N	VGST	05 Lakhs
5	Center of excellence in Intelligent cognitive Analytics for cybercrime forensics	Dr. Anjan K	VGST	46.44 Lakhs
6	Center of excellence in Intelligent surveillance using aerial cyborg	Dr. Anjan K	VGST	16.56 Lakhs

Research Proposals Submitted To AICTE for the Academic Year 2018-19

Table 4.20 Research Proposals Submitted.

Sl. No.	AQIS Scheme	Title	PI	Co-PI(s)
1	RPS-1	Development of Smart Agriculture system for lucrative yield production and soil erosion prevention by applying precision agriculture method using self-adaptive cyber-physical System.	Dr. Thippeswamy G	Dr. Anjan K Dr. Anupama H S
2	STTP	Short term training program	Dr. Thippeswamy G	Dr. Satish Kumar T
3	RPS-2	Brain computer interface in health care system	Dr. Anil G N	Dr. Mahesh G Dr. Anjan K

4.4.2 Consultancy

Faculty members take up consultancy works where 50% is given to the Institute and the other 50% is retained by concerned faculty.

Funded research from outside; considering faculty members contributing to the program: (Provide a list with Project Title, Funding Agency, Amount and Duration) Funding Amount (Cumulative for CAYm1, CAYm2 and CAYm3):

Consultancy (from Industry) (15)

Considering faculty members contributing to the program: (Provide a list with Project Title, Funding Agency, Amount and Duration) Funding Amount (Cumulative for CAYm1, CAYm2 and CAYm3):

Amount >10Lacs	15Marks,
Amount <10 and>8Lacs	10Marks,
Amount <8 and >6Lacs	8Marks,
Amount <6 and>4Lacs	5Marks,
Amount <4 and>2Lacs	2Marks,
Amount<2Lacs	0Marks

Consultancy 2020-21

SL. No.	Faculty Name	Company	Company Address	Topic	No. of days	Month	Revenue generated (INR)
			NIL				

Consultancy 2019-20

Table 4.21 Consultancy (2019-20)

SL. No.	Faculty Name	Company	Company Address	Topic	No. of days	Month	Revenue generated (INR)
1	Dr. Vishwakiran	Siemens	Electronic City	C++,OS, DS	19	July/Aug - 2019	1,52,000/-
2	Dr. Vishwakiran	Western Digital	Tokyo Japan	C++	2	Oct - 2019	24,000/-

3	Mr. Shankar	Manav Rachna International Institute of Research and studies	Faridabad, Haryana	Advanced Graphics course	3	13th - 16th August 2019	7,500/-
4	Mr. Shankar	Armed Police Training School	Yelahanka, Bangalore	Computer Basics	4	23rd Oct to 26th Oct	4,000/-
						Total	**Rs. 1,87,500/-**

Consultancy 2018-19

Table 4.22 Consultancy (2018-19)

SL. NO	Faculty Name	Company	Company Address	Topic	No. of days	Month	Revenue generated (INR)
1	Dr. Vishwakiran	L&T	Hebbal, Mysore	C	6	Jan/Feb - 2019	42,000/-
2	Dr. Vishwakiran	Volvo	Bagmane Tech park, C V Raman Nagar, Bangalore	C++	5	Feb 2019	50,000/-
3	Dr. Vishwakiran	Western Digital	Tokyo Japan	C++	4	April 2019	48,000/-
4	Dr. Vishwakiran	Volvo	Bagmane Tech park, C V Raman Nagar, Bangalore	C++	5	Feb 2019	50,000/-
5	Dr. Vishwakiran	CISCO	Cessna Business Park, Marathalli Ring Road, Bellandur	C++	3	Oct - 2019	30,000/-
6	Mrs. Vishakha Yadav	DevX	Incubation Center,4th floor, CSE ,Department, BMSI T&M	Online Attendance Management System	-	Sep 2018	24,000/-
Total							**Rs.2,44,000/-**

Consultancy 2017-18

Table 4.23 Consultancy (2017-18)

Sl. No.	Faculty Name	Company	Company Address	Topic	No. of days	Month	Revenue generated (INR)
1	Mrs. Vishakha Yadav	DevX	Incubation Center,4th floor, CSE Department, BMSIT&M	Faculty Feedback Management System	-	July 2018	11,280/-
2	Mrs. Vishakha Yadav	DevX	Incubation Center,4th floor, CSE Department, BMSIT&M	College Website	-	July 2018	88,200/-
Total							**Rs.99,480/-**

Total for three years: Rs.5,30,980/-

5 Laboratories and Research Facilities (75)

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

The Programme has well-equipped computer laboratories for course work, teaching and to carry out projects. The servers and nodes are all connected in the network with all necessary licensed software. Exposure to cutting edge technologies is provided by means of Industrial Projects and technical talks from domain experts of reputed research organizations.

Table 5.1 Laboratory Infrastructure

Sr. No.	Name of the Laboratory	Specialized Equipment Name	Equipment details	Utilization details from the perspective of PO attainment
1.	**VON NEUMANN LAB**	36 Computers	Intel® Core™ 2 CPU 2.83 GHz, 2 GB, RAM, 320 GB HDD, DVD Writer	Utilized to conduct ADBMS Laboratory
2.	**PG/ Project Lab**	1) 10 Computers	Intel® Core™ i7-CPU@ 3.10 GHz/I-5/ Quad Core/Intel P4, 2 GB, RAM, 320 GB HDD, DVD Writer	Utilized to conduct IOT Laboratory
		2) 8 IOT Kits	8 ESP- 32 development kits,10- temperature sensors, 10-I2C interface, resistors, power adapters and LEDs	

Class rooms & Laboratories

Figure 5.1 Von Neumann Lab

Figure 5.2. PG/ Project Lab

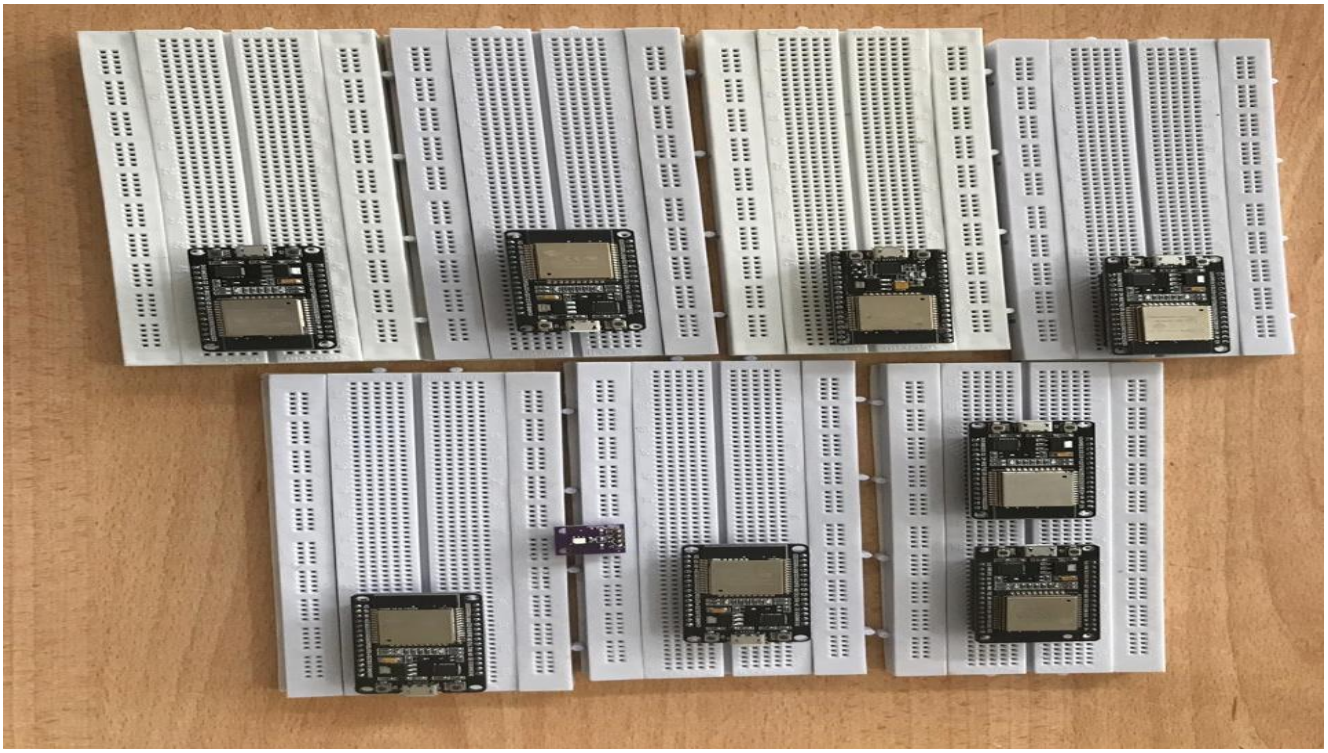


Figure 5.3 IOT Kits

Figure 5.4 Class room BSN-TR-401

Figure 5.5 Class room BSN-TR-301

b) Details of Technical Support staff

Table 5.2 Details of Technical Support staff

Sl No	Name	Qualification	Designation
1	Mr. Yateesh N G	B.E, M.Tech	System Analyst
2	Mrs. Ragini T N	Diploma in CSE	Instructor
3	Mr. Adinarayana Reddy	Diploma in CSE, MCP	Instructor
4	Mrs. Bhagya M	Diploma in CSE, BSC.IT	Instructor
5	Mr. K Hariprasad Pai	Diploma in CSE, MCP	Instructor
6	Mr.Venkatesh Banagar	Diploma in CSE, CDAC – advance program	Assistant Instructor
7	Mr. Harinath H N*	Diploma in ECE	Assistant Instructor

Table 5.3 Details of the FDP/Workshop/Training Program attended by Technical Staff

Sl No	Technical Staff	Continuing Education			
		2017-18	2018-19	2019-20	2020-21
		Pursuing AMIE	Pursuing AMIE	Pursuing AMIE, Completed Section A	Pursuing AMIE, Completed Section B
1	Mrs. Ragini T N	Attended Mobile Applications Workshop 19-21 July 2018 at Sir. MVIT Bangalore	Attended Python application Development Workshop 22nd to 25th Jan 2020 at SVIT	Completed online course Databases and SQL Query	Completed NSS online workshop on "Refresh Scape" June 2021 at BMSIT & M
		Attended ETL DATA ANALYTICS Workshop 23rd – 30th July 2017 at	Attended Employability skills on IT Literacy Workshop 3rd-5th July 2018 at		Webinar on "Intellectual Property Rights (IPRs) organized by MHRD 14th July 2021 at

		BMSIT&M	BMSIT&M		Vivekananda Institute of Technology
		Attended Microprocessor & ARM Workshop 30/01/17-1/1/18 at BIT	Attended Engineering research avenues Workshop 24th – 28th July 2018 at BMSIT&M		TEQIP -3 Webinar Back to work Preventive measures to reduce spread of COVID -19 28 July 2020 at NIE Mysore
2	Mr. Adinarayana Reddy	Attended Windows server 2012 and Linux Administration 23rd to 25th Jan 2017 SJBIT	Attended Employability skills on IT Literacy Workshop 3rd-5th July 2018 at BMSIT&M	-	Online course on "Bits and bytes" in Coursera
			Attended Building Learning Machines 16th to 21st July 2018 at MSRIT		
			Attended Engineering research avenues Workshop 24th – 28th July 2018 at BMSIT&M		
3	Mrs. Bhagya M	Attended Design and analysis of Algorithms Workshop 23rd to 28th Jan 2017 at SVIT	Attended Engineering research avenues Workshop 24th – 28th July 2018 at BMSIT&M	-	-
		Attended Windows server 2012 and Linux Administration 23rd to 25th Jan 2017 SJBIT	Attended Building Learning Machines 16th to 21st July 2018 at MSRIT		

			Attended Engineering research avenues Workshop 24th – 28th July 2018 at BMSIT&M		
4	Mr.Venkatesh Banagar		Attended Engineering research avenues Workshop 24th – 28th July 2018 at BMSIT&M	Attended Web Development using Mean stack FDP 6th Jan to 10th Jan 2020 at MSRIT	-
5	Mr. K Hariprasad Pai	VMware Vforum, 17-Nov-17	AWS Clod Day, 16-May-18	Red Hat Forum, 07-11-2019	-
		Microsoft Azure Lets move to cloud, 23-Nov-17	VMware vforum, 16-10-2018	VMware Hands on Labs, 28-11-2019	
		Dell EMC Event, 06-Dec-17	Red Hat Ideas worth Exploring, 01-10-2018	Microsoft Azure, 03-12-2019	
6	Mr. Harinath H N		Attended Building Learning Machines 16th to 21st July 2018 at MSRIT	Attended Embedded system Microcontroller Workshop (3rd to 5th FEB 2020 at SAIT	-

Table 5.4 In-house Software

In-house Software developed by Mr. Yateesh N G			
1	360 Degree Feedback	11	Company Information Sheet for Campus Recruitment
2	Faculty Appraisal	12	Grievance Cell
3	Academic Monitoring	13	Student Fee Challan Generation
4	NAAC Survey	14	ID Card Generation

5	Budget Proposal	15	PBAS for Technical Staff
6	Open Elective Registration	16	VTU Revaluation Application Form
7	TechSaransh	17	Faculty Workload Management System
8	PBAS for Teaching Staff	18	Faculty Recruitment Portal
9	Open Course Registration	19	Hostel Management System
10	College Website	20	Student Attendance Management

