स्पंदन

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

January-March 2024

From Chairperson's Desk

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

Dear Esteemed Electronics Family of J.C. Bose University of Science and Technology, YMCA, Faridabad,
Warm Greetings! "
As one chapter closes, another begins with fresh opportunities." With this sentiment, I am delighted to share with you the newest edition of "स्पंदन," the newsletter of the Electronics Department.

As the saying goes, "Alone we can do so little; together we can do so much." With this in mind, the Electronics Family continues to thrive and advance in many areas. While this newsletter may only scratch the surface of the incredible work happening in our Department, it provides a snapshot of our ongoing endeavors. We encourage you to share your valuable feedback with our enthusiastic 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:

Driven by our commitment to academic excellence and the spread of knowledge, the Department of Electronics Engineering at J.C. Bose University of Science and Technology, YMCA, proudly unveils an inspiring lineup of initiatives for 2024.

COLLOQUIUM OF DOCTORAL STUDENTS ON "Design and Analysis of Massive MIMO Communication System"

The Department of Electronics Engineering at J.C. Bose University of Science and Technology, YMCA, successfully hosted a Colloquium of Doctoral Students on January 15th, 2024, centered on the "Design and Analysis of Massive MIMO Communication Systems." The event provided a dynamic platform for doctoral candidates to present their research, engage in insightful discussions, and explore the latest advancements in Massive MIMO technology. The colloquium was a great success, fostering innovation and collaboration among participants and highlighting the department's commitment to cutting-edge research.

FIVE DAYS WORKSHOP ON "Electronic Materials and Devices Fabrication and Characterizations"

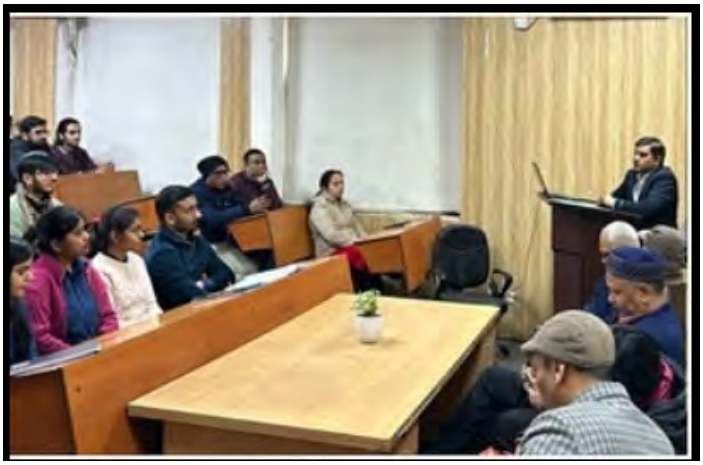
The Department of Electronics Engineering at J. C. Bose University of Science and Technology, YMCA, Faridabad, in collaboration with Technology Applications Services (TAS), Delhi, organized a five-day workshop titled "Electronic Materials and Devices Fabrication and Characterizations (EMDFC)", from 29th January to 02nd February 2024. The workshop aimed to provide participants with an in-depth understanding of electronic materials and devices, focusing on fabrication techniques and characterizations.

The event commenced with an inaugural session graced by Dr. R. K. Garg from TAS, Delhi as Chief Guest, Prof. Pradeep Dimri, Chairperson of the Department of Electronics Engineering. Senior faculty members including Prof. Munish Vashishth and Prof. Neelam Turk were also present on this occasion.

Prof. Pradeep Dimri extended a warm welcome to the guest and participants. In his address, Prof. Pradeep Dimri shed light on the pivotal role of semiconductor manufacturing in India, delving into its significance in our day-to-day lives. Emphasizing the need for a robust semiconductor ecosystem, Prof. Dimri highlighted the importance of fostering collaborative efforts within the university premises.

Dr. Anuj Kumar, the Program Coordinator, provided a concise yet insightful overview of the program, sharing his expertise on the fabrication and characterization of electronic devices. His expert perspective added depth to the workshop, enriching the understanding of the eager audience.

The session concluded with a vote of thanks presented by Program Coordinator Dr. Sunil Jadav and enlightened the participants. The event marked as a significant step towards advancing electronic engineering and fostering a spirit of collaboration and knowledge-sharing among participants.



