स्पंदन SPANDAN

Newsletter of Department of Electronics Engineering
J. C. Bose University of Science and Technology, YMCA, Faridabad

January-March 2023

From Chairperson's Desk

Dr. Pradeep Dimri
Chairperson and Professor,
Department of Electronics Engineering

Dear Electronics Family of J.C.Bose University of Science and Technology, YMCA, Faridabad.

Warm Greetings! "Celebrate endings, for they precede new beginnings." With the same motto, it is my heartfelt pleasure to present to you all the current edition of SPANDAN, the newsletter of the Electronics Department.

A famous saying goes like this: "Coming together is beginning, keeping together is progress, and working together is SUCCESS. "With this philosophy in mind, we, the Electronics Family, continue growing and learning in numerous fields. This small newsletter may not do justice to everything happening in our Department. Still, it gives a small glimpse of what is happening in the Department. Please feel free to send your valuable feedback to our zealous editorial team.

Best wishes and Regards.

Mission

- To frame a well-balanced curriculum with an emphasis on basic theoretical knowledge as well as the requirements of the industry.
- To motivate students to develop innovative solutions to the existing problems for the betterment of society.
- Collaboration with the industry, research establishments, and other academic institutions to bolster the research and development activities.

Vision

To be a Centre of Excellence for producing high-quality engineers and scientists capable of providing sustainable solutions to complex problems and promoting cost-effective indigenous technology in the area of Electronics, Communication & Control Engineering for Industry, Research Organizations, Academia, and all sections of society.

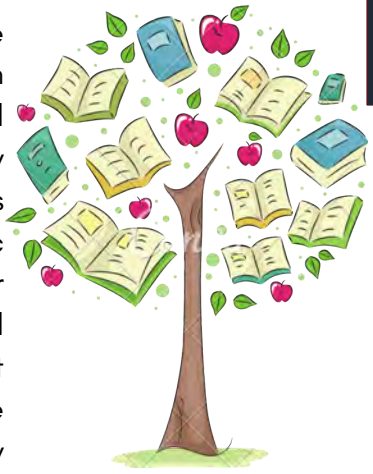
News & Events:

ACTIVITY REPORTS:

In our pursuit of academic excellence and knowledge dissemination, the Department of Electronics Engineering at J.C. Bose University of Science and Technology, YMCA, is excited to announce a series of enlightening initiatives for 2023. These endeavors are designed to empower our students, faculty, and the broader community through:

LECTURE SERIES:

Lecture: Recent Design and Application of PV, Hybrid PV and PVT Collector



Dr. Rohit Tripathi delivered the expert talk as part of the Department Seminar series in coordination with Dr. Nitin Sachdeva and Ms. Sangeeta Dhall on the topic “Recent Designs and Applications of PV, Hybrid PV And PVT Collectors” on 29th March 2023 for the faculty members, workshop staff, research scholars and PG students of the electronics department. He delivered his talk successfully by exploring the concepts of Photovoltaic thermal collectors, typically abbreviated as PVT collectors and also known as hybrid solar collectors, hybrid photovoltaic thermal solar collectors. PVT collectors or solar cogeneration systems are power generation technologies that convert solar radiation into usable thermal and electrical energy. PVT collectors combine photovoltaic solar cells, which convert sunlight into electricity, with a solar thermal collector, which transfers the otherwise unused excess heat from the PV module to a heat transfer fluid. By combining electricity and heat generation within the same component, these technologies can reach a higher overall efficiency than solar photovoltaic (PV).

Industry 4.0:

As part of the seminar series conducted by the Department of Electronics Engineering, Mr. Sunil Yadav an Alumni of the University delivered his expert lecture on the topic "Industry 4.0" on 20th February, 2023 for the faculty members, research scholars and PG students of the department. Industry 4.0 is revolutionizing the way companies manufacture, improve and distribute their products. Manufacturers are integrating new technologies, including Internet of Things (IoT), cloud computing and analytics, and AI and machine learning into their production facilities and throughout their operations.