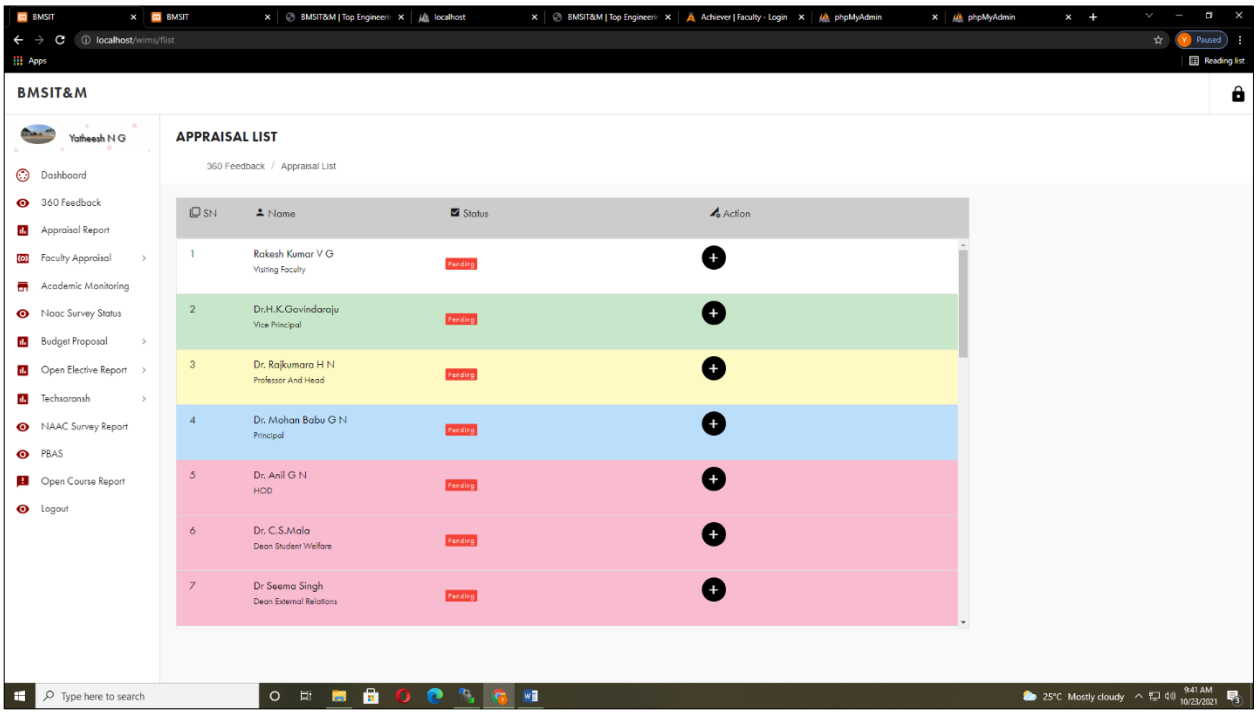


Figure 5.6 360 Degree Feedback

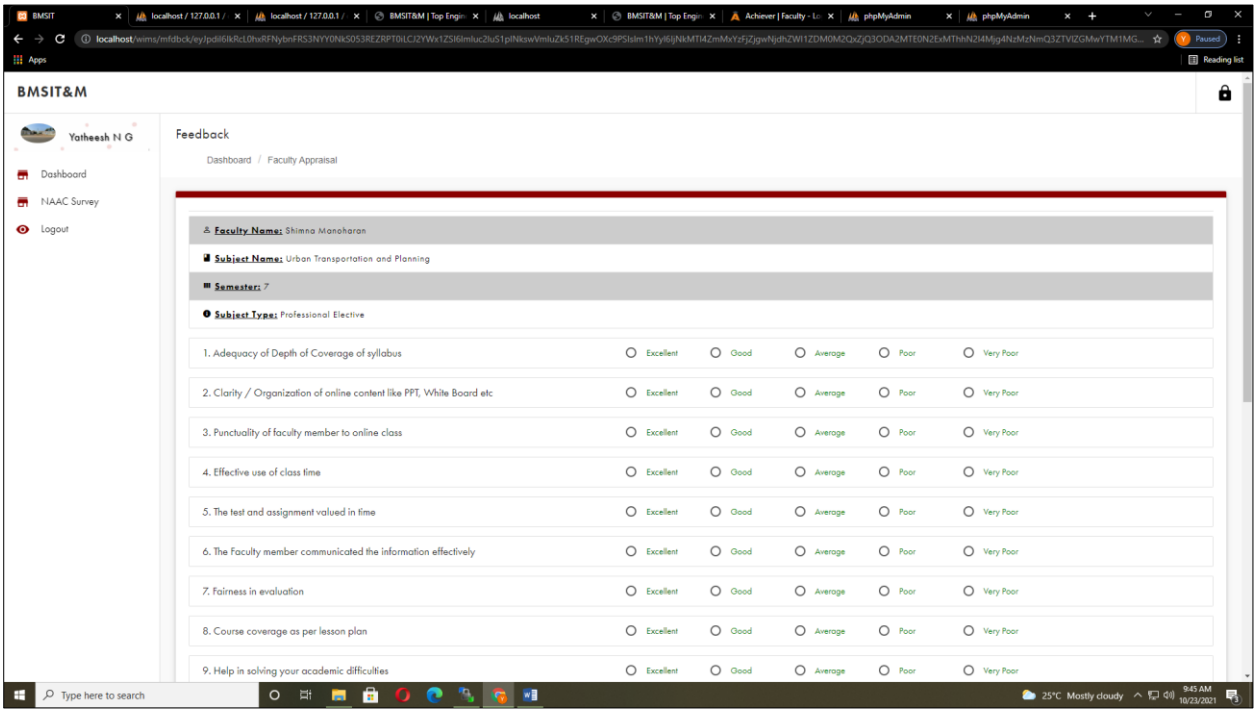


Figure 5.7 Faculty Appraisal

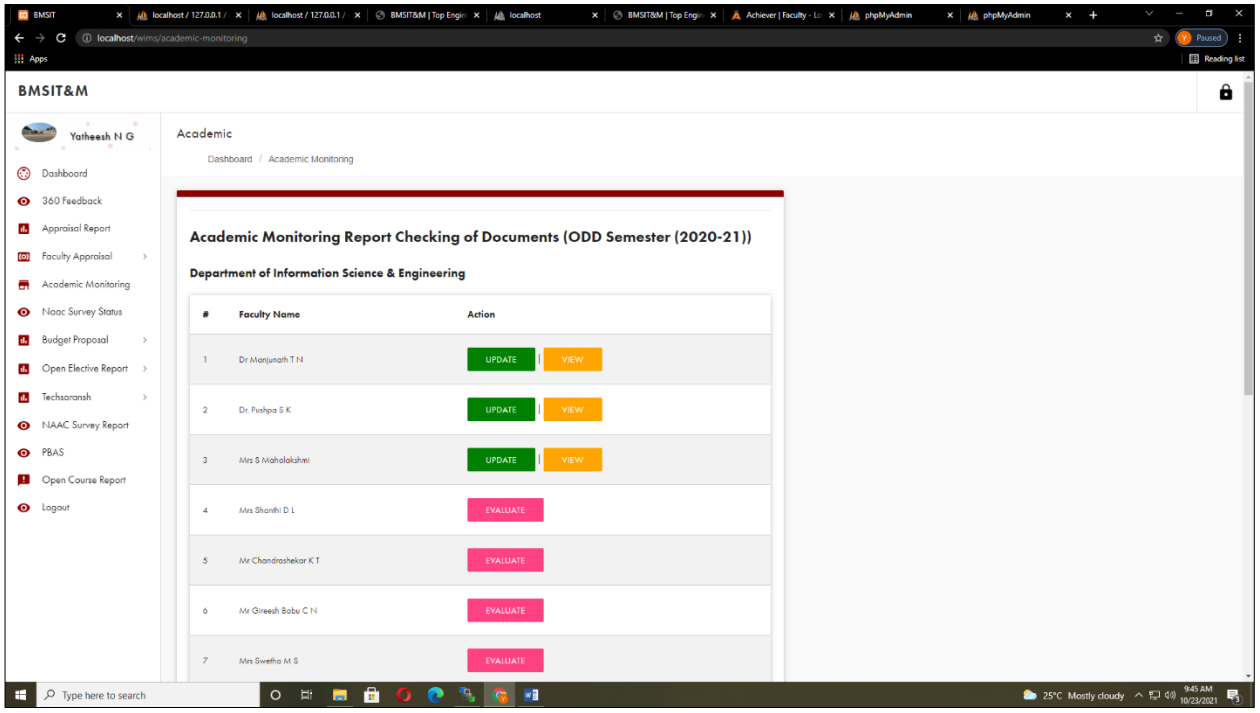


Figure 5.8 Academic Monitoring

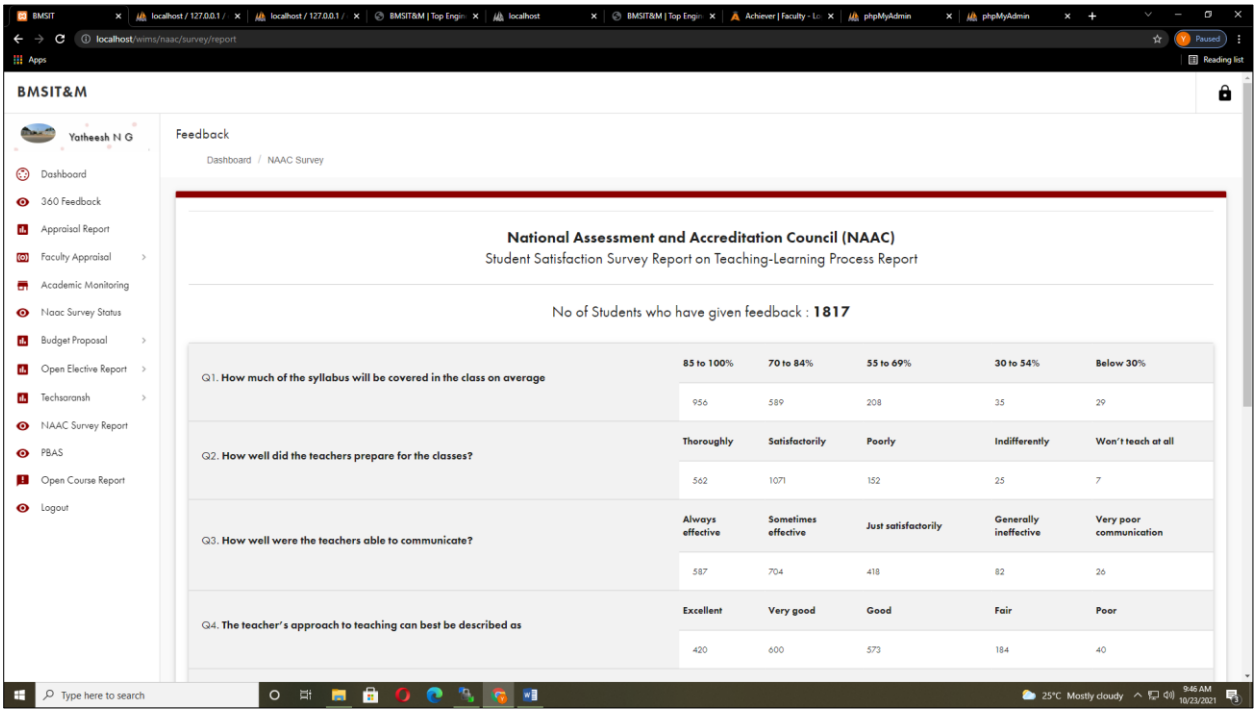


Figure 5.9 NAAC Survey

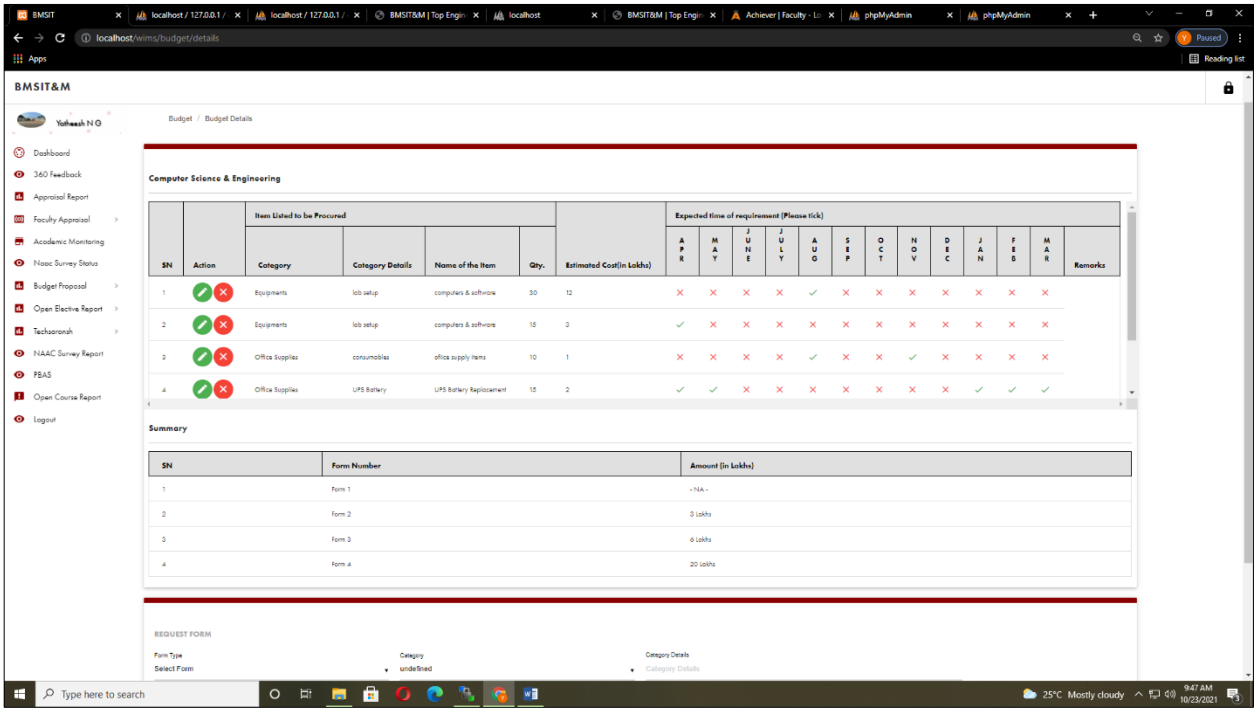


Figure 5.10 Budget Proposal

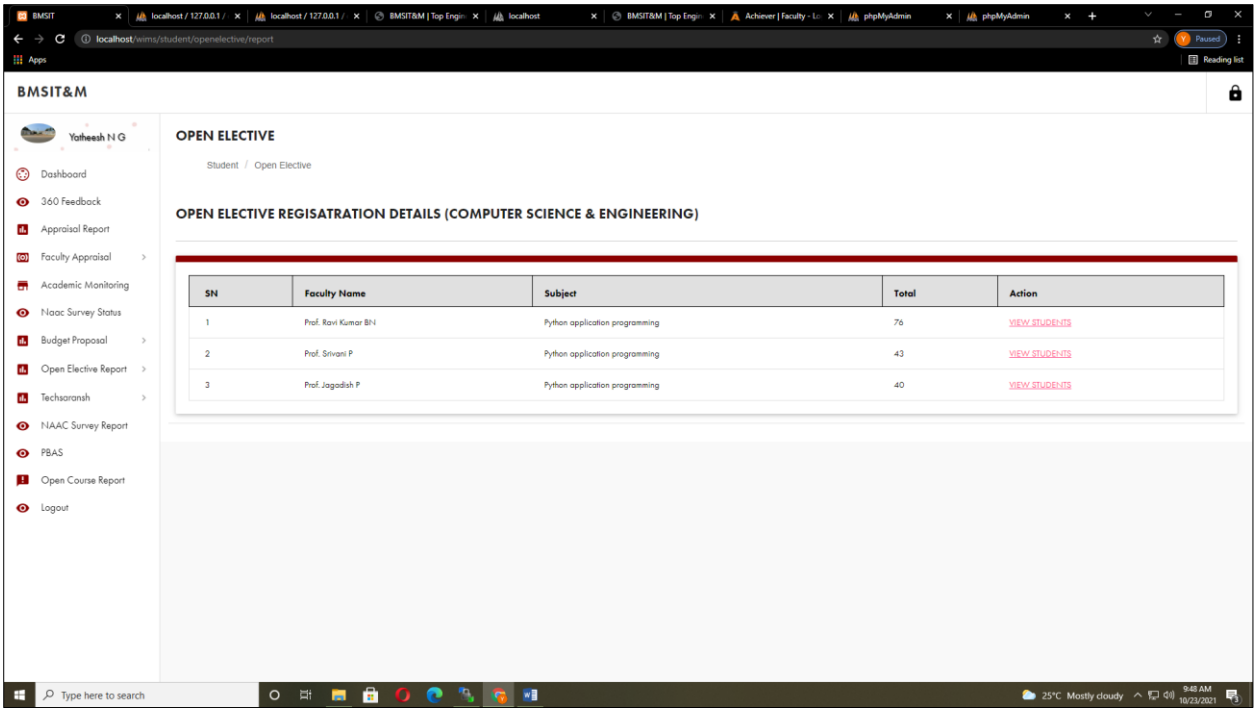


Figure 5.11 Open Elective Registration

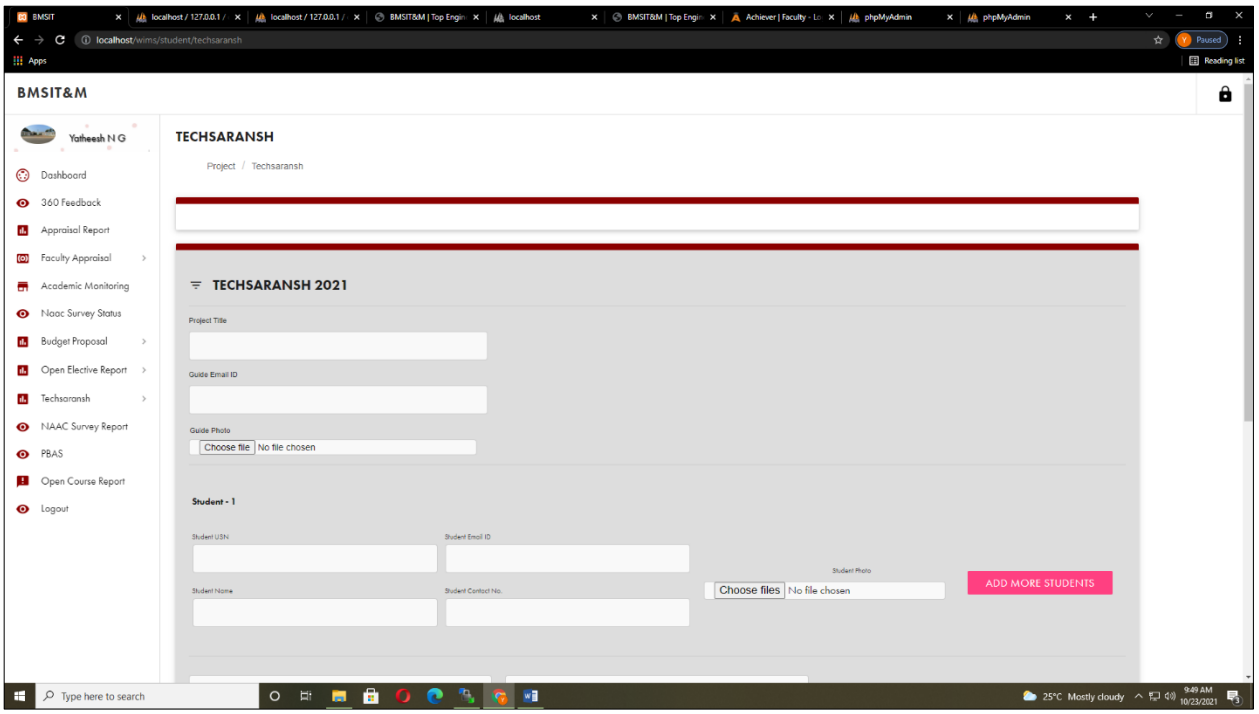


Figure 5.12 Techsaransh

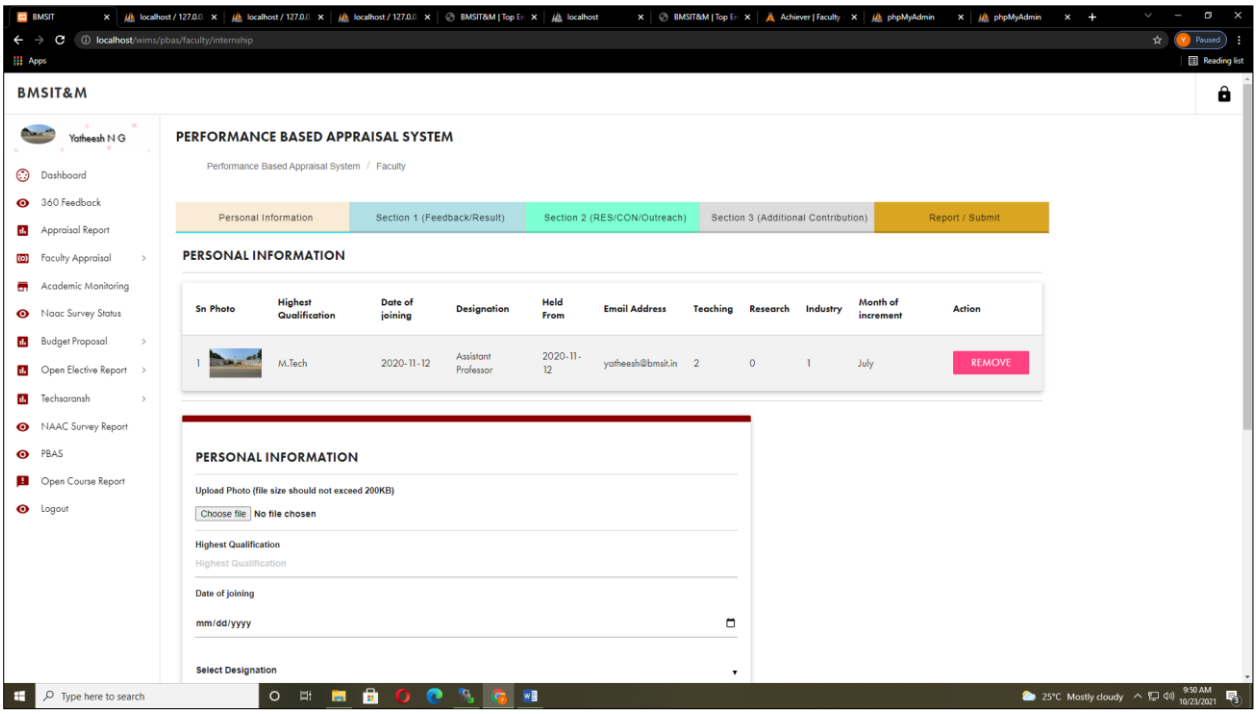


Figure 5.13 PBAS for Teaching Staff

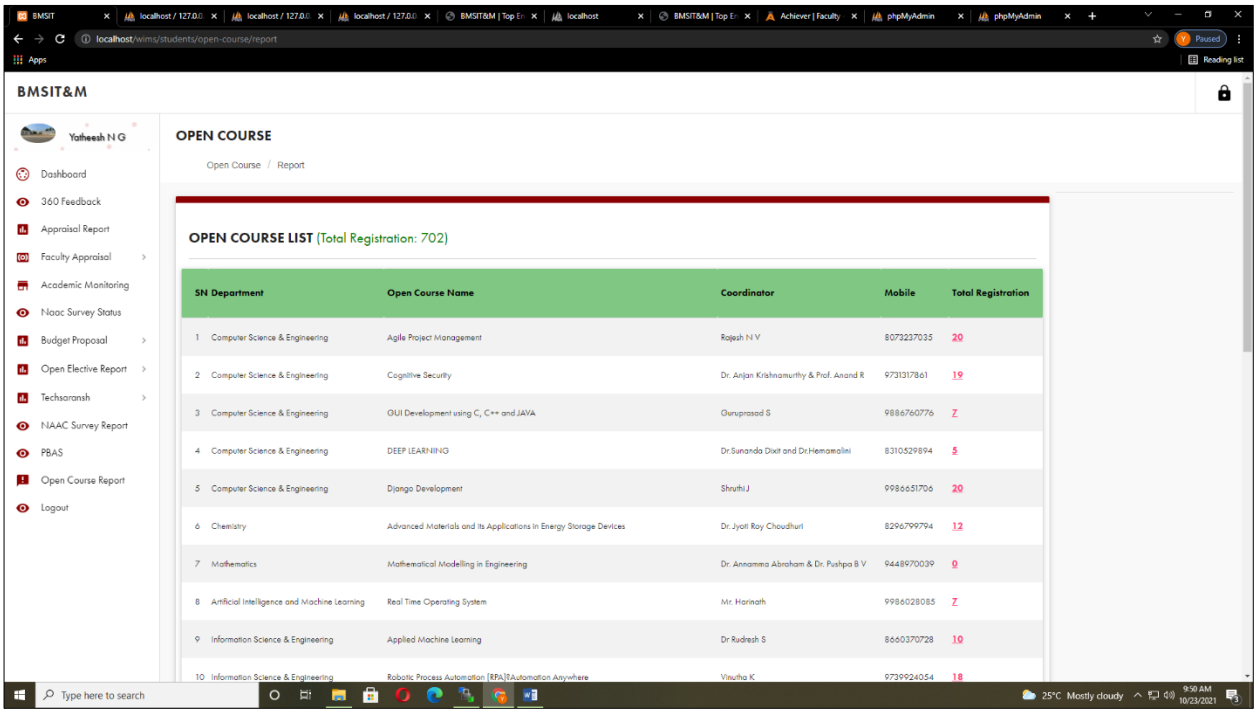


Figure 5.14 Open Course Registration

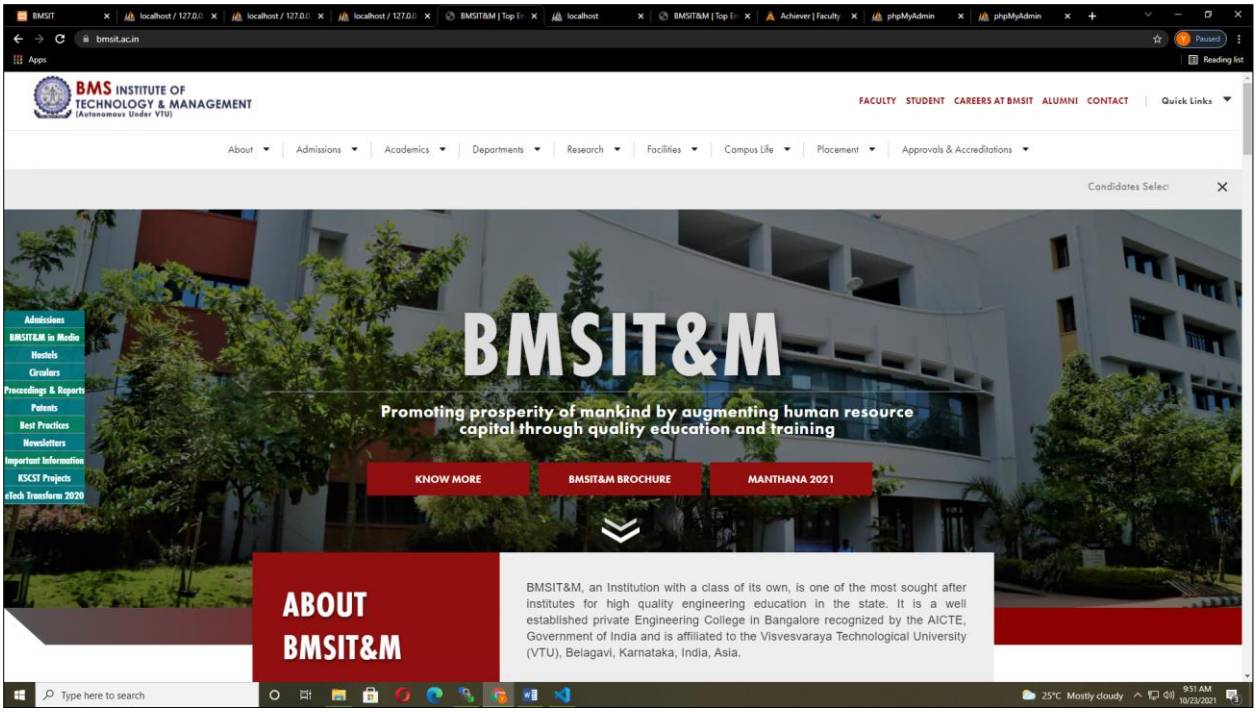


Figure 5.15 College Website

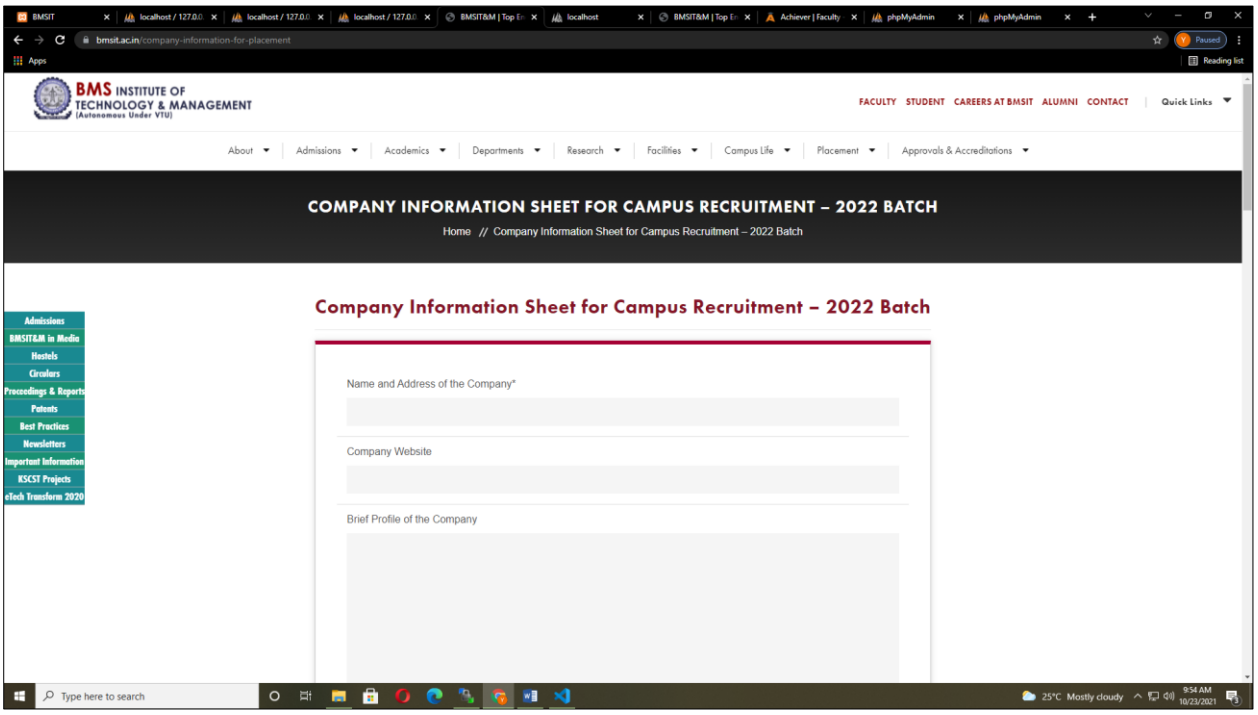


Figure 5.16 Company Information Sheet for Campus Recruitment

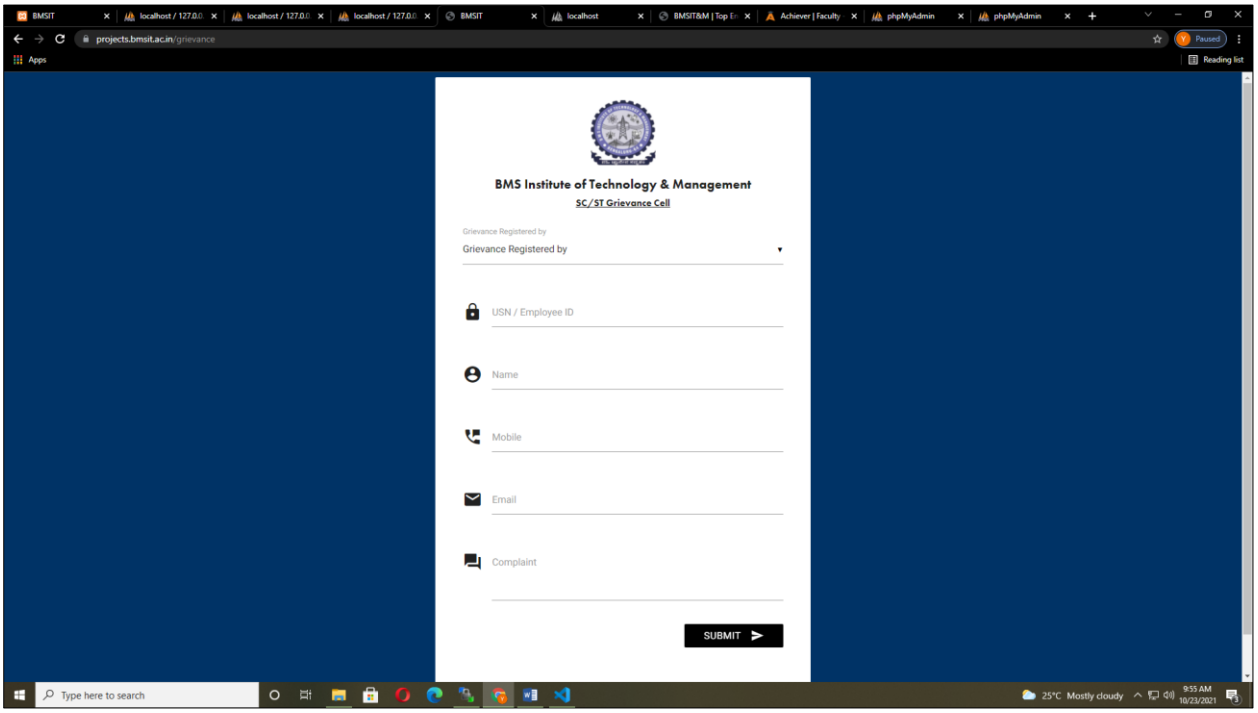


Figure 5.17 Grievance Cell

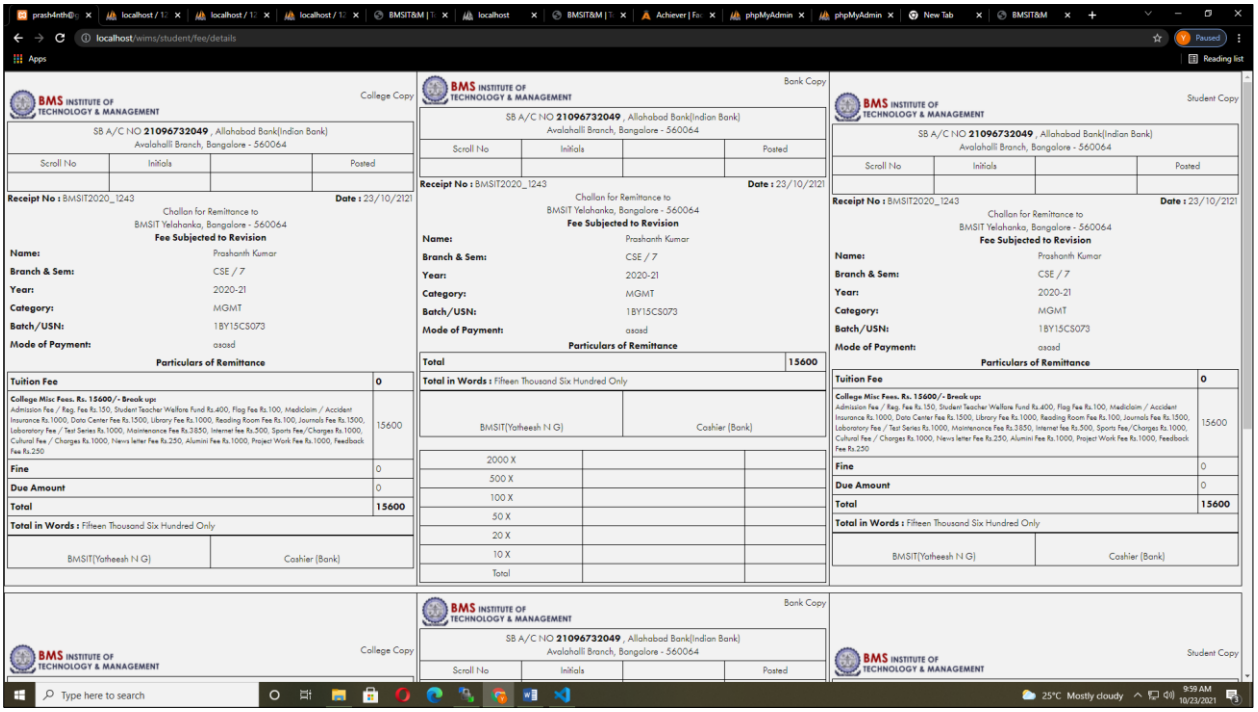


Figure 5.18 Student Fee Challan Generation

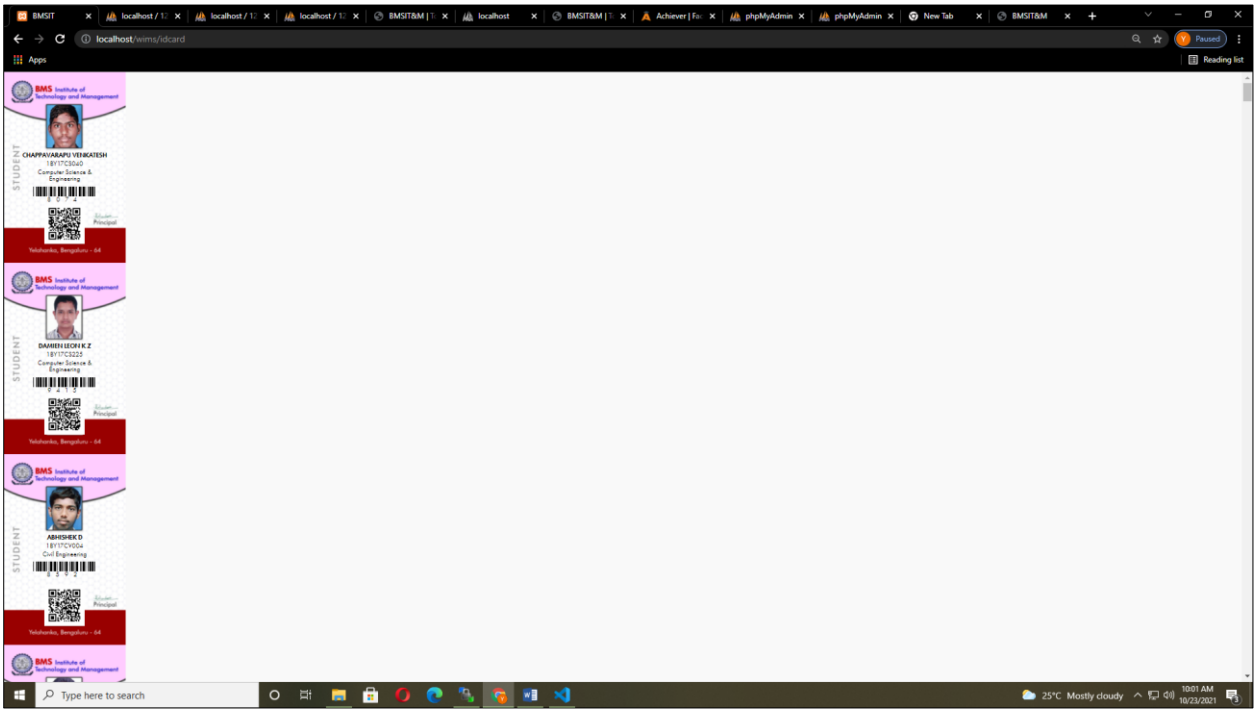


Figure 5.19 ID Card Generation

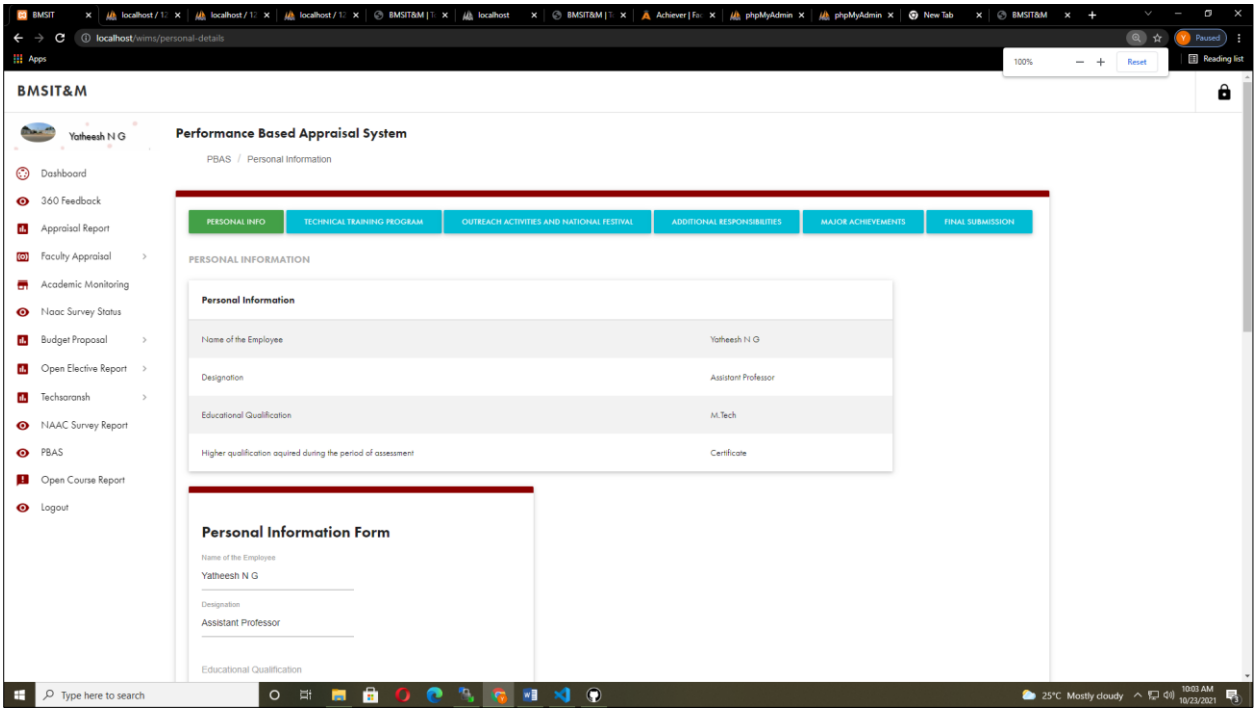


Figure 5.20 PBAS for Technical Staff

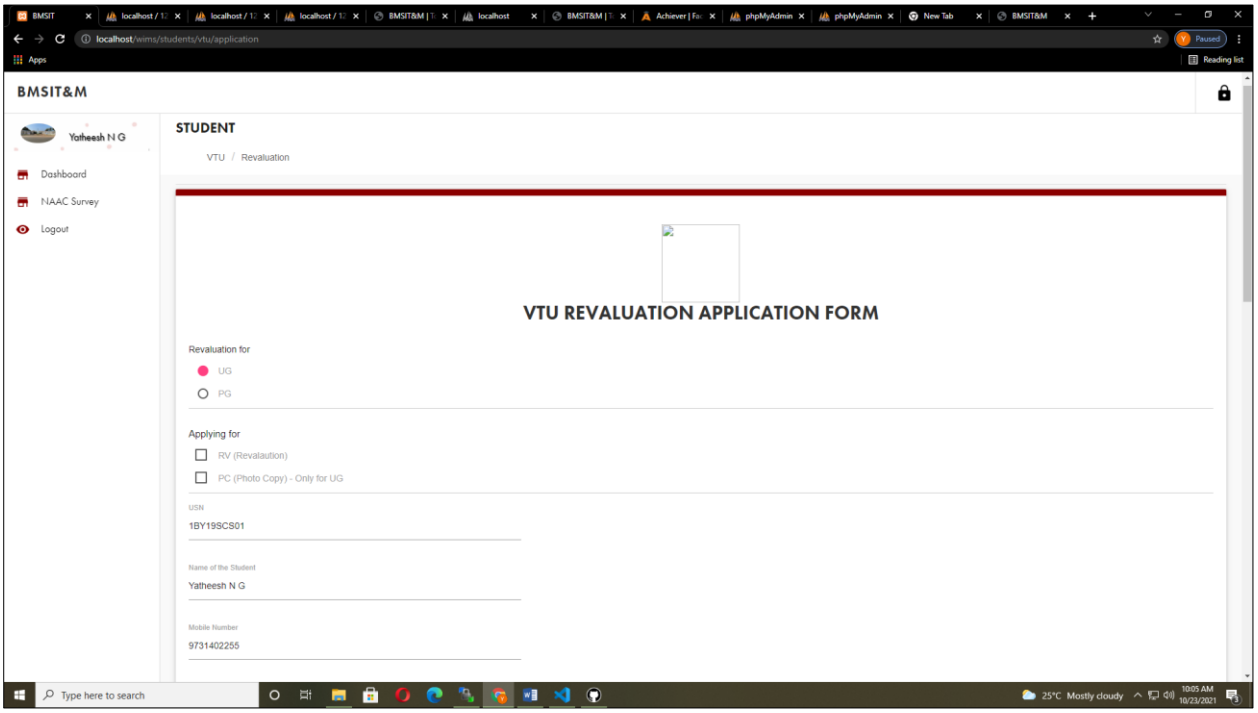


Figure 5.21 VTU Revaluation Application Form

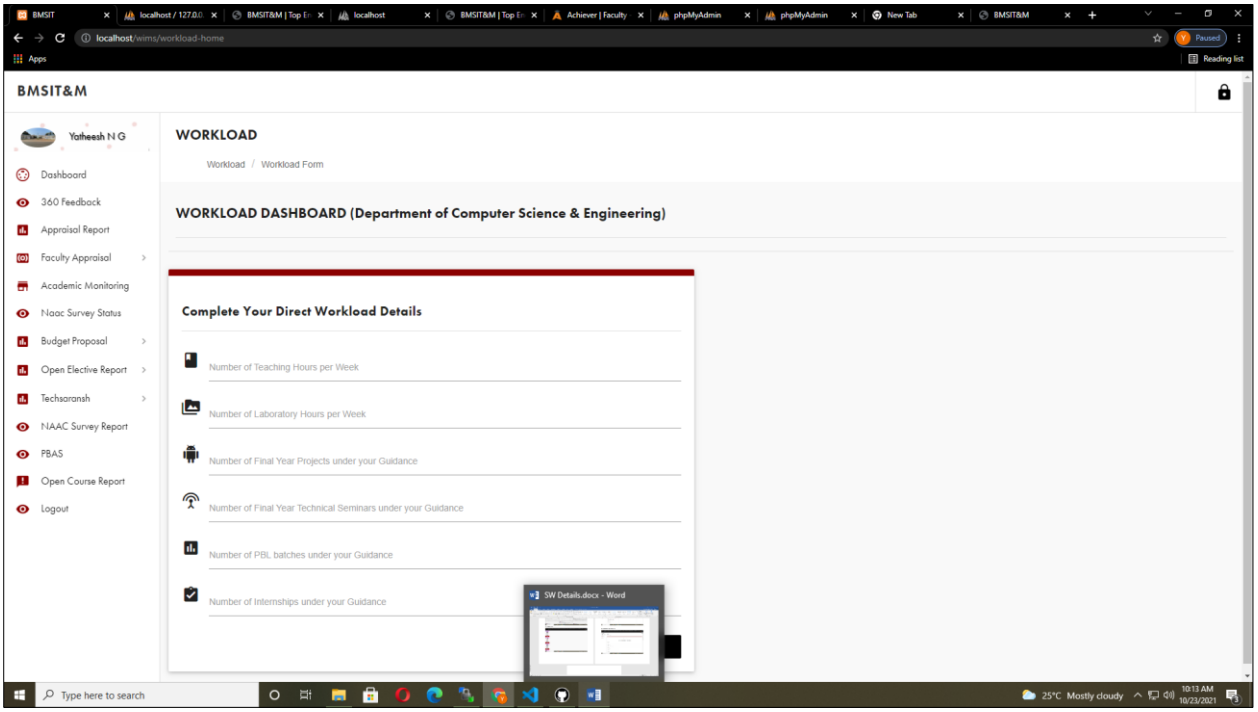


Figure 5.22 Faculty Workload Management System

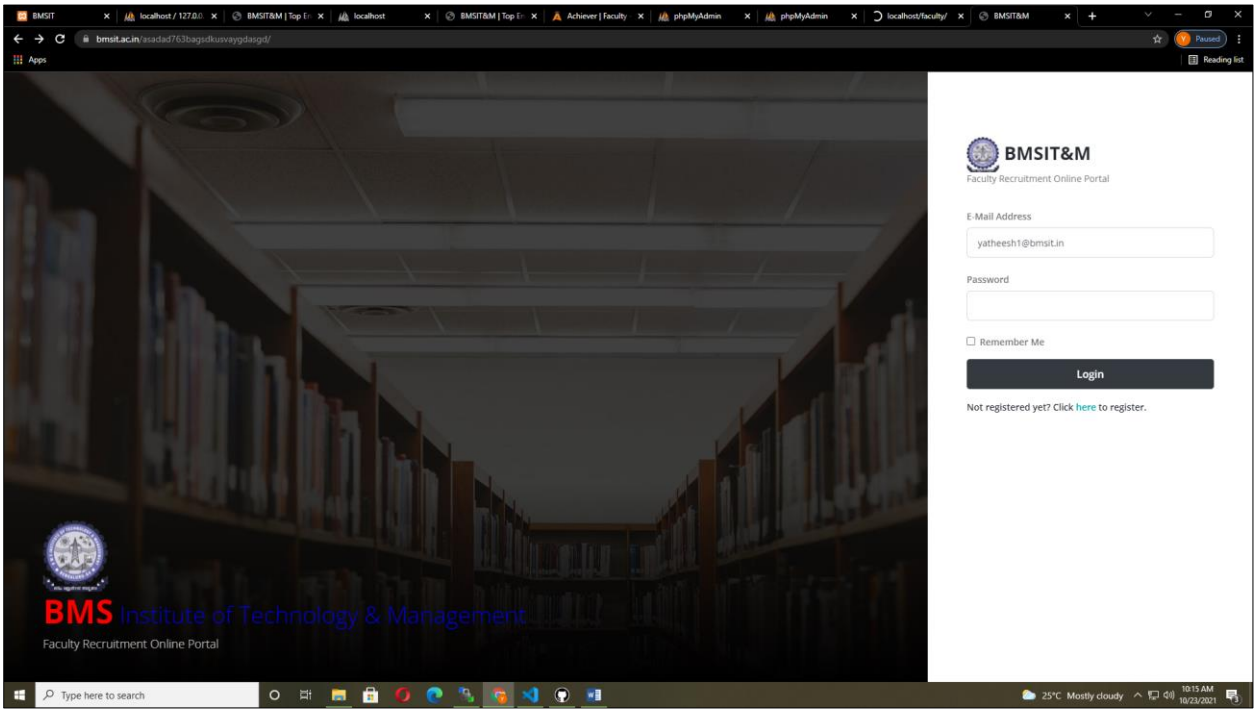


Figure 5.23 Faculty Recruitment Portal

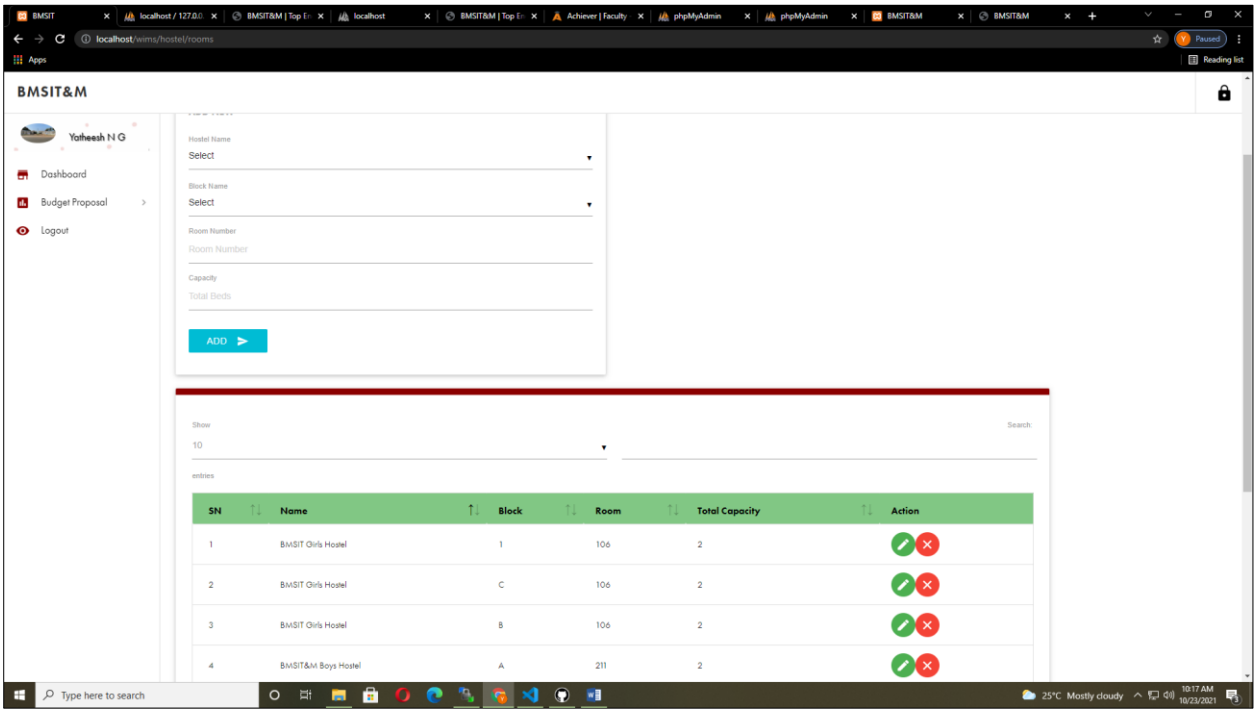


Figure 5.24 Hostel Management System

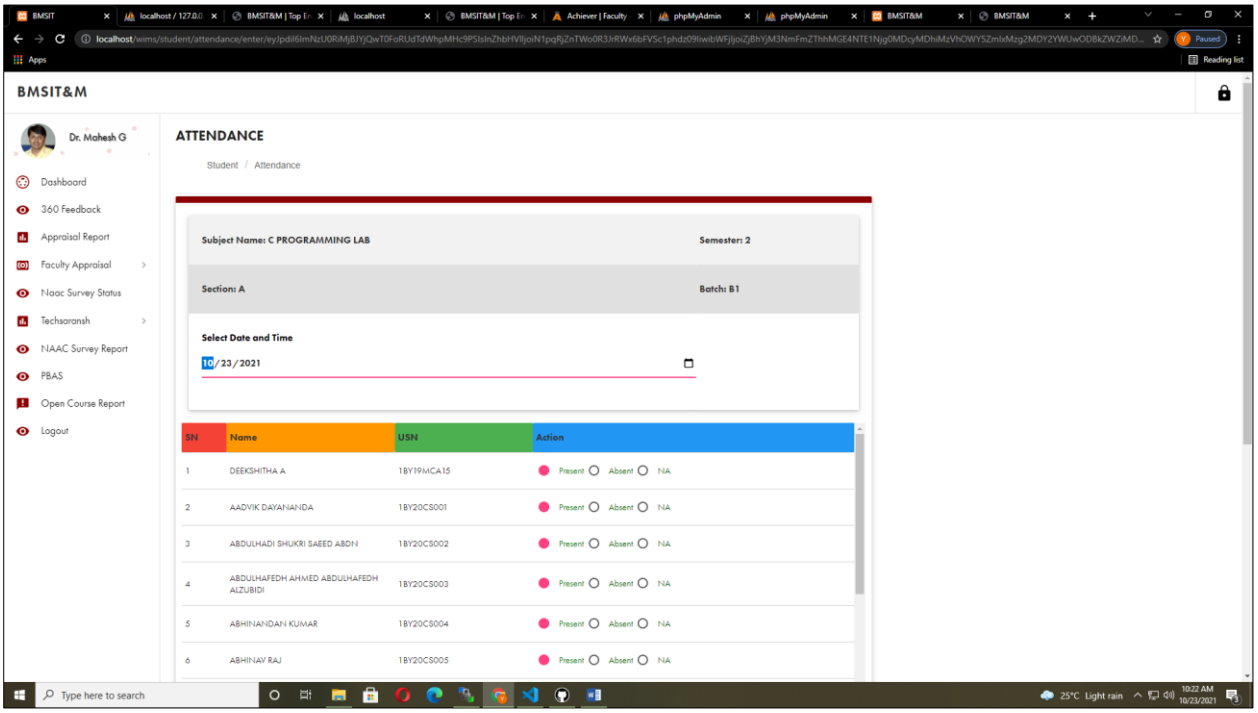


Figure 5.25 Student Attendance Management

5.2 Research facilities / Centre of excellence (30)

The Department has Research and Development Centre as well as Incubation Centre which is facilitating the students to acquire practical knowledge.

Table 5.5 Research Facility

Sr. No.	Name of the Facility	Specialized Equipment Name	Equipment details	Utilization details from the perspective of PO attainment
1	**Arayabhatta Center of Computation**	92 Computers	Intel® Core™ i7-CPU@ 3.20 GHz, 8 GB, RAM, 1-TB HDD, DVD Writer	Utilized for common computing facility
2	**Innovation Center**	10 Computers	HP 280G2 MT, RaspberryPi, Arduino, Sensors, Motors and other components to carry out IoT-based projects	• Inspire to create innovative environment • Fund innovative projects • Conduct - Awareness Programmes, Idea Contests • Motivate students to participate in various competitions, project exhibitions etc. outside

				the campus
3	**Plagiarism check software**	Turnitin	30 Licenses for 100 students	The plagiarism in project reports is prevented, engage students in the writing original project thesis and support publications
4	**MAT LAB**	MAT LAB with 46 tool boxes	30 Licenses of MAT LAB and 10 Licenses of Simulink with 46 toolboxes	Utilized for PG projects
5	**Indian TechKeys**	Printed Circuit Board(PCBs) design and fabrication, 3-D printing services, Embedded product development	IR Sensor, Temperature, Sensor (DHT11), 4-Channel Relay, 2-Channel Relay, Motion Sensor (PIR), 16X2 LCD Display, Fan, Touch sensor, 9V battery, 4digit 7-Seg, Soil Sensor, Joystick, Embedded system kit, RF Receiver and Transmitter kit, RTC Module, 4-channel push button, RPI Camera, RFID Reader +TAG, 8051 Development Kit, DTMF Receiver Module, Dot Matrix Display, XBEE Trans Receiver, Accelometer, Hall Sensor, Single Channel Relay, Metal Sensor, Lead Acid battery 12V 4200mAH, Lead Acid battery 12V 2000mAH, Lead Acid battery 6V 2A, Soil Moisture Sensor, LiPo Battery Charger, Lithium Ion Battery Charger, Transformer 15-0-15 V 2A, CNC 2D Plotter Machine, Robotic Pick and Place ARM	New Facility Created
6	**E-Yantra Robotics lab (IIT Bombay)**	Embeded Sytems, IOT, Microcontroller	2- firebird, Spark V Robot, Servo motor based gripper kit, ATmega 2560 Develpoment Board, LPC2148 Development Board, Raspberry – Pi3	New Facility Created

