



Shri Vile Parle Kelavani Mandal's  
**DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING**  
(Autonomous College Affiliated to the University of Mumbai)  
NAAC Accredited with "A" Grade (CGPA : 3.18)



# ACADEMIC BULLETIN

2020-21



**DEPARTMENT OF  
BIOMEDICAL ENGINEERING**



## **Index**

1. About the Department
2. Pacemaker – Student Chapter
  - a. Social Media Presence
  - b. Workshops and Seminars
3. Student Achievements
4. Staff Achievements



## **About the Department**

Biomedical Engineering Programme is to provide high-quality education for transforming the armatures into professionals, capable of applying knowledge of Basic Sciences and Fundamental Engineering, to take up the challenges in the health care sector and instil in them the attitudes, values, and vision for continued training and inculcate leadership abilities in their chosen careers.

It aims to develop skills enabling Biomedical Engineers to serve the Hospitals, National and International Industries, and Government Agencies. It builds a strong foundation and develops technical skills to work professionally in the areas such as Nanotechnology and Microsystems, Rehabilitation Engineering, Biomedical Signal, and Image Processing, Medical Instrumentation, Medical Imaging, Nuclear Medicine Robotics in Medicine, Networking and Information systems in hospitals; to develop core competency in the field of Biomedical Engineering to gain technical expertise in biology and medicine for effective contribution in the development and improvement of health care solutions & to train and motivate students for pursuing higher education and research for developing cutting edge technologies.



## ***Vision***

To strive for academic excellence to develop responsible, competent professionals, equipped with advanced technical knowledge and high professional ethics to support the healthcare industry.

## ***Mission***

1. To provide high-quality education through innovative teaching-learning processes.
2. To provide a forum for industry-institute interaction, with a view to grooming budding engineers as employable Biomedical Engineering professionals.
3. To inculcate research interest to develop sustainable diagnostic and life-supporting tools/ systems that cater to the needs of the medical profession.
4. To empower the students and instil in them a sense of belongingness and responsibility towards society.



## *Program Outcomes*

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis, and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.



8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



# **Pacemaker – Student Chapter**



## ***Social Media Presence***

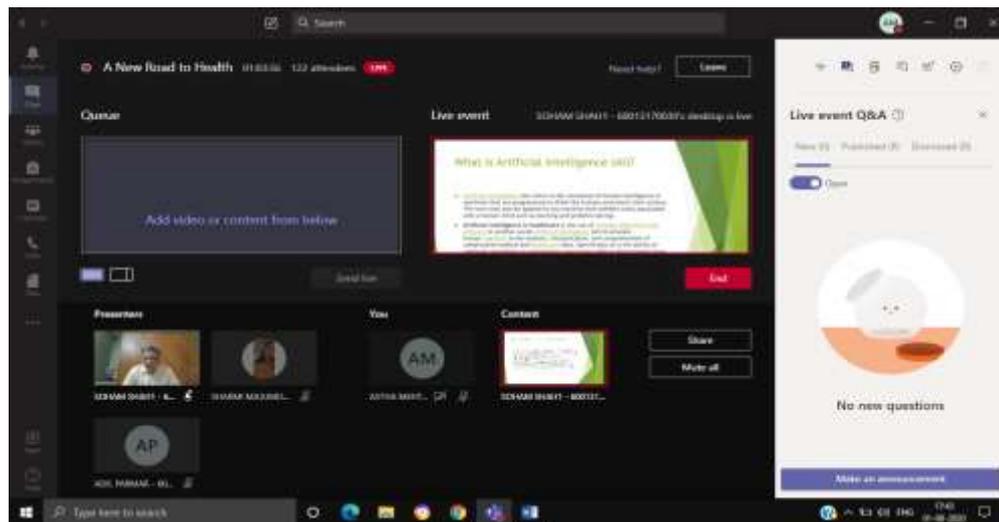
Instagram: [https://www.instagram.com/pacemaker\\_djsce/?igshid=65oaddjivxql](https://www.instagram.com/pacemaker_djsce/?igshid=65oaddjivxql)