Lecture: Introduction to Semiconducting Materials and Devices

Dr. Sunil Jadav delivered the expert talk as part of the Department Seminar series in coordination with Dr. Nitin Sachdeva and Ms. Sangeeta Dhall on the topic "Introduction to Semiconducting Materials and Devices" on 31st January 2024 for the faculty members, workshop staff, research scholars and PG students of the electronics department.

He delivered his talk successfully by exploring the basic concepts on semiconductor materials. "Introduction to Semiconducting Materials and Devices" is a foundational topic in the field of electronics and materials science. Semiconducting materials, such as silicon and gallium arsenide, are the backbone of modern electronic devices. These materials have unique electrical properties that allow them to act as insulators or conductors under different conditions, making them essential for the creation of diodes, transistors, and integrated circuits. Understanding the behavior of semiconductors, their band structure, charge carriers, and how they interact with electric fields is crucial for designing and optimizing electronic devices that power everything from smartphones to solar cells. This topic not only covers the basic physics of semiconductors but also explores the practical applications and technological advancements in the field.

Expert Lecture on the topic "Project/ Problem based learning"

The Department of Electronics Engineering in collaboration with the Institution of Engineers (India) organized an expert lecture on the topic "Project/Problem-based learning". The lecture was delivered by Prof. Pradeep Dimri, Chairperson of the Electronics Engineering Department.

The event was graced by presence of many dignitaries including Dean FET, Dean Students Welfare, Er. I.S. Oberoi, Honourable secretary of IEI, Er J. P. Singh, Past Chairman of IEI, Er Sandeep Handa & Dr. T. Senthil also from IEI.

The program started with the welcome address by program coordinator Dr. Nitin Sachdeva and Dr. Neetu Gupta followed by lamp lightening and Saraswati Vandana. Then, Dr. T. Senthil briefed the students about IEI student's chapter and its benefits. Following which Prof. Pradeep Dimri delivered his lecture. He emphasized that how in this dynamic and complex world, the traditional education methods are falling short and how there is a need to embrace a pedagogy that will prepare our students to face the challenges ahead and cultivate critical thinking and creativity in them.

The event was concluded by facilitating the speaker and the dignitaries. Er J.P. Singh gave the closing remarks and Er I.S. Oberoi delivered the vote of thanks.

Colloquium on "Automatic Generation Control with Energy Storage Systems"

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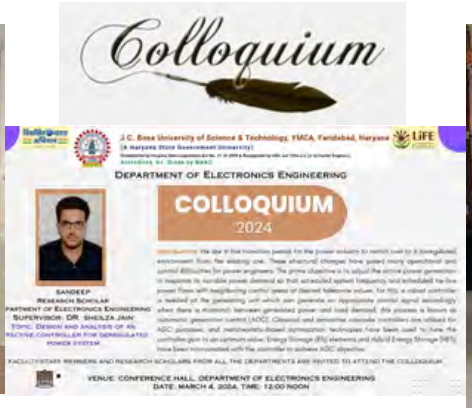
On March 4, 2024, the Department of Electronics Engineering, J.C. Bose University, YMCA, hosted a colloquium featuring Mr. Sandeep's presentation on "Automatic Generation Control with Energy Storage Systems." The session focused on the power industry's transition from a regulated to a deregulated environment, highlighting the operational challenges faced by engineers. Mr. Sandeep emphasized the need for robust controllers to address the mismatch between power generation and demand, a process known as Automatic Generation Control (AGC). He elaborated on the use of classical and cascade controllers, optimized with metaheuristic techniques, to achieve optimal performance.

The integration of Energy Storage (ES) and Hybrid Energy Storage (HES) systems was also discussed as a critical enhancement for AGC, ensuring system frequency stability and efficient power flow. The event highlighted the department's commitment to advanced research and innovation in power systems engineering.



Colloquium on "Machine Learning-Based Security Mechanisms for Image Encryption"

Colloquium on "Machine Learning-Based Security Mechanisms for Image Encryption"

On March 18, 2024, the Department of Electronics Engineering at J.C. Bose University, YMCA, hosted a colloquium featuring an engaging presentation by Mr. Dikshant Sharma on "Machine Learning-Based Security Mechanisms for Image Encryption."