INNOVATIONS

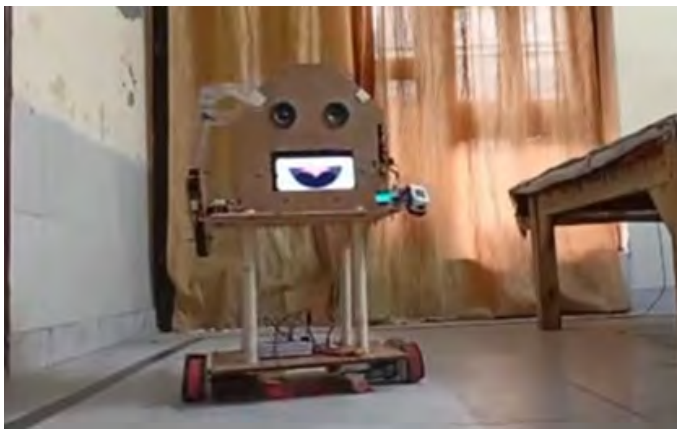
Under the aegis of various clubs, the students in the Department of Electronics Engineering have brought to life a range of innovative creations, showcasing their ingenuity and creativity:

Ward Bot:

Ward bot is a project developed by Microbird - for the competition PRAGYAN'23. In a world where the demand for healthcare and efficient industrial processes continues to grow, enter the Ward Bot - a cutting-edge technological marvel designed to serve as a versatile assistant or a nurse in hospitals and industries alike. This project uses modern technology, such as sensors, wheels, motors, cameras and infrared sensors, to create a solution for healthcare facilities where human presence is challenging or risky.

Neo-pixel Attraction:

Neopixel Attraction" is a captivating LED project created by the innovative minds of IEEE. This mesmerizing light installation showcases the incredible possibilities of Neopixel LEDs and represents a fusion of technology and creativity. The heart of the "Neopixel Attraction" lies in the Neopixel LEDs. These tiny, programmable LEDs are meticulously arranged to create stunning patterns, mesmerizing animations, and vivid color displays that can be controlled in real time.



Robotic Arm:

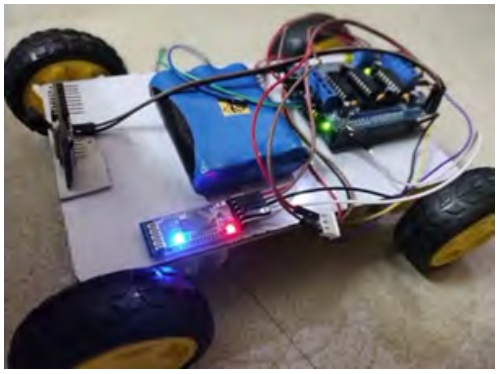
Automation is the new revolution; it is the use of machines, robots or computer systems to perform tasks with minimal human engagement. This project by Microbird Club aims at creating a robotic solution for various tasks. It is a robotic arm with four degrees of freedom and memory function. It has a pivot for smooth controls and can record and play your input infinitely many times till you pause or stop the process. Its detachable head adds to its versatility of being adaptable for performing various tasks, such as painting a car or screwing nuts.

Maze Solving Bot:

Students of IEEE YMCA SB participated in the Technoxian 2023, the world's biggest robotics championship. They created a bot in the category of maze solver, which automatically finds its route and makes way for itself to get out of the maze. The Bot is developed using Arduino, the heart of software and hardware components. The programming is done in C language, which works as the brain for the Bot to find various path-finding algorithms .

Surveillance Bot:

This project was done by Microbird - The Techno Club students for PRAGYAN'23. Surveillance Bot is a robotic system that monitors and gathers information from its surroundings. This type of project can be used for various purposes, such as home security, environmental monitoring, or even as a remote-controlled exploration tool. It uses cameras, ultrasonic sensors, IR sensors, Microphones, microcontrollers, and other components to operate around the clock, providing continuous surveillance and monitoring.

