

# Department of Biomedical Engineering

## Biomed Newsletter

**VISION:** “Our vision is to nurture engineers who can comprehend the ethical, social, and economic implications of their work by imparting quality education through integration of engineering and medical sciences for the improvement of human health care.”

### MISSION:

- To create a free and open learning environment that fosters the intellectual growth of students.
- To provide skill based technical education.
- To enable students to be sensitive towards the ethical issues of medical industry
- To prepare students for confronting medical challenges by applying engineering principles.

### PROGRAM EDUCATIONAL OBJECTIVES PEOs:

Our diploma graduates will:

- Pursue higher Education and research in either biomedical engineering or any other relevant field.
- Continue to learn and expand and develop their knowledge and skill sets to pursue successful professional engineering career.
- Work in multidisciplinary areas with a strong focus on medial innovation and entrepreneurship.
- Adapt emerging technologies to address social medical issue and environment issue.



Issued:

December 2021

Faculty details:

1. Mr. R.D.Motka (M.Tech, Digital comm., experience: 14 years)
2. Ms. J.H.Suthar (M.E.Biomedical engg.), experience: 14 years)
3. Ms. A.R.Dalwadi, (BE, Biomedical engg., experience:8 years)
4. Ms. M.M.Patel, (M.E., Biomedical engg., experience: 8 years)
5. Ms. N.B.Modi, (M.E., Biomedical Engg., experience: 8 years)

## From HOD's Desk:



Due to the Covid pandemic, this term too has to be conducted online even if the students and teachers were all ready to go for offline mode. Online teaching has been the toughest methods to teach and learn, for teachers as well as for students. Apart from teaching, it has become extremely difficult to expose the students to their field of work,

which are hospitals and industries. Some of the industry persons have been kind enough to provide the practical exposure in online mode. Online webinars have been conducted during the term which made the students feel connected with the ongoing technical trends in medical industry. The details are inside this issue.

### Covid contribution

*It has been the matter of pride for department of Biomedical engineering at GPG, that one of the faculty members, Ms. Aarti R. Dalwadi, had been deputed and worked effectively at COVID Dhanvantari Hospital at Gujarat Convention Center, as coordinator for Biomedical Waste Management for a month during second wave of pandemic. During these testing times, one of our Biomedical department family members has made a small contribution to the community and it has been the proud moment for GPG family.*

### Inside this issue:

<i>Innovation 2021</i>	2
<i>Result</i>	3
<i>Placement</i>	3
<i>Co-curricular activities</i>	3
<i>Student achievements</i>	3
<i>Faculty training details</i>	4
<i>Student's art gallery</i>	4

## 1. Surgical Robotics:

A new wave of robotics innovations is having a major impact across various industries. In bioengineering, AI-assisted surgical robots are providing valuable support to surgeons in the operating room. While surgical robots have existed for decades, these new models come with AI algorithms that can provide improved support to surgeons. For example, AI-powered smoothing algorithms reduce jitters or noise in the recording of a surgeon's hand movement, allowing for extremely careful and precise translation of their trajectory. In some cases, robots can conduct surgery entirely on their own. The Smart Tissue Autonomous Robot (STAR) performed better than people in "a series of ex vivo and in vivo tasks" — all without any human intervention. It used an AI algorithm and data from a set of visual and haptic sensors to perform the operations.

## 2. Telesurgery:

Beyond offering improved precision and reduced recovery time, robotics could also enable the use of telesurgery or remote surgery. With telesurgery, the surgeon controls a robot at another medical facility using a high-speed internet connection. The telesurgery robot closely follows the hand movements or inputs of the doctor, enabling them to operate on a patient from hundreds of miles away. Telesurgery robots have been on the market for decades, but they've never been widely used. In most cases, they simply weren't practical due to the high cost of robotics and the dangers that latency could pose for patients. New telesurgery robots, enabled by improved internet infrastructure and technology like AI, could be different. Some models connected to surgeons via 5G have already been used in trial surgeries on cadavers. Like telemedicine, telesurgery has the potential to greatly improve the accessibility of specialized medicine. Patients in need of surgery wouldn't need to commute to a world-renowned hospital for treatments that are only available from a handful of doctors. Instead, they may be able to travel to a local hospital outfitted with the proper robotics.

