VIT Vidyalankar Institute of Technology
Accredited A+ by NAAC
An Autonomous Institute Affiliated to University of Mumbai

MEDITRONICS

DEPARTMENT OF BIOMEDICAL ENGINEERING

OCTOBER-2024 • VOLUME XVI • ISSUE 1

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

PROF. DR. GAJANAN NAGARE

HEAD OF DEPARTMENT, BIOMEDICAL ENGINEERING

Ratan Tata, a visionary leader and a source of inspiration for us all, once said: *"I don't believe in taking right decisions. I take decisions and then make them right."*

In **Biomedical Engineering**, this sentiment resonates deeply. Our 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.

Our department has been at the forefront of this journey. We strive to bridge the gap between cutting-edge research and real-world healthcare applications. Collaborating with industry, medical practitioners, and researchers worldwide, we empower our students to become problem solvers, innovators, and leaders.

This coming year, we look forward to deeper engagements with **industry partners**, fostering more **research collaborations**, and enabling our students and faculty to bring transformative ideas to life. I encourage every student to embrace the ethos of creativity and perseverance, for it is through the challenges that we often discover the most profound innovations. Let us continue to take bold steps in our mission to make meaningful difference in healthcare through technology. Together, we can shape a future where healthcare is more accessible, advanced, and sustainable for all.

"If you want to walk fast, walk alone. If you want to walk far, walk together"-Rata Tata

One Day Workshop on "Radiation based Techniques for Imaging and Therapy of Cancer"

On August 17, 2024, Department of Biomedical Engineering conducted a workshop titled "Radiation-Based Techniques for Imaging and Therapy of Cancer" at Tata Memorial Hospital (TMH), Mumbai. The workshop was organized under the aegis of Society for Radiation Research (SRR). Dr. Badri N. Pandey from SRR helped us to facilitate this event. Mrs. Priyadarshini Sahoo from TMH coordinated the workshop catered to Biomedical Engineering students, with participation limited to 30 attendees. From VIT, Prof. Geetha Narayanan and Prof. Arunkumar Ram coordinated this workshop.

The program included three key sessions:

1. **Linear Accelerator Novalis Tx** by Mrs. Priyadarshini Sahoo, covering the principles and evolution of linear accelerators.
2. **Brachytherapy HDR V3-18** by Mr. Mukesh Patil, focusing on the application of brachytherapy in treating skin and cervical cancers.
3. **PET CT Technique** by Mrs. Sneha Mithun, detailing the technology and precautions involved in PET scans.

The interactive sessions encouraged participant engagement, and post-workshop feedback highlighted the event's educational value. The workshop strengthened ties between VIT and TMH, paving the way for future collaborative efforts.

Mrs. Priyadarshini Sahoo demonstrating working and key principles of Linear Accelerator

Student, Teachers & Experts at Tata Memorial Centre

Department Staff

PROF. ARUNKUMAR RAM
ASSISTANT PROFESSOR

EDUCATION QUALIFICATION:
ME-BIOMEDICAL ENGINEERING

TEACHING EXPERIENCE:
15 YEARS

AREA OF SPECIALIZATION:
BIOMEDICAL INSTRUMENTATION,
MEDICAL IMAGING
MEDICAL SENSORS

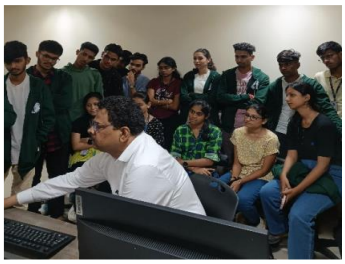
PROF. HARISH OJHA
ASSISTANT PROFESSOR

EDUCATION QUALIFICATION:
M.TECH-ELECTRONICS ENGINEERING

TEACHING EXPERIENCE:
15 YEARS

AREA OF SPECIALIZATION:
ELECTRONIC DEVICES
DIGITAL CIRCUITS
MICROCONTROLLER

Events organized by BMSA and BMESI-VIT Chapter



The Biomedical Students Association (BMSA) at VIT organized a seminar titled "MOSFAB: MOSFET Characterization Using Cadence" on 29th August 2024 led by Prof. Satendra Mane. The seminar covered MOSFET theory, operational principles, and their applications in biomedical engineering. It concluded with a hands-on session using Cadence for simulating MOSFET characteristics.

An event titled "TechVeda" featuring Dr. Sandeep Kale, who discussed the integration of AI in Ayurvedic healthcare was organized by BMSA on 03rd September 2024. He introduced ayurvedic principles, emphasized the role of biomedical engineers in modernizing practices, and provided a hands-on session on Naadi Parikshan and dosha analysis.

The Biomedical Engineering Society of India (BMESI-VIT Chapter) committee hosted "ALGORHYTHMX". This student activity was spread across two days on 4th and 5th September 2024. Day-1 was led by our final year student Riddhi Parasnaik, focusing on medical imaging advancements. Riddhi introduced imaging modalities, discussed the significance of image segmentation, and demonstrated 3D Slicer software for medical image analysis. The event aimed to enhance understanding of imaging technologies in healthcare.