Figure 5.26 Incubation Centre & Research Centre

Figure 5.27 Arayabhatta Centre of Computation

Figure 5.28 Innovation Centre

Figure 5.29 Indian TechKeys Lab

Figure 5.30 E-Yantra Lab

Table 5.6 List of software

Licensed software	Open source software
Microsoft CASA Agreement	UBUNTU 14
Oracle	XAMP Server
AWS	Ardino IDE
Unity 3D	Android Studio
Adobe Animate CC 2017	
Adobe Media Encoder CC 2017	

Journals and e-book facilities

- The students have access to 24 Journals both print and e-journals and 6 packages of e-books.

	Journals
1	IETE Journal of Research
2	Indian Journal of Information Technology
3	IOSR Journal of Computer Engineering
4	Journal of Intelligent Computing
5	Journal of Internet Research
6	Journal of Mobile Computing and Applications
7	Journal of Software Engineering
8	Journal of Software Quality Assurance
9	Journal of Software Testing
10	Indian Journal of Advances in Knowledge Engineering and Computer Science
11	Indian journal of applied computational intelligence and soft computing
12	Indian Journal of Computer and Mathematical Sciences
13	Indian journal of computer science and engineering
14	Indian journal of computer systems, networks, and communications
15	Indian journal of computing and software technology
16	Indian journal of Mobile Computing
17	Journal of Hybrid Computing Research
18	Journal of Neural Computing Systems

19	IEEE-IEL
20	Elsevier
21	Springer nature
22	Taylor & Francis
23	Institution of Civil Engineers
e-books	
1	Elsevier
2	Taylor & Francis
3	McGraw Hill Education
4	New Age International
5	Packt
6	K-nimbus

These facilities are provided to students for carrying out their project work, R&D and report writing. These facilities contribute to achievement of PO1, PO2 & PO5.

Usage statistics of TURNITIN

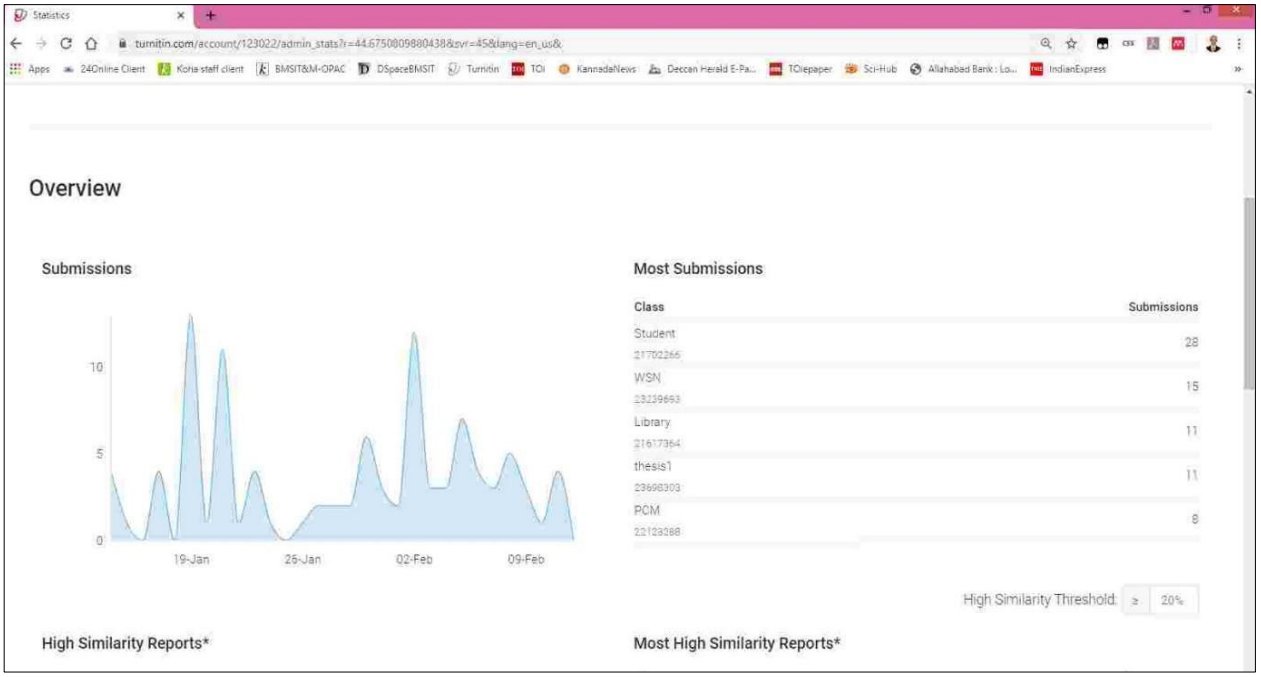


Figure 5.31 (a) TURNITIN usage

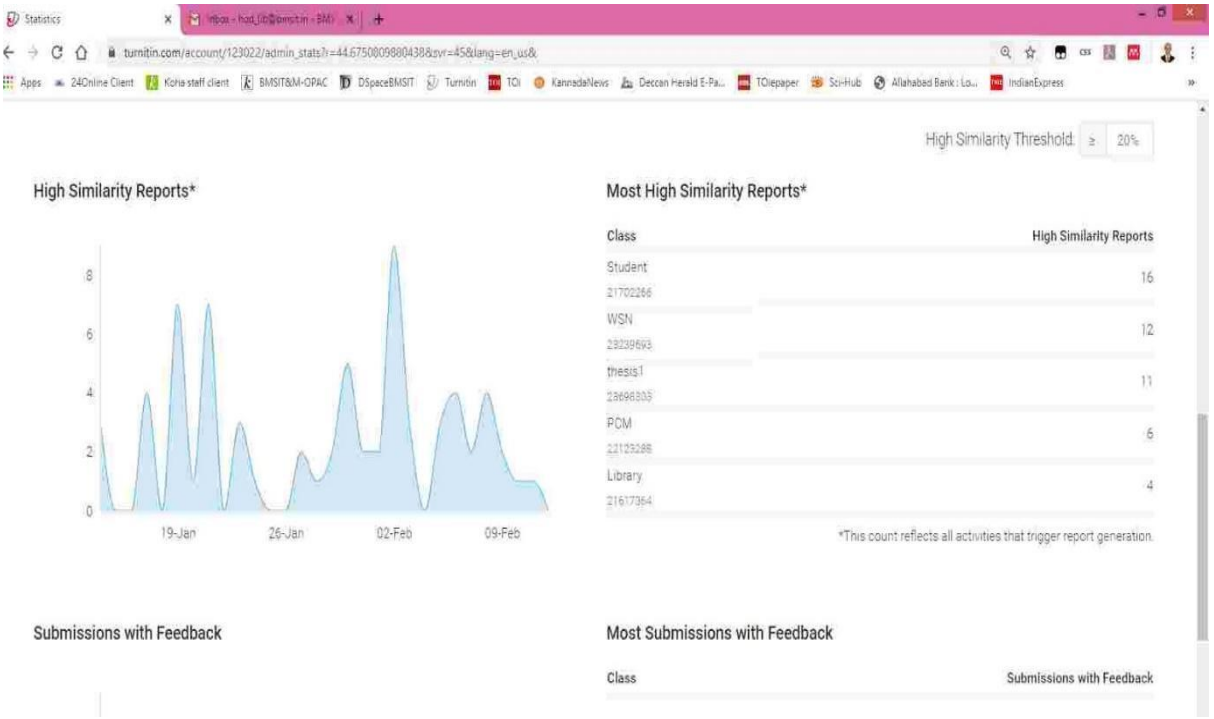


Figure 5.31 (b) TURNITIN usage

Publication Statistics by utilizing the research facilities:

PG Student publications:

Academic Year	2020-21	2019-20	2018-19
No. of International Journals	05	09	06
No. of International Conferences	02	01	-
No. of Publications	07	10	06

Figure 5.32 Publications of PG students

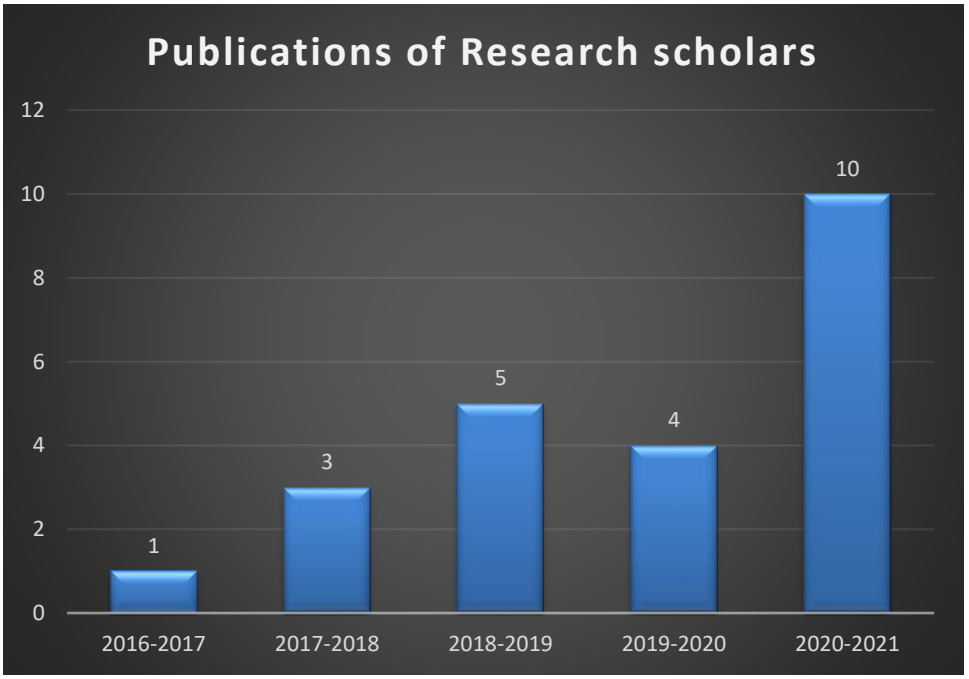


Figure 5.33 Publications of research scholars

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

a) Access to Laboratory facilities

The students are provided access to the laboratories and research facilities during all working days from 8:30 AM to 4:30 PM.

b) Training in the use of Equipment

- The faculty coordinators provide necessary guidance and support to utilize the research facilities
- The lab instructor, faculty in-charge and the project guides assist the students in conducting the laboratory experiments and the projects

ICT Academy Membership Deliverables for the year 2020 – 21:

Faculty Development Programs:

One faculty development program (3 days or 5 days) will be hosted at your institution at no cost access to FDP Programs 3 Faculty Members can be nominated in every FDP conducted in various locations of Karnataka & across India. Minimum of 10 faculty members or any number of faculty members will be trained on various technology and soft skill faculty development programs conducted in the state and access to attend FDP programs conducted by ICT Academy across India.

ICT Academy Research Journals:

- ICTACT Journal on Communication technology
- ICTACT Journal on Image and video processing
- ICTACT Journal on Soft computing
- ICTACT Journal on Microelectronics
- ICTACT Journal on Management studies
- ICTACT Journal on Data Science and Machine Learning

Online Access to journals and the faculty members can submit the papers to the journals at no cost. Inviting Industry leaders as chief guest for your National and International Conferences

Student Skill Training:

International certification and training programs from Corporate Partners of ICT Academy (DELLEMC, VMware, Autodesk, Salesforce) for the students at subsidized cost. New Partners added are Automation Anywhere and Mathworks

Industry Supported Lab with Indian TechKeys

About Indian Tech Keys: Indian Tech Keys is an Indian startup that provides services like; Printed Circuit Board(PCBs) design and fabrication, 3-D printing services, Embedded product development, industry interaction programs, hands-on sessions or workshops, E-store supply and innovation labs. It is headquartered in Baiyappanahalli extension road, Near Swami Vivekananda Road metro, Bengaluru, Karnataka 560038. It was started in the year 2016 and is growing till date. There are two major departments or wings in the company: R&D (Research and Development) in the field of industrial automation and smart city products and also has Service Sector (SS) in which the team is involved in providing the technical support for small scale industries along with educational institutions and different universities in Karnataka. Indian Tech Keys mainly focuses on providing hands-on experience to students of graduation and post-graduation cadre and faculties. The company's motive is to bridge the gap between student community and current technologies by conducting workshops on recent technological advancements like that of PCB, ARM, Arduino, Robotics, Copters and Android tools.

Inauguration of Indian TechKeys Lab with Dept of CSE, BMSIT&M

Dr. Usha B A, Associate Professor, Department of CSE is working as Faculty Coordinator in bridging the gap of Industry and academia requirements by establishing the lab.

Figure 5.34: Inauguration by Principal, BMSIT&M and Director of Indian TechKeys Lab

Figure 5.35: Group Photo with Faculty and Students of BMSIT&M

Table 5.7 Details of Equipment/Facilities

1	IR Sensor	13	Embedded system kit	25	Hall Sensor
2	Temperature Sensor (DHT11)	14	RF Receiver and Transmitter kit	26	Single Channel Relay
3	4-Channel Relay	15	RTC Module	27	Metal Sensor
4	2-Channel Relay	16	4-channel push button	28	Lead Acid battery 12V 4200mAH
5	Motion Sensor (PIR)	17	RPI Camera	29	Lead Acid battery 12V 2000mAH
6	16X2 LCD Display	18	RFID Reader +TAG	30	Lead Acid battery 6V 2A
7	Fan	19	8051 Development Kit	31	Soil Moisture Sensor
8	Touch sensor	20	DTMF	32	LiPo Battery Charger
9	9V battery	21	Receiver Module	33	Lithium Ion Battery Charger
10	4digit 7-Seg	22	Dot Matrix Display	34	Transformer 15-0-15 V 2A
11	Soil Sensor	23	XBEE Trans Receiver	35	CNC 2D Plotter Machine
12	Joystick	24	Accelometer	36	Robotic Pick and Place ARM

Desirable Outcomes (learning that students would be getting):

- Concept to Product development skill.
- Exposure to Analogue and Digital ICs.
- Schematics capture, PCB foot print design skill using Design spark (Open Source) software.
- Unit testing, Quality Check and Circuit debugging skill development.
- Clear understating of PCB fabrication process.
- Exposure to methodology of innovative product development.
- Customized Case designing for the product.
- Exposure to Industry Graded Embedded system coding
- Logic Gates implementation in Embedded system programming.
- AVR Controller/Raspberry Pi software.
- Unit testing, Quality Check and Circuit debugging skill development.
- Exposure to methodology of innovative embedded product development.

- Multiple sensors introduction and integration with AVR/Raspberry Boards.
- Driver circuits introduction and integration with AVR/Raspberry Boards.
- Interfacing DTMF, Bluetooth & Wi-Fi Modules with microcontroller/processor.
- Exposure to Embedded Python and Embedded C Programming.

Figure 5.36 Project Training

MATLAB & TURNITIN training

The training for the use of Turnitin software is provided for every batch of PG students in first semester.

Figure 5.37 (a) TURNITIN Training

The training for the use of MATLAB is provided for every batch of PG students in second semester.

