



Vision of the Department

To be a globally recognized centre of excellence in the field of biomedical engineering where learners are nurtured in a scholarly environment to evolve into competent professionals to benefit society

Mission of the Department

- Evolve a curriculum which emphasizes on strong engineering fundamentals with the flexibility to choose advanced courses of interest and gain exposure to tools and techniques in Biomedical Engineering.
- Encourage a teaching-learning process in which highly competent faculty share a symbiotic association with the institutes of repute.
- Facilitate creation and dissemination of biomedical engineering knowledge through a digitally-enabled learning environment.
- Develop academic and infrastructural facilities with modern equipment and other learning resources and encourage reciprocal sharing with other institutes through networking.
- Establish a centre of excellence to enhance academia – biomedical industry partnership and work on collaborative projects.

Programme Educational Objectives (PEO)

- To enable the pursuit of knowledge in the field of Biomedical Engineering and contribute to the profession and employability of the students.
- To engage in research, generate the employment through entrepreneurship and work effectively in multidisciplinary environment.
- To understand the human, social, ethical and environmental context of their profession and contribute positively to the needs of individuals and society.

WHAT'S INSIDE

Department Staff

- Dr. Gajanan Nagare
- Prof. Geetha Narayanan

Student Article

- Ms. Sanika Korpe

Know an Alumna

- Ms. Niti Chikhale (2024 Batch)

- Workshop on "Advancements in Radiotherapy Equipment".
- Guest Lecture Series organized by the department.
- Student Activities conducted by BMSA and BMESI-VIT Chapter.
- OT Reconnect Session by MEDTRONIC COVIDIEN

PROF. DR. GAJANAN NAGARE

HEAD OF DEPARTMENT, BIOMEDICAL ENGINEERING

It gives me immense pleasure to extend my heartfelt appreciation to all the faculty members and students of the department for successfully organizing a variety of educational events this semester. These included guest lectures, educational tours, workshops, and seminars, all of which have significantly strengthened our engagement with the industry and fostered valuable collaborative linkages.

Our department has an active MoU with Capgemini Engineering, under which we conducted two value-added courses this semester: Requirement Engineering and Verification and Validation of Medical Devices. These courses were delivered by industry experts from Capgemini Engineering, equipping our students with relevant and practical skills aligned with current industry needs.

We also organized a workshop on Advancements in Radiotherapy Equipment under the aegis of the Society for Radiation Research (SRR), held at the Cancer Care Centre, MGM's New Bombay Hospital, Vashi. We sincerely thank SRR for their continued and active collaboration.

Our student bodies, BMESI-VIT Chapter and BMSA, have shown great initiative and creativity in organizing a series of workshops, seminars, and training programs for both students and faculty.

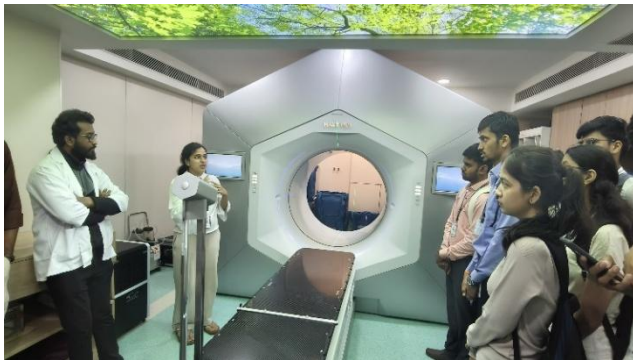
As the end-semester examinations approach, I extend my best wishes to all students and look forward to seeing them excel in their assessments.

Thank you.



“Don't read success stories, you will only get a message. Read failure stories, you will get some ideas to achieve success.” -
Dr. A.P.J. Abdul Kalam

Workshop on "Advancements in Radiotherapy Equipment"



Department of Biomedical Engineering under the aegis of the Society for Radiation Research (SRR), organized a one-day workshop on "Advancements in Radiotherapy Equipment" on 23rd August 2025 at MGM's New Bombay Hospital, Vashi, continuing its tradition of promoting research-oriented learning. Supported by Dr. Badri N. Pandey, SRR Chairman (Academic Activities), and coordinated with Dr. Shyam Shrivastava, Director of Radiation Oncology at MGM's New Bombay Hospital, the event aimed to expose Biomedical Engineering students to the latest technologies in radiotherapy.

