Table 1: Faculty Competencies in Program Specific criteria

Sl. No.	Engineering (Specialization Area)	Relevant Courses in the Curriculum	Competent Faculty
1.	Data Engineering	Database Management Systems, Data Mining, Data Science, Machine Learning, Big data etc.	Dr. Anitha M L Prof. T S Prabhakar Prof. Bramesh S M Prof. B S Puttaswamy
2.	Network Engineering	Communication Networks, Cyber security, Internet of Things, Cloud Computing etc.	Prof. M R Suresh Dr. Mahesh Kaluti Prof. Rakshith N
3.	Software Engineering	Software Engineering, Software Project Management, Software Testing, Object Oriented System Development etc.	Prof. M R Suresh Prof. Bramesh S M Prof. B S Puttaswamy Prof. Harshith K S
4.	Programming	Java Programming, Python Programming etc.	Dr. Anitha M L Dr. Mahesh Kaluti Prof. Rakshith N Prof. Ruchitha K J
5.	Core Courses	Data Structures, Design and Analysis of Algorithms, Computer Organization, Operating System etc.	Prof. T M Geethanjali Prof. T S Prabhakar Prof. Bramesh S M Prof. B S Puttaswamy
6.	Robotic Process Automation	Robotic Process Automation using UiPath	Prof. Bramesh S M Prof. B S Puttaswamy

Table 2: Faculty Competencies based on Publications

Sl. No.	Name of the Faculty	Competency	Research Publications with respect to specialization
1.	Dr. Anitha M L	Machine Learning, Computer Vision, Internet of Things	(1) Computer Aided Diagnostic System for Diabetic Retinopathy Detection using Image Processing and Artificial Intelligence (2) iSmart Cyclist Jacket (3) Survey on Safety Devices Using IoT (4) Smart Identification of Nutrient Based pH for an NFT Hydroponic System (5) IoT Based Automated Hydroponic System Using Light Intensity for Lettuce Growth (6) Disease Grading of Diabetic Retinopathy using Deep Learning Techniques

2.	Prof. M R Suresh	Image Processing, Machine Learning	(1) Two factor authentication system to avoid shoulder surfing attack
3.	Dr. Mahesh Kaluti	Computer Networking, Machine Learning, Big Data	(1) E-Governance for Public Administration (2) 'KISAN JYOTHI' A Tracking System for Pumpsets Using IoT and GSM (3) A Novel Smart Phone Controlled Method for Plant Disease Prediction (4) Sign Language Translation Using Neural Networks
4.	Prof. T M Geethanjali	Medical Image Processing, Machine Learning	(1) Matching of Contact and Contactless FingerPrint Using CNN Model (2) Semantic Segmentation of Kidney Tumors Using Variants of U-Net Architecture (3) Ensemble Approach For Improving Kidney Tumors Segmentation Performance On CT Images Using Deep Learning Models (4) Prediction Of Wine Quality Using Machine Learning (5) Stroke Prediction Using Machine Learning (6) Heart Attack Prediction Using Machine Learning (7) Vision Based Text Entry Using Morse Code Generated By Eye Gestures (8) Video Games Sales Analysis: A Data Science Approach (9) Students Attendance Management system (10) Semantic Segmentation of Kidney and Tumors using LinkNet Models (11) Semantic Segmentation of Pancreas in Computed Tomography Images using Convolutional Neural Networks (12) Two fold encryption and decryption using fingerprint (13) Semantic Segmentation of Tumors in Kidneys using Attention U-Net Models
5.	Prof. T S Prabhakar	Data Analytics and Machine Learning	(1) Efficient anomaly detection using deer hunting optimization algorithm via adaptive deep belief neural network in mobile network (2) Anomaly Detection Using Lion Optimization Algorithm in Mobile

