REQUISITES OF MEDICAL DEVICES
Understanding Medical Device Industry

BIOSCOPE

Official Newsletter of the Department of
Biomedical Engineering, Kattankulathur
Volume 5/Issue 1/ Jul-Dec 2022

HOW ABOUT SMART FERTILITY?
Wearable for fertility! Possible!

The Future of Theranostics and Drug Delivery
See the future of Theranostics

"The human foot is a masterpiece of engineering and a work of art."
-Leonardo Da Vinci

LETTER FROM OUR HOD

A few words from the Head of the Department of Biomedical Engineering.

As we breathe the freshness of 2023, I would like to wish each one of you a great and enthusiastic year ahead.

In the second half of 2022, our students, scholars and faculty have been working well in terms of placements, consultancy projects, faculty industry immersion programs, patents, papers and book publications as an outcome of international collaborations. I see the calendar year 2022 as having directed us into some areas that were not explored earlier. My appreciation and wishes to the BME family for taking the pioneering steps and staying highly motivated. In the coming months we shall pursue extensive and multifaceted approaches as we work through our strategic plans.

This edition of BioScope will hopefully make you feel, as it does for me, that with the ever-growing challenges to be solved by our students and faculty, our solutions are defined by innovation, choice of appropriate technology and collaborations with industry/experts from other fields.

Greetings and warm welcome to this issue of BioScope

"We will continue to develop and contribute to healthcare trends that will redefine the industry in the next five years"

Dr. VARSHINI KARTHIK, HoD - BME

"Always think outside the box and embrace opportunities that appear, wherever they might be." – Lakshmi Mittal

MESSAGE FROM OUR DEAN

A few words from The Dean, School of Bioengineering.

Biomedical Engineering department at SRMIST continues to be vibrant with academic and research activities. In the year 2022, they published 36 articles in SCI/SCOPUS-indexed journals. The faculty and research scholars are now working more towards making innovative medical devices for public use.

Some faculty have been appointed as consultants for setting up clients' laboratories and testing their new devices. The progress of the department is effectively being monitored with a scope of getting the National Board for Accreditation in the future. The faculty have started new research areas and the department is becoming more visible inside SRMIST and outside also. Industries are also coming forward for collaborative academic and research work. I expect this trend to continue. I am sure the faculty and the students of Biomedical Engineering will excel in their academic and research activities if the present enthusiasm is maintained and more efforts to achieve the set goals are made.

I wish the faculty and the students all the success in their endeavours.

M. Vairamani

Dean, SBE

"The progress of the department is effectively being monitored with a scope of getting the National Board for Accreditation in the future"

M. Vairamani

Dean, SBE

"Live as if you were to die tomorrow. Learn as if you were to live forever."
– Mahatma Gandhi

Dr. Jayanthi T
Faculty Editor
Associate Professor

Ms. Sreelakshmi
Chief Editor
IV Yr, B.Tech, BME

Mr. Chandresh
Copy Editor
III Yr, B.Tech, BME

Ms. Dipanwita
Managing Editor
II Yr, B.Tech, BME

Ms. Tejaswini
Section Editor
II Yr, B.Tech, BME

Ms. Tanya Preeti
Section Editor
I Yr, B.Tech, BME

Mr. Shree Sai Sarathi
Section Editor
I Yr, B.Tech, BME

Ms. Sowmya Vijay
Quotes Editor
I Yr, B.Tech, BME

Mr. Om Das Gupta
Opinion Editor
II Yr, B.Tech, BME

WORD FROM OUR TEAM BME

Meet the team behind this issue of BioScope - the editorial team.

Dear Readers,

Welcome to the Volume 5, issue 1 of BioScope, for the academic year of 2022 - 2023. As the official newsletter of the Department of Biomedical Engineering at the SRM Institute of Science & Technology, Kattankulathur, we are happy to bring to you the latest and most exciting developments across our department and campus.

As we head into a new academic year, we celebrate another year of learning and accomplishments, both curricular & extracurricular. We have successfully navigated through a year of fruitful learning, thanks to the meticulous efforts of our faculty, staff & students. While we encourage our readers to take an active part in areas of research and development, we also hope you have a fun-filled and joyous learning experience.

We would also like to take this opportunity to congratulate the students, staff, and faculty members for their commendable efforts and commitment over the months. We also want to thank our readers for sharing their achievements with us and allowing us to make this issue possible. With the ongoing progress, we hope that the present year will be as productive as the previous one. We would like to mention special thanks to our alumni **Mr.SaiTejveer Santhan** for his guidance and support in mapping out this issue.

We would also like to heartily wish our readers all the very best and that you have a splendid year ahead of you.

Love what you do, and do what you love, readers!

Live happy, healthy, and safe!

Best Wishes,
The Editorial Board, BioScope

"Coming together is a beginning. Keeping together is progress. Working together is a success." - Henry Ford
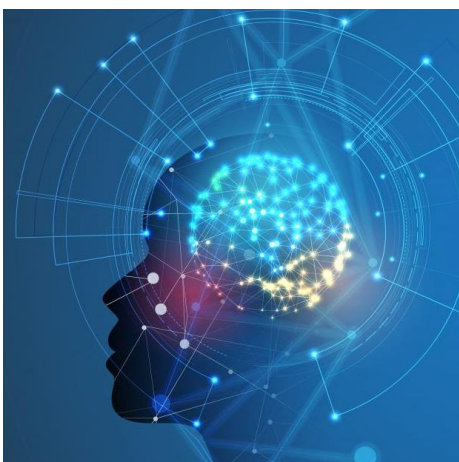
ABOUT THE DEPARTMENT

Biomedical Engineering is the amalgamation of engineering principles and medical procedures in order to create solutions for healthcare. This essentially involves collaborating with doctors and medical researchers to develop medical equipments and devices as well as automated systems and software solutions related to the field. Biomedical Engineering is one of the five departments in the School of Bioengineering. It was established in 2004, with active clinical partnership in association with SRM Medical College and Research Institute.

The department aims to graduate responsible Biomedical engineers who can provide knowledge based, cost effective and high-quality health care technology. Biomedical Engineering department offers B.Tech, M.Tech and Ph.D. programmes in Biomedical Engineering. Over the years, the department has actively been a part of diversified research and teaching, becoming one of the best institutions for the programme in the country.

RESEARCH AREAS

- Medical thermal imaging in diseases diagnosis and management
- Technologies focusing on Point of care devices for healthcare applications.
- Human Movement analysis and assistive technologies.
- Next generation healthcare technologies for communicable and non-communicable diseases
- Bio Signal and Medical Image Processing,
- Bio electronics and Biomechanics

"A life of joy and happiness is possible only on the basis of knowledge and science. -Dr. Sarvepalli Radhakrishnan

RESEARCH PUBLICATIONS AND PATENTS

Ahalya RK, U. Snekhalatha, Palani Thanaraj Krishnan, Alex Noel Raj, "Automated Assessment of Rheumatoid arthritis from Hand Radiographs using deep learning Techniques", Journal of Engineering in Medicine online 13th July 2022 DOI: 10.1177/09544119221109735 IF:1.763, (SCI).

P. Lakshmi Prabha and A. K. Jayanthy, "Risk analysis and classification of myocardial infarction from carotid intima media thickness of b-mode ultrasound image using various machine learning and deep learning techniques", July 2022, Biomedical Engineering: Applications, Basis and Communications, SNIP:0.36, (Scopus Indexed).

Kavya Ganesh, U. Snekhalatha Umapathy, Palani Thanaraj Krishnan, Computer Aided Diagnosis of Autism Spectrum Disorder Based on Thermal Imaging. In: Raman, B., Murala, S., Chowdhury, A., Dhall, A., Goyal, P.(eds)ComputerVision and Image Processing. CVIP 2021. Communications in Computer and Information Science,vol 1567. Springer, Cham. https://doi.org/10.1007/978-3-031-11346-8_3 6th IAPR International conference on Computer Vision and Image Processing IIT Ropar, India, online 24th July SNIP:0.286.

Satyamoorthi B, U. Snekhalatha, T. Rajalakshmi, "Automated Robotic arm based on Bluetooth regulated for progressed surgical task",

International Conference on Industry 4.0 Technology (I4 Tech), IEEE Explore, Nov 2022. pp. 1-4, Doi: 10.1109/I4Tech55392.2022.9952598.

Snekhalatha, Palani Thanaraj Krishnan, Kurt Ammer, authored book titled "Artificial Intelligence-based Infrared Thermal Image Processing and its Applications". Book Publisher: CRC Press Taylor and Francis Group. Online 27th July 2022. ISBN 9781032158143.

Dr. T. Jayanthi and Dr.A. K. Jayanthy collaborative patent work on "A MASK AND A MONITORING SYSTEM FOR RESPIRATORY MONITORING OF A USER", Status: granted on 19th July 2022

"Revisiting the properties of suture materials: an overview", Ashwin Kumar N, Thella Shalem Rahul, Saravanan Krishnan, In the Book: Advanced Technologies and Polymer Materials for Surgical Sutures, ISBN: 9780128197509.

Lakshmi Prabha.P, A.K Jayanthy, Kumar Janardanan, "M-Mode carotid artery image classification and risk analysis based on machine learning and deep learning techniques", Expert clouds and application, LNNS Vol 444, 18 August 2022, pg675-689.