The workshop began with an introduction to MGM Hospital by Dr. Ruchi Shukla, followed by a talk on SRR's objectives by Dr. Rohit Sharma (BARC). Dr. Shreyasee Karmakar presented the fundamentals and advancements in radiation oncology, and Ms. Kinnari Chitnis, Radiation Safety Officer, discussed nuclear medicine and PET/SPECT imaging. Participants later visited the HALCYON Linear Accelerator (LINAC) and Siemens PET-CT facility, observing equipment demonstrations and patient workflow processes.

The sessions provided valuable insight into modern diagnostic and therapeutic technologies, radiation safety, and hospital operations. The workshop concluded with a vote of thanks, felicitation of MGM and SRR experts, and a group photograph, marking a successful academic-industry collaboration enriching student learning.

DR. GAJANAN NAGARE
PROFESSOR & HEAD



EDUCATION QUALIFICATION:
PhD BIOMEDICAL ENGINEERING
M.TECH INSTRUMENTATION & CONTROL

TEACHING EXPERIENCE:
14 YEARS

AREA OF SPECIALIZATION:
BIOMEDICAL INSTRUMENTATION
BIOSENSORS
BIOMEMS

Department Staff

PROF. GEETHA NARAYANAN
ASSOCIATE PROFESSOR



EDUCATION QUALIFICATION:
M. TECH POWER ELECTRONICS
B.TECH ELECTRICAL
& ELECTRONICS ENGG..

TEACHING EXPERIENCE:
31 YEARS

AREA OF SPECIALIZATION:
VLSI
DIGITAL IMAGE PROCESSING
ROBOTICS

Guest Lecture Series Organized by the Department



The Biomedical Engineering Department of VIT organized an Interactive Session on "Opportunities in Regulatory Affairs: Navigating EU MDR" on 13th September 2025, led by Ms. Vijaylaxmi Sahu, Project Manager and EU MDR expert from Tata Elxsi. Introduced by Prof. Geetha Narayanan, Ms. Sahu discussed diverse career options for Biomedical Engineers and provided detailed insights into the EU MDR framework, regulatory documentation, and comparisons with the US FDA system. The session, attended by about 75 participants, offered valuable guidance on careers in regulatory affairs and inspired future collaborations and training initiatives in this domain.



A guest lecture on "Medical Device Safety and Quality Assurance" was organized on 10th September 2025, coordinated by Prof. Arunkumar Ram from the department. The session was delivered online by Mr. Siddharth Roychowdhury, HOD, Biomedical Engineering, Wockhardt Hospitals, Nagpur. He discussed the importance of adhering to international safety and quality standards such as ISO, FDA, CDSCO, and NABH, emphasizing their role in ensuring device reliability and compliance. He also highlighted diverse career opportunities for biomedical engineers in hospitals. The session, attended by 54 participants, received an excellent average feedback score of 4.18, reflecting its success.



A session on "Hybrid Imaging" was organized on 23rd September 2025 and delivered by Dr. Prathamesh Mangale. Aimed at second, third and final year students, the session explained how hybrid imaging techniques like PET-CT, PET-MRI, and SPECT-CT integrate structural and functional data for improved diagnosis and treatment planning. Dr. Mangale discussed advancements such as AI-enhanced analysis, 3D reconstruction, and multispectral imaging, highlighting their impact on personalized healthcare. The interactive session, attended by 92 participants, enhanced students' understanding of imaging innovations and inspired them to explore research and career opportunities in medical imaging.

A guest lecture on "Innovation and Patient Safety in Biomedical Engineering" was organized on 19th September 2025 for third year biomedical engineering students. The session featured Mr. Viraj Bhatkar, Senior Biomedical Engineer at Apex Group of Hospitals and VIT alumnus (Batch 2021), coordinated by Prof. Harish Ojha and Prof. Sampada Pawar. Mr. Bhatkar shared his professional journey, emphasizing patient safety protocols, innovation in healthcare, and his experience from the e-Yantra Hackathon 2020. The interactive session, attended by 60 participants, provided valuable insights into real-world biomedical practices, ethical responsibility, and career growth in the healthcare sector.