## ***Webinars and Workshops***

- On August 1, 2020, a webinar, “A New Road to Health - Telemedicine, AI and 3-D printing in Medicine” was conducted by Mr. Hemang Mehta organized by DJSCE Pacemaker in association with Force Biomedical.
- Pacemaker organized a workshop on MATLAB for SE Biomedical students on 18<sup>th</sup>, 26<sup>th</sup> and 27<sup>th</sup> January, 2021. 16 students successfully completed the course.
- On February 13, 2021, an Alumni Meet was hosted by DJSCE Pacemaker with the aim of connecting current students with alumni to help them get better insights into postgraduate studies, placements, and more.
- On May 1, 2021, a session on Healthcare Management was conducted by Mr. Kaustubh Kolwankar as a part of the MedTalks series created by DJSCE Pacemaker in association with Force Biomedical.



## A New Road To Health



The Biomedical Engineering Department in association with FORCE Biomedical organized a webinar, A New Road to Health - Telemedicine, AI, and 3-D printing in Medicine on 1st August at 5pm. The platform used was MS Teams. The session was commenced by the HOD, Dr Manali Godse, addressing all the participants and welcoming Mr. Hemang Mehta, a decorated awardee with an experience of over 25 years in the healthcare industry. He shared his expertise in Telemedicine which uses computers, video, phone, and messaging to diagnose and treat patients in a remote location. Latest systems capable of transmitting patient data such as ECG, SpO<sub>2</sub>, Temperature, Pulse rate etc. were introduced to the attendees. The concepts of



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Artificial Intelligence and 3-D printing in patient care were also covered. The participants received insights about transforming the biomedical industry due to Covid-19. The webinar ended with a Q&A session between Mr. Hemang and over 100 attendees, which included a variety of doubts and queries. Lastly, a vote of thanks was given to the guest speaker who shared his valuable knowledge and guided all attendees in these promising field.



## **MATLAB WORKSHOP**



A workshop on MATLAB was organized by Pacemaker for the students of SE Biomedical. Prof. Vivek Deodeshmukh conducted the 3-day workshop on Microsoft Teams to make students familiar with MATLAB software so that they can use it in the upcoming semesters for writing MATLAB programs in various subjects. This session was divided into 3 parts:

- First Part: Basic functions of MATLAB like how to create a matrix, their operations and familiarization with the software were covered.
- Second Part: Functions like plot, semiology, help, diary, save, load etc.
- Third Part: Linspace, axis, subplot and many more functions of MATLAB. A quiz was scheduled to test our overall understanding of all the topics.

16 students successfully completed the workshop.



## Alumni Meet



An Alumni Meet was organized for the Biomedical Department at 10.00 am on 13th February 2021 and was carried out through Microsoft Teams. The event was hosted by Prof. Vaibhavi Sonetha and Miss Nidhi Panchal (T.E Student). The session commenced with all alumni introducing themselves and describing their current fields of study and ongoing projects. The students and faculty members had an engaging and informative conversation with the alumni.



Masters in the USA and Germany, Product Patenting and Healthcare Industry trends were discussed. This was followed by a Question and Answer session where various questions were answered by the guests. The event was ended with a vote of thanks by Prof. Mangal Dandekar.

Through this session, the faculty members and current students were able to create a good network and goodwill with the alumni. The current students were able to obtain better insights into the pre-requisites, process, and prospects for postgraduate studies, placement options and upcoming fields of Data Science and Machine Learning in Healthcare.



## MedTalks – Healthcare Management



Pacemaker, a student chapter the Biomedical Department and Force Biomedical together conducted a webinar on Healthcare Management on 1st May at 4:30pm on MS Teams.

The objectives of this webinar included discussing career prospects for a Biomedical Engineer, exploring the field of Healthcare Management, and learning about the functioning of hospitals during the Covid-19 pandemic.

Mr. Kaustubh Kolwankar, who is the Operations Manager of Nanavati Max Super Speciality Hospital, Mumbai, spoke about the various responsibilities that come under the role of a Hospital Manager. It is a multitasking role which includes quality management, supply chain management, staff management, finance management and patient record management. He



discussed the problems that hospitals are facing during the pandemic and the measures that they are taking to adapt to the new normal.