			Network Data
			(3) Leaf Classification Model Using Machine Learning
6.	Prof. Bramesh S M	Clinical Data Mining and Machine Learning	(1) Identifying the Paddy Crop Disease in Mobile App using Image Processing and Machine Learning Techniques (2) An IoT based Smart Water Management System (3) Predicting Presence of Heart Disease using Machine Learning Algorithms (4) Movie Success Prediction using k-Nearest Neighbor Algorithm
7.	Prof. Rakshith N	Internet of Things, Computer Networks	(1) Software Fault Proneness Prediction using Genetic Based Machine Learning Techniques (2) An IoT based working model of Self Driving car using Machine Learning Techniques (3) An Opinion Mining for Indian Premier League using Machine Learning Techniques (4) A Vision-Based Detection and Identification System for Flying Insects in Intelligent Agriculture Using IoT and ML Techniques (5) A study of various Simulators for an Energy-Neutral Operation of Internet of Things Nodes
8.	Prof. B S Puttaswamy	Machine Learning	(1) Identifying the Paddy Crop Disease in Mobile App using Image Processing and Machine Learning Techniques (2) An IoT based Smart Water Management System (3) Performance Evaluation of various Machine Learning Algorithms for Personality Detection using Handwritten Document (4) Movie Success Prediction using k-Nearest Neighbor Algorithm

Table 3: Faculty competencies in correlation to Research Patents

Sl. No.	Name of the Authors	Patent details		
		Title of the Patent	Application No. / Design No.	Date of Application/ Publication
1	(1) Dr. Anitha M L (2) Ms. Hemashree S S	Predicting child mental stress using AI	202341016400 A	17/03/2023
2	(1) Dr. Anitha M L (2) Ms. Hemashree S S	Certificate authentication system with block chain technology	202341016404 A	17/03/2023
3	(1) Mr. M R Suresh	Gluing Machine	355630-001	28/12/2021
4	(1) Mr. M R Suresh	Ergonomically Designed DIE Casting Table for Safety and Quality	202041034350 A	04/09/2020

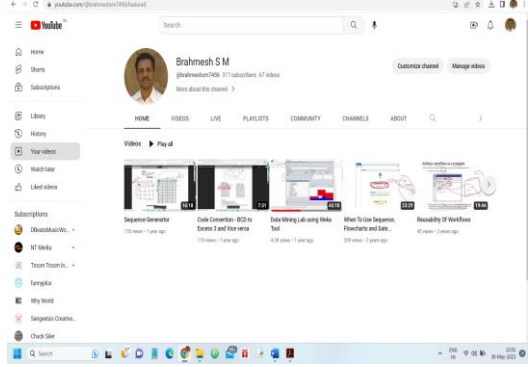**Table 4: Faculty competencies in clearing NPTEL Courses**

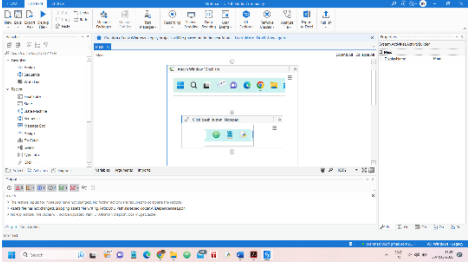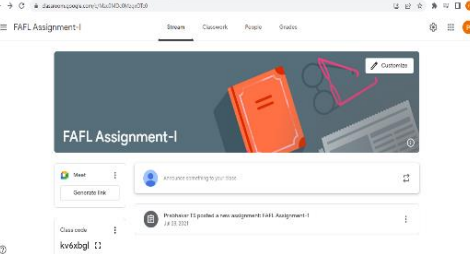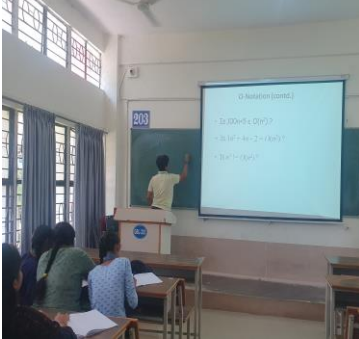| Sl. No.	Faculty Name	Course Name	Course Duration	Certificate Type
1	Prof. Bramesh S M	Software Engineering	12 Weeks	Elite + Gold (One of the Topper)
2	Prof. Rakshitha M S	Operating System	12 Weeks	Successfully Completed
3	Prof. Geethanjali T M	Operating System	12 Weeks	Successfully Completed

Table 5: Faculty competencies in clearing Coursera / Udemy Courses

Sl. No.	Faculty Name	Course Name	University	Offered through (Coursera / Udemy)
1.	Prof. Bramesh S M	AI for Medical Prognosis	deeplearning.ai	Coursera
		AI for Medical Treatment	deeplearning.ai	Coursera
		Introduction to Clinical Data Science	University of Colorado System	Coursera
		Human Research & Data or Specimens Only Research	Massachusetts Institute of Technology Affiliates	CITI