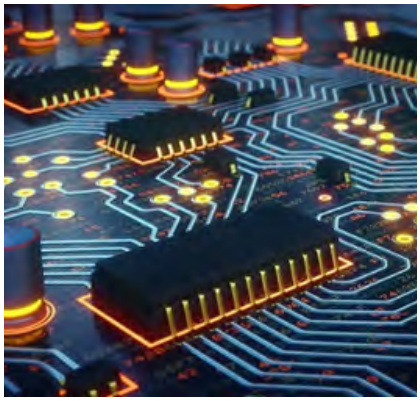


RC Controlled Bot:

The RC Control Bot, developed by the students and members of IEEE YMCA SB, is your ultimate remote companion for exploration and fun! This agile and versatile robotic marvel is equipped with precision controls that allow you to navigate effortlessly through any terrain. Its sleek design and durable construction suit indoor and outdoor adventures. Get ready to steer, explore, and conquer with this high-tech, remote-controlled marvel.

Electricity Generating Shoes:

Students of the Electronics Department under Microbird Club developed this project. Electricity-generating shoes, also known as "power-generating shoes" or "energy-harvesting shoes," are a fascinating technological concept aimed at harnessing the energy generated by the movement of our feet to create electrical power. This innovative idea can potentially revolutionize how we power small electronic devices and even contribute to sustainable energy solutions.



SiC Electronics

In electronics, Silicon Carbide (SiC) has emerged as a transformative technology with significant implications for India's technological landscape. The Indian Government estimates that the semiconductor market will be worth $63bn by 2026.

SiC is a compound semiconductor material that exhibits remarkable properties, making it a key player in the evolution of electronic devices. The primary advantage of SiC is its ability to handle higher temperatures and voltages while maintaining efficiency, a crucial factor in power electronics. This feature is especially pertinent for India's energy sector, where SiC-based devices can enhance the efficiency of power generation and distribution.

Moreover, SiC electronics can potentially revolutionize electric vehicles (EVs) in India. The Economic Survey 2023 predicts that India's EV market will grow with a CAGR of 49% between 2022 and 2030, with 10 million annual sales by 2030. Hence, SiC is very Crucial

Furthermore, SiC's durability makes it ideal for harsh environmental conditions, such as those prevalent in India. Its application extends to solar inverters, essential for the country's renewable energy goals. As India continues its journey toward technological leadership, SiC electronics will undoubtedly play a pivotal role in shaping a greener and more efficient future.

A Brief Insight into PhD Research Area

Research programs at our university serve as a cornerstone for driving innovative research endeavors. Our dedicated Ph.D. scholars are actively engaged in multifaceted research across diverse domains. Several of them have earned prestigious government scholarships for their outstanding contributions. Here's a glimpse into the ongoing research projects undertaken by our diligent students:

Name: Dikshant Sharma **Supervisor :** Prof Neelam Turk **Co supervisor:** Dr. Shailender Gupta
Topic: Machine Learning based security mechanisms for image encryption
Work: Due to technological advancement, processing capabilities, and an increase in internet usage, communication has become easier and faster but, at the same time, helped intruders to track data and fetch private information. So, to protect our data, especially the media (image), I am working on the encryption part of how to protect them from getting hacked in the communication process using different encryption techniques. My research is divided into various objectives that are explained as:
First, to study the various diversified techniques of image encryption based on Qubit, Quantum, Chaotic and traditional techniques from given available literature. Secondly, to explore the different machine learning models for generating optimized random numbers that will help make image encryption more secure. Thirdly, to design and implement a machine learning-based image encryption scheme. Lastly, to compare its efficacy with the recent techniques for validation.

Name: Nisha Yadav **Supervisors:** Dr. Sunil Jadav and Dr. Gaurav Saini
Research Title: Design and Analysis of Steep Sub-threshold slope devices for futuristic electronics.
Work: To meet the scaling targets and continue with Moore's Law, MOSFETs are unsuitable due to their thermal limit. It is high time to look for an alternate steep sub-threshold slope device which can be used for low-power to high-performance applications. Hence, the Tunnel Field Effect Transistors (TFETs) are being explored extensively. A Tunnel FET has a steep switching characteristic as it works on the phenomena of band-to-band tunnelling.
Over the past few years, TFETs have been heavily researched by various notable groups in the field of semiconductor devices across the globe. My work is to design a novel device which an provide slope < 60 mV/decade.