Dr. Ashwin Kumar N, "MICROFLUIDIC DEVICE AND A PROCESS FOR ITS PREPARATION", Patent Application No. 202241066271, Status: filed on 18/11/2022

"For those who dare to dream, there is a whole world to win."- Dhirubhai Ambani

Nanotechnology interventions in neuroscience: current perspectives and strategies, Ashwin Kumar N, Gowri Annasamy, Pavani Rekulapally, Suresh S N, Saravanan Krishnan, In Book: Applications of Nanotechnology in Drug Discovery and Delivery, A volume in Drug Discovery Update, Publisher: Elsevier, (Published Online), ISBN : 978-0-12-824408-1 Editors: Chukwuebuka Egbuna, Mihnea-Alexandru Găman and Jaison Jeevanandam

Glory Precious, S. P. Angeline Kirubha, Keren Evangeline, "SYSTEM AND METHOD FOR BRAIN TUMOUR CLASSIFICATION IN BRAIN IMAGES OBTAINED FROM MAGNETIC RESONANCE IMAGING", Status: Patent filled, Patent Application No : 202241055054, Date: 26.09.2022

Bhargavee Guhan, Laila Almutari, Sowmiya S, U.Snekhalatha, T.Rajalakshmi, Shabnam Mohammed Aslam, "Automated System for classification of COVID-19 Infection from Lung CT Images based on Deep Learning Techniques", Scientific Report 12: 17417; October 2022, Nature Portfolio, (IF:4.99), SCI/Scopus indexed.

Hari Raj K, Gnanavel S, Ramalingam S, Investigation of 3D printed biodegradable PLA orthopedic screw and surface modified with nanocomposites (Ti-Zr) for biocompatibility", ceramics international Journal, (IF:5.6), SCI/Scopus indexed

Porkodi Jayavel, Ashok kumar Devaraj, "A REHABILITATION DEVICE FOR AN ELBOW JOINT", Patent Application No : 202241063970, Status: Published on 18/11/22

Prabha, P. Lakshmi, Kavya Atluri, Nikhil Varughese, and R. Roopesh. "A Low-Cost Portable Ventilator Using IoT" In Journal of Physics: Conference Series, vol. 2335, no. 1, p. 012061. IOP Publishing, 24/04/2022

Mohammed Ameen, Varshini Karthik, Oinam Robita Chanu, "AN APPARATUS FOR ANALYSIS OF SALIVA SAMPLE", Patent Application No : 202241054267 A, Status: Published on 14/10/2022

Anavai Kandaswami Jayanthy, Qaysar Mohi Ud Din, "A SYSTEM AND A METHOD FOR CLASSIFYING AUTISM SPECTRUM DISORDER (ASD) USING ELECTROENCEPHALOGRAM SIGNALS", Patent Application No. 202241058352 A, Status: published on 21/10/2022

Richa Rashmi, U. Snekhalatha, "A PORTABLE INSTRUMENT FOR DETERMINING FAT AND WATER IN MASS", Patent Application No: 201941013152, Status: Filed on 1st April 2019, Published on 21st August 2020, Granted on 27/10/2022

Jayanthi T, "NON-INVASIVE NON-CONTACT SYSTEM AND METHOD FOR MEASURING HEALTH PARAMETERS "Patent Application No : 11475564 B2, Status: Patent Granted (United States Patent) on 18/10/2022

Mahima,U.Snekhalatha,"Multi-stage classification of Alzheimer's disease in 18F-FDG-PET imaging using Deep learning techniques", APES J online, 10th November 2022, (IF:7.099), SCI/Scopus indexed.

Emilda Judith Ezhil Rajan, Jayanthi T, Karnam Anantha Sunitha "A SYSTEM AND A METHOD FOR VISUAL AND AUDITORY BIOFEEDBACK BASED ON ECOTHERAPY", Patent Application No. 202241058947 A, Status: published on 18/11/2022

A.K Jayanthy, "Expert clouds and applications", Ebook ISBN 978-981-19-2500-9, Print ISBN 978-981-19-2499-6, Springer.

"Engineering is not only study of 45 subjects, but it is moral studies of intellectual life." - Prakhar Srivastav

Qaysar Mohi Ud Din and A.K.Jayanthy, "Detection of autism spectrum disorder by feature extraction of EEG signals and machine learning classifiers", Biomedical Engineering: Applications, Basis and Communications, online ready, http://doi.org/10.4015/S1016237222500466.

Ahalya RK, U. Snekhalatha, Varun Dhanraj, "Evaluation of Rheumatoid Arthritis in hand X-ray and Ultrasound Imaging using Machine Learning Techniques: A comparison with Quantum machine learning techniques", Journal of Thermal biology, online 5th Dec 2022 DOI: https://doi.org/10.1016/j.jtherbio.2022.103404 (IF 3.189), SCI/Scopus indexed.
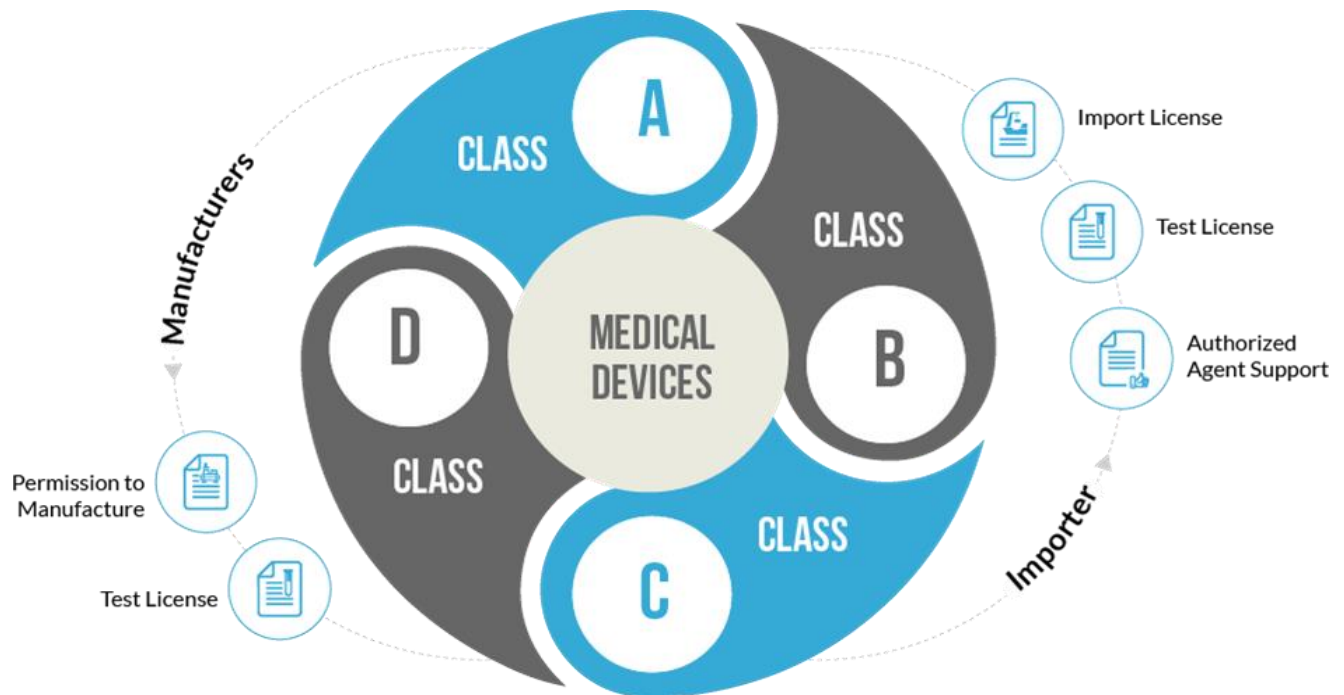
Sathyamoorthy, U.Snekhalatha, T.Rajalakshmi, "Facial Emotion detection in Digital and Thermal images using machine learning Techniques", Biomedical Engineering Application Basis Communication Journal online 10th Dec 2022, DOI: https://doi.org/10.4015/S1016237222500521.

Clyde John, Kaahini Jain, Hema Brindha Masanam, Ashwin Kumar Narasimhan and Arutselvan Natarajan, "Recent Trends and Opportunities for the Targeted Immuno-Nanomaterials for Cancer Theranostics Applications", MDPI micro missions Journal, (IF:3.523), SCI

Nithyakalyani Krishnan , **Dr.Reegan Jose.M and P Muthu**, "study of chronic venous insufficiency condition of the lower limbs", Journal of Pharmaceutical Negative Results, Volume 13, Special Issue 7, 5003–5009, December 2022. https://doi.org/10.47750/pnr.2022.13.S07.618, (IF: 0.654), (SNIP: 0.162), ESCI & Scopus indexed.

INTERNSHIPS & PLACEMENTS CAREERS & ACHIEVEMENTS

We congratulate all our students who have been placed in various companies. In this academic year of 2022, 25 students have been offered positions in companies such as Baxter, Capgemini, TCS, CTS, The Math company, HCL Technologies, Morphle Labs etc.

"Great achievement is usually born of great sacrifice, and is never the result of selfishness." -Napoleon Hill

REQUISITES OF MEDICAL DEVICES

Global Medical Device Industry has seen a paradigm shift in the Post-Covid era. The supply vs demand gap in supportive equipment such as ventilators, patient monitors, SPO_2 monitors etc. led to many innovations in this sector as well as PPE segment of the biomedical industry. India has seen a steady rise in the growth of its medical device sector with current evaluation at 5.2 billion USD and is expected to grow to $50 billion USD by 2025 (Manu & Anand, 2022).

