



Adi Jagadguru  
Sri Shivarathreeshwara  
Shivayogi Mahaswamiji



H.H. Jagadguru  
Manthra Maharshi  
Sri Shivarathreeshwara



Srimanmaharaja Rajagurutilaka  
H.H. Jagadguru Dr. Sri Shivarathri  
Rajendra Mahaswamiji

## ABOUT JSS MAHAVIDYAPEETHA

The Jagadguru Veerasimhaasana Peetha was established in the 11th Century A.D. at Suttur by Adi Jagadguru Sri Shivarathreeshwara Shivayogi Mahaswamiji. Suttur is a village in Nanjangud taluk, Mysuru District in Karnataka. It is about 28 km from Mysuru city, in the south east direction. The Peetha with its high ideals has been making remarkable contribution in religious, social, educational and economic spheres in the state and across the country. It is striving for social development by responding to the community needs. It strongly believes that, unless the problems of the socially backward communities and the poor are taken care, there will not be social development. With this objective, the math has initiated several programmes, while at the same time living up to its principle of "work is worship" and is engaged in raising public awareness on issues of social concern.



His Holiness Jagadguru Sri Shivarathri  
Deshikendra Mahaswamiji



Jagadguru Sri Veerasimhasana  
Mahasamsthana Math – Suttur Sriksheetra



## ABOUT THE INSTITUTION

JSS Academy of Technical Education (JSSATE) was established in the year 1997 at Bengaluru and is under the umbrella of JSS Mahavidyapeetha, Mysuru. JSSATE is the result of the vision of our President, His Holiness Jagadguru Sri Shivarathri Deshikendra Mahaswamiji to proactively participate in establishing a world class Institution for Technical Education. The Campus is located on a sprawling 21.17 acres land surrounded by lush green plantation on the South-Western edge of Bengaluru City. The institution is affiliated to Visvesvaraya Technological University (VTU), Belagavi, India



## ABOUT THE DEPARTMENT

The Department of Electronics and Instrumentation Engineering was established in the year 1997, affiliated to Visvesvaraya Technological University, Belagavi, Karnataka with an intake of 60 students. Department is continuously striving towards to meet the ever-changing needs of industry with its innovative curriculum structure. The Department has VTU recognized research centre which offers Ph.D program both full time & Part time. The Department provides a platform for effective interaction between Alumni & students. It also conducts pre-placement activities to train the students in aptitude, logical thinking and communication skills. The Department encourages the students for their participation in co-curricular & extra-curricular activities. The Department has well qualified and highly experienced faculty members with rich experience in research in allied domains. Presently Department is headed by Dr. D. Jayadevappa.



**Dr. BHIMASEN  
SORAGAON**

### FROM THE DESK OF PRINCIPAL

It gives me immense pleasure to pen a few words as prologue to the 1st issue of Volume 9 of the biannual newsletter "SANGATHI" which is being released by the Department of Electronics and Instrumentation Engineering. One of the greatest strengths of the Department is its highly qualified and dedicated faculty members, who, apart from teaching, are engaged in research work. The objective of this newsletter is to churn out the latent writing talent which bears enormous potentiality of sharpening the communication skill of the students as well as to depict the different activities and achievements of the Department. I congratulate all the contributors and the editorial board, for materializing this issue of "SANGATHI".



## MESSAGE FROM HOD



**Dr. JAYADEVAPPA**

I am extremely happy to present the first issue of volume nine of our Department's newsletter-"SANGATHI". This is going to be a continuous process portraying the various academic as well as the non academic activities of our Department. We strive to be at the forefront of research, to educate our students in core fundamentals, and to engage students with emerging technologies and their applications. E&IE is a constantly advancing and widening branch of the engineering profession. It is one of the oldest branches which involves multidisciplinary aspects and also complies with the NEP2020 regulations. I, on behalf of the Department congratulate the editorial members, faculty and students.