Research publications:

- **Amir Mansoori, Shamim Ahmad, Sonia, Munish Vashishath,** "Flexible Graphite-Based Humidity Sensor Using Green Technology," ECS Sensors Plus, Volume 1, 2022.
- **Rahul Gupta, Anil Kumar, Vishal Rohilla, Pradeep Kumar, Mukesh Kumar, Dinesh Kumar, "**Noise Spectroscopy Based Numerical Modelling of Chemisorption on SnO2 Surface for O Gas Sensing Applications," Micro and Nanostructures, Volume 171, 2022.
- **Rishi Singhal, Shailender Gupta and Poonam Singhal,** "An Ensembling Approach using DL & Non-DL Techniques for Detecting Brain Tumors using MRI Scans," 2022 IEEE International Power and Renewable Energy Conference (IPRECON), Kollam, India, 2022, pp. 1-6.
- **Kalyanee Devi and Rohit Tripathi "**Applying an Optimal Seed Selection Scheme Under a Progressive Model," 2022 13th International Conference on Computing Communication and Networking Technologies (ICCCNT), Kharagpur, India, 2022, pp. 1-6.
- **Kuldeep Choudhary, Sunil Jadav, Shubham Tayal, Preet Kaur, Lalit Rai, Rajneesh Sharma,** "Power Efficient Multiplier using Vedic Algorithm and Self Bias Transistor Technique," International Journal of Electronics, 1-15, Taylor & Francis, 2022.
- **Prashant Kumar, Lalit Rai, Neeraj Gupta and Rashmi Gupta**, "Diminished Short Channel Effects (SCEs) in Junction Less Double Gate (JL DG) MOSFET," 2022 IEEE International Conference of Electron Devices Society Kolkata Chapter (EDKCON), Kolkata, India, 2022, pp. 231-234.
- **Lalit Rai, Prashant Kumar, Neeraj Gupta and Rashmi Gupta,** "Performance Analysis of Adiabatic CMOS Interface for Low Power Applications," 2022 IEEE International Conference of Electron Devices Society Kolkata Chapter (EDKCON), Kolkata, India, 2022, pp. 226-230.

- **Sandeep Rangi, Sheilza Jain, Yogendra Arya**, "Utilization of Energy Storage Devices with Optimal Controller for Multi-Area Hydro-Hydro Power System Under Deregulated Environment," Sustainable Energy Technologies and Assessments, Volume 52, 2022.
- **Om Dev Singh, Sangeeta Dhall, Anjali Malik, Shailender Gupta**, "A Robust and Secure Immensely Random GAN Based Image Encryption Mechanism," Multimedia Tools and Applications, 2022.
- **Shweta, Sunil Jadav and Rohit Tripathi,** "Criterion for Capacitive Interdigitated Electrode for Gas Sensing Applications," International Conference for Advancement in Technology (ICONAT), Goa, India, January 2023.
- **Savita Lohat, Sheilza Jain and Rajender Kumar,** "AROA: Adam Remora Optimization Algorithm and Deep Q network for energy harvesting in Fog-IoV network," Applied Soft Computing, March 2023.
- **Neetu Gupta and Gunjan Sardana,** "Anomaly detection in video frames: hybrid gain optimized Kalman filter," Multimedia Tools Applications, March 2023.

CRIMSON ACHIEVEMENTS

A technical competition named "Techkirti 2023" was held at IIT Kanpur where Aditya Pal, a student of ECE, 3rd year along with his team (Samarpan) secured 2nd position with a cash prize of INR 15,000. We extend our heartfelt congratulations to the entire team for this remarkable feat.

Pankaj Sachdeva, a student of EE(IOT), 3rd year, grabbed 2nd position along with a prize worth INR 3500 in a technical competition "Hackathon" hosted at Bhartiya Vidya Peeth. We applaud Pankaj for his exceptional skills and encourage him to continue his remarkable journey of success. Keep up the fantastic work!

Pankaj Sachdeva, a student of EE(IOT), 3rd year along with his team (Samarpan) participated in a technical competition "Ideathon" organised at JC BOSE University of science and technology, YMCA and secured 3rd position with a cash prize of INR 3000. We extend our heartfelt congratulations to the entire team for this outstanding achievement. Kudos!