With almost 70% of Medical devices being imported in India, (Merkan & Verma, 2016), there lacked a centralized set of rules for classification, manufacturing, labeling etc. Medical Devices and Diagnostics division under Central Drug Standard Control Organization (CDSCO) released Indian Medical Devices Rules (2017)[IMDR] and amended it in Feb 2020 as Medical Device Rules to govern and monitor the process for conceptualization to Post-market surveillance.

Similar to global standards, the CDSCO via Central Licensing Authority (CLA) classifies devices based on risks from Class A (low risk) to Class D (high Risk). For manufacturing of Class A/B devices, the state licensing authorities issues the license whereas for Class C/D devices, CLA issues the license.

"We are what we repeatedly do. Excellence, then, is not an act, but a habit."
-Aristotle

The licence remains active in perpetuity as long as the licence retention fee is paid 5 years from the date of issue. Since the industry is transitioning from Drugs Control Act to Medical Device Rules, all Class A/B devices should have been registered by 1st October 2022, and all Class C/D devices have to be registered before 1st October 2023. Alike Australia where CE certificate is mandatory for local marketability, MDR in India mandates the manufacturers of medical devices to have ISO 13485 certification for the devices to be registered successfully in India. This certification is audited and assessed by notified body registered with CLA. Clinical investigations are required for classes B/C/D if the device is an investigational devices and doesn't not have a predicate device or if it is a new IVDMD. Exploratory studies and pivotal studies are 2 types of clinical studies required for the new devices.

Clinical studies are not required for devices that are marketed in Australia, EU, USA or Japan for 2 years or more and the local authorities are satisfied with the clinical data provided. In such cases Post-market surveillance may be requested by CLA. Under IMDR post market surveillance is managed by Materiovigilance Program of India where the manufacturers are obligated to provide regular Public Safety Update Report (PSUR) that ensures public safety by assessing/detecting adverse effects of medical devices, malfunctions, defects etc. to avoid morbidity and mortality. India lacks a centralized database for Adverse Event reporting accessible to public, which makes the market device recall and communication an onus on the device manufacturer/importer.

Overall India's new regulatory framework is a big leap ahead to tap the growing medical device industry. The amended framework will allow Indian manufacturers to register quality products that will be easy to register in multiple countries. For medical device importers the acceptance of comparable assessment authorities' certificates makes it easier for our citizens to get access to state of the art devices. With Government initiatives such as make in India campaigns, Regulatory Landscape strengthening schemes etc. the medical device industry in India is all set to soar to new heights and knowledge on this framework however in-depth or in overview will only assist upcoming or current biomedical professionals to succeed in their career by riding the growth wave.

Karan Mehta,

Alumni (2012-2016)

Technical Product Support

Dalcross Medical Equipment

Sydney, Australia

"Ideation without execution is delusion." — Robin Sharma

TECHNICAL EVENTS PARTICIPATION

Dr. A. K. Jayanthy, participated in Professional Development Programme on "Question Paper Authoring & Student Evaluation" conducted by National Institute of Technical Teachers Training and Research, Chennai, Tamil Nadu, India from 27th June 2022 to 1st July 2022.

Dr. A. K. Jayanthy, participated in Professional Development Programme on "Biomedical electronics and Telemedicine" conducted by National Institute of Technical Teachers Training and Research, Chennai, Tamil Nadu, India from 11th 15th July 2022.

Dr. Kathirvelu D, participated in Professional Development Programme on "Animation and presentation techniques", conducted by National Institute of Technical Teachers Training and Research, Chennai, Tamil Nadu, India from 11th to 15th July 2022.

Mrs. G. Anitha, participated in Professional Development Programme on "Animation and presentation techniques", conducted by National Institute of Technical Teachers Training and Research, Chennai, Tamil Nadu, India from 11th to 15th July 2022.

Dr. P Vinupritha, participated in Professional Development Programme on "Animation and presentation techniques", conducted by National Institute of Technical Teachers Training and Research, from 11th to 15th July 2022.

Dr. D Kanchana, participated in Professional Development Programme on "Animation and presentation techniques", conducted by National Institute of Technical Teachers Training and Research, from 11th to 15th July 2022.

Dr. D. Ashokkumar, served as a resource person for the three weeks course on "Biomechanics" organized by the Department of Mechanical Engineering, SRM Institute of Science and Technology, Kattankulathur, from 11th to 29th July 2022.

Dr. D. Kanchana, participated in Faculty Refresher and Assimilation Programme (FRAP), organized by SRM Institute of Science and Technology, Kattankulathur, on 17th September 2022.

Dr. D. Kanchana, has completed "Apply AL techniques to solve wireless communications system design challenges", organized by IEEE educational activities, on 18th September 2022

Dr. D. Ashok kumar, served as a Resource Person- Two Day National Level online Seminar On "Impact of COVID19 - Advanced Technologies and Devices", Department of Biomedical Engineering, Sethu Institute of Technology, Virudhunagar, Tamil Nadu, India on 30th July 2022

Dr. D. Ashokkumar, participated in Professional Development Programme on "Biomedical electronics and Telemedicine" conducted by National Institute of Technical Teachers Training and Research, Chennai, Tamil Nadu, India from 27th June 2022 to 1st July 2022.

Dr. S. P. Angeline Kirubha, served as a resource person for the three weeks course on "Biomechanics" organized by the Department of Mechanical Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India from 11th to 29th July 2022.

Dr. S. P. Angeline Kirubha, served as a Reviewer for one Research Article for the Journal Physical and Engineering Sciences in Medicine on 6th July 2022

Mrs. G. Anitha, participated in one week FDP on "Research: contemporary trends & perspectives" organized by the Department of Management studies & IQAC cell, Jeppiaar Institute of Technology, Sriperubudur, Chennai, Tamil Nadu, India from 18th to 22nd July 2022.

Dr. P. Muthu, participated in Professional Development Programme on "Managing stress for effective living" conducted by National Institute of Technical Teachers Training and Research, Chennai, Tamil Nadu, India from 27th June 2022 to 1st July 2022.

Mrs. A. Bhargavi Haripriya, part of organizing committee of Silver jubilee reunion at university level, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India on 27th July 2022

Dr. Varshini Karthik, participated in six days Faculty development programme on "Virtual reality development using UNITY", organised by Centre for Immersive Technologies (CIT), SRM Institute of Science and Technology, Kattanlulathur, Chengalpattu, Tamil Nadu, India during 27th, 29th, 30th July 2022 and 2nd, 3rd and 5th August 2022.

Dr. D Ashok Kumar, participated in six days Faculty development program on "Virtual reality development using UNITY", organized by the Centre for Immersive Technologies (CIT), SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India during 27th, 29th, 30th July 2022 and 2nd, 3rd and 5 August 2022.

Dr. D. Kanchana, paper titled "Automated Classification of CTG signals using Deep Learning based Scalogram Analysis", has been accepted for Oral presentation at 5th IEEE IAS GUCON 2022 on 23rd to 25th September 2022.

Dr. U. Snekhalatha, successfully completed the Journal Citation Reports (JCR) certification series – 2022, certificate ID:448800 on 10th August 2022.

Dr. A. K. Jayanthy, participated in 5 day online faculty development programme on "Research Methodology and Tools", organized by Department of computer science and engineering, ABES Engineering College, Ghaziabad, India from 22nd to 28th August, 2022.

Dr. A. K. Jayanthy, participated in IP awareness/training program under "National intellectual property awareness mission", organised by Intellectual property office, India on 3rd August 2022.

Dr. A. K. Jayanthy, completed the Journal citation reports (JCR) certification series-2022, certificate ID: 969530 on 10th August 2022

Dr. P. Vinupritha, participated in 5 days online faculty development programme on "Research Methodology and Tools", organised by Department of Computer Science and Engineering, ABES Engineering College, Ghaziabad, from 22nd to 26th August 2022.

Dr. A. K. Jayanthy, completed online one week faculty development programme on "E-content Development", organized by Teaching Learning Centre, Ramanujan College, University of Delhi, India from 20th to 26th August 2022.

Dr. D. Ashok kumar, Dr. S. Gnanavel Judge and Mentor for SMART INDIA HACKATHON-SRMIST,

Gilbert Sangu (RA2112015010019), M.Tech-BME II year, has successfully completed the Fluke Biomedical Advantage Training "Medical Device Quality Assurance-Electrical Safety", on 19th August 2022.

"A little progress each day adds up to big results."
– Satya Nani

Dr. T. Jayanthi, completed online one week faculty development programme on "E-content Development", organized by Teaching Learning Centre, Ramanujan College, University of Delhi, India from 20th to 26th August 2022.

Dr. D. Ashokkumar, Resource person, "BUSINESS PLAN DEVELOPMENT-Components and Stages in Business plan Development", on 12th August 2022.

Dr. Kathirvelu D, participated in 5 days online faculty development programme on "Research Methodology and Tools", organised by Department of Computer Science and Engineering, ABES Engineering College, Ghaziabad, from 22nd to 26th August 2022.

Dr. Vani Damodaran, participated in the online faculty development programme on "Mentoring pedagogy and classroom delivery enhancement techniques", organised by E&ICT academy IIT Guwahati from 3rd to 10th August 2022.

Dr. Vani Damodaran, completed online one week faculty development programme on "E-content Development", organized by Teaching Learning Centre, Ramanujan College, University of Delhi, India from 20th to 26th August 2022.