## From the Editorial Desk

With the blessings of His Holiness, Jagadguru Sri Sri Shivarathri Deshikendra Mahaswamigalavaru, It is indeed a great honour to present the Volume 9, Issue 1 of our department's biannual e-newsletter-SANGATHI. In this issue, we will recount the various activities and achievements of our students and faculty during the academic term January -June, 2024. Through our newsletter we aim to provide useful information to our stakeholders. We wish for your continued support in this regard, and a huge thank you to all those who contributed to this issue as these are essential to the newsletter's success.



**To become globally competent in the field of Electronics and Instrumentation Engineering through Education, Research & Personality development**

- 1. Provide quality education by enriching students with technical knowledge and skills through holistic learning environment and state-of-the-art facility.**
- 2. Encourage students to pursue higher studies and engage them in research and development**
- 3. Instill professionalism and ethics among students who can strive to fulfill the needs of industry and society**





## Training and Workshops Attended

### Dr. Nagesha

Eight weeks of FDP on “Database management system” conducted by NPTEL from Jan - Apr 2024

### Dr. Bhanumathi K S:

- Five days FDP on “Role of Green Energy Towards Sustainable Smart Cities” organized by IEEE section of JSSATE, Noida from 13th - 17th Feb 2024.
- Two days FDP on “Sustainable Development Goals” on 28th & 29th June 2024 organized by Management studies, JSSATEB

### Mrs. Sowmya M S

#### FDP attended

- Two days FDP on “Sustainable Development Goals” Organized by – Department of Management Studies, JSS Academy of Technical Education, Bengaluru from 28-06-2024 to 29-06-2024
- Two week ISTE approved online STTP on "Recent Trends in AI, ML and IOT " Organized by – Department of Electronics & Telecommunication Engineering, Sinhgad Technical Education Society's Smt. Kashibai Navale College of Engineering, Pune from 12-06-2024 to 25-06-2024

#### Conference attended

- 1st International Clini-Tech Conference “NeuroTechCon-2024” on theme "Disrupting Neuro Rehabilitation Uniting functional Neuroscientists, Rehab professionals Technologists and Data Scientists" Newro KAAYA, PRS Neuroscience, at NIMHANS Convention Centre, Bengaluru on 18h May 2024

### Dr. Sharadha Suresh Dambal

- Two days FDP on Sustainable Development Goals ,Organized by the Department of Management Studies, JSSATEB from 28 to 29-06-2024

### Mrs. Nagarathna S

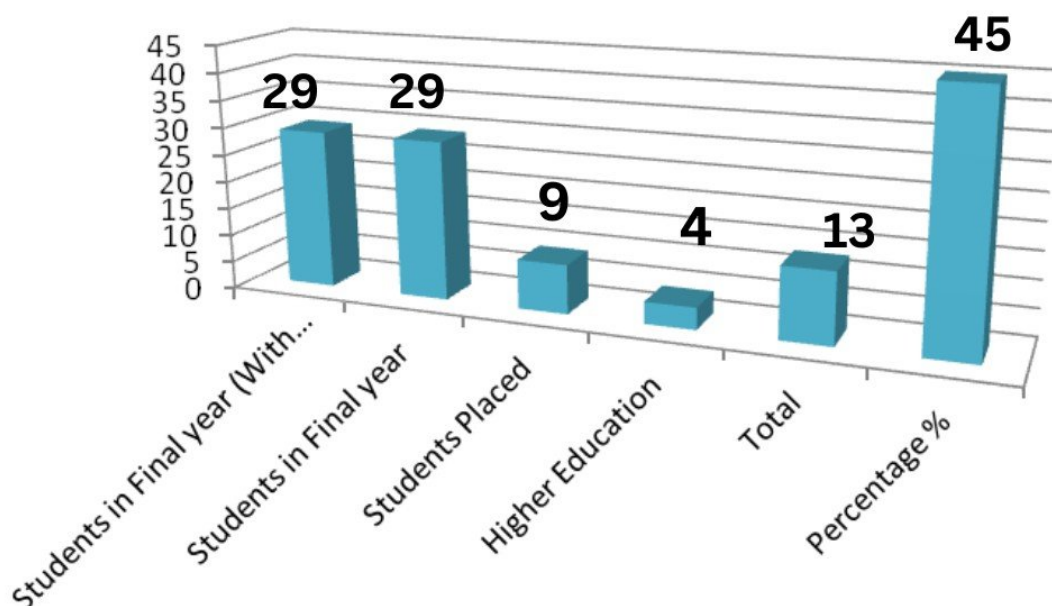
- ISTE approved 6 days STTP on Cloud Computing and its services. Organized by – Department of Information Technology, A. C. Patil College of Engineering, Kharghar Navi Mumbai.
- Two weeks ISTE approved Self-Financing Faculty Development Program on Recent Trends in AI, ML and IoT. Organized by the Department. of Electronics & Telecommunication Engineering, Smt. Kashibai Navale College of Engineering, Pune, Maharashtra.
- Two days FDP on Sustainable Development Goals. Organized by the Department of Management Studies, JSSATEB