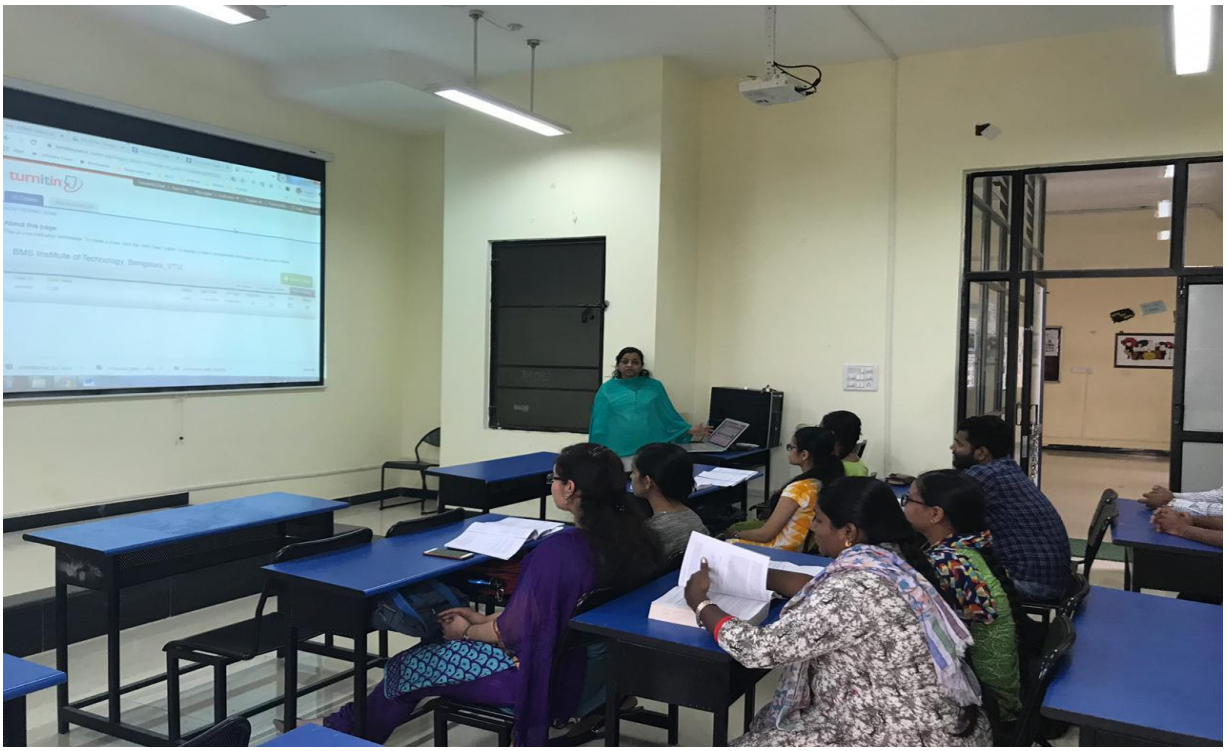


Figure 5.37 (b) TURNITIN Training

Figure 5.38 MATLAB Training

6 CONTINOUS IMPROVEMENT (75)

6.1 Actions taken based on the results of evaluation of each of the POs (25)

Table 6.1: PO observation and action taken for 2018-20

PO	Target Level	Attainment Level	Observations
PO1	***1.8***	***1.54***	It was observed that the students were able to analyze and formulate problems.
	Independently carry out research and development work to solve practical problems related to Computer Science and Engineering domain.		
Action 1	Encouraged students to present research ideas in conferences and journals.		
Action 2	Students were encouraged to conduct exclusive literature survey to have better understanding of current research issues.		
PO2	***1.8***	***1.79***	It was observed that presentation and documentation skill was strengthened.
	Write and present a substantial technical report/document.		
Action1	Inclusion of Technical seminar, mini project improved the ability to present and document report.		
Action 2	Introduction of Subject based assignments improved the reporting skills.		
PO3	***1.8***	***2.18***	It was noticed that mastery level over the subjects was Consistent.
	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.		
Action 1	The number activities under value added programs were strengthened.		
PO4	***1.8***	***1.92***	Exposure to domain knowledge through various activities improved the analytical thinking.
	Analyze the acquired domain knowledge for providing feasible solution(s).		
Action 1	Technical quiz and poster presented were conducted to improve the domain knowledge.		
Action 2	Assignments on various topics related to their course improved their exposure beyond the curriculum.		
PO5	***1.8***	***1.72***	More opportunities are required for industrial exposure.
	Relate the learning outcomes to build requisite competency in professional environment.		
Action 1	Students were provided opportunity to present their work in open platform.		
Action 2	Industry interactions was improved.		
PO6	***1.8***	***1.78***	Significant improvement is seen in learning outcomes.
	Appraise the need for engaging in lifelong learning.		

Action 1	Projects provided by the industry was taken up.
Action 2	Students were trained in emerging technologies.

Table 6.4: PO observation and action taken for 2019-21

PO	Target Level	Attainment Level	Observations
PO1	***1.8***	**1.66**	▯ It was observed that the students were able to analyse and formulate problems.
	Independently carry out research and development work to solve practical problems related to Computer Science and Engineering domain.		
Action 1	Encouraged students to present research ideas in conferences and journals. All students have either presented their work in conferences or submitted their work to journals and patent.		
Action 2	Students were encouraged to conduct exclusive literature survey to have better understanding of current research issues.		
PO2	***1.8***	**1.89**	▯ It was observed that presentation and documentation skill was strengthened.
	Write and present a substantial technical report/document.		
Action1	Inclusion of Technical seminar, mini project improved the ability to present and document report. The writing skills and of students and their plagiarism rate has been significantly improved.		
Action 2	Introduction of Subject based assignments and improved the reporting skills.		
PO3	***1.8***	***2.05***	▯ It was noticed that mastery level over the subjects was Consistent.
	Demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.		
Action 1	The number activities under value added programs were strengthened.		
PO4	***1.8***	***1.87***	▯ Exposure to domain knowledge through various activities improved the analytical thinking.
	Analyse the acquired domain knowledge for providing feasible solution(s).		
Action 1	Technical quiz and poster presented were conducted to improve the domain Knowledge.		
Action 2	Assignments on various topics related to their course improved their exposure beyond the curriculum.		
PO5	***1.8***	***1.84***	▯ More opportunities are required for industrial exposure.
	Relate the learning outcomes to build requisite competency in professional environment.		

Action 1	Students were provided opportunity to present their work in open platform. Open source software were provided in MTech lab for students to use and explore.		
Action 2	Industry interactions was improved through expert talk, internship and workshops.		
PO6	***1.8***	***1.84***	The value is dropped compared to the previse batch, even though improvement is seen in learning outcomes.
	Appraise the need for engaging in lifelong learning.		
Action 1	Emphasis on projects provided by the industry. Students were able to take up industrial projects.		
Action 2	Students were trained in emerging technologies. Open course sessions were attended by the students.		

6.2 Improvement in Quality of Projects (10)

Quality of Projects for Postgraduate are defined in 3 components

1) Faculty Specialization in the Domain Area.
2) Publication for each project.
3) PO attainment.
4) Classification of Project

Faculty Specialization in the Domain Area.

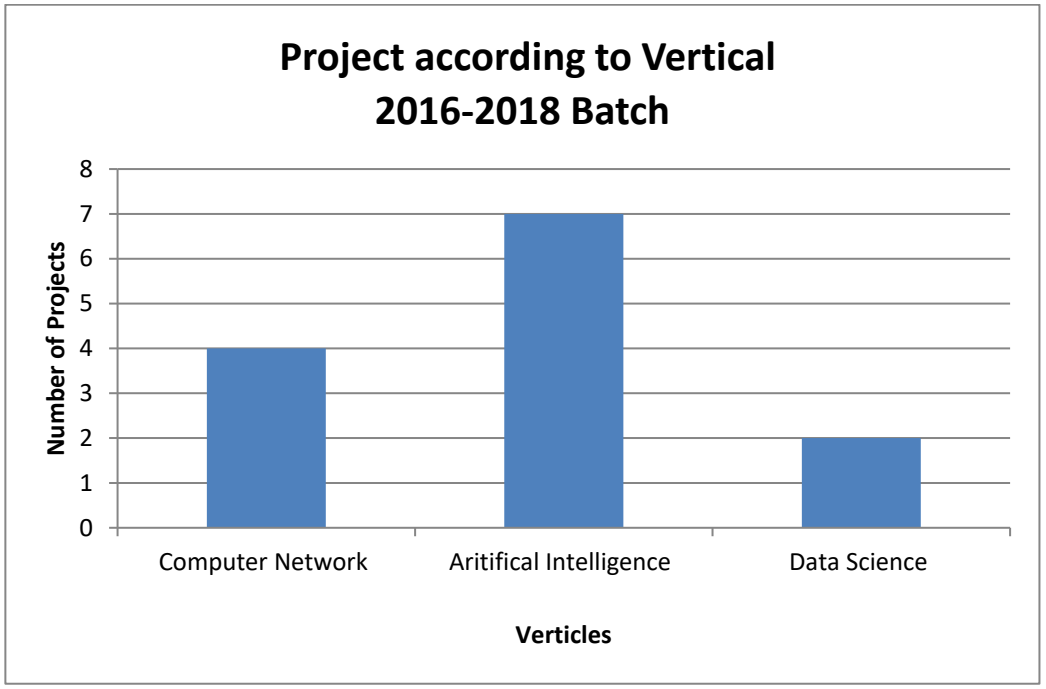
The research domain of each faculty are divided into different verticals and Project to PG students are allocated according the vertical so that PG will get involved in Research activity that will be carried out by faculty

Project list of 2016-18 batch according to Faculty Specialization

USN	Student Name	Project Guide	Project Title	Project Type
1BY16SCS01	AISHWARYA S	Mrs. Chethana C	Implementation of Privacy preserving Decision Control System for Photo Publishing in online Social Medis	Aritifical Intelligence
1BY16SCS02	AKSHATHA T	Dr.Bharathi Malakreddy A	IOT Embedded Multi-Purpose Agricultural BOT using Solar Energy Based	Aritifical Intelligence
1BY16SCS03	Aplana Kushwaha	Dr.Anil G N	Securing the Authentication Mechanism for Implementing Secret Password	Computer Network

1BY16SCS04	ANURADHA V	Mr.Shankar R	Framework Enhancement for Common Public Radio Interface In SBTS	Aritifical Intelligence
1BY16SCS05	GURUPRASAD HIREMATH	Dr.Bharathi Malakreddy A	Cold Start Product Recommendation by Socializing e-Commerce	Aritifical Intelligence
1BY16SCS06	HINDU SINDHURA Y	Mr.Anand R	Data Processing Using Clustering Algorithm	**Data Science**
1BY16SCS07	MEHEBUB RAHMAN	Dr.Bharathi Malakreddy A	Early detection of childhood diseases	Aritifical Intelligence
1BY16SCS08	NAYAN R	Dr.Bharathi Malakreddy A	IOT Based Passenger Count System in Public Transport	Computer Network
1BY16SCS09	P JOSEPHINE SORNA	Mrs.Radhika K R	A Performance Efficient Approach for Parallel Mining of frequent Item sets	Data Science
1BY16SCS10	PRAMILA MARY A	Dr.Thippeswamy G	Leaf quality Hyperspectral imaging Technology	Aritifical Intelligence
1BY16SCS11	SARIKA C G	Mrs. Shruthi J	Speech Based wheel Chair Control using Android Bluetooth Technology	Aritifical Intelligence
1BY16SCS12	TEJA REDDY	Dr.Bharathi Malakreddy A	Weight based Smart assistance medicine tracker and refill system For secured Healthcare	Computer Network
1BY16SCS13	VIBHA VINOD	Mrs. Durgadevi G Y	Spam Detection Framework Using Sentimental Analysis	Computer Network

Computer Network	Artificial Intelligence	Data Science
4	7	2

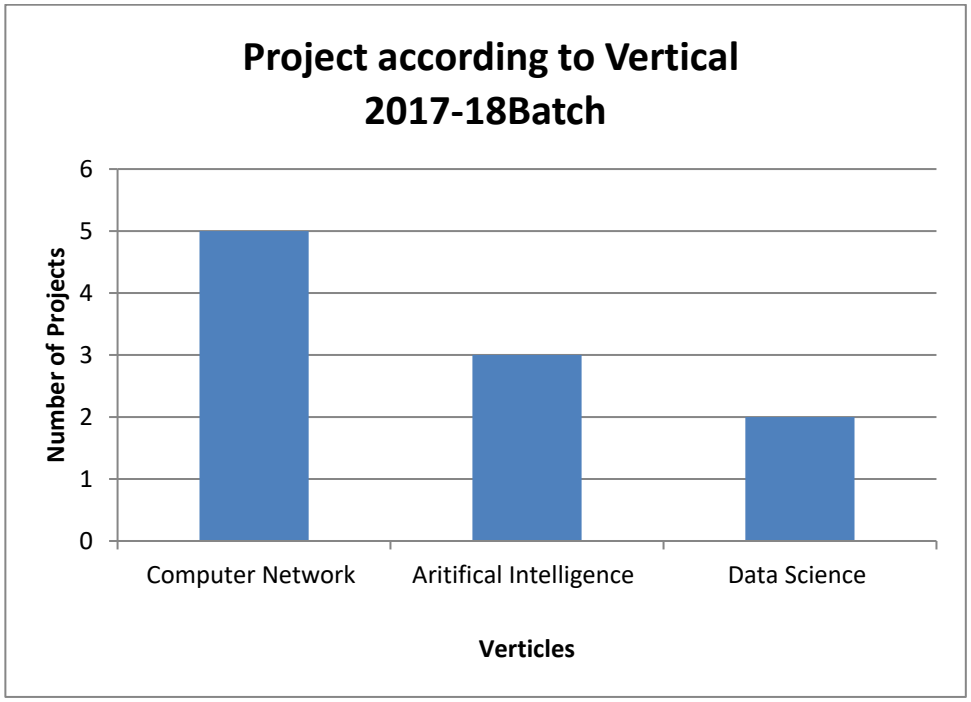


Project list of 2017-19 batch according to Faculty Specialization

USN	Student Name	Project Guide	Project Title	Project Type
1BY17SCS02	KUSUMA S S	Dr. ANIL G N	Military Iot System Air Pollution Detection And Power Management	Computer Network
1BY17SCS03	LAXMI JADHAV	Mrs.VIDYA R PAI	Implementaion & Testing Of Soil Analysis In Cultivation Land Using Iot	Computer Network
1BY17SCS04	MEGHA S M	Mrs.CHETHANA C	Cyber Attack Detection Using Machine Learning	Aritifical Intelligence
1BY17SCS05	MINU CORREYA	Dr. THIPPESWAMY G	Expression Invariant Face Recognition Using Convolutional Neural Networks	Aritifical Intelligence
1BY17SCS06	NIKHIL	Mr.ANANAD R	Comparision Study Of Machine Learning Algorthims For Spam Detection In Twitter	Data Science

1BY17SCS07	PRATHAMA	Dr. THIPPESWAMY G	Age Invariant Face Recognition.	Aritifical Intelligence
1BY17SCS08	PRIYANKA P	Dr.BHARATHI MALAKREDDY	An Iot Based Smart Health Monitoring System For Animal	Computer Network
1BY17SCS09	RAKSHITHA K S	Mrs. RADHIKA K R	Iot Based Groggy Driving Alterting And An Traffic Collision	Data Science
1BY17SCS10	SHIVALEELA S P	Dr.BHARATHI MALAKREDDY	Smart Washoom Cleaning System Using Image Processing And Iot	Computer Network
1BY17SCS11	SRUTHI KRISHANA U	Dr. ANIL G N	Secure Patient E - Health Record Using Blockchain Technology	Computer Network

Computer Network	Artificial Intelligence	**Data Science**
5	3	2

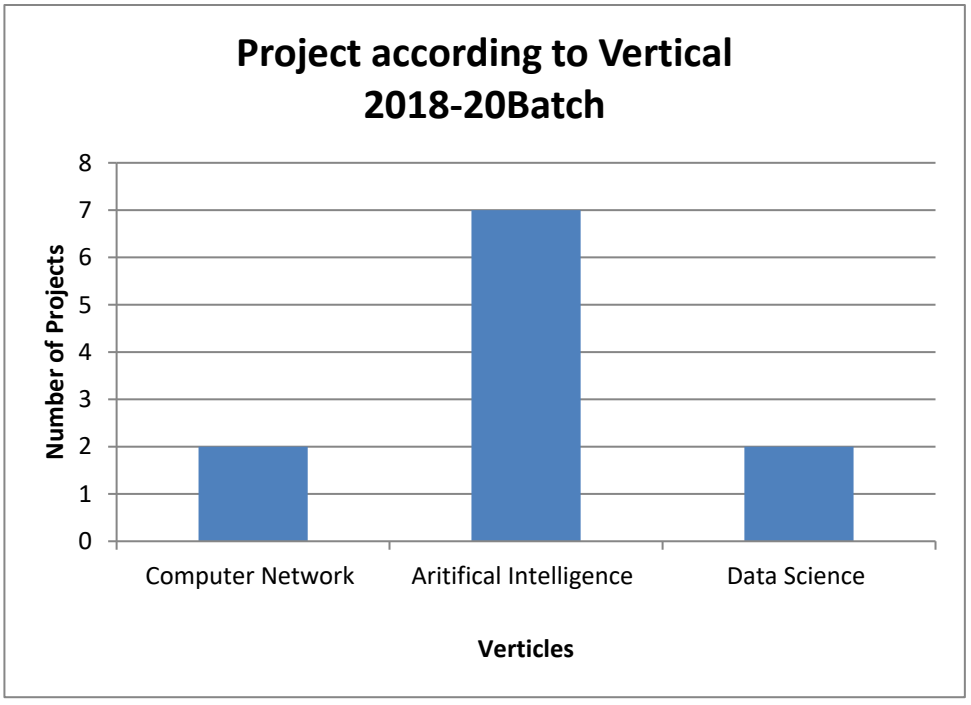


Project list of 2018-20 batch according to Faculty Specialization

USN	Student Name	Project Guide	Project Title	Project Type
1BY18SCS01	BHAGYASHREE A V	Dr. Anjan Krishnamurthy	Detection Of Phishing Websites Using Machine Learning Techniques	Computer Network
1BY18SCS03	DIVYASHREE S	Dr. Bharathi M A	Mie Scattering Phenomenon Modelling Using DGTD Method For Bio Sensing Applications	Computer Network
1BY18SCS04	FASIHA KAUSAR	Dr. Satish Kumar T	Quadcopter drone for multi machine tasks	Artificial Intelligence
1BY18SCS05	KAVERI T HOMBAL	Prof. Radhika K R	Efficient Subspace Clustering Of High Dimensional Data Using FGK-Means Algorithm	Data Science
1BY18SCS06	NAVEEN KUMAR K V	Dr. Anil G N	Smart Assistive System For Visually Impaired People	Artificial Intelligence
1BY18SCS07	P PRAJWALA	Dr. Anupama H S	Epileptic Seizure Prediction Using Different Machine Learning Techniques	Artificial Intelligence
1BY18SCS08	PURUSHOTHAM NAIDU V	Prof. Ambika G N	Narrow Band Internet Of Things (NB-Iot) Based Soil Quality Monitoring System To Enhance Crop Yield	Artificial Intelligence

1BY18SCS09	RAJESHWARI N	Prof. G Y Durga Devi	Portable Spirometer For Copd Patients Using Iot	Artificial Intelligence
1BY18SCS10	RAMYA PL	Dr. Anil G N	Iot based pattern recognition using OCR	Artificial Intelligence
1BY18SCS12	SNEHA S	Dr. Bharathi M A	Approach For Classification Of Mammogram Images Using Deep Learning Techniques	Artificial Intelligence
1BY18SCS13	SRIVATSA RAJU S	Prof. Shruthi J	Forecasting & Detection Of Flood Using Random Forest Learning Method	Artificial Intelligence
1BY18SCS14	SUDHANSHU GUPTA	Prof. Anand R	Detection Of Fraud Application Using Sentimental Analysis	Data Science

Computer Network	Artificial Intelligence	Data Science
2	7	2

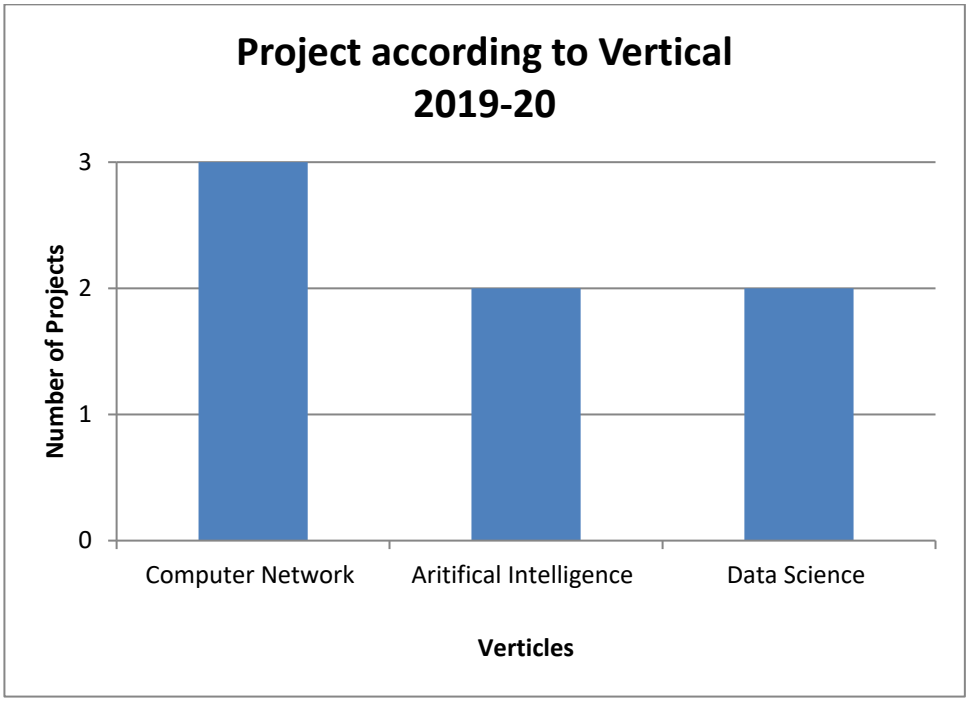


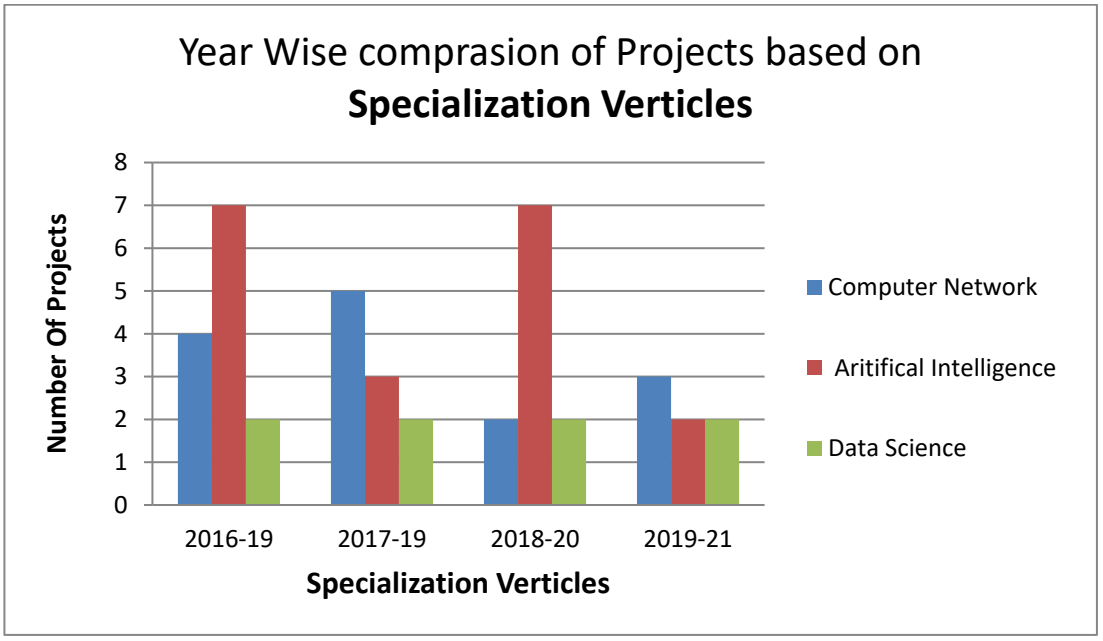
Project list of 2019-21 batch according to Faculty Specialization

USN	Student Name	Project Guide	Project Title	Project Type
1BY19SCS01	Deepthi M	Dr. Thippeswamy G	Ethnicity Identification	Computer Network

1BY19SCS02	Gautham S K	Dr. Anjan Krishnamurthy	CNN Based security authentication for wireless multimedia network	Computer Network
1BY19SCS03	Madeha Kauser	Dr. Satish Kumar T	Analysis of soil and leaf texture using machine learning Technique	Artificial Intelligence
1BY19SCS04	Meghana Kumar K J	Dr. Bharathi M A	Predication of COVID 19 severity using patients PHR	Data Science
1BY19SCS05	Pujitha J	Dr. Mahesh G	Stock Market Prediction	Data Science
1BY19SCS06	Tejaswini A Kantanavar	Dr. Sunanda Dixit	Myocardial blood flow quantification for evaluation of coronary artery disease using CNN Algorithm	Artificial Intelligence
1BY19SCS07	Varshini N	Prof. Radhika K R	IoT Enabled Real time aquarium monitoring system	Computer Network

Computer Network	Artificial Intelligence	Data Science
3	2	2





Observation:

Students are allocated projects according to faculty Specialization so that students can get involved in research activities of faulty and the above graph indicate that students are constantly allocated with project in current research area like Artificial intelligence which increase the quality of project students have done and which indirectly expose students to research activity(PO1) .