Ms. Hema Brindha, participated in IP Awareness/Training program under National intellectual property awareness mission, organized by Government of India, Ministry of commerce and Industry, Department for Promotion of Industry and Internal Trade office of the controller general of patents, designs and trade marks on 18th August 2022

Mr. Hari Raj K, participated in IP Awareness/Training program under National intellectual property awareness mission, organized by Government of India, Ministry of commerce and Industry, Department for Promotion of Industry and Internal Trade office of the controller general of patents, designs and trade marks on 18th August 2022

Ms. Abira Bright attended the Conference on "Women in optics and photonics in India 2022", organized by Raman Research Institute – Bengaluru, India 6th to 7th December 2022.

Ms. Fabiola Jemmie Shilparani, presented a paper entitled "Elastic and fatique analysis of various biomaterials in dental implant applications using FEA", in International Conference on future trends in materials and mechanical engineering (ICFTMME-2022), organised by the department of Mechanical and Automobile Engineering, SRM Institute of Science and Technology, Delhi NCR Campus, Ghaziabad, India during 19th to 20th August 2022.

Ms. Gloria Nkondo (RA2112015010020) M.Tech-BME II year student, participated as a Delegate in the 'Female genital system pathology', webinar held virtually on 12th and 13th August 2022

Gilbert Sangu (Reg.No. RA2112015010019), M.Tech-BME II year, Volunteering in open house event, organised by Department of Biomedical Engineering, SRMIST, Kattankulathur, Chengalpattu, Tamil Nadu, India on 24th August 2022.

Dr. U. Snekhalatha, served as DC member in the for the research scholar Ms.Bhuvana at Vels University, Pallavaram, Chennai, Tamil Nadu, India on 16th August 2022

Dr. D. Kanchana, as reviewer for IEEE Mysurucon 2022 – the second edition of the Mysuru subsection flagship International Conference, organized by NITTE Meenakshi Institute of Technology, NITTE Education Trust from 16th to 17th September 2022

Dr. D. Kanchana, contributed as Technical reviewer in the IICAIET 2022 held virtually in 4th IEEE International Conference on Artificial Intelligence In Engineering and Technology (IICAIET 2022), organised by University Malaysia Sabah from 13th to 15th September 2022.

Dr. U. Snekhalatha, presented the paper titled "Automatic robotic arm based on Bluetooth regulated for progressed surgical task" in International Conference on Industry 4.0 Technology 2022 organised by Department of Instrumentation Engineering, Vishwakarma Institute of Technology, Pune, India from 22nd to 24th September 2022.

"Be so busy improving yourself that you have no time to criticize others." – Chetan Bhagat

Dr. U. Snekhalatha, participated in one week AICTE sponsored online FDP on "IOT based smart automation system", in association with GSAS microsystems, Bengaluru, organized by MVGR College of Engineering (A), Vizianagaram from 22nd to 27th August 2022

Dr. S. Gnanavel participated in 6 days Faculty Development Programme on "Current trends in Nanomaterials and its Applications (CTNA 2022), organized by Department of Chemical Engineering, SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India from 22nd to 27th August 2022.

Dr. A. Bhargavi Haripriya, participated in six days Faculty Development Programme on "Artificial intelligence for medical image classification", organized by the Department of Electronics and Instrumentation Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India from 12th to 17th September 2022.

Dr. D. Kanchana, has presented a paper titled "Automated classification of CTG signals using deep learning based scalogram analysis", in 2022 IEEE Global Conference on computing, Power and Communication Technologies (GlobConPT), organized by India Habitat Centre, Lodhi Road, New Delhi, India, from 23rd to 25th September 2022

Ms. Fabina J, completed two days workshop on "Principles and practice of ideating image for science communication – design tools for science", organized by Department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India from 26th to 27th August 2022

Ms. Devaki, completed two days workshop on "Principles and practice of ideating image for science communication – design tools for science", organized by Department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India from 26th to 27th August 2022

Ms. Sameera Fathimal M, participated in two days workshop on "Cloud computing in healthcare", organized by Department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India 22nd and 23rd September 2022

Ms. Hema Brindha M, participated in two days workshop on "Cloud computing in healthcare", organized by Department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India 22nd and 23rd September 2022

Ms. Porkodi J successfully completed one week Faculty Development Program on "Amazon Web Services", organized by Department of Computer Engineering, AISSMS College of Engineering, Pune, India from 22nd to 27th August 2022

Ms. Fabiola Jemmie Shilparani, participated in 6 days Faculty Development Programme on "Current trends in Nanomaterials and its Applications" (CTNA 2022), organized by Department of Chemical Engineering, SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India from 22nd to 27th August 2022.

Mrs.P.Lakshmi Prabha, participated in two days workshop on "Cloud computing in health care", organized by the department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India from 22nd to 23rd September 2022.

Mrs. Nithyakalyani Krishnan, participated in six days Faculty Development Programme on "Artificial intelligence for medical image classification", organized by the Department of Electronics and Instrumentation Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India from 12th to 17th September 2022.

"Every accomplishment starts with the decision to try."
– Gail Devers

Dr A. K. Jayanthy, voluntarily contributed as a reviewer of papers for IEEE International Conference on interdisciplinary approaches in technology and management for social innovation (IATMASI-2022), organized by IEEE MP section and ABV-IIITM, Gwalior, India during October 2022

Dr. U. Snekhalatha, participated in 6 days FDP on "Hands-on deep learning architectures for data classification using python", organized by Dhanekula Institute of Engineering and Technology, Ganguru, Vijayawada in association with AIQUANTUM smart solutions Pvt. Ltd., STEP, NITK Surathkal from 26th September to 1st October 2022

Dr. D. Kanchana, attended the 120 minutes International online webinar on "Upcoming trends in wearable electronics and internet of things (IoT)", conducted by National Institute of Technical Teachers Training and Research (Ministry of Education, Government of India), Chennai, Tamil Nadu, India during 15th October 2022

Dr. D. Kanchana, presented a paper entitled "Design and development of cardiopulmonary health monitoring system using IoMT" in 3rd Global Conference for Advancement in Technology (GCAT), organised by IEEE Bangalore section, Bangalore, India 7th and 9th October 2022

Dr. D. Kanchana, participated in the 6 days virtual workshop on "Research opportunities in semiconductor materials and devices (ROSMD-2022)", organised by Department of electronics and communication SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India from 19th to 24th October 2022

Dr. P. Muthu, successfully completed the NPTEL online certification course "Medical Image Analysis" with a consolidated score of 60%, total number of candidates certified in this course:215, organized by Indian Institute of Technology, Madras, Tamil Nadu, India from July – October 2022 (12 week course)

Dr. S. Gnanavel, as a reviewer "Result in chemistry" contributed to the Journal since September 2022.

Dr. A.K. Jayanthy, Participated as Member of Board of Studies Meeting, Sri Manakula Vinayagar Engineering College, Puducherry, on 17th September 2022

Kaavya P, participated six day FDP on "Design and Analysis of Micro Structure", organized by center for MEMS, Department of electronics and instrumentation engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India 10th to 15th October 2022

Ms. V. Devaki, attended the 120 minutes International online webinar on "Upcoming trends in wearable electronics and internet of things (IoT), conducted by National Institute of Technical Teachers Training and Research (Ministry of Education, Government of India), Chennai, Tamil Nadu, India during 15th October 2022

Dr. T. Jayanthi, gave expert lecture on "Interpretability and Machine Learning in Biomedical Research" in Karunya Institute of Technology and Sciences, Coimbatore Tamil Nadu, India during 21st October, 2022

Dr. Kanchana D, successfully participated in IP awareness/Training program under "NATIONAL INTELLECTUAL PROPERTY AWARENESS MISSION", organized by intellectual property office, India on 4th November 2022

Jeyaprabha A attended five days faculty development programme on "Machine Learning for Multidisciplinary Fields", organized by the Department of Data Science and Business Systems in association with RAISE center of Excellence powered by MIT square, London from 27th to 31st October

Ms. Abira Bright B, attended five days FDP on "Machine Learning for Multidisciplinary Fields", organised by the department of Data science and Business Systems in association with RAISE center of Excellence powered by MIT square, London from 27th – 31st October 2022.

"Man needs his difficulties because they are necessary to enjoy success." – A P J Abdul Kalam

•

Dr. Kanchana D, attended 2 days National Seminar on "COMPUTER VISION AND IMAGE PROCESSING", organized by Marwadi University, Rajkot, IEEE Gujarat section, India during 11th to 12th November 2022

Dr. A. Bhargavi Haripriya, successfully completed 5 days short term training programme on "Intelligent IOT system development: from scratch to prototype", organized by Department of computational intelligence, school of computing, SRM Institute of science and technology, Kattankulathur, Chennai, Tamil Nadu, India from 21st to 25th November 2022

Dr. S. P. Angeline Kirubha, Delivered Guest Lecture on "Application of Artificial intelligence in retinal diseases" in World Sight Day celebration conducted by Department of Optometry, SRM Medical College Hospital & Research Centre, Kattankulathur, Chennai, Tamil Nadu, India on 11th and 12th Nov 2022

Mr. Hari Raj, participated in three days "Hands on training program on advanced characterization techniques", organized by Nanotechnology Research centre (NRC), SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India during 10th to 12th November, 2022

Nithyakalyani Krishnan, P Muthu Presented a paper entitled: "Infrared thermal imaging as a prediction tool for the diagnosis of varicose veins", and received "BEST PAPER AWARD" in the International Conference on Innovative Trends in Engineering and Sciences (ICITES) 2022, organised by School of Mechanical Science at Bannari Amman Institute of Technology, Sathyamangalam held on 07th & 08th November 2022.