# STUDENT ACHIEVEMENT

- Mr.Akshatha V, Ms.Lekhana H G, Ms.Pushpavalli K are selected KSCST: 47th Series of Student Project Programme (SPP): Sponsored Project by Karnataka State Council for Science and Technology, Indian Institute of Science Campus, Bengaluru.and they got Rs 5,500 sponsorship.
- Mr.Arun Kumar A V, Mr.Athish Surya Gosi ,Mr.Chetan B K, Mr.Sagar P are participation in the Open Day Project Exhibition organized by the department of Electronics & Instrumentation Engg. JSS Academy of Technical Education, Bengaluru.and Won 1st Prize.
- Ms.Akshatha,V Ms.Lekhana H G ,Ms.Pushpavalli K are participation in the Open Day Project Exhibition organized by the department of Electronics & Instrumentation Engg. JSS Academy of Technical Education, Bengaluru.and Won 2nd Prize.
- Mr.Barket Hussain Dar Ms.Harishree B R Ms.Muskan Tabassum Ms.Pallavi H are participation in the Open Day Project Exhibition organized by the department of Electronics & Instrumentation Engg. JSS Academy of Technical Education, Bengaluru.and Won 3rd Prize.
- Mr.Chandana G Hublikar Mr.Charan Kumar T Mr.Vineeth J these Student's participation in the National Science Fair - 2024 exhibition competition organized by the department of Chemistry, JSS Academy of Technical Education, Bengaluru and they won 2nd prize.

## Placements

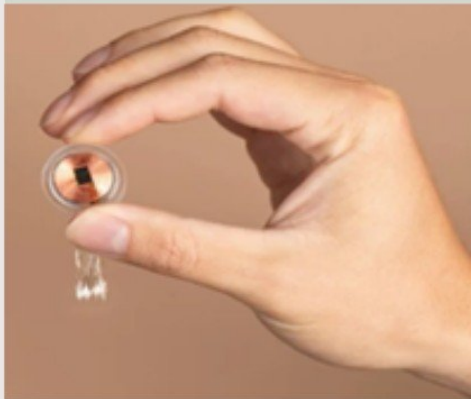
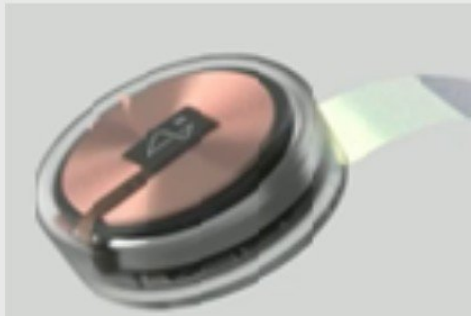
year 2023-24





# Student Article

## Neuralink: Pioneering the Future of Brain-Machine Interfaces in Neuroscience



The human brain is a complex and largely uncharted territory in biology, despite significant advancements in neuroscience and technology. Neuralink, founded by Elon Musk in 2016, is at the forefront of this field, focusing on developing an implantable brain-machine interface (BMI) to improve the lives of individuals with severe brain and spinal cord injuries. Although early tests in animals show promising results, clinical trials on humans have not yet begun. A recent search of PubMed revealed only 28 references related to Neuralink, indicating limited direct research on the device, emphasizing the need for more comprehensive studies to assess its safety and efficacy.