Publication Quality of project.
2016-18 batch

S.no	Name of the Student & USN	Paper title	Name of the Journal	Indexing
1	Aishwarya S 1BY16SCS01	Implementation of Privacy preserving Decision Control System for Photo publishing in online social media	International Journal of Creative Research Thoughts, Volume: 6, Issue:2 , April 2018 ISSN: 2320-2882	Google Scholar Thomson Reuters
2	Akshata T 1BY16SCS02	Solar energy based Iot based embedded multipurpose agricultural BOT	International Journal of innovations in Engineering and Technology, May 2018, ISSN:2319-1058	Google Scholar Thomson Reuters
3	Anuradha V 1BY16SCS04	Framework Enhancement for Common public ration Interface in SBTS	International Journal of Engineering and Technology, Volume:7, 2018	Google Scholar
4	Hindu Sindhura Y 1BY16SCS06	Data Processing using Clustering Algorithm	International Journal of Computer Science and Network, Volume:7, Issue:2,April 2018 ISSN (ONLINE): 2277-5420	Elsevier mendeley Google Scholar
5	Nayana R 1BY16SCS08	IoT based passenger Count System in public transport	International Journal of innovations in Engineering and Technology, May 2018 ISSN:2319-1058	Google Scholar Thomson Reuters

6	Sarika C G 1BY16SCS011	Survey on Socially Intelligent Robots by using NLP.	International Journal of Computer Applications, Volume:171, No.1,August 2017 ISSN:0975-8887	Google Scholar
7	Vibha Vinod 1BY16SCS13	Spam Detection framework using Sentimental Analysis	International Journal of Advanced Research in Computer Science, ISSN: 0976-5687, Vol:9, Issue:3 May-June 2018	Google Scholar Research Gate

2017-19 batch

S.no	Name of the Student & USN	Paper title	Name of the Journal	Indexing
1	Laxmi Jadhav 1BY17SCS03	Implementation and Testing of soil analysis in cultivation land using IoT.	International Research Journal of Engineering and Technology, Volume:6,Issue:6, June 2019 ISSN: 2385-0058	Google Scholar
2	Nikhil K S 1BY17SCS06	Comparative study of Spam Detection in Twitter by different approaches of Sentimental Analysis and MachineLearning Algorithm	International Journal of Engineering Science and Computing, Vol:9,Issue:6,June 2019 ISSN: 2321-3361	Google Scholar
3	Prathama V 1BY17SCS07	Age Invariant Face recognition	International Journal of Trend in Scientific Research and Development (IJTSRD) Volume: 3 | Issue: 4 | May-Jun 2019 Available Online: www.ijtsrd.com e-ISSN: 2456 - 6470	Google Scholar Thomson Reuters
4	Megha. S. M 1BY17SCS04	Cyber Attack Prevention using Machine Learning	International Journal of Engineering Science and Computing, Volume 9 Issue No. 5, May 2019 ISSN 2321 3361	Google Scholar
5	Rakshitha K S 1BY17SCS09	IoT based Groggy driving alerting and Traffic collision information System	International Journal of Scientific Research in Computer Science applications and Management Studies, Vol:8, Issue:2, March 2019ISSN: 2319-1953.	SIS

2018-2020 batch

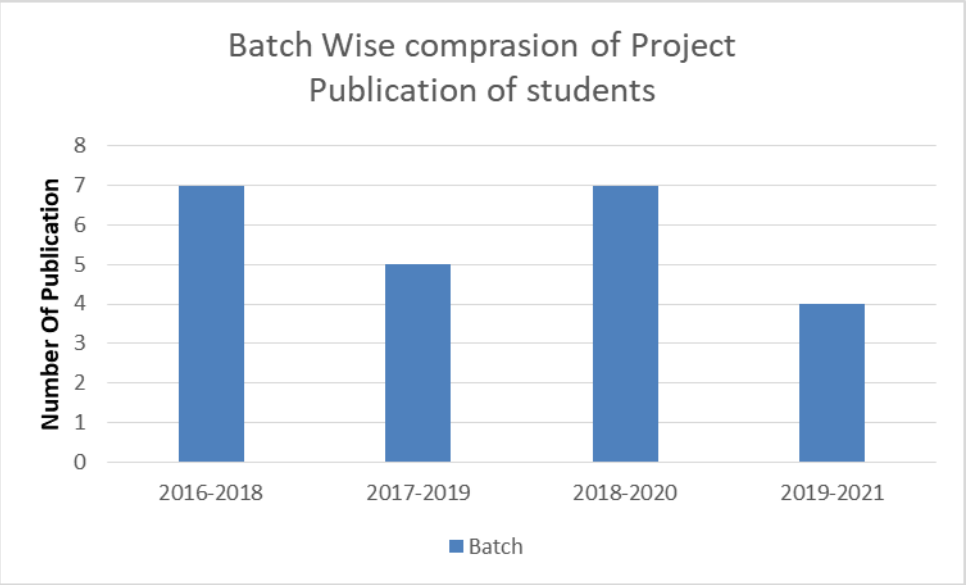
S.no	Name of the Student & USN	Paper title	Name of the Journal	Indexing
1	Sudhanshu Gupta 1BY18SCS14	Forensic Technical Process By E-Mail	International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8 Issue-5, January 2020	Scopus indexed
2	Kaveri T Hombal 1BY18SCS06	A Deep Dive Into Load Balancing Tools For Hadoop Application Management	International Journal of Engineering Applied Sciences and Technology, 2019, Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 119-122	Google Scholar

3	Sneha S 1BY18SCS05	Emerging Real Time Streaming Analytics Processing Using Hadoop Framework.	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 213-216	Google Scholar
4	Srivatsa Raju S 1BY18SCS11	Structural Analysis Of Hpc's For Big Data Analytics	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 168-170	Google Scholar
5	Purushotham Naidu V 1BY18SCS08	Enhancing Performance And Efficiency For Big Data Analytics Application In Hadoop Mapreduce Environment	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 221-223	Google Scholar
6	Bhagyashree A V 1BY18SCS01	Convergent Analytical Tools For Big Data Applications In Hadoop Environment	International Journal of Engineering Applied Sciences and Technology,2020, Vol. 4, Issue 9, ISSN No. 2455-2143, Pages 283-285	Google Scholar
7	FASIHA KAUSAR 1BY18SCS04	Urban Drone Control through Machine Learning Technique	Jour of Adv Research in Dynamical & Control Systems, Vol. 12, Special Issue-06, 2020	Scopus indexed

2019-21

S.no	Name of the Student & USN	Paper title	Name of the Journal	Indexing
1	Gautham S K 1BY19SCS02	**Machine learning based security Authentication for wireless Multimedia Network**	International Conference on information and Communication technology for Competitive Strategies	Springer
2	Gautham S K 1BY19SCS02	CNN-based Security Authentication for Wireless Multimedia Devices	International Journal of Wireless and Microwave Technologies	Google Scholar
3	Gautham S K 1BY19SCS02	Two-Layer Encryption based on Paillier and ElGamal Cryptosystem for Privacy Violation	International Journal of Wireless and Microwave Technologies	Google Scholar
4	Deepthi M 1BY19SCS01	Ethnicity Identification	IJRAR INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR)	Google Scholar

Batch	Number of Publication
2016-2018	7
2017-2019	5
2018-2020	7
2019-2021	4



Batch	Scopus indexed	Google scholar indexed	Thomson Reuters	Springer
2016-2018	0	7	2	0
2017-2019	0	4	1	0
2018-2020	2	5	0	0
2019-2021	0	3	1	1

Observation:

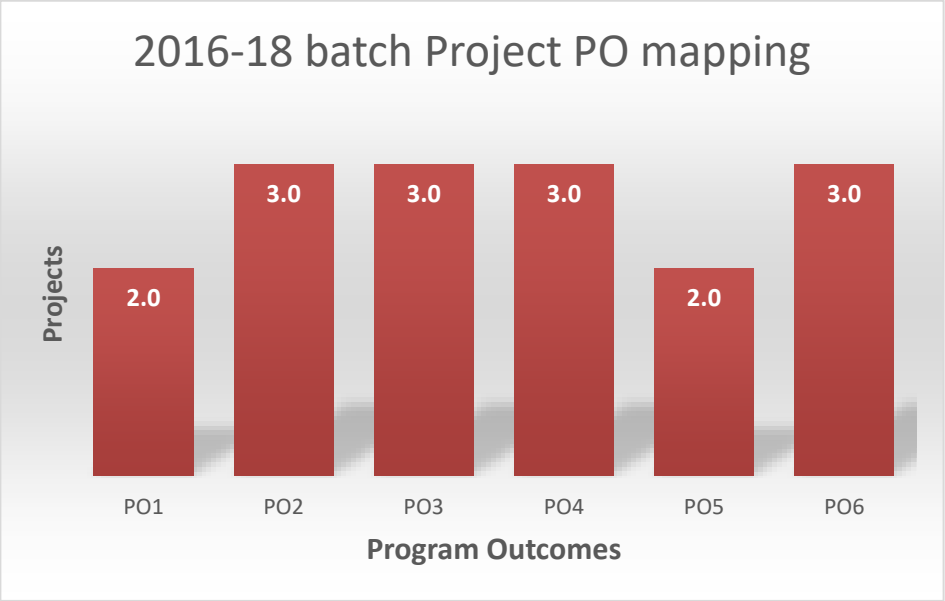
From above graph we can observed that quality of Publication increase as quality of project have increased.

PO attainment

Project List of 2016-2018 batch with PO mappings							
SL No	**Project Title**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
1	**Implementation of Privacy preserving Decision Control System for Photo Publishing in online Social Media**	**3**	**3**	**3**	**3**	**2**	**3**
2	**IOT Embedded Multi-Purpose Agricultural BOT using Solar Energy Based**	**2**	**3**	**3**	**3**	**3**	**3**
3	**Securing the Authentication Mechanism for Implementing Secret Password**	**3**	**3**	**3**	**3**	**2**	**3**
4	**Framework Enhancement for Common Public Radio Interface In SBTS**	**2**	**3**	**3**	**3**	**3**	**3**

5	**Cold Start Product Recommendation by Socializing e-Commerce**	**2**	**3**	**3**	**3**	**3**	**3**
6	**Data Processing Using Clustering Algorithm**	**3**	**3**	**3**	**3**	**2**	**3**
7	**Early detection of childhood diseases**	**2**	**3**	**3**	**3**	**3**	**3**
8	**IOT Based Passenger Count System in Public Transport**	**2**	**3**	**3**	**3**	**3**	**3**
9	**A Performance Efficient Approach for Parallel Mining of frequent Item sets**	**3**	**3**	**3**	**3**	**2**	**3**
10	**Leaf quality Hyperspectral imaging Technology**	**3**	**3**	**3**	**3**	**2**	**3**
11	**Speech Based wheel Chair Control using Android Bluetooth Technology**	**2**	**3**	**3**	**3**	**3**	**3**
12	**Weight based Smart assistance medicine tracker and refill system For secured Healthcare**	**2**	**3**	**3**	**3**	**3**	**3**
13	**Spam Detection Framework Using Sentimental Analysis**	**3**	**3**	**3**	**3**	**3**	**3**
		2.0	**3.0**	**3.0**	**3.0**	**2.0**	**3.0**

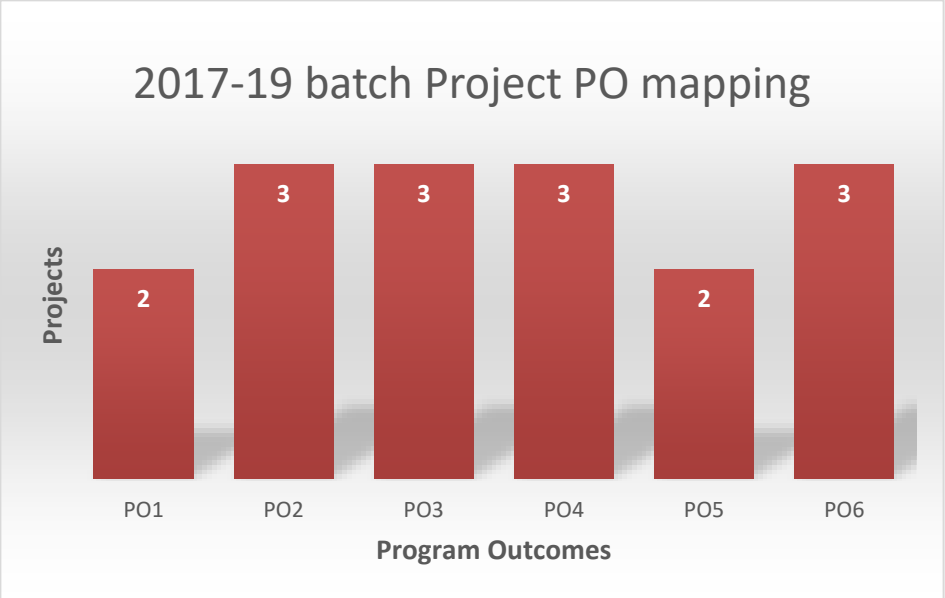
2016-18					
PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
2.0	**3.0**	**3.0**	**3.0**	**2.0**	**3.0**



Project List of 2017-2019 batch with PO mappings							
SL No	**Project Title**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
1	**Military IOT System Air Pollution Detection And Power Management**	**2**	**3**	**3**	**3**	**3**	**3**
2	**Implementation & Testing Of Soil Analysis In Cultivation Land Using IOT**	**2**	**3**	**3**	**3**	**3**	**3**
3	**Cyber Attack Detection Using Machine Learning**	**3**	**3**	**3**	**3**	**2**	**3**
4	**Expression Invariant Face Recognition Using Convolutional Neural Networks**	**3**	**3**	**3**	**3**	**2**	**3**
5	**Comparison Study Of Machine Learning Algorithms For Spam Detection In Twitter**	**3**	**3**	**3**	**3**	**2**	**3**
6	**Age Invariant Recognition.**	**2**	**3**	**3**	**3**	**3**	**3**
7	**An IOT Based Smart Health Monitoring System For Animal**	**2**	**3**	**3**	**3**	**3**	**3**
8	**IOT Based Groggy Driving Alerting And An Traffic Collision**	**2**	**3**	**3**	**3**	**3**	**3**
9	**Smart Washroom Cleaning System Using Image Processing And IOT**	**2**	**3**	**3**	**3**	**3**	**3**

10	**SECURE PATIENT E -HEALTH RECORD USING BLOCKCHAIN TECHNOLOGY**	**3**	**3**	**3**	**3**	**2**	**3**
		2.0	**3.0**	**3.0**	**3.0**	**2.0**	**3.0**

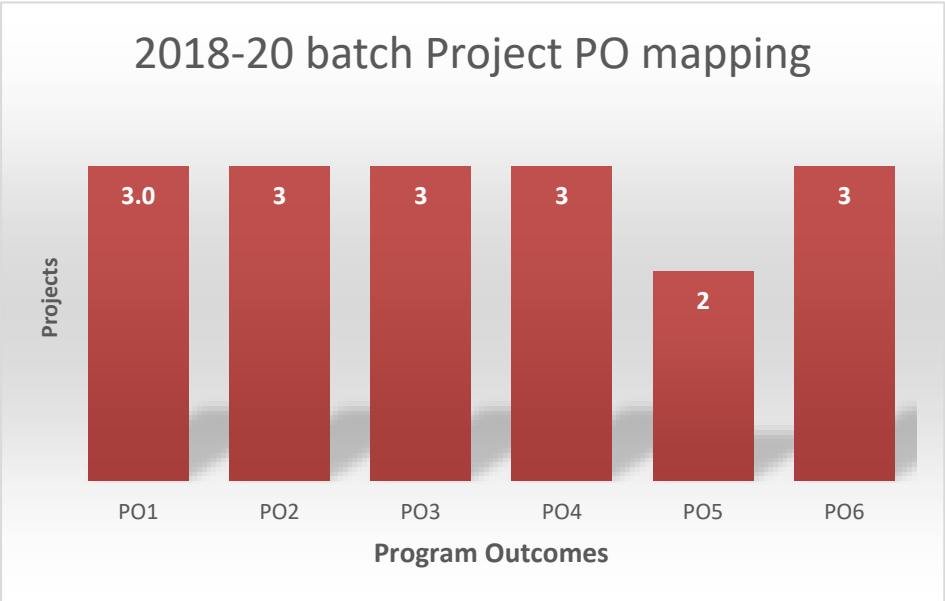
2017-19					
PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
2.0	3	3	3	2.0	3



Project List of 2018-2020 batch with PO mappings							
SL No	**Project Title**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
1	**Detection Of Phishing Websites Using Machine Learning Techniques**	**3**	**3**	**3**	**3**	**3**	**3**
2	**Mie Scattering Phenomenon Modelling Using DGTD Method For Bio Sensing Applications**	**3**	**3**	**3**	**3**	**2**	**3**
3	**Quadcopter drone for multi machine tasks**	**3**	**3**	**3**	**3**	**2**	**3**
4	**Efficient Subspace Clustering Of High Dimensional Data Using FGK-Means Algorithm**	**3**	**3**	**3**	**3**	**2**	**3**
5	**Smart Assistive System For Visually Impaired People**	**2**	**3**	**3**	**3**	**3**	**3**
6	**Epileptic Seizure Prediction Using Different Machine Learning Techniques**	**3**	**3**	**3**	**3**	**2**	**3**

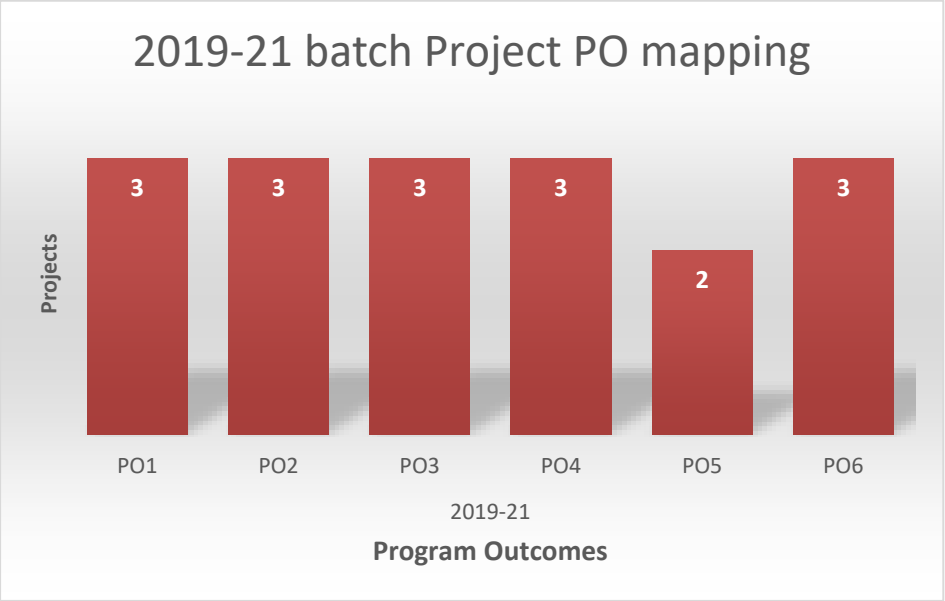
7	Narrow Band Internet Of Things (NB-Iot) Based Soil Quality Monitoring System To Enhance Crop Yield	3	3	3	3	3	3
8	Portable Spirometer For Copd Patients Using Iot	3	3	3	3	3	3
9	Iot based pattern recognition using OCR	3	3	3	3	2	3
10	Approach For Classification Of Mammogram Images Using Deep Learning Techniques	3	3	3	3	2	3
11	Forecasting & Detection Of Flood Using Random Forest Learning Method	2	3	3	3	3	3
12	Deployment Strategy of Sensor Nodes Based on Structure and Behaviour of WSN	3	3	3	3	2	3
13	Detection Of Fraud Application Using Sentimental Analysis	3	3	3	3	3	3
		3.0	3.0	3.0	3.0	2.0	3.0