2.	Prof. Rakshith N	The Science of Well-Being	Yale University	Coursera
		Search Engine Optimization (SEO)	University of California, DAVIS	Coursera
		Optimizing a Website for Search	University of California, DAVIS	Coursera
		Advanced Content and Social Tactics to Optimize SEO	University of California, DAVIS	Coursera
		Programming Foundations with JavaScript, HTML and CSS	Duke University	Coursera
		AWS Academy Solutions Architect	-	AWS Academy & EduSkills
		AWS Academy Cloud Foundations	-	AWS Academy & EduSkills

Table 6: An overview of the Innovation in Teaching and Learning Method

Name of the Faculty - Courses	Type of Innovation in Teaching and Learning Method	The Objective of the Innovation	Significant Results Observed	Template
Prof. Bramesh S M - Robotic Process Automation and VHDL Simulation	Learning with Technology - YouTube channel	To make it easier and more convenient for teachers to pass knowledge to students. With video lectures it encourages a level of familiarity that helps with building a community and knowledge that is always available and accessible, irrespective of teacher's and student's location.	The students were able to attend lectures at any place and at any time. Also, they would explore and learn from more lectures available for all the new technologies and frameworks.	https://www.youtube.com/@brahmeshsm7456
For some selected courses like Java, DBMS and so on	Learning with Course Certifications (NPTEL, Coursera, & so on)	To continuously encourage and guide students and to act as a mentor in solving NPTEL, Coursera etc. assignments.	This experience gives exposure to ideas and approaches outside their comfort zone. In addition, they are being able to think outside their experience which is an	

			ingredient of leadership.	
Prof. Bramesh and Prof. B S Puttaswamy – Robotic Process Automation	Learning with tools like UiPath	To help students in boosting their task by creating software robots using recent tools like UiPath.	Students got better understanding of concepts and as well as got knowledge of how to use tool for creating software robots.	
Prof. T M Geethanjali and Prof T S Prabhakar – Computer Organization and FAFL	Virtual Teaching - Learning Management System (LMS) (Google Class Room)	To make it easier and more convenient for teachers to pass knowledge to students in ways that were never possible in the past. i.e., to bring back the classroom back to the students with the click of a mouse.	Allows students to learn at a time, place and pace that they are comfortable with.	
Dr. Mahesh Kaluti, Prof. M R Suresh, Prof. B S Puttaswamy, Prof. Harshith K S – Software Engineering	Learning by Industrial Visit	In order to overcome the gap between the theoretical knowledge and Practical knowledge, this teaching technique is very helpful.	The students were very involved and learned how the industry works, what practices are followed there and how to prepare for working in the IT field.	
For some selected topics	Student Seminars	To make students develop communication skills and reduce the stage fear in them.	Bringing out the communication skills of students	
All Faculty – Project Work	Project Based Learning	To integrate knowledge and skills	The students were very involved and learned how to develop applications.	
All Faculty – Lab Courses	Learning by Doing	The primary aim of arranging laboratory learning for students is to develop the practical competence often within their area of specialization.	Allows students to relate and reinforce the theoretical concepts taught in class.	