Neuralink's overarching goals include understanding and treating neurological disorders, enhancing cognitive abilities, and fostering a harmonious relationship between human brains and artificial intelligence (AI). Potential medical applications include enabling patients to control exoskeletons, facilitating communication for those with locked-in syndrome, restoring neuronal connections in degenerative diseases like Alzheimer's, and improving seizure management for drug-resistant epilepsy.

The core concept of Neuralink revolves around creating a BMI that can restore both sensory and motor functions in people with neurological impairments. The device employs "threads"—tiny electrodes implanted in the brain via a specialized robotic system. These electrodes can capture real-time data on neuronal activity more accurately than traditional electrodes used in deep brain stimulation (DBS). The data collected appears as "spike" patterns, similar to actual neuronal depolarization, and can be monitored through an external device and a corresponding iPhone application.

Neuralink distinguishes itself from traditional DBS by using flexible, biocompatible probes with a significantly higher number of electrodes—3,072 across 96 threads, compared to the 256 electrodes typically used in DBS systems. This design not only allows for more precise data collection but also enhances the biocompatibility of the device within living tissue. Furthermore, a custom integrated circuit enables real-time monitoring of electrophysiological data, improving the device's overall efficacy.

In terms of engineering, Neuralink has developed a sophisticated surgical robot capable of implanting these tiny electrodes with precision. This robot utilizes advanced imaging techniques to accurately locate and insert the threads while minimizing damage to surrounding brain tissue. Initial tests in rats demonstrated an impressive average insertion success rate of 87.1%.

The device's ability to record and process neural signals is another significant technological achievement. It includes 256 programmable amplifiers and on-chip converters to filter and digitize faint neural signals for real-time processing. Elon Musk previously outlined two platforms—System A and System B—targeting neuroprosthetic applications, with early tests showing promising outcomes in recording neuronal activity.

Human trials are essential for validating Neuralink's potential as a neuroprosthetic tool, but various challenges must be addressed first. The implantation process requires extensive training for neurosurgeons to ensure safety, given the delicate nature of the electrodes and the anatomical structures involved.

The restoration of motor function may be limited by the extent of neuronal damage, particularly in severe cases, necessitating further exploration of the interplay between BMIs and neuronal regeneration.

Moreover, Neuralink's applications may extend beyond motor function restoration. The device could potentially play a role in monitoring and preventing brain tumor recurrence by measuring neuronal excitability around tumors, offering timely interventions that could enhance patient outcomes and life expectancy.

In conclusion, Neuralink's innovative approach to brain-machine interfaces presents exciting possibilities for treating a range of neurological conditions and enhancing human capabilities. However, substantial research is needed to fully understand its implications, ensuring safety and effectiveness before moving to human clinical trials. The path ahead involves not only technological and scientific challenges but also ethical considerations as we venture into this new frontier of human enhancement and medical intervention.

Reference:

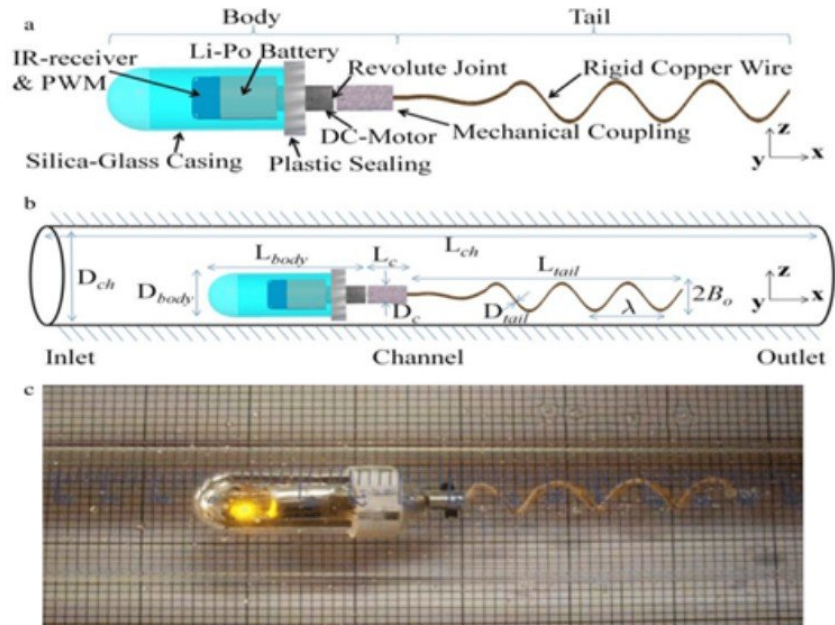
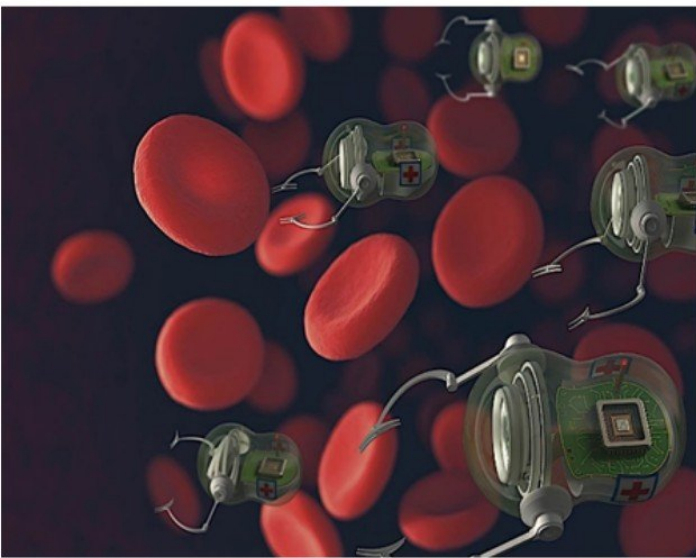
1. Neuralink: the ethical 'rhythmic of reading and writing to the brain. Dadia T, Greenbaum D. *AJOB Neurosci.* 2019;10:187–189. [PubMed] [Google Scholar]
2. The hybridization of the human with brain implants: the neuralink project. Fournier É. *Camb Q Healthc Ethics.* 2020;29:668–672. [PubMed] [Google Scholar]
3. Neuralink- an Elon Musk start-up achieve symbiosis with artificial intelligence. Kulshreshtha A, Anand A, Lakanpal A. 2019 International Conference on Computing, Communication, and Intelligent Systems (ICCCIS) 2019:105–109. [Google Scholar]

**Tejas S**  
**1JS22EI049**



# New Robotic Swimmer Developed to Study Bacterial Movement

Researchers at Brown University have made a giant leap in the quest to understand the behavior of microbes with the development of a self-propelled swimming robotic device inspired by the shape of an \*E. coli\* bacterium. The design was produced with the help of a 3D printer and is capable of mimicking the complex swimming patterns of bacteria and other microorganisms with their intricate mechanics.



## Design and Functionality

The robotic swimmer has an encapsulated waterproof head containing a small engine, a power source, and necessary electronics. Its most distinctive feature is a helical tail, easily varied to test various helix angles and geometries that can represent different swimming styles and conditions. The remote control helps in controlling the swimmer, wherein the speed of rotation of the motor along with its direction can be orchestrated perfectly. As Assistant Professor of Engineering at Brown Daniel Harris claims, "What this gives us is the ability to do macroscopic experiments that we have full control over."

## Research Effects

This robotic swimmer opens new venues for the study of swimming behavior of bacteria, which often is complex or simply impossible to be observed directly in their natural environment. It would be possible to conduct controlled experiments, e.g., on the impact of fluid dynamics on bacterial swimming or how variations of swimming strategies influence the displacement of bacteria. The scientific robotic innovation marks a great leap in studies toward the micro-world. This would probably help scientists discover new things about microbiology and related technologies. By replicating and manipulating the swimming behavior of bacteria, one may have an improved understanding of microbial ecosystems, biofilm formation, and perhaps be informed for medical applications regarding bacterial movement in the human body.