The seminar ended with a question-answer session between Mr. Kolwankar and over 100 attendees who included Indian and international Biomedical Engineering students, Medical students, Doctors and Professionals from the healthcare industry. A token of appreciation was given to the presenter who shared his valuable insights and guided all attendees in these promising fields



## Student Achievements

➤ Department Toppers

Sr. No.	Name	CGPA	Year of Passing
1	Sharmi Majumdar	9.44	2020
2	Shameen Khan	9.38	2020
3	Mansi Vaze	9.31	2020

➤ Students from all years completed online courses through Coursera, Udemy, NPTEL, and other platforms

Academic Year	Number of Courses Completed
2020-21	182

➤ Two students from BE – Ms. Ashita Dandekar and Ms. Mansi Vaze secured the Third position for “Arterial Blood pH Monitoring using a Fingertip Device to Predict Cardiovascular as well as Respiratory Diseases” at IEEE AMPHE 2020 Conference organized by Adamas University, Kolkata from 25<sup>th</sup>-26<sup>th</sup> September 2020.



➤ A prototype titled “Blood Glucose Monitoring using a Non-Invasive Measurement Technique”, created by four students from BE namely, Ms. Riya Shah, Mr. Mehul Lad,



- Ms. Astha Mehta, and Ms. Nili Shah, was selected for the second stage of training and evaluation by MOE's Innovation Cell (Govt. of India).

### Team composition and competency and skill set to turn the innovation/solution into a startup

			
<b>Skills-</b> Embedded Systems Project Management Pcb Designing	<b>Skills-</b> Project Management Marketing	<b>Skills-</b> Advanced Excel Python Finance Management	<b>Skills-</b> Machinet earning using Python C, C++

### Photographs: Team and Prototype



S.NO	NIC2020/SHI2020 ID	IDEA TITLE	IC /SHI INSTITUTE ID	INSTITUTE NAME	STATE	ZONE
387	59286	Innovative idea to develop a stapler for letterment	IC201810343	PIMPRI CHINCHWAD COLLEGE OF ENGINEERING	Maharashtra	Western/WRO
388	84704	Multipurpose Anti Gravity	IC201810343	PIMPRI CHINCHWAD COLLEGE OF ENGINEERING	Maharashtra	Western/WRO
389	52422	Dawa Bank ( Reuse of unused medicine)	IC201810776	POONA COLLEGE OF PHARMACY, ERANDWANE, PUNE	Maharashtra	Western/WRO
390	47856	Natural Polymer Coated Metal Oxide Nano-systems as an Innovative Technology for Wastewater Treatment	IC201810776	POONA COLLEGE OF PHARMACY, ERANDWANE, PUNE	Maharashtra	Western/WRO
391	51370	FAC Solution : A Protective Cover	IC201810163	PRIVADARSHINI J. L. COLLEGE OF PHARMACY	Maharashtra	Western/WRO
392	54874	Using innovative printer cartridge waste recycling solution as a catalyst to reduce e-waste and imports of the nation	IC201811069	PTVAS INSTITUTE OF MANAGEMENT	Maharashtra	Western/WRO
393	62807	EDIBLE FILMS FOR PACKAGING FROM POLYSACCHARIDE AND PROTEINS	IC201912314	Rasthantant Tukadaji Maharaj Nagpur University, Nagpur	Maharashtra	Western/WRO
394	61644	Production Of Organic Shoe Polish From Waste Banana Peels	IC201611013	Gantrihal Phule Puse University	Maharashtra	Western/WRO
395	49439	Wireless Bike Starter using Android App and Voice Control using Google Assistant	IC201611013	Gantrihal Phule Puse University	Maharashtra	Western/WRO
396	52718	AI based robotic trash boat	IC201810796	SHAH AND ANCHOR KUTCHHI ENGINEERING COLLEGE	Maharashtra	Western/WRO
397	60291	Eye Controlled Wheelchair using raspberry Pi	IC201810796	SHAH AND ANCHOR KUTCHHI ENGINEERING COLLEGE	Maharashtra	Western/WRO
398	53519	GLUT - Gas Level Indicators and demand prediction remotely.	IC201810796	SHAH AND ANCHOR KUTCHHI ENGINEERING COLLEGE	Maharashtra	Western/WRO
399	56856	Smart Parcel Box With UV Based Sanitization	IC201810796	SHAH AND ANCHOR KUTCHHI ENGINEERING COLLEGE	Maharashtra	Western/WRO
400	46654	Blood glucose monitoring using a non-invasive measurement technique	IC201811183	SHRI VILE PARLE KELAVANI MANDALE DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING	Maharashtra	Western/WRO
401	48823	Parasit's Polix	IC201612885	SIKS GOODRUTE SCHOOL OF TECHNOLOGY	Maharashtra	Western/WRO
402	65700	Ezbelia- A Herbal Antihelmintic Suspension for curing Helminthiasis in Infants	IC201811118	SINHGAD TECHNICAL EDUCATION SOCIETY'S SINHGAD COLLEGE OF PHARMACY	Maharashtra	Western/WRO
403	64525	MediGum : Immediate-acting medicated chewing gum for dysmenorrhea prepared using wheat glutes.	IC201811118	SINHGAD TECHNICAL EDUCATION SOCIETY'S SINHGAD COLLEGE OF PHARMACY	Maharashtra	Western/WRO
404	62727	SOYRICE(complete protein): A NUTRI SUPPLEMENT FOR DIABETIC PATIENTS	IC201811118	SINHGAD TECHNICAL EDUCATION SOCIETY'S SINHGAD COLLEGE OF PHARMACY	Maharashtra	Western/WRO
405	55663	Increasing Productivity By Using Multi Agro Mechanisms	IC201810296	THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY	Maharashtra	Western/WRO