Session on "Innovation and Patient Safety in Biomedical Engineering" delivered by Mr. Viraj Bhatkar

Student Activities conducted by BMSA and BMESI-VIT Chapter

Seminar on Neuromodulation and Deep Brain Stimulation organized by BMSA



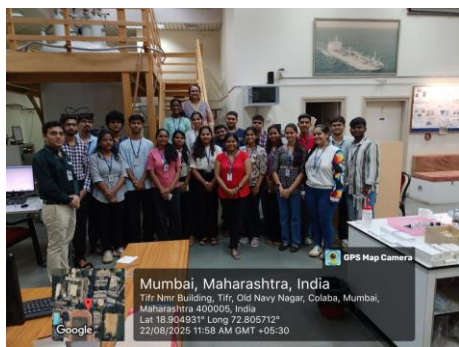
A seminar on neuromodulation and deep brain stimulation was organized by BMSA on 7th August 2025 at Vidyalankar Institute of Technology. It explored cutting-edge neurostimulation techniques. Featuring speakers Mr. Santlal Yadav, Mr. Krishnakant Shukla, and Mr. Ahsan Khan from Medtronic. DBS involves implanting electrodes in targeted brain regions to treat disorders like Parkinson's, while SCS targets spinal nerves to alleviate chronic pain. The session highlighted innovations in miniaturized implantable pulse generators and closed-loop feedback systems, offering students insights into the interdisciplinary challenges and advancements in neurotechnology and biomedical engineering.

First Aid and CPR Training jointly organized by BMSA and BMESI



The Hands-On First Aid and CPR Workshop was organized by BMESI and BMSA on 11th August 2025. The workshop was conducted by Mr. Pandurang Tekawade, the session trained participants in essential CPR and first aid techniques following AHA 2010 guidelines. Through live demonstrations using mannequins, attendees practiced the CAB (Compressions–Airway–Breathing) steps and learned about AED use and emergency response. The event saw enthusiastic participation from students, faculty, and staff, fostering awareness of life-saving skills and social responsibility. Concluding with a vote of thanks, the workshop encouraged future initiatives in advanced CPR training and collaborations.

Visit to TIFR organized by BMSA



The BMSA and Industry Institute Interaction Committee (IIC) of Vidyalankar Institute of Technology organized an educational visit to the Tata Institute of Fundamental Research (TIFR), Mumbai, on 22nd August 2025. The visit provided students from Biomedical Engineering Dept. and Electronics & Telecommunication Engg. Dept. with exposure to advanced research facilities, including the Pelletron LINAC, NMR, Low Temperature, and Biological Sciences labs. Students gained valuable insights into accelerator technology, NMR applications, and genetic research. Prof. Sampada Pawar and Prof. Amey Revandkar accompanied the students for the visit. The visit enhanced scientific curiosity and inspired innovation. It also encouraged future research collaborations and workshops to connect theory with real-world applications.

Expert Session on Nephrocare jointly organized by BMSA and BMESI-VIT Chapter



The BMSA and BMESI-VIT jointly organized "NephroCare – Expert Session" on 19th September 2025, focusing on renal care and haemodialysis systems. The session was conducted by Mr. Uday Ningawale, an expert with over 30 years of experience in dialysis and critical care. He explained the principles, components, and functioning of hemodialysis machines, emphasizing their vital role in life support and the contribution of biomedical engineers in ensuring effective operation and innovation. Through real-life experiences, he illustrated the challenges faced in clinical practice and the importance of technology in improving patient survival. The engaging session connected theoretical learning with practical applications and encouraged interactive discussions and queries from students. The event saw enthusiastic participation from students, faculty, and committee members. Future NephroCare sessions aim to introduce hands-on workshops, case-based learning, and collaborative projects to enhance students' practical knowledge and industry readiness.

OT Reconnect Session by MEDTRONIC COVIDIEN



Our third year and final year students of Biomedical Engineering attended the OT Reconnect Workshop organized by Medtronic Covidien on 27th September 2025 at Nanavati Max Super Speciality Hospital. The session was led by experts from Medtronic including Mr. Akshay Pawar, Mr. Shubham Singh, Ms. Namrata Gavas, and Ms. Akanksha Singh, provided in-depth insights into advanced surgical technologies such as the Tri-Staple™ reload portfolio, MaxTack30 powered fixation device, Ligasure Maryland Jaw, ProTack fixation system, and the ValleyLab energy platform. The workshop offered valuable exposure to the mechanical and electronic design principles of cutting-edge surgical tools and their clinical applications. Students expressed gratitude to the organizers from Biomedical Engineering dept. at Nanavati Max Superspeciality Hospital including Ms. Shilpa Poul and Ms. Neha Mhatre and the Medtronic India team for this enriching experience.



Know an Alumna Ms. Niti Chikhale (2024 Batch)

Niti is an alumna of VIT , passed out in the year 2024 from the Biomedical Engineering Department.