Dr. P. Muthu, for successfully completing the NPTEL-AICTE Faculty Development Programme course "Psychology of Everyday", with a consolidated score of 53% during August to September 2022 (4 weeks).

Dr. Kanchana D, Completed every module within "Research design" in the Elsevier Researcher Academy on 23rd December 2022.

Dr. A. Bhargavi Haripriya, team leader, in University level ISO:14001:2015 Internal Audit program from our department (audited EB, rain water harvesting, STP plant, RO plant of E&T among few other locations.), organised by SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India on 15th November 2022

Mrs. P. Lakshmi Prabha, team member, in University level ISO:14001:2015 Internal Audit program from our department (audited EB, rain water harvesting, STP plant, RO plant of E&T among few other locations.), organised by SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India on 15th November 2022

Mr. Jothiraj, attended five days faculty development programme on "Machine Learning for Multidisciplinary fields", organized by Department of Data Science and Business Systems in association with RAISE centre of excellence powered by MIT square, London from 27th October to 31st October 2022.

Ms. Hema Brindha M, participated in three days "Hands on training program on advanced characterization techniques", organized by Nanotechnology Research centre (NRC), SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India during 10th to 12th November 2022

Ms. Kaavya P, participated in three days "Hands on training program on advanced characterization techniques", organized by Nanotechnology Research centre (NRC), SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India during 10th to 12th November 2022

"If you want to shine like Sun, first burn like Sun."
– A P J Abdul Kalam

Ms. Febina J, attended five days faculty development programme on "Machine Learning for Multidisciplinary Fields", organized by the department of Data Science and Business Systems in association with RAISE center of excellence powered by MIT square, London from 27th to 31st Oct 2022.

Ms. Fabiola Jemmie Shilparani, participated in three days "Hands-on training program on advanced characterization techniques", organized by Nanotechnology Research center (NRC), SRM Institute of Science and Technology, Kattankulathur during 10th to 12th November 2022

Priyanka P (RA2112015010015), won 3rd prize and cash prize of Rs 2000/- titled Development of in-vivo optical imaging system in Tek clusterz National level technical symposium held at Kongunadu college of engineering and technology -Trichy in the month of 17th September 2022.

Ms. Abira Bright B, participated in the two days Workshop on Photonics and Photovoltaic devices (WOPPD-22), organized by the Electronics and Communication Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India during 29th to 30th September 2022.

Mrs. Sameera Fathimal M, attended five days faculty development programme on "Machine Learning for Multidisciplinary Fields", organized by the Department of Data Science and Business Systems in association with RAISE center of Excellence powered by MIT square, London from 27th to 31st October.

Ms. Abira Bright B, has participated and successfully completed 6 days faculty Development Programme on "Wearable Devices for IoT and Microwave Infrastructure", organized by

Department of Electronics and Communication Engineering, SRM Institute of Science and Technology, Modinagar, Delhi-NCR, India during 20th to 25th December 2022.

Jothiraj S and Jayanthy A K, presented a paper entitled: "Localization and Semantic Segmentation of Polyp in an Effort of Early Diagnosis of Colorectal Cancer from Wireless Capsule Endoscopy Images", in the Seventh International Conference on Parallel, Distributed and Grid Computing (PDGC-2022), organized by the Department of Computer Science & Engineering and Information Technology, Jaypee University of Information Technology, Waknaghat, Himachal Pradesh, India from 25th to 27th November 2022

Ms. Jeevitha K (RA2112015010017), M.Tech-BME II year student, attended the webinar on "Research and publication writings and tips", organized by IEEE Madras young professionals, Tamil Nadu, India on 22nd October 2022

Ms. Jeevitha K (RA2112015010017), an M.Tech-BME II year student, participated in a Two-Day Boot Camp for the "Fusion 360 Design Challenge", under the aegis of "Naan Mudhalvan" program, organized by the Department of Biomedical Engineering, SSNCE and AUTODESK Corporation, Chennai, Tamil Nadu, India from 7th to 8th October 2022

Ms. Jeevitha K (RA2112015010017) M.Tech-BME II year student, completed two days workshop on "Principles and practice of ideating image for science communication – design tools for science", organized by the Department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India from 26th to 27th August 2022

"A man is but the product of his thoughts, what he thinks, he becomes" [17]
- Mahatma Gandhi

Ms. Priyanka P (RA2112015010015) M.Tech-BME II year student, won 3rd place in presented a paper entitled: "Development of Invivo optical imaging system", in one day national level symposium TEKCLUSTER'22, organized by Department of Biomedical Engineering, Kongunadu College of Engineering and Technology, Trichy, Tamil Nadu, India on 17th September 2022

Ms. Priyanka P (RA2112015010015) M.Tech-BME II year student, Poster presentation titled: "Multi channel light sensor spectrum with MIT APP inventor" and Won prize in the "Indo-USA International Conference on Applications of Nanotechnology in Biology, Biotechnology and Biopharmaceuticals (ICNB3)" organized by School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology in association with University of Missouri, USA, The Biotech research society, India, Microbiologist society, India, Nano & Biomaterials Association, BSACIST from 11th and 12th August 2022.

Mr. Sivaprasath R (RA2011013010052), B.Tech-BME III year student, completed two days workshop on "Principles and practice of ideating image for science communication – design tools for science", organized by Department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India from 26th to 27th August 2022

Ms. Priyanka P (RA2112015010015) M.Tech-BME II year student, completed two days workshop on "Principles and practice of ideating image for science communication – design tools for science", organized by.

Gilbert L Sangu (RA2112015010019), participated in two days workshop on "Cloud computing in healthcare", organized by the department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India from 22nd to 23rd September 2022.

Janani M A (RA2112015010007) M.Tech-BME II year student, completed two days workshop on "Principles and practice of ideating image for science communication – design tools for science", organized by Department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India from 26th to 27th August 2022

Jeevitha K (RA2112015010017) M.Tech-BME II year student, participated in the e-Training Program on "Occupational safety and disaster management", organized by National Institute of Disaster Management, Ministry of Home Affairs, GOI in collaboration with SRM Institute of Science and Technology, Chennai, during 27th to 29th October 2022.

Janani M A (RA2112015010007), M.Tech-BME II-year student, participated in three days "Hands on training program on advanced characterization techniques", organized by Nanotechnology Research centre (NRC), SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India during 10th to 12th November, 2022

Qaysar Mohi Ud Din and Dr. A.K.Jayanthy, "Detection of autism spectrum disorder by feature extraction of EEG signals and machine learning classifiers", Biomedical Engineering: Applications, Basis and Communications, online ready, http://doi.org/10.4015/S1016237222500466.

"Wisdom comes not from age, but from imagination and learning." – Anton Chekhov

Ahalya RK, U. Snekhalatha, Varun Dhanraj, "Evaluation of Rheumatoid Arthritis in hand X-ray and Ultrasound Imaging using Machine Learning Techniques: A comparison with Quantum machine learning techniques", Journal of Thermal biology, online 5th Dec 2022 DOI: https://doi.org/10.1016/j.jtherbio.2022.103404 (IF 3.189), SCI/Scopus indexed.

Sathyamoorthy, U.Snekhalatha, T.Rajalakshmi, "Facial Emotion detection in Digital and Thermal images using machine learning Techniques", Biomedical Engineering Application Basis Communication Journal online 10th Dec 2022, DOI: https://doi.org/10.4015/S1016237222500521.
4.
Clyde John, Kaahini Jain, Hema Brindha Masanam, Ashwin Kumar Narasimhan and Arutselvan Natarajan, "Recent Trends and Opportunities for the Targeted Immuno-Nanomaterials for Cancer Theranostics Applications", MDPI micro missions Journal, (IF:3.523), SCI

Nithyakalyani Krishnan , Dr.Reegan Jose.M and P Muthu, "study of chronic venous insufficiency condition of the lower limbs", Journal of Pharmaceutical Negative Results, Volume 13, Special Issue 7, 5003–5009, December 2022. (IF: 0.654), (SNIP: 0.162), ESCI & Scopus indexed.

Abira Bright and Vani Damodaran, presented a paper title: "Simulated retinal layers to study Optical Coherence Tomography imaging", Women in Optics and Photonics India (WOPI), SPIE, held on 6th-7th December 2022 in Bangalore

Mrs. Glory J, program committee member and reviewer in the International Conference on Communication and Intelligent Systems held online, organized by Soft computing Research Society, NIT, Delhi, India during 19th to 20th December 2020

Abira Bright B, Lakshmi Parvathi M, Vani Damodaran, presented a paper title: "Motion estimation of Handheld Optical Coherence Tomography System using real time Eye Tracking system", International Conference on Nanoscience and Photonics for Medical Application – (ICNPMA 2022), held on 28th-30th December 2022 in Manipal, Karnataka

Gilbert L Sangu (RA2112015010019), participated in two days workshop on "Cloud computing in healthcare", organized by the department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India from 22nd to 23rd September 2022.

Janani M A (RA2112015010007) M.Tech-BME II year student, completed two days workshop on "Principles and practice of ideating image for science communication – design tools for science", organized by Department of Biomedical Engineering, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India from 26th to 27th August 2022

Jeevitha K (RA2112015010017) M.Tech-BME II year student, participated in the e-Training Program on "Occupational safety and disaster management", organized by National Institute of Disaster Management, Ministry of Home Affairs, GOI in collaboration with SRM Institute of Science and Technology, Chennai, during 27th to 29th October 2022.