All Faculty – Project Work	Learning by Research Paper	In order to encourage the students to get acquainted with reading and understanding research papers and technical terms given in quality literature and understand its implementation in emerging technologies and recent advancement.	The students developed their habit to refer research papers from reputed journals. They developed their understanding over the recent advancement in the field; knew the peer community and got familiar with technical way of documentation.	**An IoT based Smart Water Management System** Bramesh S M[1], Puttaswamy B S[2], Bhoomika M[3], Megha S[4], Spoorthy B N[5], Uday M[6] [1,2,3,4,5,6]Department of Information Science & Engineering, P.E.S. College of Engineering, Karnataka, India. **Abstract** In our daily lives, water is a valuable natural resource. Presently, due to the fluctuating nature of water demand in urban and/or rural areas and also in the context of water resource scarcity, ideal management of water resources is a vital component of sustainable management. On the other hand, with the advent of Machine Learning (ML) and the Internet of Things (IoT), the pursuit of the smart water management system is also gaining momentum. Hence, we aimed at creating an IoT based smart water management system that can monitor and also predict water consumption in real-time. The proposed system consists of two main components, namely an IoT component and a Machine learning component. An IoT component's role is to collect the water usage data in real-time using several sensors, Arduino UNO, Wi-Fi, and the cloud. The Machine learning component's role is to analyze the collected real-time water consumption data and then forecast the consumption of the water using the machine learning algorithms (Long Short-Term Memory and Random Forest). Finally, our experimental findings reveal that the Random Forest algorithm performed better when compared with the LSTM algorithm based on R-Squared value (R^2), Root Mean Squared Error (RMSE), Mean Squared Error (MSE), and Mean Absolute Error (MAE) metrics, thereby helping us to choose the better prediction algorithm for the ideal management of water resources. Keywords: Arduino Uno, Long-Short Term Memory (LSTM), Random Forest, Sensors, Water consumption, Wi-Fi.
Dr. Anitha M L, Prof. T M Geethanjali and Prof. Harshith K S	Teaching through Expert Interaction	It involves sharing knowledge by subject experts for providing knowledge beyond the curriculum.	The students were very involved and learned the concepts	
Dr. Anitha M L and Prof. B S Puttaswamy	Teaching through Alumni Interaction	It involves sharing knowledge by alumni working as a software engineer in IT Industry with their juniors on practical grounds.	Students learned how the concepts learned in theory classes are used while developing a product.	
For some selected courses	Teaching through Virtual Labs	Virtual Labs do not require any additional infrastructural setup for conducting experiments at user premises. The simulations-based experiments can be accessed remotely via internet.	Students can benefit from the content and related teaching resources	https://www.vlab.co.in/broad-area-computer-science-and-engineering
Prof. B S Puttaswamy and NSS Programme Officer	Social Responsibility	To inculcate the social responsibility by participating students in NSS and or AICTE Activity Points programmes.	Bringing out the Social responsibility by creative thoughts of students.	

All Faculty - All Courses	Learning by Technology (Blogs)	The department has its own blog for providing study materials for students. These materials can openly be accessed by all students.	The students were able to access study materials at any place and at any time. Also, they can comment and share for its further improvement	https://isepesce.blogspot.com/
All Courses	Digital Library	To help Faculty and students by providing access to the video lectures, previous year question papers, E-books and E-journals.	Students were able learn by themselves.	https://pescemandya.org/library/library-e-resources.php http://61.1.175.66:8080/jspui/ http://61.1.175.66:8001/

Table 7: List of Paper Publications by Faculties in the Academic Year 2022 - 23

S. No.	Author Name	Title of the paper	National /International	Journal / Conference Name	ISBN / ISSN / DOI Number
1.	Dr. Anitha M L	IoT Based Automated Hydroponic System Using Light Intensity for Lettuce Growth	International	ICERECT	doi: 10.1109/ICERECT56837.2022.10060509
		Smart Identification of Nutrient Based pH for an NFT Hydroponic System	International	ACCTHPA	doi: 10. 1109 / ACCTHPA 57160. 2023. 1008 3370
2.	Prof. M R Suresh	Two factor authentication system to Avoid shoulder surfing attack	International	JETIR	2349-5162
3.	Dr. Mahesh Kaluti	Stroke Prediction Using MRI Images	International	ICRTST	2395-5295
		Infant Care (Smart Cradle)	International	ICRTST	2395-5295
		Face Recognition Based Automated Attendance System	International	ICRTST	2395-5295
4.	T M Geethanjali	Semantic Segmentation of Kidney Tumors Using Variants of U-Net Architecture.	International	iJOE	DOI: https://doi.org/10.3991/ijoe.v18i10.31347
		Matching of Contact and Contactless FingerPrint Using CNN Model.	International	IOSRJEN	2250-3021
		Two fold encryption and decryption using Fingerprint.	International	ICRTST	2395-5295
		Semantic Segmentation of Pancreas in Computed Tomography Images using Convolutional	International	ICRTST	2395-5295

