



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.

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PROF. DR. GAJANAN NAGARE

HEAD OF DEPARTMENT, BIOMEDICAL ENGINEERING

Biomedical Engineering, field thrives on bold decisions, risk-taking, and the continuous pursuit of making groundbreaking innovations "right" for society. From developing advanced medical devices to improving diagnostic tools, and enhancing patient care, each decision we make leads to a better world.

I wish to convey that our first Autonomy batch (R-2022) would be graduating this year. This is a great milestone for our institute. I congratulate all the graduating students of the passing batch of 2026.

I like to appreciate the efforts taken by our faculty in organizing several industrial visits and guest lectures from industry experts. Some of the notable one include visit to Medirays Corporation, ACTREC and AIIPMR.

At the end, I wish all the best to my students who will be appearing for their end semester examinations in May-2026 examination.





“Dream, dream, dream. Dreams transform into thoughts and thoughts result in action.”- Dr. A.P.J. Abdul Kalam



Hands-on Workshop on Ortho Drill and SPY-PHI System organized by Stryker at Nanavati Max Super Speciality Hospital

The Department of Biomedical Engineering organized an enriching industrial visit and hands-on workshop at Nanavati Max Super Speciality Hospital on 17th January 2026 for third-year students. The session focused on advanced surgical technologies, including the Ortho Drill and SPY-PHI imaging system, aiming to bridge the gap between theoretical learning and clinical application. Students experienced live demonstrations and gained practical exposure to the working principles, maintenance, and safety protocols of these sophisticated devices. The workshop was conducted in collaboration with industry experts from Stryker, who provided valuable insights and addressed student queries, making the session highly interactive and informative.

The initiative also strengthened industry-academia collaboration, contributing to holistic learning beyond the classroom. This workshop was coordinated by Prof. Arunkumar Ram from the department.



Glimpses of the workshop conducted at Nanavati Max Super Speciality Hospital, Mumbai

Department Staff

PROF. BHAVIKA KHATRI
ASSISTANT PROFESSOR



EDUCATION QUALIFICATION:
ME INSTRUMENTATION

TEACHING EXPERIENCE:
16 YEARS

AREA OF SPECIALIZATION:
HOSPITAL MANAGEMENT
HUMAN ANATOMY & PHYSIOLOGY
ARTIFICIAL INTELLIGENCE

PROF. ARUNKUMAR RAM
ASSISTANT PROFESSOR



EDUCATION QUALIFICATION:
ME-BIOMEDICAL ENGINEERING

TEACHING EXPERIENCE:
15 YEARS

AREA OF SPECIALIZATION:
BIOMEDICAL INSTRUMENTATION
MEDICAL IMAGING
MEDICAL SENSORS

Industrial Visit to The Advanced Centre for Treatment, Research and Education in Cancer (ACTREC)

The Department of Biomedical Engineering organized an industrial visit to the Advanced Centre for Treatment, Research and Education in Cancer (ACTREC) on 14th March 2026, offering students valuable exposure to cutting-edge oncology technologies and research practices. The visit enabled second, third, and final-year students to explore advanced diagnostic and therapeutic systems, including SPECT, PET, CT, MRI, and radiation therapy equipment, while gaining insights into multidisciplinary cancer care under the Tata Memorial Centre.

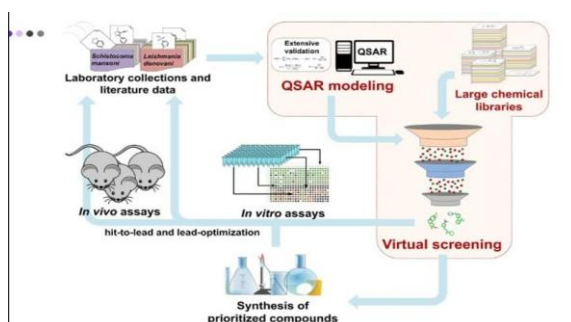
Through expert interactions and guided observations, students developed a deeper understanding of clinical workflows, treatment planning, and ongoing innovations in cancer treatment. The experience effectively bridged the gap between theoretical knowledge and real-world applications, while also highlighting career opportunities in biomedical engineering within healthcare and research sectors. This visit was coordinated by Prof. Arunkumar Ram from the department.



