SPECTRUM

ELECTRONICS AND COMMUNICATION ENGINEERING DEPARTMENT

2024

Welcome to the 1st edition of **SPECTRUM** !

As the Electronics and Communication Engineering Department (Batch 2024–2028) at LBS Institute of Technology for Women, Poojappura, we take pride in compiling and sharing the highlights, achievements and activities that reflect the vibrant spirit of our department. This edition features a celebration of innovation, academic excellence and collaborative efforts that continue to shape our journey forward.

We invite you to explore, reflect, and be inspired. Stay informed. Stay engaged. Happy reading !

ECE

Written by: Adithya D

6G Prototypes & Terahertz Communication

While the world continues to roll out 5G networks, global researchers and engineers have already turned their attention to the next major leap in wireless communication — 6G. Expected to be commercially available by 2030, 6G aims to revolutionize connectivity with data speeds up to 1 terabit per second, ultra-low latency, and the use of terahertz (THz) frequency bands, which lie between microwave and infrared waves in the electromagnetic spectrum.6G is not merely an upgrade over 5G; it's a transformative ecosystem designed to power emerging technologies like holographic communication, fully immersive AR/VR, real-time digital twins, and AI-integrated intelligent networks. These advancements will usher in smarter cities, autonomous mobility, and groundbreaking innovations in healthcare, education, and space technologies.

At the core of this revolution lies terahertz communication, which enables ultra-high data rates but also poses challenges in signal attenuation and hardware design. Researchers worldwide are actively developing 6G prototypes, including THz transceivers, reconfigurable intelligent surfaces (RIS), and advanced antenna arrays, to test and refine next-generation wireless solutions.For students of Electronics and Communication Engineering, this presents an exciting interdisciplinary frontier. The development of 6G involves areas such as signal processing, antenna and RF design, VLSI, machine learning, and edge computing. As the industry transitions toward 6G, it calls for a new generation of engineers ready to think beyond conventional paradigms and create sustainable, ultra-fast, and intelligent communication systems.India, too, is making significant strides in this domain. The launch of the Bharat 6G Vision Document in 2023 demonstrated a national commitment to becoming a global leader in 6G technology. Leading institutions such as IIT Madras, IIT Delhi, and ISRO have already begun work on 6G testbeds and pilot projects, particularly focusing on indigenous hardware and THz system integration.As we look ahead, 6G is not just about faster internet — it's about enabling seamless, intelligent, and deeply integrated digital experiences. For budding engineers, now is the perfect time to explore the world of 6G through research papers, technical seminars, hackathons, internships, and collaborative innovation.

Terahertz Waves: The Backbone of 6G Speed

As 6G technology evolves, terahertz (THz) waves are gaining attention for their ability to support ultra-fast wireless communication. Positioned between microwaves and infrared light, THz waves operate in the 0.1 to 10 THz range, offering wavelengths between 0.03 mm and 3 mm. This makes them ideal for transmitting massive amounts of data quickly and efficiently. The broad frequency bands in this range are crucial for meeting the demands of future applications like holographic calls, real-time digital twins, and immersive virtual environments. With research and development in full swing, terahertz technology is set to become the backbone of next-generation wireless systems.

Written by: Maidhily S

TechX '24 – Reimagine What's Possible!

Organized by IEEE CS SYP and IEEE CS SBC LBSITW, TechX '24 was a two-day tech event that brought together students and professionals to explore the frontiers of technology. The event featured a hands-on IoT workshop by Muhammed Rems Iqubal Oyalott, an insightful cloud computing session by Hiba Shabu, and an engaging DevOps talk by Govind S R. A thought-provoking group discussion led by Deepa Nair explored how technology is reshaping jobs and careers. Day two included a captivating session on gene editing by Austin P., followed by a Machine Learning Buildathon led by Danwand N S, where participants worked on real-world challenges. The event concluded with vibrant cultural activities, adding a celebratory touch. TechX '24 was an inspiring blend of knowledge-sharing, innovation, and collaboration, leaving attendees eager for more such experiences.

YIP 7.0

The vibrant and curious minds of LBS Institute of Technology for Women (LBSITW) proudly participated in Young Innovators Program (YIP) 7.0, a flagship initiative by the Kerala Development and Innovation Strategic Council (K-DISC). Designed to foster creativity and problem-solving among students, YIP challenges participants to develop innovative solutions addressing real-world problems.