We are delighted to announce that Chirag Tyagi, a second-year student pursuing EE (IOT), showcased his oratory prowess by participating in the National Level "Speak For India" Debate Competition hosted by Federal Bank. His exceptional performance led to his qualification for the State level. Congratulations, Chirag, on this impressive achievement!

How can we incorporate creativity in daily life?



Incorporating creativity into your daily life can be enjoyable and fulfilling. Here are some tips:

Set aside time: Dedicate a specific time each day for creative activities, whether writing, drawing, or brainstorming.

Explore different mediums: Experiment with various forms of creative expression like painting, photography, music, or cooking.

Keep a journal: Write your thoughts, ideas, and observations regularly. This can spark creativity and help you track your progress.

Change your routine: Break out your daily habits to encourage fresh ideas. Visit new places, meet people, or take a different route to work.

Collaborate: Engage with others in creative endeavors. Collaborative projects can provide fresh perspectives and inspiration.

Read and consume art: Consume a wide range of literature, art, music, and other forms of media to expose yourself to different ideas and styles.

Mindfulness and meditation: Practices like mindfulness can clear your mind, making space for creative thoughts.

Set goals: Establish creative goals to motivate yourself. Whether it's finishing a novel or learning a new instrument, having dreams keeps you focused.

Embrace failure: Be bold and avoid making mistakes or encountering creative blocks. Failure often leads to breakthroughs.

Stay curious: Keep asking questions and seeking knowledge. Curiosity is a powerful driver of creativity.

Remember, creativity can be integrated into any aspect of your life, from problem-solving at work to personal hobbies. It's about fostering an open and imaginative mindset.

Guidance For Placements

By: Arun Shekhar ECE'23 (Currently working for Brahma.fi))

Your journey toward a successful engineering career begins in the first year of college. Rather than waiting, seize the opportunity to explore, learn, and grow throughout your four-year B.Tech program. Here, we present a concise roadmap for engineering students, starting from day one.

1. Early Exploration: The first year is the ideal time to explore various technical and extracurricular fields. Embrace your boundless energy to discover your passions and interests.

2. Dare to Try: Never doubt your capabilities. Apply for opportunities even if they seem challenging. Rejection is a stepping stone to improvement.

3. Unlimited Opportunities: Opportunities exist in every domain, provided you work diligently. Keep an open mind, and you'll find doors opening where you least expect them.

4. Leverage Connections: Build a robust network on LinkedIn, connecting with professionals in your field of interest. These connections can be invaluable later in your career.

5. Embrace Diversity: Don't confine yourself to a single niche. Exploring various domains can open unexpected doors and make you a well-rounded professional.

6. Learn from Experiences: Participate in expos, events, and conferences to gain real-world insights. Practical experiences complement your academic learning.

7. Calculated Risks: Confidence in your abilities is vital. Don't settle for less if you believe you can offer more. Taking calculated risks can lead to remarkable opportunities.

8. Master Soft Skills: Apart from technical skills, focus on soft skills like communication, leadership, and time management. These are crucial for securing opportunities.

9. Tailor Your Skills: Align your technical skills with your interests. Whether it's coding languages, electronics, or other specialties, focus on what you're passionate about.

10. Network's Value: Build a robust network by joining organizations like IEEE or participating in cross-college competitions. Stay connected with seniors for insights and opportunities.

11. Stay Organized: Maintain a diary or digital calendar to track deadlines for various opportunities. Timely applications are essential.

Your engineering journey is a four-year adventure filled with personal and professional growth. Starting early, embracing diversity, taking calculated risks, and mastering soft and technical skills are crucial for success. Seize the opportunities along the way and make your engineering future bright!

Alumni Relations

Alumni play a vital role in nurturing and advancing their alma mater. Their contributions extend far beyond their time as students and continue to shape the institution's future. Here are a few lines of advice and experience shared by one of our Alumni:

Sh. Manoj Kapoor
VP and Head Service Assurance APAC
@ Nokia

Q.What according to you is the most important skill one needs to perform well professionally?

As far as job is concerned, you must look for any skill that the organization you are working with might be deficient in and work accordingly to bring that skill on board. Also observing your seniors with higher qualifications or higher job posts can always give you an idea what it takes to reach the next step. There might also be some types of jobs or positions, which other people might overlook, there you must find one matching your interests and make a mark by walking an extra mile. Getting yourself noticed for good may often require you to sacrifice a date or a party!