Glimpses of the visit to ACTREC, Kharghar, Navi Mumbai

Guest Lecture on Bioinformatics- Computer-Aided Drug Design (CADD) and Modern Approaches in Drug Discovery

The Department of Biomedical Engineering organized an online guest lecture on “Bioinformatics: Computer-Aided Drug Design (CADD) and Modern Approaches in Drug Discovery” on 10th March 2026. The session, delivered by Dr. Prayukta Padelkar, provided in-depth insights into computational techniques used in drug discovery, including molecular modeling, docking, QSAR, and virtual screening. Students learned about structure-based and ligand-based drug design, as well as the role of databases and emerging technologies in accelerating pharmaceutical research.



COMFA GRID AND FIELD CONCEPT

COMFA (Comparative Molecular Field Analysis) is a 3D-QSAR technique that correlates steric and electrostatic molecular fields with biological activity.

Molecules are aligned in 3D space

A probe atom measures:

- Steric interactions
- Electrostatic interactions

Then PLS statistical analysis correlates these fields with biological activity.

Example Application:
COMFA has been widely used for studying:

- HIV protease inhibitors
- Anticancer drugs
- Antimalarial agents
- Anti-inflammatory compounds

Steps in CoMFA:

1. Select compounds with known activity
2. Generate 3D molecular structures
3. Perform molecular alignment
4. Place molecules inside a 3D grid
5. Calculate steric and electrostatic fields
6. Apply Partial Least Squares (PLS) analysis
7. Generate contour maps

Educational Tour to Medirays Corporation

The Department of Biomedical Engineering organized an educational tour to Medirays Corporation, Asangaon, on 14th February 2026 for second and third-year students. The visit aimed to bridge the gap between theoretical learning and real-world applications by providing exposure to advanced medical imaging technologies used in diagnostics and patient care.

Students were introduced to key imaging components such as X-ray and CT tubes, MRI chillers, gantry systems, detectors, and data acquisition systems. Guided by industry expert Mr. Kalpesh Deshmukh, participants gained insights into the working principles, troubleshooting techniques, and operational protocols of these systems. The session also emphasized the role of innovation and precision in modern healthcare delivery.

Through interactive group-based learning and expert discussions, students developed a deeper understanding of medical imaging technologies, along with enhanced awareness of professional practices. The visit proved to be an enriching experience, fostering technical knowledge, industry exposure, and inspiration for future careers in biomedical engineering. This educational tour was coordinated by Prof. Bhavika Khatri and Prof. Geetha Narayanan from the department.



Glimpses of the Educational Tour to Medirays Corporation

Guest Lecture on Career Pathways and Opportunities in AI, ML, Bioinformatics & Biomedical Engineering

The Department of Biomedical Engineering organized a guest lecture on “Career Pathways and Opportunities in AI, ML, Bioinformatics & Biomedical Engineering” on 8th January 2026. The session, delivered by industry expert Mr. Akshat Karambe from Mount Sinai Health System, provided valuable insights into emerging technologies and diverse career options in interdisciplinary domains. Students were guided on selecting impactful projects, developing technical and soft skills, and preparing for higher studies and job opportunities. The lecture effectively bridged the gap between academic learning and industry expectations. Mr. Akshat is also our 2015 batch Alumna. This guest lecture was coordinated by Prof. Bhavika Khatri for the department.



Educational Tour to Tata Power Limited Carnac Receiving Station

An educational industrial visit to Tata Power's Carnac Receiving Station, Mumbai was organized on 14th February 2026 for second- and third-year engineering students. The visit aimed to connect classroom learning with real-world industrial practices in the power sector. Students were introduced to key components of a receiving station, including transformers, circuit breakers, protection systems, and SCADA-based monitoring technologies. Industry experts provided detailed explanations of power transmission, distribution, and automation processes, along with essential safety protocols followed in high-voltage environments. The interactive session enabled students to understand the practical applications of concepts such as sensors, control systems, and industrial automation. The visit also highlighted the role of computer, IT, and electronics engineers in modern power infrastructure. Overall, the experience enriched students' technical knowledge, offered valuable industry exposure, and inspired them to explore future career opportunities in the power and energy sector. This visit was coordinated by Dr. Arati Kane from the department.