2018-20					
PO1	PO2	PO3	PO4	PO5	PO6
3	3	3	3	2	3

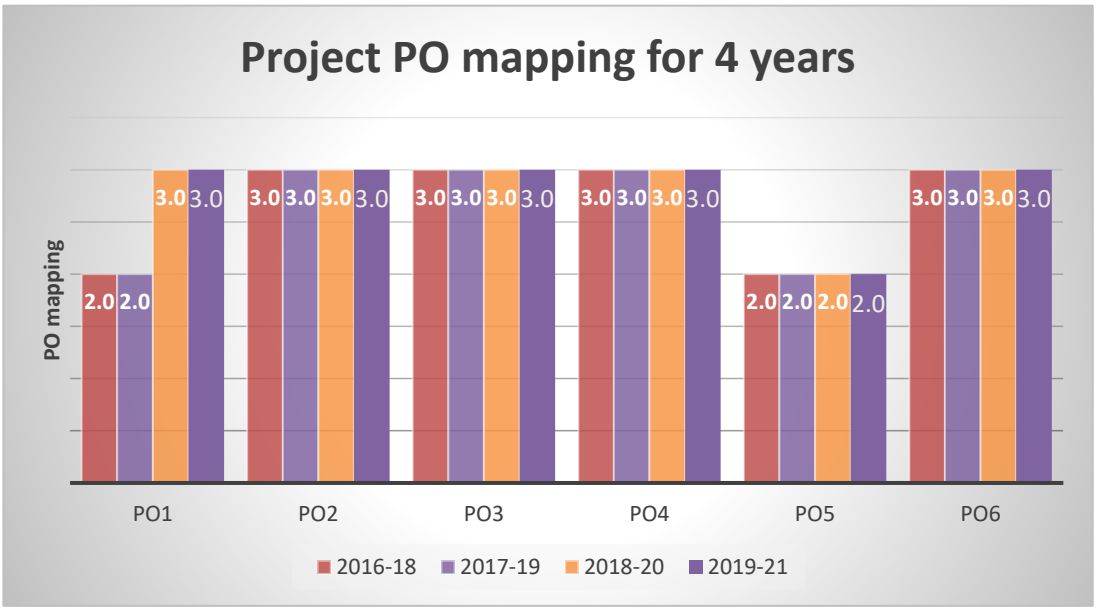


Project List of 2019-21 batch with PO mappings							
SL No	**Project Title**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
1	**Ethnicity Identification**	**3**	**3**	**3**	**3**	**2**	**3**
2	**CNN Based security authentication for wireless multimedia network**	**3**	**3**	**3**	**3**	**2**	**3**
3	**Analysis of soil and leaf texture using machine learning Technique**	**3**	**3**	**3**	**3**	**3**	**3**
4	**Predication of COVID 19 severity using patients PHR**	**3**	**3**	**3**	**3**	**3**	**3**
5	**Stock Market Prediction**	**3**	**3**	**3**	**3**	**3**	**3**
6	**Myocardial blood flow quantification for evaluation of coronary artery disease using CNN Algorithm**	**3**	**3**	**3**	**3**	**3**	**3**
7	**IoT Enabled Real time aquarium monitoring system**	**3**	**3**	**3**	**3**	**2**	**3**
		3	**3**	**3**	**3**	**2**	**3**

2019-21					
PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**
3	**3**	**3**	**3**	**2**	**3**



Year	PO1	PO2	PO3	PO4	PO5	PO6
2016-18	2.0	3.0	3.0	3.0	2.0	3.0
2017-19	2.0	3.0	3.0	3.0	2.0	3.0
2018-20	3.0	3.0	3.0	3.0	2.0	3.0
2019-21	3.0	3.0	3.0	3.0	2.0	3.0



Observations:

From the above graph we can observe that as PO1 attainment has increased from batch to batch so students has done more of research and development work to solve practical problems related to Computer Science and Engineering domain.

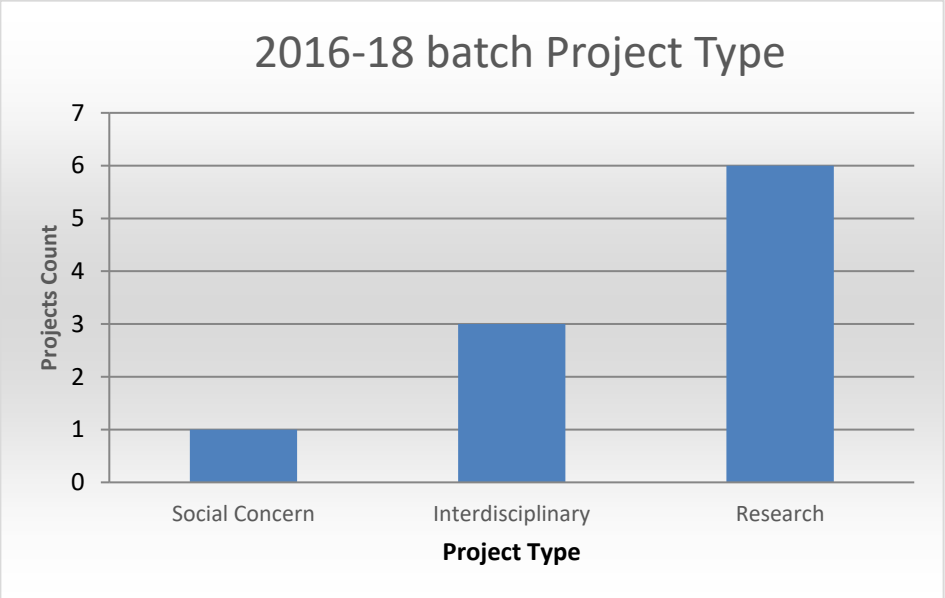
Classification of Project

Projects can be classified based on Research , Interdisciplinary and Social Concern based on Program outcome,PO1 can be related to Research project ,PO5 can be related to Social Concern and PO6 can be related to Interdisciplinary project.
Project Type of 2016-18 batch

USN	Student Name	Project Guide	Project Title	Project Type
1BY16SCS01	AISHWARYA S	Mrs. Chethana C	Implementation of Privacy preserving Decision Control System for Photo Publishing in online Social Medis	Research
1BY16SCS02	AKSHATHA T	Dr.Bharathi Malakreddy A	IOT Embedded Multi-Purpose Agricultural BOT using Solar Energy Based	Interdisciplinary
1BY16SCS03	Aplana Kushwaha	Dr.Anil G N	Securing the Authentication Mechanism for Implementing Secret Password	Research
1BY16SCS04	ANURADHA V	Mr.Shankar R	Framework Enhancement for Common Public Radio Interface In SBTS	Interdisciplinary
1BY16SCS05	GURUPRASAD HIREMATH	Dr.Bharathi Malakreddy A	Cold Start Product Recommendation by Socializing e-Commerce	Social Concern
1BY16SCS06	HINDU SINDHURA Y	Mr.Anand R	Data Processing Using Clustering Algorithm	Research
1BY16SCS07	MEHEBUB RAHMAN	Dr.Bharathi Malakreddy A	Early detection of childhood diseases	Social Concern
1BY16SCS08	NAYAN R	Dr.Bharathi Malakreddy A	IOT Based Passenger Count System in Public Transport	Interdisciplinary
1BY16SCS09	P JOSEPHINE SORNA	Mrs.Radhika K R	A Performance Efficient Approach for Parallel Mining of frequent Item sets	Research

1BY16SCS10	PRAMILA MARY A	Dr.Thippeswamy G	Leaf quality Hyperspectral imaging Technology	Research
1BY16SCS11	SARIKA C G	Mrs. Shruthi J	Speech Based wheel Chair Control using Android Bluetooth Technology	Social Concern
1BY16SCS12	TEJA REDDY	Dr.Bharathi Malakreddy A	Weight based Smart assistance medicine tracker and refill system For secured Healthcare	Social Concern
1BY16SCS13	VIBHA VINOD	Mrs. Durgadevi G Y	Spam Detection Framework Using Sentimental Analysis	Research

Project type 2016-2018		
Social Concern	interdisciplinary	Research
1	3	6

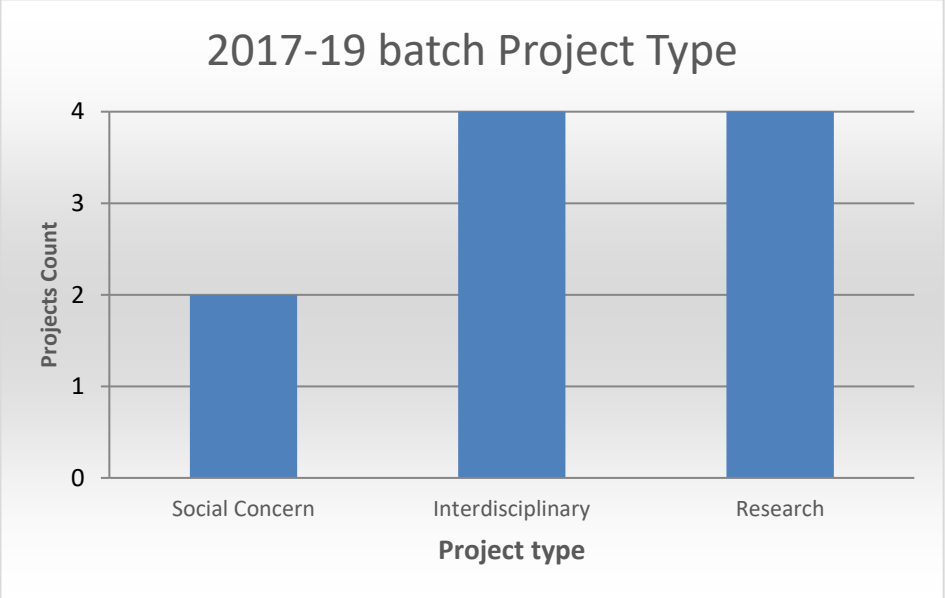


USN	Student Name	Project Guide	Project Title	Project Type
1BY17SCS02	KUSUMA S S	Dr. ANIL G N	Military Iot System Air Pollution Detection And Power Management	Interdisciplinary

1BY17SCS03	LAXMI JADHAV	Mrs.VIDYA R PAI	Implementaion & Testing Of Soil Analysis In Cultivation Land Using Iot	Interdisciplinary
1BY17SCS04	MEGHA S M	Mrs.CHETHANA C	Cyber Attack Detection Using Machine Learning	Research
1BY17SCS05	MINU CORREYA	Dr. THIPPESWAMY G	Expression Invariant Face Recognition Using Convolutional Neural Networks	Research
1BY17SCS06	NIKHIL	Mr.ANANAD R	Comparision Study Of Machine Learning Algorthims For Spam Detection In Twitter	Research
1BY17SCS07	PRATHAMA	Dr. THIPPESWAMY G	Age Invariant Face Recognition.	Social concern
1BY17SCS08	PRIYANKA P	Dr.BHARATHI MALAKREDDY	An Iot Based Smart Health Monitoring System For Animal	Interdisciplinary
1BY17SCS09	RAKSHITHA K S	Mrs. RADHIKA K R	Iot Based Groggy Driving Alterting And An Traffic Collision	Interdisciplinary

1BY17SCS10	SHIVALEELA S P	Dr. BHARATHI MALAKREDDY	Smart Washoom Cleaning System Using Image Processing And Iot	Social concern
1BY17SCS11	SRUTHI KRISHANA U	Dr. ANIL G N	Secure Patient E - Health Record Using Blockchain Technology	Research

Project type 2017-2019		
Social Concern	interdisciplinary	Research
1	3	6

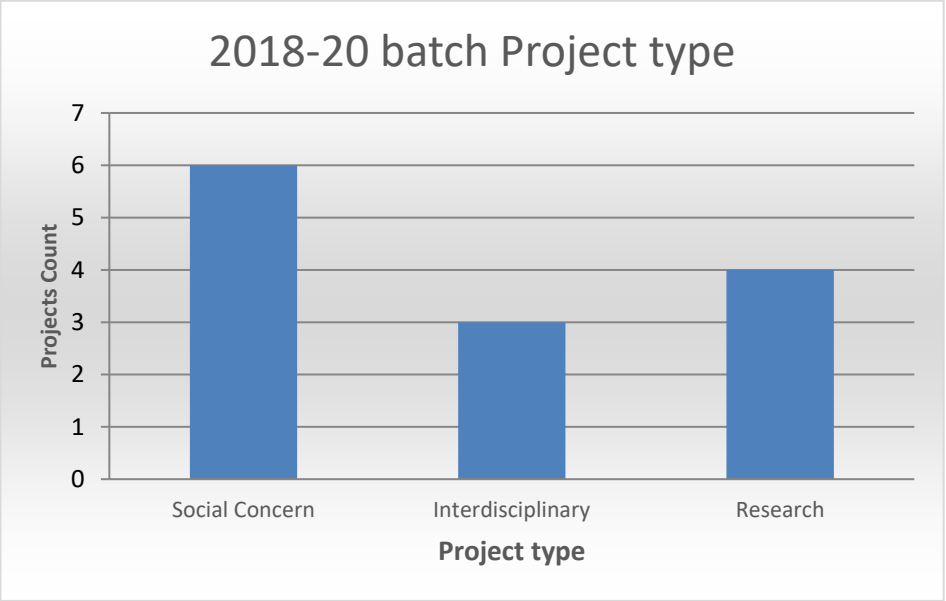


Project Type of 2018-20 batch

USN	Student Name	Project Guide	Project Title	Project Type
1BY18SCS01	BHAGYASHREE A V	Dr. Anjan Krishnamurthy	Detection Of Phishing Websites Using Machine Learning Techniques	social concern
1BY18SCS03	DIVYASHREE S	Dr. Bharathi M A	Mie Scattering Phenomenon Modelling Using DGTD Method For Bio Sensing Applications	interdisciplinary

1BY18SCS04	FASIHA KAUSAR	Dr. Satish Kumar T	Quadcopter drone for multi machine tasks	interdisciplinary
1BY18SCS05	KAVERI T HOMBAL	Prof. Radhika K R	Efficient Subspace Clustering Of High Dimensional Data Using FGK-Means Algorithm	research
1BY18SCS06	NAVEEN KUMAR K V	Dr. Anil G N	Smart Assistive System For Visually Impaired People	social concern
1BY18SCS07	P PRAJWALA	Dr. Anupama H S	Epileptic Seizure Prediction Using Different Machine Learning Techniques	research
1BY18SCS08	PURUSHOTHAM NAIDU V	Prof. Ambika G N	Narrow Band Internet Of Things (NB-Iot) Based Soil Quality Monitoring System To Enhance Crop Yield	social concern
1BY18SCS09	RAJESHWARI N	Prof. G Y Durga Devi	Portable Spirometer For Copd Patients Using Iot	social concern
1BY18SCS10	RAMYA PL	Dr. Anil G N	Iot based pattern recognition using OCR	interdisciplinary
1BY18SCS12	SNEHA S	Dr. Bharathi M A	Approach For Classification Of Mammogram Images Using Deep Learning Techniques	research
1BY18SCS13	SRIVATSA RAJU S	Prof. Shruthi J	Forecasting & Detection Of Flood Using Random Forest Learning Method	social concern
1BY18SCS14	SUDHANSHU GUPTA	Prof. Anand R	Detection Of Fraud Application Using Sentimental Analysis	research
				social concern

Project type 2018-20		
Social Concern	interdisciplinary	Research
6	3	4

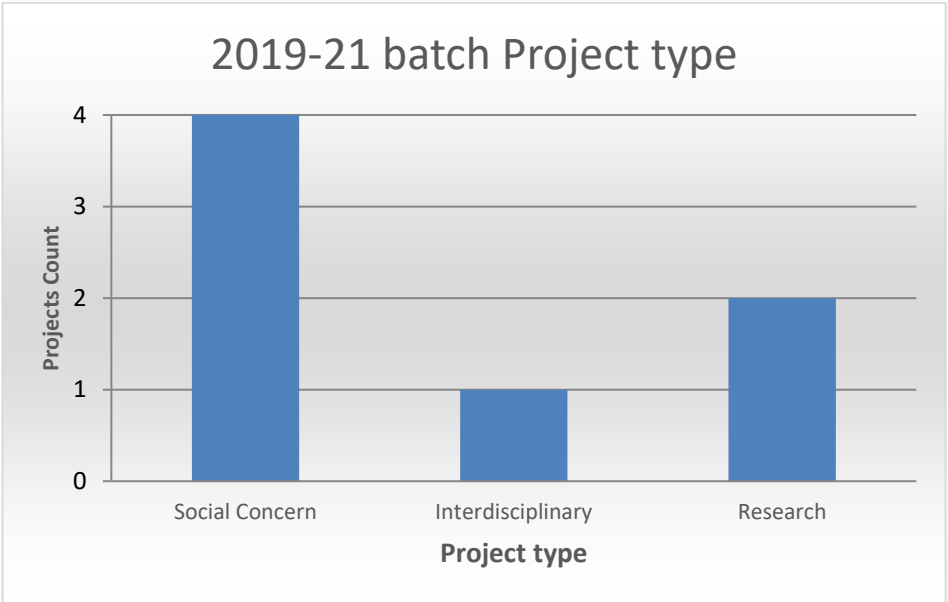


Project Type of 2019-21 batch

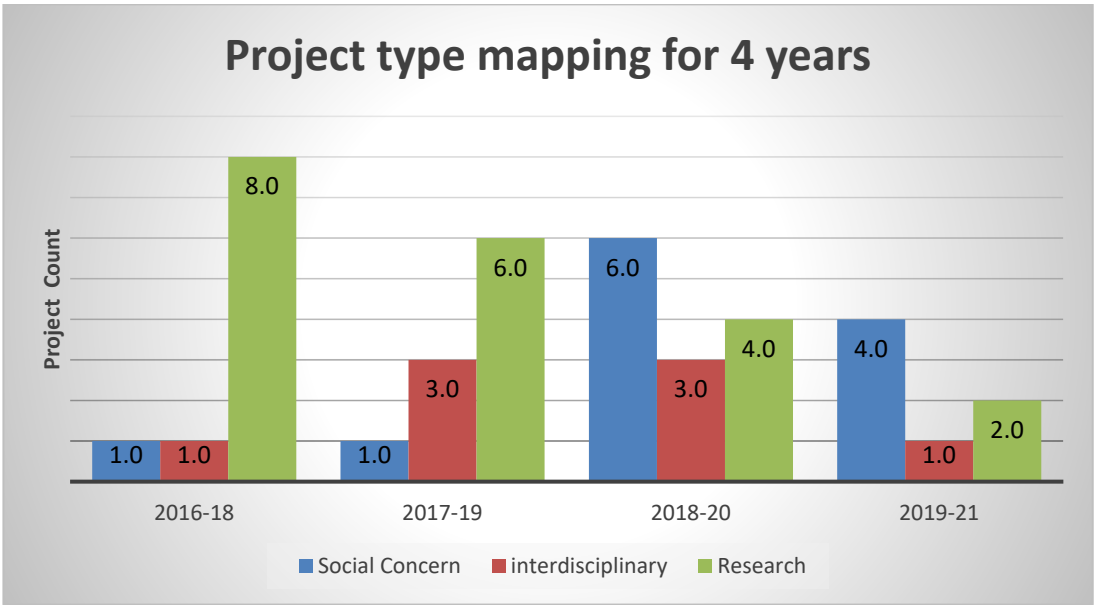
USN	Student Name	Project Guide	Project Title	Project Type
1BY19SCS01	Deepthi M	Dr. Thippeswamy G	Ethnicity Identification	Research
1BY19SCS02	Gautham S K	Dr. Anjan Krishnamurthy	CNN Based security authentication for wireless multimedia network	Research
1BY19SCS03	Madeha Kauser	Dr. Satish Kumar T	Analysis of soil and leaf texture using machine learning Technique	social concern
1BY19SCS04	Meghana Kumar K J	Dr. Bharathi M A	Predication of COVID 19 severity using patients PHR	social concern
1BY19SCS05	Pujitha J	Dr. Mahesh G	Stock Market Prediction	social concern
1BY19SCS06	Tejaswini A Kantanavar	Dr. Sunanda Dixit	Myocardial blood flow quantification for evaluation of coronary artery disease using CNN Algorithm	social concern
1BY19SCS07	Varshini N	Prof. Radhika K R	IoT Enabled Real time aquarium monitoring system	interdisciplinary

Project type 2019-21		
Social Concern	Interdisciplinary	Research

4	1	2



Year	Social Concern	interdisciplinary	Research
2016-18	1.0	1.0	8.0
2017-19	1.0	3.0	6.0
2018-20	6.0	3.0	4.0
2019-21	4.0	1.0	2.0



Observation:

Students are allocated projects according to current problems and trends so that students can get involved in research activities and solve problem which world is currently facing .The above graph indicate that students are constantly allocated with research project type and Social Concern project type which can help in life long learning of students