Lakshmi Parvathi M and Vani Damodaran, presented a paper titled: "Real-Time Eye tracking for Handheld Optical Coherence Tomography system", Women in Optics and Photonics India (WOPI), SPIE, held on 6th-7th December 2022 in Bangalore.

"Wisdom comes not from age, but from imagination and learning." – Anton Chekhov

Dr. T. Jayanthi, participated in the 6 days faculty development program on "Artificial Intelligence", conducted by Department of Computational Intelligence, School of Computing, SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India from 28th November 2022 to 3rd December 2022.

Dr. P. Muthu, participated and successfully completed the 5 days online FDP on the theme "Inculcating universal human values technical education", organized by All India Council Technical Education (AICTE), New Delhi, India from 5th to 9th December 2022.

Dr. Kanchana D, Acted as reviewer for 2nd International Conference on "Mobile Networks and Wireless Communications" (ICMNWC-2022), organized by the Sri Siddhartha Institute of Technology, Tumakuru, India in association with IEEE Bangalore Section from 2nd to 3rd December, 2022

Dr. Kanchana D, attended the "How to do Quality Publications", organized by IEEE student branch and department of electronics and communication engineering, NITTE Meenakshi Institute of Technology, NMIT, Bengaluru, India during 7th December 2022

Lakshmi Parvathi M, Abira Bright B, Vani Damodaran, presented a paper title: "Spectrometer Design for an 840nm Spectral-Domain Optical Coherence Tomography System", International Conference on Nanoscience and Photonics for Medical Application – (ICNPMA 2022), held on 28th-30th December 2022 in Manipal, Karnataka.

Dr. D. Kanchana, acted as reviewer for the International Conference on Recent Trends in Microelectronics, Automation, Computing and Communication Systems (ICMACC 2022) held during, IEEE Hyderabad section, India from 28th to 30th December, 2022.

Mrs. Oinam Robita Chanu, attended the Short term training program (STTP) on "Connecting people to the Semiconductor Industry", organized by the Department of Electronics and Communication Engineering, SRM Institute of Science and Technology, Vadapalani Campus, Chennai, Tamil Nadu, India from 15th to 17th December 2022.

•

Dr. G. Anitha, one day offline workshop on "Elimination of violence against Women at workplace", organized by Internal Committee, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India on 25th November 2022

•

Dr. Lakshmi Prabha P, one day offline workshop on "Elimination of violence against Women at workplace", organized by Internal Committee, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu, India on 25th November 2022

Dr. A. Bhargavi Haripriya, presented a paper entitled: "Extrapolation of possible foot ulceration based on gait and foot type", in the International Conference on Electronic and Photonic Integrated Circuits (EPIC- 2022), SRM University AP, India from December 15th to 17th December, 2022.

•

Dr. Anitha G, Dr. A. Bhargavi Haripriya, presented a paper entitled: "Tracking various lower extremity parameters of an athlete during squats using a wearable performance analysis system", in the International Conference on Electronic and Photonic Integrated Circuits (EPIC- 2022), SRM University AP, India from December 15th to 17th December 2022.

"We come nearest to the great when we are great in humility. – Rabindranath Tagore"

Ms. Devaki V, attended "Avoiding rejection: How to successfully navigate the publishing process", organized by Taylor and Francis Group on 29th November 2022

Mr. Jothiraj S , participated in the one week online faculty development program on "Emerging Technologies on Biomedical-Healthcare Applications", organized by Department of Biomedical Engineering, School of Bio and Chemical Engineering, Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu, India during 12th to 17th December, 2022

Dr. Vani Damodaran, Undergoing FIIP at M/s. Elisar Lifesciences Pvt Ltd from 17th to 31st December 2022.

Dr. T. Jayanthi, Served as DC member for the research scholar Mrs. Jeyarubi at Department of Biomedical Engineering, Vels University, Pallavaram, Chennai, Tamil Nadu, India on 16th September 2022

Dr. S. P. Angeline Kirubha, Served as a reviewer for SERB CRG funded project on 19th September 2022.

Dr. S. P. Angeline Kirubha, Served as DC member for 3rd Research Advisory Committee (RAC) meeting for the Ph.D Research Scholar Mrs.T.R.Thamizhvani, at Department of Biomedical Engineering, School of Engineering, VISTAS (Vels University), Pallavaram , Chennai, Tamil Nadu, India on 19th September 2022.

Dharani R, Angeline Kirubha S, Vani S, Malavika K, Tejaswini R, Lavanya R, presented paper, "Development of Smart spectacles to monitor and modify myopia related health behavior in children" in 18th International Myopia Conference 2022, Netherland from 4th to 7th September 2022.

PROJECT FUNDING

Dr. Varshini Karthik, Dr. Ashok Kumar, Dr. Gayathri.M, Dr. Ganapathy, Interdisciplinary project title "Design and development of console based gaming for balance training in autism spectrum disorder children, Amount sanctioned Rs. 3,90,000/-, duration 2 years

Dr. Kathirvelu D, Co-Principal Investigator, Submitted a research proposal to ICMR on "Computer-aided diagnosis system for the measurement of mandibular cortical thickness on digital panoramic radiographs for the prediction of women with low bone mineral density", in collaboration with SRM dental college

Dr. U Snekhalatha, Co-Principal investigator for the Collaborative work with Dr.Siew Goh, University of Malaya funded successfully by the funding agency MyGrants Malaysia for the period of 3 years for the Satu project title Knee osteoarthritis: elucidating the role of radiographic biomarkers as mechanistic predictor of pain severity and response to intra-articular hyaluronic acid therapy RM158534
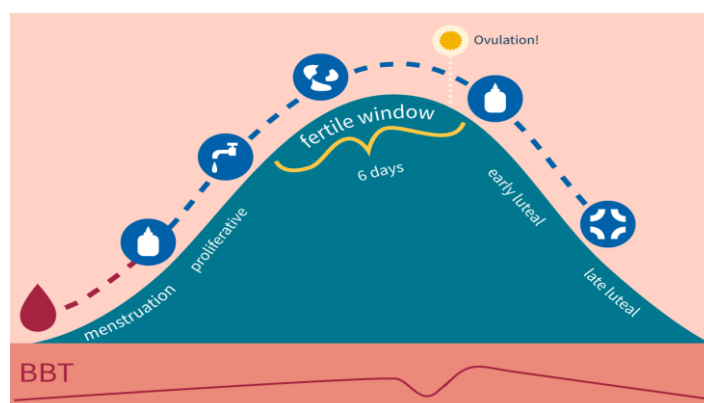
Dr. Ashwin Kumar N - Received SRM SIIC funding of Rs. 2.25 lakhs on the title, "Table-Top cell culture unit"

"Wisdom comes not from age, but from imagination and learning." –Anton Chekhov

HOW ABOUT SMART FERTILITY?

Wearable sensors (WS) are technological devices that individuals wear to track health-related information. They are integrated with fashion accessories monitoring vital parameters. They are mostly wireless devices. Heart rate, step count with metabolic activities, and blood pressure are a few parameters widely measured by wearable sensors. However, a dearth of studies on wearable sensors in women's health care, especially on reproductive health, is visible, and a lesser number of articles, when searched in research libraries/search engines, proves it.

Fertility tracking is all about knowing the fertile window, a six-day journey a woman travels during their menstrual phase, with five days on the process that leads to ovulation and the sixth day of ovulation itself. The gold standard for ovulation detection is transvaginal ultrasound tests. However, they are expensive and sometimes unrealistic in traditional clinical settings. Urine-based luteinizing hormone (LH) kits are also used for ovulation detection, which detects LH surge that occurs 24 to 36 hours before ovulation. According to studies, 49.5% of women who were aware of their fertility window became pregnant during the following menstrual cycle. Traditionally ovulation was known using the oldest ways of natural family planning (NFP), which needs a calendar. A normal menstrual cycle lasts between 28 and 32 days. Ovulation usually happens around day 14. However, several studies reported that NFP has limitations in accommodating natural cycle variations leading to more significant inaccuracy. Let us see the physiological parameter WS measures to find the fertility window. The body's core temperature at rest is the biphasic basal body temperature (BBT).

''Devotion is that which generates knowledge; knowledge is that which fashions freedom.'' -Tulsidas

This is calculated by taking one's oral, rectal, or vaginal temperature right after waking up and before engaging in any physical activity. Since the early 1900s, researchers have reported on and investigated the BBT rhythm during the menstrual cycle; the first observational study was conducted in the 1960s. The BBT varies throughout the menstrual cycle for most women as a result of hormonal changes. During the fertility window, a woman's BBT falls to its lowest point soon before ovulation, coinciding with a high estrogen secretion. According to earlier research, sperms can remain viable in the female vaginal canal for up to 6 days, with a more significant likelihood of pregnancy occurring close to ovulation. Therefore, the researchers define the fertile window, or the specific time for conception, as the five days prior to ovulation and the actual day of ovulation. After ovulation, the likelihood of pregnancy decreases substantially, indicating that oocytes can only survive without fertilization for 12–24 hours. A woman's BBT usually rises as progesterone levels rise during ovulation. Since the post-ovulation temperature spike follows the prior-to-ovulation, BBT serves as a retrospective indicator of the fertile window.

A large number of research were conducted with WS that are preferably placed on the wrist, followed by the hip, chest, arm, and finger. Wrist-worn wearable sensors are the highest revenue-generating segment, and motion-tracking applications using accelerometers dominates the field. BBT temperature correlated with wrist temperature, which gave a breakthrough to a Wrist-worn Ovulation Detection (WOD) wearable sensor that detects wrist skin temperature. Companies, to name a few, apple watch series 8 and Ovufirst manufacture WS for WOD.