**REFERENCES :-**  
**Brown University**

**NAMRATHA BS**  
**1JS22EI020**





# Biodegradable Bytes

What if all our electronics could disappear into earth's soil like leaves? Imagine taking a camera pill before a surgery. How exciting! The answer to this could be biodegradable electronics.

The emerging world of biodegradable electronics aims to revolutionize the field by addressing e-waste and develop unique biomedical devices. The rapid advancement of technology has led to an increase in electronic waste (e-waste), posing significant environmental challenges. Traditional electronic devices are composed of non-biodegradable materials, which accumulate in landfills and release harmful substances.

One of the pioneering efforts in this area was led by researchers at Stanford University, who developed a flexible, biodegradable semiconductor that can decompose when exposed to a weak acid like vinegar. This innovation was significant as it addressed concerns of e-waste by breaking down into non-toxic components after use.

Biodegradable electronics are primarily made from organic materials that can break down into non-toxic byproducts. Common materials include cellulose, silk proteins, and polylactic acid (PLA). These materials are chosen for their biocompatibility and ability to degrade under environmental conditions. For example, cellulose, from plants, is used in substrates and insulating layers due to its flexibility and biodegradability.

The design of biodegradable electronics involves creating transient devices that maintain functionality for a specific period before degrading. This requires careful selection of materials and innovative fabrication techniques. The evolution of biodegradable electronic devices is contributed by breakthroughs in materials science. Researchers have been exploring novel materials and fabrication techniques to enhance the durability and efficiency of friendly electronics while maintaining eco-friendliness. For instance, bioresorbable polymers like polylactic acid (PLA) or polyhydroxyalkanoates (PHA) offer excellent mechanical properties and electrical conductivity, making them ideal electronic components.

These "green" electronics use PLA and PHA, with other materials such as conducting inks, polymers, and soft semiconductors, to fabricate biodegradable electronic components.

## Disintegrating circuits

Another exciting advancement in the field of biodegradable electronics is the development of circuits that disintegrate after use. These biodegradable circuits are typically made from polymers that are engineered to dissolve when exposed to specific environmental conditions such as heat or moisture. This technology helps us to create circuits for both medically and industrially compostable circuits that do not compromise on their electrical properties.

## Sensors

Sensors are a very integral part of any electronic device. These biodegradable sensors are designed to perform various functions while still being able to degrade naturally over time. These can be used in a variety of applications, from environmental monitoring to healthcare diagnostics avoiding invasive surgeries and procedures

## Applications

Biodegradable electronics have a wide range of applications, particularly in medical and environmental fields. In medical applications, transient devices can be used for temporary implants that dissolve after completing their function, eliminating the need for surgical removal. Examples : Biodegradable sensors for monitoring physiological conditions and drug delivery systems. In environment, biodegradable sensors deployed in ecosystems can collect data and then degrade without leaving harmful residues. This reduces the environmental impact compared to conventional sensors. They can also be used in consumer electronics, disposable devices like cells and packaging to reduce e-waste.

## Conclusion

Despite the benefits, biodegradable electronics face several challenges. One major challenge is ensuring the stability and performance of biodegradable materials under various environmental conditions. Researchers are working on enhancing the durability and functionality of these materials on par with traditional electronics. Another challenge is integration of biodegradable components into existing manufacturing processes. Developing scalable and cost-effective fabrication techniques is crucial for the widespread adoption of biodegradable electronics.

The future of biodegradable electronics lies in the development of new material synthesis, printing technologies and designs that offer improved performance and sustainability. Advances in organic bioelectronics, soft electronics, and novel fabrication mechanisms are expected to drive the growth of this field. Collaboration among academia, industry, and government is crucial to achieve sustainable development goals. Innovative technologies and green manufacturing can help create sustainable systems with minimal environmental impact.

**Nireeksha A**  
**1JS23EI035**



## INDUSTRIAL VISIT

The department of Electronics and Instrumentation Engineering had organized an industrial visit to Mangalore Paper Mills Pvt. Ltd. on 23rd January 2024 for 5th semester students. The purpose of the visit was to gain firsthand knowledge and experience on the inner workings of the operation and functioning of the paper industry; Mangalore Paper Mills Pvt. Ltd. being a key player in the sector. The students were accompanied by two faculty members, Dr. D. Jayadevappa, HoD, and Mrs. Sowmya M.S, Assistant Professor.