I am Niti Chikhale, currently pursuing my M.Tech in Biomedical Engineering at IIT Hyderabad, working at the intersection of MRI science and artificial intelligence. In the MRI Lab at IIT Hyderabad, where I am completing my thesis, I design and evaluate AI methods for MRI image analysis with the twin goals of improving clinical decision-making and streamlining radiology workflows—building models that detect structures reliably, quantify them rigorously, and present results in ways that fit how clinicians actually work. In parallel, I serve as an R&D intern at the Philips Innovation Campus in Bangalore in the MRI scanning team, which has exposed me to the realities of translating algorithms into robust, scanner-ready solutions: protocol constraints, safety requirements, performance on diverse data, and the many small engineering choices that determine whether a concept is deployable.

The foundation for this journey was built at VIT. Coming from a biomedical background, the core subjects at VIT made advanced coursework intuitive later on: physiology, anatomy, signals and systems, and medical imaging provided the conceptual scaffolding that I still rely on when troubleshooting artifacts, designing datasets, or interpreting model behavior. Equally important, VIT created opportunities to stretch beyond the syllabus. During my final year at VIT, I collaborated with IIT Bombay, an experience that sharpened my AI/ML skills and, more importantly, taught me discipline—clean coding practices, reproducible experiments, careful ablation studies, and the habit of connecting algorithmic ideas with real clinical problems. Beyond academics, the hackathons and Power Pitches VIT organized were a big boost. Building quick prototypes, pitching to judges, and getting feedback in a fast cycle, built confidence and communication skills. Clubs, events, and other extracurriculars helped just as much—they taught teamwork, leadership, and how to handle pressure. Altogether, VIT didn't just teach me subjects; it shaped and groomed me as a person so I could face the real world with skills, confidence, and a clear sense of how to learn and deliver.

For juniors, my advice is simple: focus on skills, and let projects be your engine for learning. Concepts become durable when you implement them—build tools, not just slides. Pick problems with a clear user, define measurable outcomes, and track your progress with metrics and error analysis. Pursue internships and collaborations; speak to clinicians and engineers; join hackathons; contribute to open-source; publish when the work teaches you something new, not just for a line on a CV. This is also the time to build a strong base of knowledge because the world is big and the competition is real; at every step you'll need to prove your value, and the best way to do that is by strengthening your fundamentals and sharpening your skills. I have experienced both research and industry, and though they differ in pace and constraints, the same core capabilities—coding fluency, domain understanding, and systematic problem-solving—create value in both settings. Above all, stay curious, seek feedback, and build things that matter to patients and practitioners alike.

STUDENT ARTICLE



Early Detection of Breast Cancer using ML techniques Ms. Sanika Korpe (B.E. Biomedical Engineering)

Breast cancer is a leading cause of cancer-related deaths among women worldwide, accounting for approximately 25% of female cancer cases. Early detection is crucial for improving survival rates, but interpreting mammograms can be challenging and time-consuming for radiologists. Machine Learning and Artificial Intelligence techniques have emerged as promising tools to assist in this process, analyzing medical imaging data and patient information to identify potential malignancies with high accuracy. A recent study by Naseem et al., titled "An Automatic Detection of Breast Cancer Diagnosis and Prognosis Based on Machine Learning Using Ensemble of Classifiers," explores the application of various machine learning techniques to enhance the accuracy and efficiency of breast cancer detection and prognosis.

The study utilized an ensemble of machine learning classifiers to detect breast cancer, combining algorithms such as Support Vector Machines, Logistic Regression, Naive Bayes, and Decision Trees. This approach aimed to leverage the strengths of each classifier while minimizing their weaknesses. An Artificial Neural Network was used as a final layer to integrate the outputs of these classifiers. The results were promising, with the best ensemble model achieving 98.83% accuracy for breast cancer diagnosis and 88.83% accuracy for prognosis when using techniques to address data imbalance. These ensemble methods consistently outperformed individual classifiers. Overall, these results demonstrate the potential of ensemble machine learning methods in enhancing the accuracy of breast cancer detection and prognosis.

Machine learning techniques show great potential for improving breast cancer detection and diagnosis. By analyzing complex patterns in medical imaging and patient data, these methods can assist radiologists and doctors in identifying malignancies early and accurately. As algorithms continue to improve and more training data becomes available; machine learning is likely to play an increasingly important role in breast cancer screening and diagnosis in the future. However, these tools should be seen as aids to human medical experts rather than replacements. The combination of artificial and human intelligence offers the most promising path forward for advancing breast cancer detection and care.

THE EDITORIAL TEAM

PROF. ARUNKUMAR RAM
Chief Editor