Researchers from the University of Zurich, Switzerland, conducted a study to identify the accuracy of wrist skin temperature in detecting ovulation compared to BBT. The study suggested that WOD WS showed similar sensitivity to NFP and LH testing. However, the study also pointed out that the result had a high true-negative prediction, recommending that wrist temperature can assist in maximizing the chance of pregnancy but not to be used as a standalone technique to avoid unplanned pregnancy. The scientific world also looks into studies related to pulse rate and its correlation with the menstrual cycle phase.

To conclude, research on this not-much-explored topic can provide more health-related solutions associated with reproduction. A few related parameters like Wrist- temperature and pulse rate can be joined to make way for an excellent accurate prediction algorithm to predict fertility window with more advanced machine learning and deep learning techniques.

JAISON JACOB MATHUNNY,

Research Scholar

BIOMEDICAL ENGINEE

Dept of Biomedical Engineering,

SRMIST

"Vulnerability is the birthplace of innovation, creativity and change."
— Brene Brown

EXPERT AND ALUMNI LECTURES SERIES

Expert lecture was delivered by Dr. J Vijay Rathan Lingaa, Techno-legal Advisor At SRM Innovation And Incubation Centre on "IPR COMMERCIALIZATION" was held on 17th august 2022 and organised by Dr. S. P. Angeline Kirubha, Dr. T. Jayanthi and Dr. Ashwin Kumar N

Expert lecture was delivered by Mr. AMARJEET SINGH TAK, Strategic Business Unit Head (Radiotherapy & Microsurgery), Zeiss Medical Technology on the Topic: "CAREER PROSPECTS IN MEDICAL TECHNOLOGY", held on 19th October 2022 organised by Dr. T. Jayanthi.

Expert lecture done by Mr. Shribalaji K, Assistant Manager, Chettinad Hospital and Research Institute, (B.Tech-BME), MS (BME), MBA (Health care and hospital management),on the Topic: "In depth analysis on bridging the gap in Biomedical Engineering field", held on 8th November 2022a organised by Dr. T. Jayanthi, Dr. Ashwin Kumar N & Dr. D. Ashokkumar.

"You've got to get up every morning with determination if you're going to go to bed with satisfaction." — George Lorimer

An alumni connect event was organised on 27th, July, 2022 on "Nuances in Research and Development for health care applications".The event was presided by our alumnus **Dr. Ramji K (2016-20)** Associate Professor in Bharath Institute of Higher Education Research Chennai Organising committee involved **Dr. Ratinam ,Dr. Varshin Karthik , Dr..A.Bhargavi Haripriya, Ms.Oninam,**

Mr. RAKESH S, from B Tech (BME) 2016-2020 batch Executive Director of travel episodes and Employee in Medtronics. Shared his experience with our students This event was organised by committee **Dr. Ratinam, Dr. Varshini Karthik, Dr. A. Bhargavi Haripriya.**
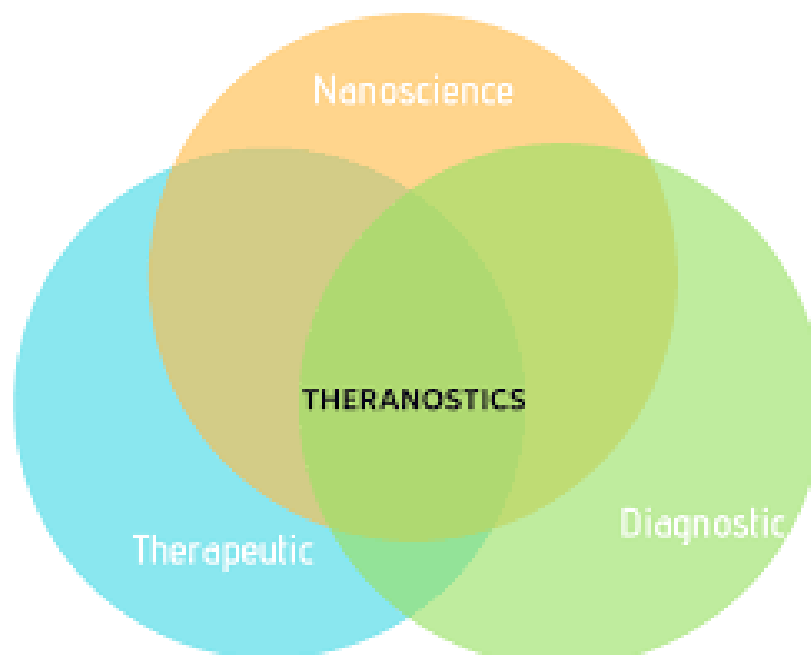
"Buliding Green Future", Alumni talk by **Mr. Atul (2018-2022)** organized by Dr. Ratinam, Director of Alumni affair, **Dr. Varshini Karthik,** HOD-BME, Dr .**A.Bhargavi Haripriya**, Asst Prof-BME, **Mrs. Oinam Robita Chanu**, Asst Prof-BME

Mukherjee Aviroop, B.Tech-BME (2015-19 Batch) Founder, The Nascent Research association of India, Administrative head of the organization delivered talk on "Advancements in Biomaterials and Tissue Engineering on 12th Oct,2022

Rohith M, Senior Engineering Manager and **Natasha Datta**, software engineer **(2005-2009)** shared their experience on "Job opportunities in Biomedical Field" on 19th Dec,2022

"The expert in anything was once a beginner." —Helen Hayes

REVOLUTIONIZING MEDICINE: THE FUTURE OF THERANOSTICS AND DRUG DELIVERY

Theranostics is an exciting field that aims to bring together diagnostic and therapeutic approaches in order to provide personalized and efficient healthcare to patients. This innovative approach combines engineering principles with medical practices, allowing for highly customized options for both diagnosis and treatment methods. At present, theranostics has shown impressive progress in the fields of oncology and cardiology and is likely to expand to other areas in the future.

Lipid microbubbles are gas-filled bubbles made up of a lipid shell and a gas core (generally, inert gases like perfluorobutane). These microbubbles have a variety of potential applications, including ultrasound imaging and drug delivery. For example, the Arizona-based company Microvascular Therapeutics (MVT-Group) has received FDA approval for the use of lipid microbubbles as contrast agents for imaging procedures. However, some research groups are also exploring the use of these microbubbles for targeted drug delivery. By attaching specific target-binding proteins, antibodies, or similar biomolecules to the microbubbles, they can be directed to specific cells or tissues, improving the accuracy and effectiveness of treatment. In addition, the use of lipid microbubbles allows for real-time visualization of their distribution in the body, enabling non-invasive monitoring of treatment.

''Every once in a while, a new technology, an old problem, and a big idea turn into an innovation''. -Dean Kamen

The potential benefits of using lipid microbubbles for drug delivery is the localization of drug activation at the targeted site, as well as the increased bioavailability of the drug at the action site. This can lead to more effective treatment outcomes, as the drug is able to reach and act on the targeted cells or tissues in a highly targeted manner. Additionally, lipid microbubbles have been found to have virtually no biotoxicity, making them a safe and effective option for drug delivery.

Another promising development in the field of theranostics is the use of "one-two punch nanoparticles" – nanoparticles that can deliver a combination of two different therapies to a specific location in the body. This approach is being explored as a way to improve the effectiveness of cancer treatments, by combining chemotherapy drugs and immunotherapies in a single delivery system. Researchers at the Massachusetts Institute of Technology (MIT) are working on developing nanoparticles that can target tumor cells specifically, releasing the therapies in a controlled manner.

Using one-two punch nanoparticles has the potential to overcome some of the challenges associated with traditional cancer treatments, such as chemotherapy resistance and immune evasion. By delivering a combination of therapies, these nanoparticles may be able to attack cancer cells and stimulate the immune system to attack the tumor. This approach has the potential to significantly improve treatment outcomes for cancer patients and may lead to the development of more personalized cancer therapies in the future.
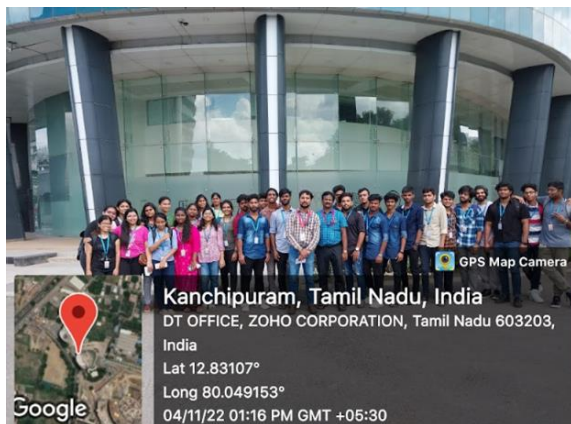
In conclusion, theranostics is a promising field that is already demonstrating significant progress in the areas of oncology and cardiology. With the continued collaboration of professionals from various technical domains, including engineering, medicine, biotechnology, pharmacology, and others, it is likely that we will see even greater advances in personalized and effective healthcare solutions, ultimately leading to improved outcomes for patients. The potential for theranostics to revolutionize healthcare is significant, and as the field continues to grow and develop, we can look forward to even more exciting developments in the future.