The talk emphasized how Machine Learning (ML) offers innovative solutions to tackle evolving cybersecurity challenges, particularly in image encryption. Mr. Sharma explored various ML-driven approaches, including adversarial machine learning, deep learning-based encryption, behavioral analysis, anomaly detection, and transfer learning.

He highlighted the limitations of traditional encryption methods in countering sophisticated cyber threats and demonstrated how AI and ML enhance encryption techniques to ensure the confidentiality, integrity, and authenticity of sensitive visual data.

The session provided valuable insights into the role of AI and deep learning in developing robust, adaptive encryption mechanisms, showcasing their potential to fortify cybersecurity in diverse applications.

CRIMSON ACHIEVEMENTS

1. Dhruv Singhal – Third Prize at Techstars Startup Week

Department: Electronics and Computers, 3rd Year

Achievement: Dhruv participated in the prestigious Techstars Startup Week, organized by the E-Cell of DTU, where he secured third place! This competition challenged participants to build a startup from scratch, with a final presentation after multiple rigorous rounds.

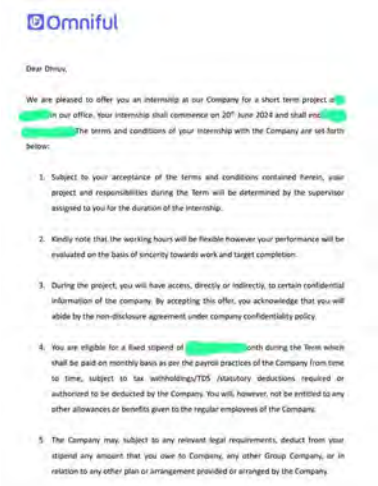
Congratulations, Dhruv! Keep up the innovation and drive!

2.Sahil-National Representation at Republic Day Camp

Department: Electronics and Communication Engineering, 3rd Year

Achievement: Sahil represented our college on a national platform at the prestigious Republic Day Camp, where only 27 cadets were selected from Haryana and approximately 2000 from across India. He had the honor of meeting President Smt. Draupadi Murmu and marching before Prime Minister Narendra Modi.

Congratulations, Sahil on this tremendous achievement!


Omniful

Dear Dhruv,

We are pleased to offer you an internship at our Company for a short term project at [redacted] in our office. Your internship shall commence on 20th June 2024 and shall end [redacted] The terms and conditions of your internship with the Company are set forth below:

1. Subject to your acceptance of the terms and conditions contained herein, your project and responsibilities during the Term will be determined by the supervisor assigned to you for the duration of the internship.
2. Kindly note that the working hours will be flexible however your performance will be evaluated on the basis of sincerity towards work and target completion.
3. During the project, you will have access, directly or indirectly, to certain confidential information of the company. By accepting this offer, you acknowledge that you will abide by the non-disclosure agreement under company confidentiality policy.
4. You are eligible for a fixed stipend of [redacted]onth during the Term which shall be paid on monthly basis as per the payroll practices of the Company from time to time, subject to tax withholdings/TDS /statutory deductions required or authorized to be deducted by the Company. You will, however, not be entitled to any other allowances or benefits given to the regular employees of the Company.
5. The Company may, subject to any relevant legal requirements, deduct from your stipend any amount that you owe to Company, any other Group Company, or in relation to any other plan or arrangement provided or arranged by the Company.

3. Chirag Tyagi – 2nd Position in Annual Debate Competition

Department: Electronics (IoT), 4th Year

Achievement: Chirag showcased his remarkable oratory skills in the Annual Debate Competition at PCTE College of Engineering, where he secured second position amidst top colleges including IITs and NITs, along with a cash prize!

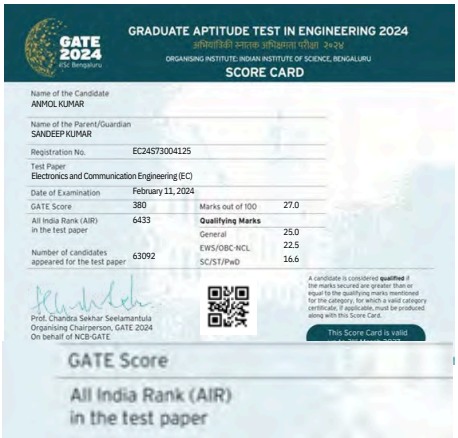
Congratulations, Chirag on this outstanding accomplishment!