Glimpses of the Educational Tour to Tata Power Limited Carnac Receiving Station

Guest Lecture on Patent System and Intellectual Property Rights

The Institute IIC and R&D committee organized a guest lecture on "Patent System and Intellectual Property Rights" on 16th February 2026. The session was delivered by Shri. Pratik Hendre from the Indian Patent Office, Mumbai. It focused on creating awareness about patents, types of intellectual property, and the importance of protecting innovations. Students and faculty gained insights into patent filing procedures, documentation, and examination processes. Real-world examples highlighted the role of intellectual property in innovation and entrepreneurship. The lecture enhanced participants' understanding of research commercialization and encouraged them to safeguard their creative and technical work through proper intellectual property practices.



Industrial Visit to The All India Institute of Physical Medicine and Rehabilitation (AIIPMR)

The Department of Biomedical Engineering organized an industrial visit to the All India Institute of Physical Medicine and Rehabilitation (AIIPMR), Mumbai, on 12th March 2026 to provide students with practical exposure to rehabilitation engineering. The visit focused on orthotics and prosthetics, where students explored devices such as AFO, KAFO, spinal braces, and prosthetic limbs, along with their clinical applications. Students gained insights into device design, materials, manufacturing, and customization based on patient needs. Interactive guidance from experts enhanced understanding of real-world applications. The visit also highlighted career opportunities and research scope in rehabilitation engineering, making it a valuable experiential learning experience. This event was jointly organized by the BMSA and BMESI-VIT chapter and coordinated by Prof. Komal Shinde from the department.



Know an Alumnus

Mr. Ashwin Vaidya (2013 Batch)

Ashwin is an alumnus of VIT , passed out in the year 2013 from the Biomedical Engineering Department.



Hello readers and aspiring engineers,

I am Ashwin Vaidya, an alumnus of Vidyalankar Institute of Technology (BE, 2013). My professional journey in Biomedical Engineering has taken me through diverse roles—Application Specialist, Sales and Service Engineer, Clinical Engineer in a reputed Mumbai hospital, and later into procurement for healthcare centres across Maharashtra.

My journey began at VIT in 2008 as a first-year student, much like many of you today. Those years were filled with challenges and growth, supported immensely by dedicated faculty who not only imparted knowledge but also shaped my thinking and professional outlook. Their mentorship, especially during project work, played a crucial role in building my problem-solving approach.

While academics form the foundation of your career, it is the skills you develop beyond the classroom that truly define your success. I would like to highlight two such essential skills.

In BME, you will talk to doctors, nurses, hospital administrators, procurement officers, and patients' families. Each one speaks a different language. As an Application Specialist, I once failed to get approval for a critical repair simply because I used too much technical jargon with a hospital administrator. He didn't care about the circuit diagram—he cared about downtime and patient safety. I learned to translate. As a life skill, this same ability—listening first, then speaking in the other person's frame—has saved my friendships and family relationships. Most fights are not about facts; they are about mismatched language. Learn to bridge that gap early. In a hospital, a ventilator or dialysis machine can fail at 2 AM with a patient connected. Panic helps no one. As a Clinical Engineer, I saw colleagues who thrived because they had a mental checklist: isolate the variable, check power and source, recall past patterns, escalate if needed. I had to learn this under fire. As a life skill, the same habit—pausing, breaking the problem into parts, acting one step at a time—has helped me through relationship cracks and health scares.

So, my fellow Engineers, you will have your own highs and lows in life. Stick closely with your loved and close ones, because their support alone will help you stand tall under any pressure and competition.

STUDENT ARTICLE



Early Detection of Breast Cancer using ML techniques

Ms. Sanika Korpe (Final Year 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.

FACULTY ACHIEVEMENTS

Sr. No.	Faculty	Achievement
1	Dr. Gajanan Nagare	Paper Published: Smart Cell-Based Immunotherapy for Targeted Cancer Treatment: A Promising Future
2	Prof. Bhavika Khatri	Grant of Registration of Design: Vertical Aquaponic Farming Growing Tower for Cultivation of Vegetables and Plants
3	Prof. Komal Shinde	Grant of Registration of Design: Solar Dryer for Horticultural Crops
4	Prof. Geetha Narayanan	Received Senior Life Membership from Biomedical Engineering Society of India
5	Prof. Geetha Narayanan	Paper Published: An Analytical Study on the Development of Fuzzy Graphs and their Integration with Emerging Artificial Intelligence Technologies for Overall System Development
6	Prof. Geetha Narayanan	Book Chapter Published: Reshaping ASIC Design Using AI-Driven Technique

THE EDITORIAL TEAM

PROF. ARUNKUMAR RAM
Chief Editor