Dhyaneshwar Gowri Shankar

Master's in Biomedical Engineering

Carnegie Mellon University

''What is now proved was once only imagined.''
-William Blake

INDUSTRY INSTITUTE COLLABORATION

Moving towards the goal of keeping us closely associated with industries and making our students industry ready, we have joined hands with **Capgemini** and are all set for the launch of the industry-driven course on 18th August,2022

One day **industrial visit** to vTitan Corporation Limited, Vallanchery, Chengalpattu, for III-year (Vth sem) to provide practical exposure on theory course titled "Biomedical Device Design". Industrial visit on 4th Nov, 2022 with total 40 students were taken including 2 research scholars. The visit is coordinated by **Dr. Muthu P and Dr Ashwin Kumar N.**

Discussion of MoU with faculty of BME and Mr. Madhu Reddiboina, Founder of RediMinds, Inc, USA

'Coming together is beginning, Keeping together is progress, working together is success'' -Henry Ford
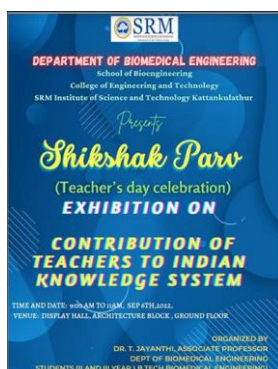
EVENTS ORGANIZED

OPEN HOUSE 2022 an event to outreach school students was organized by Dr.S. P. Angeline Kirubha, Dr. P. Muthu on 24th august 2022.

WORKSHOP on "Principles and practice of Ideating images for science communication" was conducted by Convener Dr. Varshini Karthik Coordinator: Dr. N. Ashwin Kumar on 26th and 27th August 2022

"No research without action, no action without research."
- Kurt Lewin

TWO DAYS WORKSHOP on "CLOUD COMPUTING IN HEALTH CARE "was conducted **by Dr. T. Jayanthi** from 22nd to 23rd September 2022.

On 5th september 2022, SHIKSHAK PARV, teachers' day celebration was conducted by coordinator **Dr. T. Jayanthi**.

HEALTH CAMP was held during 16th to 14th november 2022 by Convener **Dr. Varshini Karthik and Dr. U. Snekhalatha** Co-conveners are **Mrs. P. Lakshmi Prabha and Dr. Vani Damodaran**

Two days workshop on "mathematics aspects in bio sciences and engineering" held in 11th and 12th november 2022 by convener **Dr. Varshini Karthik and** coordinator **Dr. D. Ashokkumar.**

"There's no good idea that cannot be improved on." -Michael Eisne

STAR PERFORMERS
OF THE YEAR
2022

GOLD STAR PERFORMERS
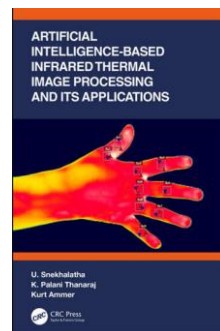
Dr. U. Snekhalatha

Dr. Vani Damodaran

SILVER STAR PERFORMERS

Dr. Angeline Kirubha S.P

Dr. Ashwin Kumar. N.

"The whole of science is nothing more than a refinement of everyday thinking."
- Albert Einstein

EVENTS

BOOK LAUNCH, **U. Snekhalatha**, **Palani Thanaraj Krishnan, Kurt Ammer** book titled "Artificial Intelligence-based Infrared Thermal Image Processing and its Applications". Book Publisher: CRC Press Taylor and Francis Group. Online 27th July 2022. ISBN 9781032158143.

Brainstorming session on to get inputs for 'New interdisciplinary programs from BME department' on 27th October 2022

Dr. N. Ashwin Kumar, In the anatomy lab for first year masters' students, the following three study experiments were converted into real time experiments to facilitate the students to obtain hand-on- experience.
1. Visualization of blood cell components in a microscope.
2. Blood grouping analysis.
3. Bleeding time & Clotting time.

Dr. S Gnanavel, New lab experiment performed for MTech students - An experiment using 3D printer for implant design

"Education is the most powerful weapon which you can use to change the world."
—Nelson Mandela

Club Tekmedica Inaugural address on 18th October 2022 by ,Mr. Karthik Raghavendran, CEO & Founder, Neurostellar Pvt. Ltd., IITM, Research Park, Chennai, on "Neurotechnology: Futuristic Trends & Applications" organized by **Dr. Ashwin Kumar N and Dr. D. Kanchana**

Dr. T. Jayanthi, Dr. S. Gnanavel, Design The Thinking Session - Welcome Note (3 days), Organised by SIIC, Intellect Design Arena Ltd, Chennai, Tamil Nadu, India during 31st October 2022, 1st & 2nd November 2022

Dr. Ashwin Kumar N, Design of new methodology for express the working of Piezo-electric transducer device in Biosensors lab for 1st years students. To enable students for practical understanding about the effects of piezoelectric horn (transducer) to mix oil (two viscosities) and water using bath sonicator system (contain piezo transducer).

Team BME (Dr.A.K. Jayanthy. Dr.T.Jayanthi. Dr. Angeline Kirubha and Dr.P.Muthu) won 'Second Prize' at an event held as part of 6 days FDP on "21CSC304T-Artificial Intelligence'' course from Nov.28th to Dec.3rd 2022.

"Nations consist of people. And with their effort, A nation can accomplish all it could ever want".- Dr. APJ Abdul Kalam

NON TEACHING PARTICIPATION & CONTRIBUTION

Mr. J. Bilal Ahamed, successfully completed a free online course "Software Testing Tutorial", provided by Great Learning Academy during October 2022

Mr. J. Bilal Ahamed, successfully completed the online course: "JAVA certification course", organized Skillup by Simplilearn during 22nd October 2022

Mrs. G. Nagalakshmi, successfully completed a online course "Introduction to Big Data Tools for Beginners", organized Skillup by Simplilearn during 22nd October 2022

Mr. J. Bilal Ahamed, successfully completed the course "Python", during 26th November 2022 at Kaggle (online)

Mr. J. Bilal Ahamed, successfully completed the course "Introduction to Programming", during 24th November 2022 at Kaggle (online)

Mr. Madankumar V, successfully completed a free online course "Excel for Beginners", provided by Great Learning Academy during November 2022

Mrs. G. Nagalakshmi, successfully completed the professional development course on "Real time data acquisition and signal conditioning for industrial applications", organized by Department of Electronics and instrumentation Engineering, SRM Institute of science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India from 23rd to 25th November 2022.

Mrs. C. Chitra, Mrs. S. Nagalakshmi and Mrs. A. Josephine Shaila participated in "Awareness on prevention of sexual harassment against women at workplace", organized by the Directorate of Students affairs in association with internal committee, SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India on 5th December 2022.

•

Mr. J. Bilal Ahamed, has participated in the one-day workshop titled: "Smart documentation tools and soft skills for Non-Teaching staffs", conducted by the Department of Biotechnology, School of Bioengineering, SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu, India on 20th December 2022.

"Leadership and learning are indispensable to each other." - John.F.Kennedy

DOCTORAL ACCOMPLISHMENT

Dr. A Bhargavi Haripriya, received her PhD degree, 18th Convocation of SRM Institute of Science and Technology which was held on 25th sept, 2022

Dr. P Lakshmi Prabha, of Biomedical Department, defended her Ph.D. Public Viva-Voce (Oral) for the Thesis topic "Classification And Risk Analysis For Cardiovascular Disease Using Carotid Artery Images And Biochemical Parameters". On 19th December 2022

Dr. G. Anitha, of Biomedical Department, defended her Ph.D. Public Viva-Voce (Oral) for the Thesis topic "Design Of Integrated Robotic Control Systems And Evaluation Of Drilling Temperature Effects For Dental Implantation Procedures" On 18th November 2022
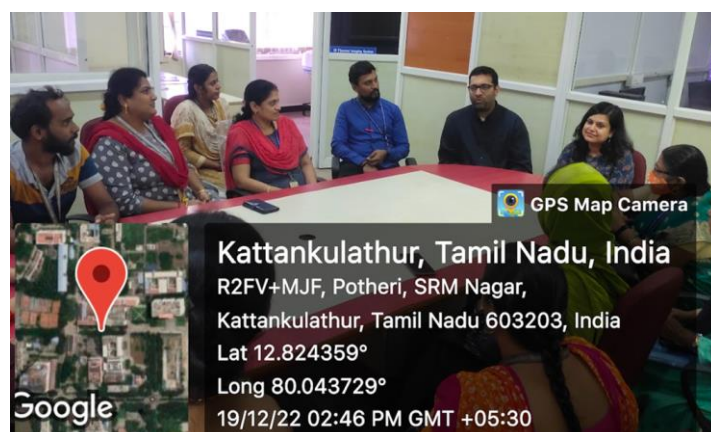
"The one exclusive sign of thorough knowledge is the power of teaching." –Aristotle

GALLERY

TEACHER'S DAY

ALUMNI CONNECT

HEALTH CAMP

OUTREACH PROGRAM

INTERNAL AUDIT

"The one exclusive sign of thorough knowledge is the power of teaching." –**Aristotle**

Celebrations

*''Setting goals is the first step in turning the invisible into the visible.'' — **Tony Robbins***

"Perfection is achieved, not when there is nothing more to add, but when there is nothing left to take away."

- Antoine de Saint-Exupéry

For enquiries and suggestions,
Email us at: secy.hod.biomedi.ktr@srmist.edu.in
Contact us at: 044-27417854

For more information about the department, please visit https://www.srmist.edu.in/engineering/department-of-biomedical-engineering

"You must be the change you wish to see in the world"- Mahatma Gandhi