- Two groups of students participated in the Avishkar Convention organized by the University of Mumbai.
  - One of the groups consisting of Ms. Sharmi Majumdar and Mr. Soham Shah submitted a project titled “Fabrication of a Transdermal Drug Delivery System using Biodegradable Microneedles for the Treatment of Migraine in Engineering and Technology”.
  - The second group consisting of Mr. Mehul Lad, Ms. Astha Mehta, Ms. Riya Shah submitted a project titled “Blood Glucose Monitoring using a Non-Invasive Measurement Technique”.



- Ms. Radhika Gawde, a student from SE, made the department proud by securing the First position in 4x100m Freestyle and Third position in 4x100m Medley in the Khelo Youth India Games 2020 held in Guwahati, Assam from 10<sup>th</sup>-22<sup>nd</sup> January 2020.





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- Ms. Radhika Gawde also participated in Swimming in the 200m Butterfly category at Khelo India Youth Games 2020.





## Staff Achievements

- Prof. Purva Badhe and Dr. Vaishali Kulkarni published a paper titled “Artificial Neural Network based Indian Sign Language Recognition using Hand Crafted Features” at the Eleventh International Conference on Computing, Communication and Networking Technologies organized by Indian Institute of Technology, Kharagpur, India, in association with IEEE Kharagpur Section from July 1 to July 3, 2020.
- Prof. Shruti Dodani and Dr. Mrunal Rane authored a paper titled “Arterial Blood pH Monitoring using a Fingertip Device to Predict Cardiovascular as well as Respiratory Diseases” which secured the **third place** at IEEE AMPHE 2020 Conference organized by Adamas University, Kolkata from 25<sup>th</sup>-26<sup>th</sup> September 2020.
- Dr. Vaibhavi Sonetha submitted a paper titled “Fabrication and In Vitro Testing of Bio-Synthetic Patch for Burn Wounds” in the Advances in Medical Physics and Healthcare Engineering Conference which was later published in the Lecture Notes in Bioengineering Journal in June 2021.
- Prof. Shruti Dodani conducted Applied Statistics Practical and Deep Learning Practical as a part of the IBM Advanced Technology courses in July-Nov 2020 and Jan-April 2021 respectively.
- Prof. Purva Badhe conducted Deep Learning Practical as a part of the IBM Advanced Technology courses in Jan-April 2021.
- Faculty members successfully completed various STTP, FDP arranged by various institutes as well as through platforms like Coursera, Udemy etc.

Name of Faculty Member	Number of courses completed in A.Y. 2020-21
Dr. Manali J. Godse	16
Prof. Vivek Deodeshmukh	14
Dr. Vaibhavi Sonetha	51
Prof. Mangal Dandekar	21
Prof. Shruti N. Dodani	40
Prof. Purva Badhe	14
Prof. Chandrashekhar Beral	17
Prof. Pavankumar Borra	17



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