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

Table 6.3.1: Placement details of PG students of various batches

Programs Name and Assessment Year M.Tech CSE 2016-17					
S.No	Name of the student placed	Enrollment no.	Name of the Employer	Appointment letter reference no. with date	Type of Placement
1	Amaresh Naik	1BY15SCS01	East Point College of Engineering &Technology	31-07-2018	Academic
2	Apeksha Haveri	1BY15SCS02	Altair India	23-05-2018	Core
3	Kavya D	1BY15SCS04	Boeing India Pvt.Ltd.	07-05-2018	Core
4	Priyanka N	1BY15SCS07	Utthunga Technologies Pvt.Ltd.	27-09-2018	Core
5	Punith B N	1BY15SCS08	nuVizz Mobile Business Software Solutions Pvt.Ltd.	02-02-2019	Core
6	Sanjana S	1BY15SCS10	Government of Karnataka (UNIQUE DISABILITY ID)	09-10-2018	Academic
7	Shilpa K M	1BY15SCS11	Bangalore University	15-10-2018	Core
8	Shobharani D A	1BY15SCS12	GITAM University	12-04-2019	Academic
Programs Name and Assessment Year M.Tech CSE 2017-18					
1	Guruprasad Hiremath	1BY16SCS05	Aris Global Software Pvt.Ltd.	26-09-2018	Core
2	Nayana R	1BY16SCS08	Simpli Learn Solutions Pvt.Ltd	02-05-2019	Core
3	Pramila A	1BY16SCS10	Cerner	25-06-2019	Core
4	Teja Reddy	1BY16SCS12	BOSCH	25-06-2019	Core
5	Vibha Vinod	1BY16SCS13	UST Global	26-02-2019	Core
6	Sarika	1BY16SCS11	CBIT Kolar	22-07-2019	Academic

Programs Name and Assessment Year M.Tech CSE 2018-19					
1	Kusuma S S	1BY17SCS02	Nokia Networks	22-05-2019	Core
2	Minu Correya	1BY17SCS05	Nokia Networks	22-05-2019	Core
3	Nikhil K S	1BY17SCS06	Mindtree	06-07-2019	Core
4	Prathama V	1BY17SCS07	TeamLease services	15-07-2019	Core
5	Priyanka P	1BY17SCS08	TeamLease services Ltd.	15-07-2019	Core
6	Rakshitha K S	1BY17SCS09	Sri Venkateswara College of Engineering	01-08-2019	Academic
7	Shivaleela P	1BY17SCS10	KPIT Technologies	24-10-2018	Core
Programs Name and Assessment Year M.Tech CSE 2019-20					
1	Kaveri timmaraddi hombal	1BY16SCS10	Nokia	02-07-2020	Core
2	Srivatsa raju	1BY16SCS13	Nokia	02-07-2020	Core

Table 6.3.1: Placement details of PG students of various batches

Year	No of students placed in Company
2016-17	8
2017-18	5
2018-19	7
2019-20	2

Table 6.3.2: Placement statistics for Four years

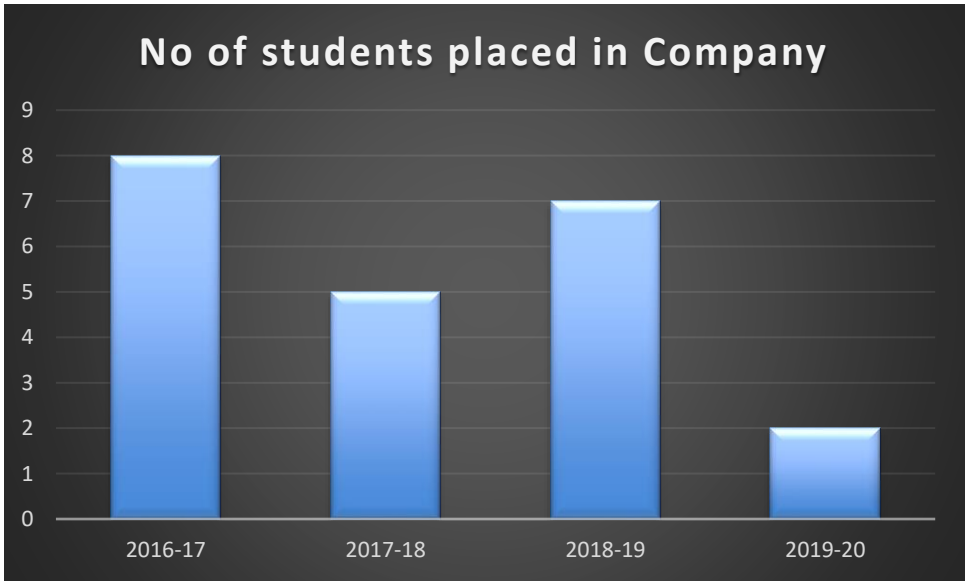


Figure 6.3.1: Placement statistics for Four years

Table 6.3.3: Placement statistics for four years

Year wise Comparison Highest and lowest CTC in LPA

Year	Highest CTC in LPA	Lowest CTC in LPA
2015-16	563473	228200
2016-17	420000	279996
2017-18	676653	300000
2018-19	650000	286764
2019-20	300000	120000

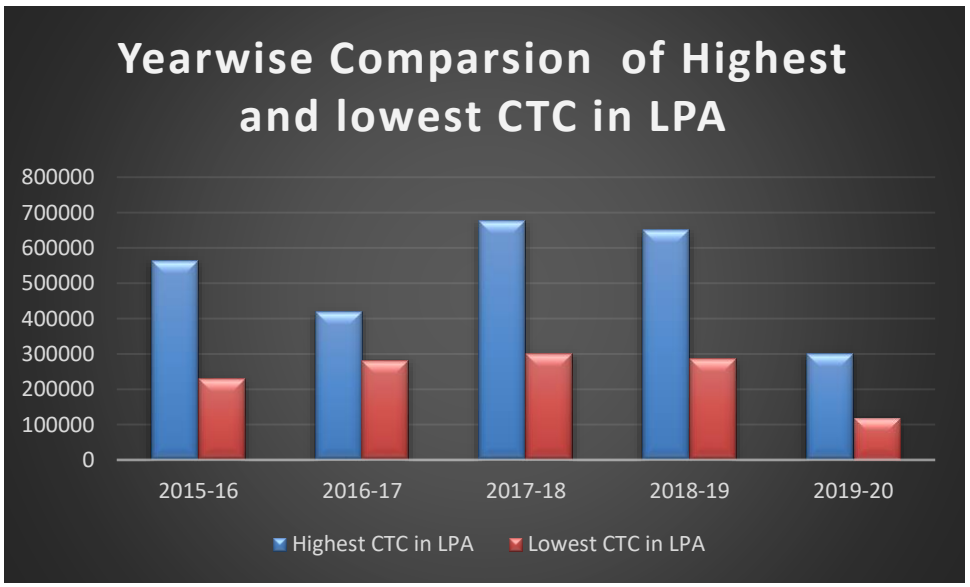


Figure 6.3.2: Placement statistics for Five years

Table 6.3.4: Student placed details

Number of students placed in Core Company

Year	No of students placed in Core company
2015-16	5
2016-17	5
2017-18	5
2018-19	6
2019-20	2

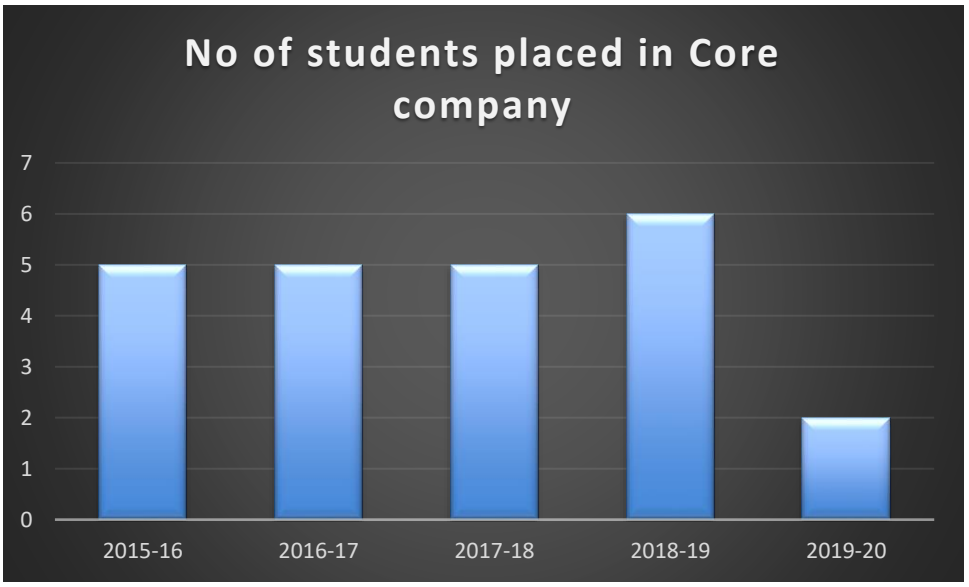


Figure 6.3.3: Placement statsistics in core companies

Observations: Significant improvement was observed in CTC offered for PG students, sliding the average salary CTC to higher value. More core companies visited the campuss and inclusive opportunities were provided for PG students.

6.4 Improvement in the quality of students admitted to the program (10)

Table 6.15: Assessment is based on improvement in terms of ranks/score in GATE examination

GATE Score	2020-2021	2019-2020	2018-19	2017-18	2016-17
Highest Score	NIL	NIL	NIL	NIL	NIL
Minimum Score	NIL	NIL	NIL	NIL	NIL

Assessment is based on improvement in terms of ranks/score in CET examination

Table 6.16: Rank details of PGCET

CET Ranking	**2020-2021**	**2019-2020**	**2018-19**	**2017-18**	**2016-17**
Opening ranking	2433	2603	2686	2808	3802
Closing Ranking	10837	7644	7730	7609	11796

Gender Equality

Table 6.17: Gender diversity for PG admissions

2020-21		2019-20		2018-19		2017-18		2016-17	
Total No of Girls got admission	Total No of Boys got admission	Total No of Girls got admission	Total No of Boys got admission	Total No of Girls got admission	Total No of Boys got admission	Total No of Girls got admission	Total No of Boys got admission	Total No of Girls got admission	Total No of Boys got admission
7	3	6	1	10	5	09	1	11	2

6.5 Improvement in quality of paper publication

Table 6.18: Paper publications for five years

Sl no:	Year	No of journal publications (Indexed)	National /International conferences
1	2020-21	5	
2	2019-20	4	-
3	2018-19	4	-
4	2017-18	15	-
5	2016-17	6	20
6	2015-16	7	1

Table 6.19: Paper publications in reputed journals and conferences

The institute has supported all the researchers to utilize the Turnitin software which is available at central library. The students could utilize this software for plagiarism check for their articles.The institution subscribed IEEE, IEL online, the complete articles under IEEE explore can be accessed and downloaded by the students. The institution also supported by NATIONAL DIGITAL LIBRARY which is an initiative of MHRD.

The students are also the members of CSI(computer society if India) professional body. The central library has subscribed for many National and International journals. So the students can refer those journals for identifying the gaps, performing literature review and gaining the knowledge on research activities with respect to current trends and technologies. Recently on Feb 8 2020, a workshop had been organized on e-resources, academic writing, strategies to enhance research visibility, citation/impact. This workshop was open for faculties, research scholars and also students who are interested in research. This FDP was platform for improving article rating skills, identification of research topic, literature review and manuscript preparation.

2020-21					
PUBLICATIONS IN INTERNATIONAL JOURNALS					
S.no	Name of the Student & USN	Paper title	Name of the Conference/ Journal	Indexing Type (Scopus/UGC/ SCI)	Non-indexing
1	Tejaswini A Kantanavar, 1BY19SCS06	Cloud Based IOT Applications, challenges	Recent Trends in Electrical, Electronics, Telecommunications, Medical Electronics Engg.&Physics	Google scholar	

2	Deepthi M, 1BY19SCS01	Ethnicity Identification	International Journal of Research and Analytical Reviews (IJRAR), ISSN 2348-1269, Volume 8, Issue 3, August 2021	UGC	
3	Gautham S. K, 1BY19SCS02	Machine Learning Based Security Authentication for Wireless Multimedia Network	Fifth International Conference on Information and Communication Technology for Competitive Strategies (ICTCS 2020) held during December 11-12, 2020.	Springer	
4	Gautham S. K, 1BY19SCS02	Two-Layer Encryption based on Paillier and ElGamal Cryptosystem for Privacy Violation	I.J. Wireless and Microwave Technologies, 2021, 3, 9-15 Published Online June 2021 in MECS	Google Scholar	
5	Gautham S. K, 1BY19SCS02	CNN-based Security Authentication for Wireless Multimedia Devices	I.J. Wireless and Microwave Technologies, 2021, 4, 1-10 Published Online August 2021 in MECS	Google Scholar	
			UGC/Google scholar	4	
			Scopus/springer	1	
			Total	5	0

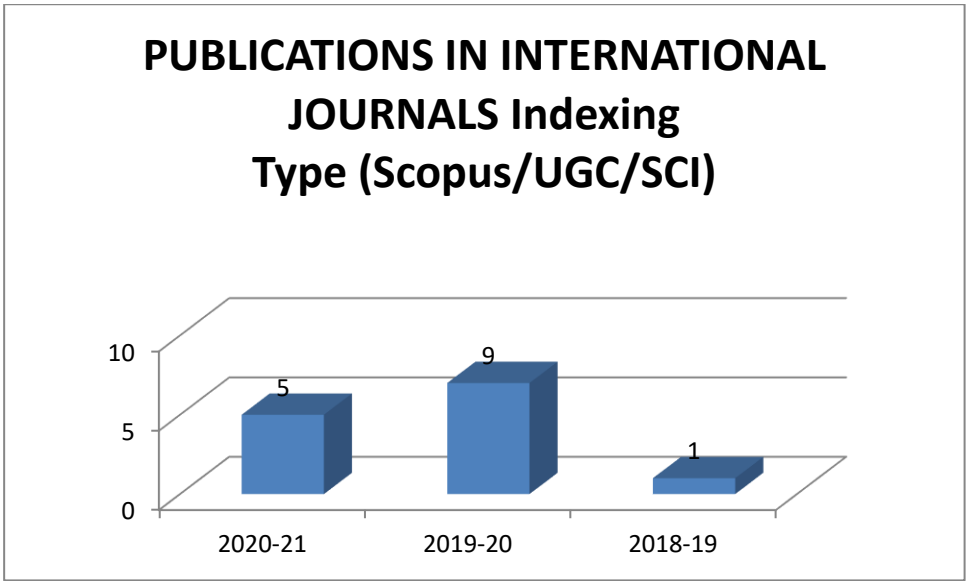
2019-20					
PUBLICATIONS IN INTERNATIONAL JOURNALS					
S.no	Name of the Student & USN	Paper title	Name of the Journal	Indexing Type (Scopus/UGC/ SCI)	Non-indexing
1	Sudhanshu Gupta 1BY18SCS14	Forensic Technical Process By E-Mail	International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8 Issue-5, January 2020	SCOPUS	

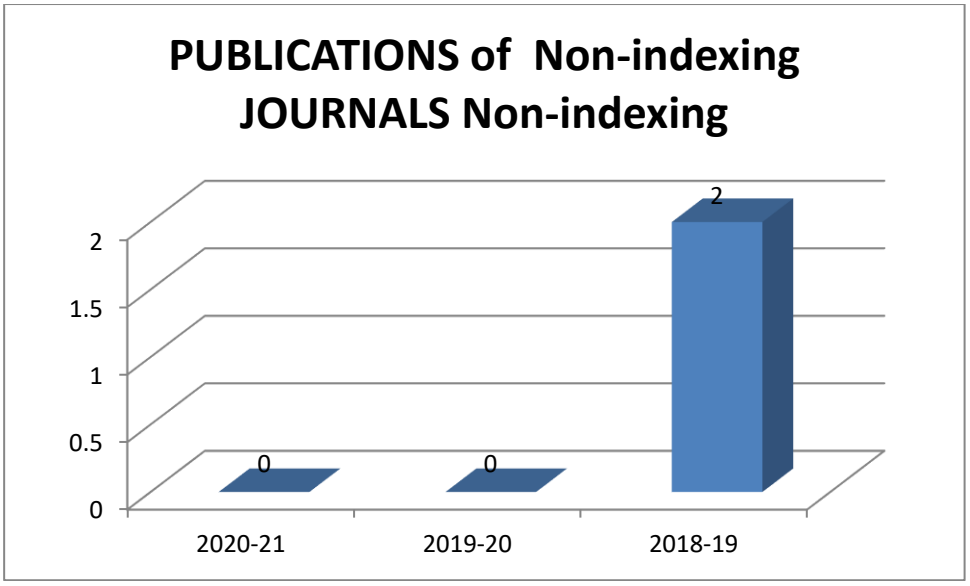
2	Kaveri T Hombal 1BY18SCS06	A Deep Dive Into Load Balancing Tools For Hadoop Application Management	International Journal of Engineering Applied Sciences and Technology, 2019, Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 119-122	Google Scholar	
3	Sneha S 1BY18SCS05	Emerging Real Time Streaming Analytics Processing Using Hadoop Framework.	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 213-216	Google Scholar	
4	Srivatsa Raju S 1BY18SCS11	Structural Analysis Of Hpc's For Big Data Analytics	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 168-170	Google Scholar	
5	Purushotham Naidu V 1BY18SCS04	Enhancing Performance And Efficiency For Big Data Analytics Application In Hadoop Mapreduce Environment	International Journal of Engineering Applied Sciences and Technology, 2019,Vol. 4, Issue 8, ISSN No. 2455-2143, Pages 221-223	Google Scholar	
6	Bhagyashree A V 1BY18SCS01	Convergent Analytical Tools For Big Data Applications In Hadoop Environment	International Journal of Engineering Applied Sciences and Technology,2020, Vol. 4, Issue 9, ISSN No. 2455-2143, Pages 283-285	Google Scholar	
7	Bhagyashree A V 1BY18SCS01	Detection of phishing websites using Machine Learning Techniques	International Journal of Computer Science and Information security(IJCSIS)-July 2020, Vol.18, No.7	Thomson Reuters	
8	Srivatsa Raju S 1BY18SCS11	Gathering Evidence from Android OS for	IJCSN - International Journal of Computer Science and Network,	Mendely	

		Mobile Forensics	Volume 9, Issue 4, August 2020 ISSN (Online) : 2277-5420		
9	Divya Shree S	Anti-Forensics of Data in Classical and Quantum Systems Over the Classical Communication Channels	IJCSN - International Journal of Computer Science and Network, Volume 9, Issue 4, August 2020 ISSN (Online) : 2277-5420	Mendely	
			SCOPUS	3	
			UGC Indexed/ Google Scholar	6	
			Total	9	0

2018-19					
PUBLICATIONS IN INTERNATIONAL JOURNALS					
S.no	Name of the Student & USN	Paper title	Name of the Journal	Indexing Type (Scopus/UGC/SCI)	Non-indexing
1	Laxmi Jadhav 1BY17SCS03	Implementation and Testing of soil analysis in cultivation land using IoT	International Research Journal of Engineering and Technology, Volume:6,Issue:6, June 2019 ISSN: 2385-0058	UGC	

2	Nikhil K S 1BY17SCS06	Comparative study of Spam Detection in Twitter by different approaches of Sentimental Analysis and Machine Learning Algorithm	International Journal of Engineering Science and Computing, Vol:9,Issue:6,June 2019 ISSN: 2321-3361		Not indexed
3	Rakshitha K S 1BY17SCS09	IoT based Groggy driving alerting and Traffic collision information System	International Journal of Scientific Research in Computer Science applications and Management Studies, Vol:8, Issue:2, March 2019 ISSN:2319-1953		Not indexed
			SCOPUS	0	
			UGC INDEXED	1	
			Total	1	2





Observations: The research papers listed above are categorized based on 2 categories viz., Indexed and Non-indexed Journals. Comparative analysis of last 3 academic years shows that there is a need of improvement and focus towards Scopus and web of science journals. The projects are to be taken forward as research publications, copyrights and patents.

This will facilitate the students in engaging with self-learning experiences. This research will give awareness towards the latest challenges and gaps in the several domain areas and societal issues. The students will also inculcate the ethical responsibilities and professional practices.

6.6 Improvement in laboratories (10)

The laboratory work for PG students is in 1st Semester of the curriculum. The students are motivated to take up open-ended experiments for IoT Lab in association with QikPod. Some of these experiments have turned into projects and products as discussed the table 6.1 of this criteria.

Sr. No.	Name of the Facility	Year	Specialized Equipment Name	Equipment details	Utilization details from the perspective of PO attainment
1	e-yantra lab IIT Bombay	2020-21	Embeded Sytems, IOT, Microcontroller	2- firebird, Spark V Robot, Servo motor based gripper kit, ATmega 2560 Develpoment Board, LPC2148 Development Board, Raspberry – Pi3	New Facility Created
2	Indian TechKeys	2020-21	Printed Circuit Board(PCBs) design and fabrication, 3-D printing services, Embedded product	IR Sensor, Temperature, Sensor (DHT11), 4-Channel Relay, 2-Channel Relay, Motion Sensor (PIR), 16X2 LCD Display, Fan, Touch sensor, 9V battery, 4digit 7-Seg, Soil Sensor, Joystick,	New Facility Created

			development	Embedded system kit, RF Receiver and Transmitter kit, RTC Module, 4-channel push button, RPI Camera, RFID Reader +TAG, 8051 Development Kit, DTMF Receiver Module, Dot Matrix Display, XBEE Trans Receiver, Accelometer, Hall Sensor, Single Channel Relay, Metal Sensor, Lead Acid battery 12V 4200mAH, Lead Acid battery 12V 2000mAH, Lead Acid battery 6V 2A, Soil Moisture Sensor, LiPo Battery Charger, Lithium Ion Battery Charger, Transformer 15-0-15 V 2A, CNC 2D Plotter Machine, Robotic Pick and Place ARM	
3	Providing additional PCs	2019-20	I7, 9 Gen,16 GB,ITB HDD,21" inch monitor, DELL 3071	4 systems added to the M.Tech Lab	Each usage of system is entered into the Log book
4	MAT LAB	2018-19	MAT LAB with 46 tool boxes	30 Licenses of MAT LAB and 10 Licenses of Simulink with 46 toolboxes	Utilized for PG projects
5	Plagiarism check software	2018-19	Turnitin	30 Licenses for 100 students	The plagiarism in project reports s prevented, engage students in the writing original project thesis and support publications
6	Android IDE	2017-18	Android IDE	7 Licensed version of Android IDE with IOT components	IOT lab and to carry out other Mini 7project related to IOT
7	Arayabhatta Center of Computation	2017-18	Intel® Core™ i7-CPU@ 3.20 GHz, 8 GB, RAM, 1-TB HDD, DVD Writer	92 Computers	Utilized for common computing facility