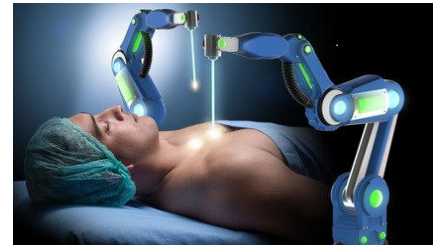
## 3. Medical VR:

Over the past few years, researchers have been working to apply virtual reality — technology that uses visual displays and motion controllers to transport users to digital environments — to medicine. For example, care providers are experimenting with the use of VR in treating Alzheimer's patients. These patients often have limited mobility, which makes it hard for them to access new stimuli — usually provided in the form of day trips and time spent outdoors — which is positively correlated with an improvement in Alzheimer's symptoms. Medical VR programs can transport patients to a virtual environment, offering them new stimuli that, in one study, helped them recover old memories and improved their quality of life. The technology is still experimental but could be an essential tool for care providers working with patients with limited mobility. While day trips may not always be possible, virtual outings could be a viable option.



## 4. Smartphone connected pacemaker devices:

Implantable devices like pacemakers and defibrillators deliver electrical impulses to the heart muscle chambers to contract and pump blood to the body. They are used to prevent or correct arrhythmias — heartbeats that are uneven, too slow or too fast. Remote monitoring of these devices is an essential part of care. Traditionally, remote monitoring of this device takes place through a bedside console that transmits the pacemaker or defibrillator data to the physician. Though millions of patients have pacemakers and defibrillators, many lack a basic understanding of the device or how it functions and adherence to remote monitoring has been suboptimal. Bluetooth-enabled pacemaker devices can remedy these issues of disconnection between patients and their cardiac treatment. Used in conjunction with a mobile app, these connected devices allow patients greater insight into the health data from the pacemakers and transmit the health information to their physicians.



## 5. Bubble CPAP for increasing lung function:

Underweight and frail, babies born prematurely often require specialized care — including ventilation for those with infant respiratory distress syndrome (IRDS). For IRDS, infants are commonly administered surfactant during mechanical ventilation, a practice that can cause lasting lung injury in preterm infants and contribute to the development of chronic lung disease. Unlike mechanical ventilation, b-CPAP is a non-invasive ventilation strategy — delivering continuous positive airway pressure to newborns to maintain lung volumes during exhalation. The oscillating, rather than constant pressure, plays a role in its safety and efficacy, minimizing physical trauma and stimulating lung growth when administered over a prolonged period.

## Result

Sr. No.	Semester	No. of students appeared	No. of students passed	Percentage result	Exam
1	1	45	26	57.78	WINTER 2020
2	3	53	28	47.17	
3	5	39	27	69.23	
4	6	43	42	97.67	SUMMER 2021

## Placement

Sr. No.	Name of company	No. of students appeared	No. of students shortlisted	Date of placement
1	Uteshiya medicare Pvt. Ltd.	7	2	31/07/2021
2	Advance medical technologies	7	0	31/07/2021

## Co-curricular activities

Sr. No.	Type of event	Date	Delivered by	Topic	No. of participants
1	Webinar	31/8/2021	Mr. Hitesh Prajapati (Raytech medical services)	Demonstration of X-ray machine	105

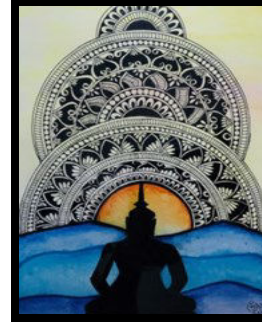
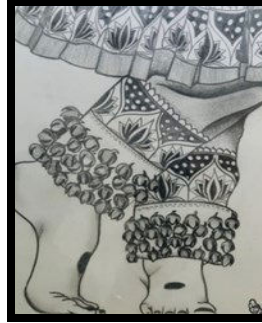
## Students' achievements

GTU TOP 3					
Sr. No.	Enrollment No.	Name	CPI	SPI	CGPA
1	186140303058	VARMA PAYAL GOVIND PRASAD	8.49	8.75	8.80
2	186140303060	VIRPARA POONAM AJAYSINH	8.31	8.31	8.60
3	186140303031	NEMADE DEVANSHI PRAMOD	8.30	8.33	9.00

# Students' Art Gallery



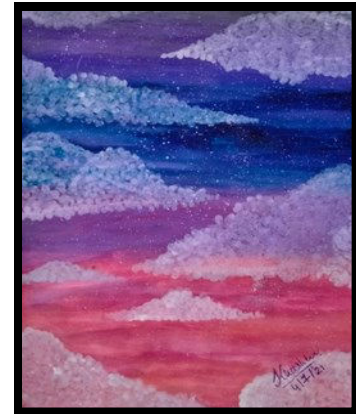
*Vanshika Barot, semester 3*



*Yatri Zinzuwadia, semester 5*



*Khushboo Thaker, semester 3*



*Prachi Patel, semester 3*