4. Anmol Kumar – Qualified GATE (2024)

Department: Electronics (IoT), 4th Year

Achievement: Anmol successfully qualified the GATE exam, positioning himself for future opportunities in the science and technology sector.

Well done, Anmol on this remarkable achievement!


GRADUATE APTITUDE TEST IN ENGINEERING 2024

ORGANISING INSTITUTE: INDIAN INSTITUTE OF SCIENCE, BENGALURU

SCORE CARD

Name of the Candidate	ANMOL KUMAR
Name of the Parent/Guardian	SANDEEP KUMAR
Registration No.	EC24S73004125
Test Paper	Electronics and Communication Engineering (EC)
Date of Examination	February 11, 2024
GATE Score	380
All India Rank (AIR) in the test paper	6433
Number of candidates appeared for the test paper	63092
Marks out of 100	27.0
Qualifying Marks – General	25.0
Qualifying Marks – EWS/OBC-NCL	22.5
Qualifying Marks – SC/ST/PwD	16.6

Prof. Chandra Sekhar Seelamantula
Organising Chairperson, GATE 2024
On behalf of NCB-GATE

This Score Card is valid

GATE Score

All India Rank (AIR) in the test paper

5. Rahul – Qualified GATE (2024)

Department: Electronics (IoT), 4th Year

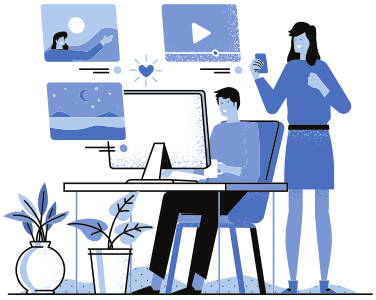
Achievement: Rahul has successfully qualified the GATE (General Aptitude Test in Engineering) exam held in February 2024, paving his way for promising careerprospects in engineering.

Kudos, Rahul! Keep up the excellent work!

FOOD FOR THOUGHT

By: Vanshika Sharma - ENC (2nd year)

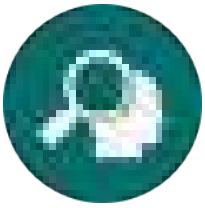
Gender Stereotypes Portrayed on Social Media



Social media heavily influences societal perceptions of gender roles, often perpetuating negative stereotypes. Platforms, movies, and advertisements frequently depict women in traditional roles, shaping a false narrative that impacts young minds. These stereotypes harm women's self-perception, mental health, and career opportunities, often reducing their value to physical appearance and perpetuating power imbalances in leadership, politics, and workplaces.

However, these stereotypes can be dismantled. Promoting accurate representations of women, increasing their participation in media production, and limiting the media's ability to perpetuate harmful stereotypes are crucial steps. Media literacy, especially for younger generations, empowers individuals to critically analyze content and challenge biases.

By fostering change in how women are portrayed, the media can evolve to support equality and reshape societal norms, paving the way for a more balanced and inclusive future.



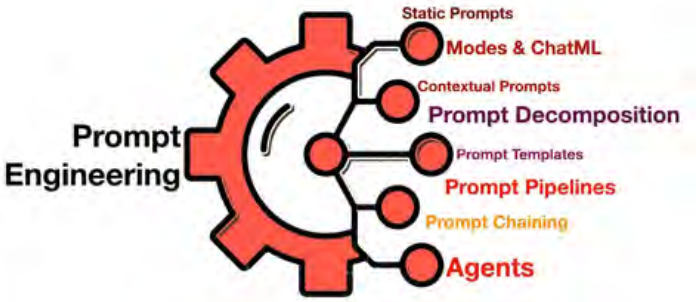
Research publications:

- Priyanka, Sonia Bansal and Preet Kaur, "Microstrip and Metamaterial Embedded Patch Antenna Sensors for Determination of Moisture in Rice, Wheat, and Pulse Grains," in Journal of The Electrochemical Society, vol. 171, no. 1, January 2024.
- Lalit Kumar and Pradeep Kumar, "Optimal Key Management for Secure D2D Communication in IoT Environment," in Adhoc & Sensor Wireless Networks, vol. 58, no. 1/2, 2024.
- Archana Agarwal, Shailender Gupta and Munish Vashisha, "Analysis of Conventional and Modern Contrast Enhancement Mechanisms," in Multimedia Tools and Applications, March 2024.
- Reema Ganotra, Shailender Gupta and Shirin Dora, "A Joint Autoencoder and Classifier Deep Neural Network for AD and MCI Classification," in International Journal of Imaging Systems and Technology, vol. 34, no. 2, March 2024.
- Priyanka, Sonia Bansal and Preet Kaur, "Reconfigurable Ring Antenna Sensor for Detection of Adulteration in Liquids", in ECS Journal of Solid State Science and Technology, vol. 13, no. 3, March 2024.
- Savita Lohat, Sheilza Jain, Rajender Kumar, "An Efficient Task Offloading Strategy ased on Aquila Student Psychology Optimization Algorithm in Internet of Vehicles-fog Computing Systems," in International Journal of Communication Systems, vol 37., no 4, March 2024.

FOOD FOR THOUGHT

Prompt Engineering

Prompt engineering is a relatively new discipline in AI that mainly focuses on the design or fine-tuning of prompts for chat with large language models, including OpenAI's model, ChatGPT. How we will interact with these systems about going forward with AI is very critical.



A well-designed prompt can make a huge difference between whether AI produces accurate, meaningful, or creative responses. For this reason, prompt engineering is one of the most critical skills that anyone who deals with AI models should possess.

Put briefly, prompt engineering is the art of knowing how to word a question or ask a question to get the best result possible. It requires creativity, a lot of trial and error, and a fair amount of insight into the behavior of the AI itself. Vague and simple prompts will probably lead to vague or incomplete answers; a much more detailed prompt might be needed to produce insightful, elaborate responses. For example, a query to an AI such as "Tell me about climate change" will give a general overview; however, asking it "Explain the effects of climate change on agriculture in developing countries" probably results in a much more focused and informative answer.

Why is it important? It is very closely related to the examination of massive amounts of existing data that AI models apply and how the question is asked determines which part of the data is accessed, so prompt engineers learn how to direct the AI to better utilize its knowledge through structuring requests that lead to more relevant outputs.

For what it is worth, the trend with the usage of AI tools to integrate with your day jobs, as in education, customer service, and content creation, makes prompt engineering go beyond what is naturally assumed. Well-optimized prompts could save you time and boost productivity, making for more meaningful human-AI collaboration and thus a vital skill in the age of AI.

LET'S CELEBRATE!

Birthday Celebration

The department nurtures a warm and inclusive community by celebrating the birthdays of its faculty, workshop staff, and support team members. Each month, a special day is dedicated to honoring those with birthdays that month. These celebrations feature thoughtful gestures, such as presenting planters and personalized birthday letters, as tokens of appreciation for their valuable 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

"Driven by curiosity and fueled by creativity, innovation thrives where passion and dedication meet. With immense pride and excitement, we, the Editorial Board, present स्पंदन—the official newsletter of the Electronics Department at J.C. Bose University of Science and Technology, YMCA. This edition is a testament to the department's journey of achievements, milestones, and technological advancements. We sincerely thank our mentors, Dr Pradeep Dimri, Dr Bharat Bhushan, Dr Sangeeta Dhall, and Dr Nisha Yadav, for their guidance and unwavering support. A special acknowledgement goes to our seniors, whose mentorship and encouragement have been invaluable. Every page of स्पंदन reflects the collective dedication, creativity, and hard work of our team. This newsletter is not just a publication but a celebration of the vibrant ideas and the spirit of innovation that define our community. We invite you, our readers, to immerse yourselves in this edition's treasure trove of insights and advancements. Your feedback will serve as a guiding light, inspiring us to refine and continue building a dynamic, tech-savvy ecosystem. Together, let us celebrate the essence of knowledge and creativity!"

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)
5th Semester:- Amolica(ECE), Atul(ECE), Dhruv(ENC), Dev(EEIOT), JYOTSNA(ECE), Poonam(EEIOT), Payal(EEIOT), Pragya(EEIOT)
3rd Semester: Pranjal Mishra (ECE), Parth Dalal EE(IOT), Isha (ECE), Naman Mishra (ENC), Vanshika Sharma (ENC), Anwesha Kat (ENC), Raghav Verma (ENC), Digvijay Singh EE(IOT), Nidhi (ECE), Sneha (ENC), Umesh Bhardwaj (ENC)