Day-2 workshop featured Mr. Pratik Kadam, who explored Prompt Engineering and Generative AI. Participants learned to create websites without coding, generate powerpoint presentations, and visualize coding challenges using AI tools. The workshop showcased the transformative power of AI, inspiring attendees to harness its potential in future projects.

Know an Alumna
Ms. Richa Bhujbal (2021 Batch)

Richa is an alumna of VIT , passed out in the year 2021 from the Biomedical Engineering Department.

As I reflect on my journey, it's incredible to think about where it all began and how far I've come. Today, I work as a Research Associate at the American Red Cross, where I support blood research projects and clinical trials. The work is both fulfilling and challenging. I've had the opportunity to explore innovations I never imagined during my time at Vidyalankar Institute of Technology.

Before stepping into the world of healthcare research, it was at VIT where I began developing the technical and personal skills I rely on today. VIT offered me more than just a degree in biomedical engineering; it gave me a supportive community, a platform for growth, and the confidence to take on leadership roles that have continued to shape my professional career. My years at VIT were transformative, to say the least. The theoretical knowledge I gained still plays a significant role in my daily work. However, it was the hands-on, practical experiences that truly prepared me for the real world. The projects I worked on gave me insights and skills that few other universities could have provided, making my education not just a credential but a practical toolkit.

What truly set VIT apart for me, though, was the balance between academics and extracurricular activities. Being a part of the council taught me how to manage teams, take initiative, and think creatively—skills that I draw on every day. In my current role, where I lead a team and coordinate complex research projects, that blend of creativity, discipline, and leadership I cultivated at VIT has been indispensable. VIT helped me shape my identity not only as a biomedical engineer but also as someone who values collaboration, teamwork, and leadership—qualities that are critical in my current work environment.

CONT. on Page 4

STUDENT ARTICLE

"The Increasing Importance of Fluorescence in Situ Hybridization (FISH) in Modern Diagnostics" -Ms. Siddhi Saraf(T.E. Biomedical)

Fluorescence in Situ Hybridization (FISH) is a powerful technique for identifying specific DNA sequences within cells. By using fluorescent probes that selectively bind to DNA segments, FISH allows scientists and medical professionals to examine and investigate genetic material in detail visually.

This article discusses the evolving trends and growing adoption of FISH, highlighting its progress and potential future applications. FISH technology is increasingly used in cancer cell research for various reasons. Firstly, it offers high specificity and sensitivity in detecting genetic abnormalities, making it a reliable tool for diagnosing genetic disorders, cancers, and infectious diseases, thereby improving diagnostic accuracy.

Secondly, in the era of personalized medicine, FISH plays a critical role in identifying specific genetic changes and enabling customized treatment plans for patients. Technological advancements in imaging technologies, probe design, and automation have improved the accessibility, efficiency, and user-friendliness of FISH, thereby reducing the time and cost associated with the technique. The ability of FISH to detect chromosomal abnormalities and gene amplifications or deletions is invaluable in clinical diagnostics, aiding in the early detection and management of genetic diseases and cancers.

Additionally, FISH serves as a powerful tool in both fundamental and translational research, enabling scientists to explore gene expression, chromosome structure, and cellular interactions, contributing toa more comprehensive understanding of biological processes and disease mechanisms.

Furthermore, combining FISH with other genomic technologies provides comprehensive genomic and spatial data, offering insights into complex genetic and epigenetic landscapes. Increased regulatory approvals for FISH-based diagnostic tests and their inclusion in clinical guidelines for certain conditions have led to their wider
adoption in clinical practice.

In the future, FISH technology is expected to advance further and find new applications. Its increasing significance in the medical and research sectors highlights its value and potential. FISH technology is becoming more crucial due to its precision, versatility, and integration with other technologies. As advancements progress, its role in diagnostics and research is poised to expand even more.

Know an Alumna...CONT

If I could offer one piece of advice to current VIT students, it would be this: take advantage of every opportunity that comes your way. Your academic education will serve as your foundation, but the experiences you gain outside the classroom will truly set you apart. Whether you're contributing to the college magazine, organizing a tech fest, or working on your final year projects, these activities will teach you lessons that will carry far beyond graduation. Don't hesitate to take on leadership roles. These opportunities were some of the most formative experiences of my time at VIT. Leadership teaches you how to handle pressure, think critically, and make decisions—all of which will make you stand out in interviews and in your career. Additionally, immerse yourself in internships and real-world projects. While they might seem intimidating at first, the lessons you'll learn from those experiences are invaluable. Lastly, never underestimate the importance of building a strong network. The relationships you establish during your time at VIT, whether with professors, peers, or mentors, will be resources you can rely on as you progress in your career.

Even now, I feel like a student at heart. I'm constantly learning new things in my role, adapting to the rapid advancements in medical research, and collaborating with teams that challenge me to grow. The field of biomedical engineering is one where continuous learning is key, and that's something I deeply appreciate. I am incredibly grateful for the journey that began at VIT and has led me to where I am today. My experiences at college laid the foundation for the person and professional I've become. To the juniors reading this: you are at the beginning of an amazing journey, and my advice to you is to make the most of every moment.

I wish you all the best as you continue your own journeys!

THE
EDITORIAL TEAM

PROF. ARUNKUMAR RAM
Chief Editor