This year, multiple student teams from LBSITW advanced through the initial idea selection rounds by presenting impactful proposals across areas such as sustainable technology, healthcare, education, and women's safety. Through expert mentoring, workshops, and prototyping support, the students explored innovation beyond the classroom, with a few teams reaching the mentoring and bootcamp phases.

YIP 7.0 not only encouraged innovation but also empowered students with design thinking, teamwork, and entrepreneurial skills—laying the foundation for future changemakers.

Written by: Devi Nandana B S

Prayaag-4.0

Prayaag 4.0, the technical fest organized by the Department of Electronics and Communication Engineering at LBS Institute of Technology for Women, celebrates innovation, creativity, and technical excellence. With a wide range of events—from project expos and paper presentations to workshops, tech games, and online contests—Prayaag provided a dynamic platform for students to showcase their skills and connect with fellow tech enthusiasts.

Highlights of Prayaag 4.0

◆ Paper Presentation & Project Expo:Platform to present technical papers and innovative hardware/software projects.

◆ Tech Events & Workshops:Workshops on trending tech like IoT, Machine Learning, VLSI, Arduino, PCB Design, etc.

◆ Fun Tech Challenges:Robo wars, circuit debugging, coding contests, technical quizzes.

◆ Creative Corners:Poster design, tech memes, short film competitions—blending tech and creativity.

◆ Online Pre-Events:Meme wars, photography, reel-making competitions, etc

Among the many highlights of Prayaag 4.0, the **Pro Show** stood out as the most awaited event of the fest. As the sun set and the stage lit up with a stunning musical performance by renowned band **Nada nucleus**, and renowned singer **Mubas**, the atmosphere transformed into a celebration of music, rhythm, and pure energy. The fest concluded beautifully with a vibrant movie night, featuring blockbuster hit **Yeh Jawani Hai Deewani**, bringing the students together with a shared vibe of nostalgia and fun.

MU Carnival

The MU Carnival was a vibrant and engaging event organised by Mulearn LBSITW, a student -led organisation focused on innovation and technology.

The MU Carnival gave students an opportunity to enjoy various tech-driven events such as an engaging UI/UX design workshop, an immersive VR workshop, and a hands-on session in web designing and development..

Creative and fun games ranging from coding challenges to tech trivia, added to the fun and enthusiasm of participants.

The MU Carnival was more than just an event—it was a celebration of technology, innovation and creativity.

Written by: Devi Nandana B S

Yavanika'25

Yavanika, the much anticipated intra-college cultural fest of LBSITW was a three-day celebration featuring a variety of events like dance, music, fashion shows and more.. Organized exclusively by our students, the event brought the campus alive with many electrifying events that showcased the diverse talents of students across departments.

Highlights of Yavanika

From graceful solo dances to power-packed group performances, Yavanika celebrated talent in every form. The fest featured exciting events like mime, duet songs, face painting, mehndi, treasure hunt, nostalgia tunes, and even a fashion-forward apparel design show. The campus buzzed with creativity, music, and laughter—capped off with a thrilling Pro Show by Funkie and DJ Evan that had everyone on their feet!

With back-to-back victories, the ECE department once again proved its all-round excellence by emerging as the champions of Yavanika, carrying forward a legacy of talent, teamwork and triumph....
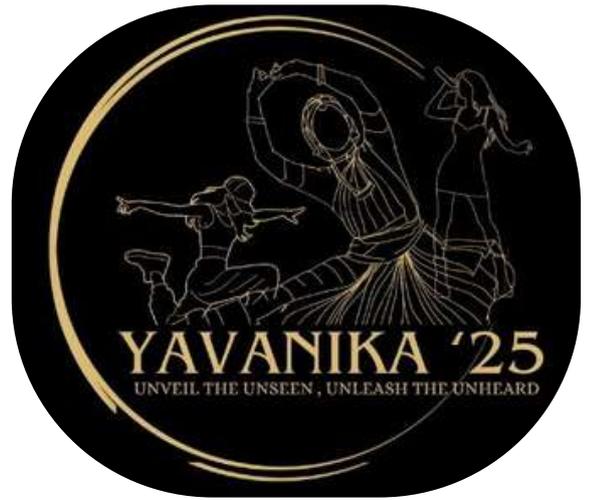
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Vision

To become the centre of electronics communication and instrumentation and computer engineering to facilitate professional education and research keeping higher level of value systems

Mission

M1: To transform young women to high quality engineers, entrepreneurs, researchers with ethical values.

M2: To contribute creative engineering solutions to industry by keeping pace with latest technological advancements.

M3: To provide intellectual services to the society by the application of Electronics, Communication, Instrumentation and Computer Engineering.