Q.What is the roadmap you followed to reach where you are today?

The road map was simple. I did a post diploma, B.Tech, and then MBA from IMT. I worked on myself enough to get a seat in a conference room with IITians and DC engineers. My journey started from there. I avoided jobs where there were stronger guys more skilled like R&D etc. I went for production engineering type profiles to prove. I transferred technology of Vectra and quasar series of computer from Hewlett Packard, France to India and became amongst the first one to bring SMT TECHNOLOGY to India. I also brought digital switching technology to India.

Q.What are the obstacles you faced in your journey and how did you overcome them? What did you learn from them?

Obstacles are un-avoidable part of life. Wherever you decide to reach through whichever path few or more hurdles are bound to make your journey difficult yet adventurous. I too faced such obstacles in my journey but I never let those obstacles pull me down instead leant great life lessons from them. I always kept myself motivated to reach my goal which gave me the power to overcome whatever came my way. The hindrances taught me to be persistent and not give up without trying your best.

Q.If you were to give one advice to the students of YMCA what would it be?

Be versatile. Industries run for their objectives, don't be hard enough & keep rejecting by saying it's not of my interest. Although Steve Jobs said to pursue your passion, but I believe not always! Sometimes you must pursue what sells. Be smart. Try to pick less crowded path initially to get noticed and get some projects with meat. There is no substitute to hard work. Always try and keep upskilling yourself according to the present requirements. And do no forget to enjoy the journey with all your heart.

Birthday Celebration

The department fosters a warm and inclusive community spirit by commemorating the birthdays of faculty members, workshop staff, and support teams. Each month, a dedicated day is set aside to celebrate the birthdays of individuals born in that month. During these celebrations, heartfelt gestures, such as presenting planters and formal birthday letters, are extended to honor and appreciate their contributions to the department's success.

Birthdays of The Quarter

Sh. Dharam Vir (1st Jan)
Sh. Shailendra Gupta (19th Jan)
MS. Poulami Jana (20th Jan)
Ms. Manju Kumari (6th Feb)
Sh. Munish Vashishath (10th Feb)
Sh. Omprakash (14th Feb)
Sh. Prashant Kumar (21st Feb)
Md. Shakir (5th March)

Message From Editorial Team

Creative and Intellectual impulse combined with curiosity opens the door to innovation, human expression, and personal growth. Our esteemed readers, We the students of the Editorial Board, have a sense of Euphoria and pride in bringing some minor aspects of our department through "**स्पंदन**", the official Newsletter of the Electronics Department of the J. C. Bose University of Science and Technology, YMCA.

We're sincerely grateful to Dr. Pradeep Dimri Sir, Bharat Bhushan Sir, Sangeeta Dhall Ma'am, and Nisha Yadav Ma'am for their invaluable guidance and exceptional leadership in helping us complete the Task. We are thankful to our seniors for leading us and for their invaluable advice to complete the Task.

Kudos to our team that worked hard, and the end product was a wealth of knowledge, insights, guidance, and skills that we learned in the process. We are extremely grateful to the Department for providing us with an opportunity to express ourselves most creatively and constructively.

We hope that our esteemed readers will be pleased with our work, we tried to bring in the latest advancements, and breakthroughs in the tech landscape. Your feedback is invaluable to us to continue fostering a vibrant tech community.

For any suggestions and feedback, get in touch with us at: spandan.eee@gmail.com

Editorial Team:- Bharat Bhushan (AP), Sangeeta Dhall (AP), Nisha Yadav (AP)
Final Year:- Armaan Alam(EEIOT), Harsh Bhawra(EEIOT), Pratham Goel(EEIOT), Shruti Yadav(ENC), Sukhman Singh(EEIOT)
Third Year: Aarusha(ECE), Anshika(ECE), Arya Mishra(EEIOT), Chirag Tyagi(EEIOT), Dolly(EEIOT), Eshita Dhar(ECE), Mishali Bansal(EEIOT), Nikita(ECE), Puneet Khoria(EEIOT), Shivam(EEIOT), Vansh Sardana(EEIOT)