S. No.	Author Name	Title of the paper	National /International	Journal / Conference Name	ISBN / ISSN Number
		Neural Networks.			
		Semantic Segmentation of Kidney and Tumors using LinkNet Models.	International	ICCR	DOI: 10.1007/978-3-031-22405-8_30.
5.	Bramesh S M	Identifying the Paddy Crop disease in Mobile App using Image Processing and Machine Learning Techniques	International	IRJMETS	2582-5208
		An IoT based Smart Water Management System	International	IJARESM	2455-6211
		An effective rule-based Approach for identification of Comorbidity patterns in diabetic patients	International	IJCSE	0976-5166
		An Efficient and Scalable Technique for Clustering Comorbidity Patterns of Diabetic Patients from Clinical Datasets	International	IJMECS	DOI: 10.5815/ijmecs.2022.06.04
6.	Rakshith N	Software Fault Proneness Prediction Using Genetic Based Machine Learning Techniques	International	IJRDT	ISSN (O) :- 2349-3585
7.	Puttaswamy B S	Identifying the Paddy Crop disease in Mobile App using Image Processing and Machine Learning Techniques	International	IRJMETS	2582-5208
		An IoT based Smart Water Management System	International	IJARESM	2455-6211
8.	Harshith K S	Software Fault Proneness Prediction Using Genetic Based Machine Learning Techniques	International	IJRDT	ISSN (O) :- 2349-3585
9.	Ruchitha K J	DNA Based Cryptography with Dual Encryption Using Multiple Cloud	International	IJRASET	ISSN: 2321-9653

Table 8: List of Paper Publications by Faculties in the Academic Year 2021 - 22

S. No.	Author Name	Title of the paper	National /International	Journal / Conference Name	ISBN / ISSN Number
1.	Dr. Anitha M L	Disease Grading of Diabetic Retinopathy using Deep Learning Techniques	International	ICCMC	doi: 10.1109/ICCMC53470.2022.9754113 IEEE Explore digital library
2.	Dr. Mahesh Kaluti	Elegant Computational Intensive Task Offloading Scenario for Android	International	Science Open Preprints	Open Science Preprint, Journal, Nov 4, 2021, DOI: 10.14293/S2199-

					1006.1.SOR-.PPJHAVB.v1
		Intelligent Gesture Recognition System for Differently Abled Persons Using Deep Learning	International	<u>Science Open Preprints</u>	Open Science Preprint, Journal, 1 June 2022, DOI: 10.14293/S2199-1006.1.SOR-.PPK1YHU.v1 SO-VID: 37c2a3cc-93e6-4d24-928c-d8170aed91
3.	T M Geethanjali	Heart Attack Prediction Using Machine Learning	International	IJSREM	2582-3930
		Stroke Prediction using Machine Learning	International	JETIR	2349-5162
		Prediction Of Wine Quality Using Machine Learning	International	JETIR	2349-5162
		Ensemble approach for Improving kidney tumors Segmentation performance on CT images using deep learning Models	International	IJCSE	0976-5166
4.	T S Prabhakar	Efficient anomaly detection using deer hunting optimization algorithm via adaptive deep belief neural network in mobile network	International	Journal of Ambient Intelligence and Humanized Computing	ISSN: 1868-5145 DOI: 10.1007/s12652-022-03861-6
5.	Bramesh S M	Predicting Presence of Heart Disease using Machine Learning Algorithms	International	International Journal for Research in Engineering Application & Management	ISSN: 2454 - 9150 Vol-07, Issue-04, July 2021, pp 192 - 195. DOI: 10.35291/2454-9150.2021.0396
6.	Rakshith N	An Opinion Mining for Indian Premier League using Machine Learning Techniques	International	International Journal of Science and Research (IJSR)	ISSN: 2319-7064, SJIF (2020): 7.803, DOI: 10.21275/SR21122 8102930, Paper ID: SR211228102930, Dec 2021
7.	Puttaswamy B S	Performance Evaluation of various Machine Learning Algorithms for Personality Detection using Handwritten Document	International	Journal of Emerging Technologies and Innovative Research	ISSN: 2349-5162