## EDITORIAL BOARD

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**Mr. Srikantaswamy sc**





**JSSATE**  
BENGALURU

  
**CET CODE: E082**  
**COMED-K: E060**

**PGCET**  
**MBA: B196**  
**MCA: C534**

**JSS MAHAVIDYAPEETHA**

# JSS ACADEMY OF TECHNICAL EDUCATION

Approved by AICTE and Affiliated to VTU, Belagavi

Sustainable Institutions of India  
**GREEN RANKINGS-2024**



**THE WEEK**

Hansa Research Survey 2023

**QS I-GAUGE**  
INDIAN UNIVERSITY RATING  
**GOLD**

**NBA**  
NATIONAL BOARD  
OF ACCREDITATION

**nirf**

INNOVATION BAND 151-300

ACCREDITED WITH GRADE  
**A+**  
**NAAC**



## HIGHLIGHTS

- Lush Green Campus spread over 21 acres.
- State of the Art Laboratories; Smart Classrooms.
- 92 faculty with Ph.D and 70 are pursuing their Ph.D.
- Industry supported (iOX, Mobile Application, etc.) Labs.
- JSS Science and Technology Entrepreneurship Park (STEP) to support innovation and incubation of companies.
- Distinguished Alumni include IAS, IFS Officers and CEO,VP of corporate.
- In-Campus Boys & Girls Hostels.
- Wi-Fi enabled Campus.
- Vibrant Student Clubs.
- Scholarships worth Rs. 5 crores have been received so far under various schemes.
- Turf Cricket Ground in collaboration with Karnataka State Cricket Association.
- Basketball and Synthetic Tennis Courts.
- Stipend paid Internships.
- Recognized Research Centers and 500+ quality articles have been published in WoS / Scopus-indexed journals.
- Received grants / funding of Rs. 3.5 crores from various agencies for research & innovation projects in the last 5 years.
- Awareness on Civil services & other competitive exams by JSSTICE.
- Number of VTU Ranks: 72



## CENTERS OF EXCELLENCE

- MoUs with IIT, Guwahati and C-DAC, Trivandrum
- M/s. Toyota Kirloskar Motor Pvt. Ltd.
- M/s. Digital Shark Technology Pvt. Ltd.
- M/s. Dassault Systemes- EV Mobility



## PLACEMENTS

- Highest package in 2020: Rs. 45 LPA (M/s. Amazon)
- 800+ offers in the year 2022-23
- 200+ offers in 2024 (ongoing) and the highest package as of now: 16 LPA
- Associated with 150+ Companies
- Highest paid Internship: Rs. 35K per month
- Soft skills training by reputed trainers

## Programs Offered

- ✓ Civil Engineering
- ✓ Computer Science & Engineering
- ✓ Computer Science & Engineering (AI & ML)
- ✓ Electronics & Communication Engineering
- ✓ Electronics & Instrumentation Engineering
- ✓ Information Science & Engineering
- ✓ Mechanical Engineering
- ✓ Robotics & Automation

**BE**

- M. Tech in VLSI Design & Embedded Systems
- M. Tech in Data Science
- MBA: Master of Business Administration
- MCA: Master of Computer Applications
- Ph. D Programs in all the Departments

## MoUs / Professional Societies



**ADMISSIONS  
OPEN  
FOR 2024-25**

For Admission Enquiry, please click the link:

<https://forms.gle/Ac4aiKCUDsqosjR7>



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## PRESTIGIOUS RECRUITERS



S.No.	Company Name	Package LPA
1	Kickdrum	16
2	nference	12
3	Eurofins	10.75
4	TCS - Prime	9
5	HashedIn Technologies	8.2

S.No.	Company Name	Package LPA
6	Intellipaat	7.25
7	Betsol	7
8	TCS - Digital	7
9	Harman	7
10	Fintellix	5.5



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