Table 9: List of Paper Publications by Faculties in the Academic Year 2020 - 21

S. No.	Author Name	Title of the paper	National /International	Journal / Conference Name	ISBN / ISSN Number
1.	Dr. Vinay S	Outsourced Auditing With Data Integrity Verification Scheme (OA-DIV) and Dynamic Operations for Cloud Data with Multi-Copies	International	EAI Endorsed Transactions on Cloud Systems	DOI: 10.4108/eai.27-4-2021.169423https://eudl.eu/doi/10.4108/eai.27-4-2021.169423
		Development of anti-phishing browser based on random forest and rule of extraction framework	International	Springer Cybersecurity Journal	https://cybersecurity.springeropen.com/articles/10.1186/s42400-020-00059-1 ISSN 2096-4862, DOI https://doi.org/10.1186/s42400-020-00059-1
2.	Geethanjali T M	Vision Based Text Entry Using Morse Code Generated By Eye Gestures	International	IJRAR	p-ISSN 2349-5138, e-ISSN 2348-1269
3.	Prabhakar T S	Leaf Classification Model Using Machine Learning	International	Intelligent Computing Paradigm and Cutting-edge Technologies	DOI:10.1007/978-3-030-65407-8_19
		Review on Anomaly Detection in Mobile Networks Using Traditional Learning, Machine Learning and Deep Learning	International	Journal of Computational and Theoretical Nanoscience	DOI:10.1166/jctn.2020.9054
4.	Bramesh S M	Movie Success Prediction using k-Nearest Neighbor Algorithm	International	International Journal for Research in Engineering Application & Management	ISSN: 2454-9150
5.	Rakshith N	A vision-based detection and identification system for flying insects in intelligent agriculture using IoT and ML techniques	International	International Journal for Research & Development in Technology Volume-15, Issue-1(Jan-21)	ISSN (O): 2349-3585

| 6. | B S Puttaswamy | Movie Success Prediction using k-Nearest Neighbor Algorithm | International | International Journal for Research in Engineering Application & Management | ISSN: 2454-9150 |

Table 10: Book Chapters

Sl. No.	Chapter Title	Book	Remarks
1	An Overview for Mining Comorbidity Patterns in Diabetic Patients	"Intelligent Systems in Healthcare and disease identification using data science", Taylor & Francis-CRC Edited Book	Accepted and recommended for publication

Table 11: List of Ph.D. Guided Details

Sl. No.	Name of the Supervisor	Name of the Student	University	Part Time / Full Time	Year of Enrollment
1.	Dr. Anitha M L	Anitha T Nair	VTU	Part Time	2019
		B P Chaitra	VTU	Part Time	2019
		Dhananjaya kumar	VTU	Part Time	2021
		Pankaj Kumar G	VTU	Part Time	2021
2.	Dr. Mahesh Kaluti	Shivashankar S K	VTU	Part Time	2021
		Vivek Sharma	VTU	Part Time	2021
		Sushant Mallappa Mangasuli	VTU	Part Time	2018
		Swomya N	VTU	Full Time	2023

Table 12: Details of Ph.D. Pursuance

Sl. No.	Name	Guide Name	University/ Research Center	Status
1.	M R Suresh	Dr. Piyush Kumar Pareek	JJT University	Coursework Completed
2.	T M Geethanjali	Dr. Minavathi	P.E.T Research Centre	Thesis Submitted
3.	T S Prabhakar	Dr. Veena M N	P.E.T Research Centre	Open Seminar-2 Completed
4.	Bramesh S M	Dr. Anil Kumar K M	SJCE Research Centre	Open Seminar-1 Completed
5.	Rakshith N	Dr. Minavathi	P.E.T Research Centre	Comprehensive Viva Completed
6.	Puttaswamy B S	Dr. Thillaiarasu N	Reva University	Coursework Completed

Table 13: Sponsored Research

Sl. No.	Principal Investigator	Title of Project	Funding Agency	Period of Project	Amount Received
1.	Dr. Vinay. S.	Artificial Intelligence and Machine Learning Lab	AICTE	2020	7.5 Lakhs
2.	Dr. Sanjay H M	IOT Based Hydroponic System Using Light Intensity for Lettuce Growth	KSCST	2022	6,000 Rupees
3.	Dr. Anitha M L	Smart Identification of Nutrient based PH in Hydroponic system	VTU	2022	5,000 Rupees

Table 14: Product Development

Sl. No.	Name of the Product	Description
1.	College Website	From A.Y. 2016 - 17 to till date, the department is looking after the college website design, development and deployment. https://pescemandya.org/
2.	Conference Website	The department have also designed, developed and deployed website for two International Conferences organized by the college (ICERECT – 2018 and – 2022) http://www.pesceconference.in/
3.	Department Blog	The department has created its own blog for providing study materials to students. https://isepesce.blogspot.com/