BUILDERS ENGINEERING COLLEGE

A NEWSLETTER OF

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

DEPARTMENT - VISION & MISSION

VISION

To be the renowned department in creating highly talented, skilled and well-disciplined professional in Electronics and Communication Engineering.

MISSION

- Providing quality education through effective teaching learning processes.

- Focus on research and excellence in electronics and communication to nurture the spirit of innovation and creativity.

- Enabling students for successful practice of the profession by nurturing career improvements and to develop human and social intellectual qualities.

Vision of the Institution

To be the most preferred knowledge provider.

Mission of the Institution

Builders Engineering College endeavors to prepare rural students for successful career through academic and applied research.

About the Department

Established in 2009, the Department commenced with an initial intake of 60 students. It boasts 10 fully-equipped laboratories, each adhering to university norms and furnished with cutting-edge technology.

The ECE Computer Centre provides students access to special software packages such as MENTOR GRAPHICS, PSPICE, MATLAB, Xilinx ISE, MULTISIM, MODELSIM, and KIEL.

The department stands out with its distinctive offerings, including advanced trainer kits, ARM Processors, Altera development boards, CPLD Trainer kits, and Wireless Sensor Networks trainer kits. These resources empower students to engage in real-time projects and practical learning experiences.

The department actively engages with professional bodies such as IEEE, IETE, and ISTE, providing a valuable platform for both faculty members and students. Additionally, an incubation centre has been established to foster and cultivate a culture of innovation, particularly in the realm of IoT systems, utilizing LoRaWAN technology.

Programme Specific Outcomes (PSOs)

- To design and develop complex systems in the research areas of next generation Communication Systems, RF and Power systems.

- To design and develop systems in the domains of IoT based Embedded Systems, Advanced Signal and Image Processing and latest Semiconductor technologies.

Program Educational Objectives (PEOs)

- Shall be successful in their professional careers, academic pursuits and research

- Shall study and build abilities on a continual basis in order to deliver high-impact, energy-efficient and futuristic solutions

- Shall demonstrate strong communication skills, a professional mindset and ethics in order to create and build real-world multidisciplinary solutions that are technically sound, economically feasible, and socially acceptable.
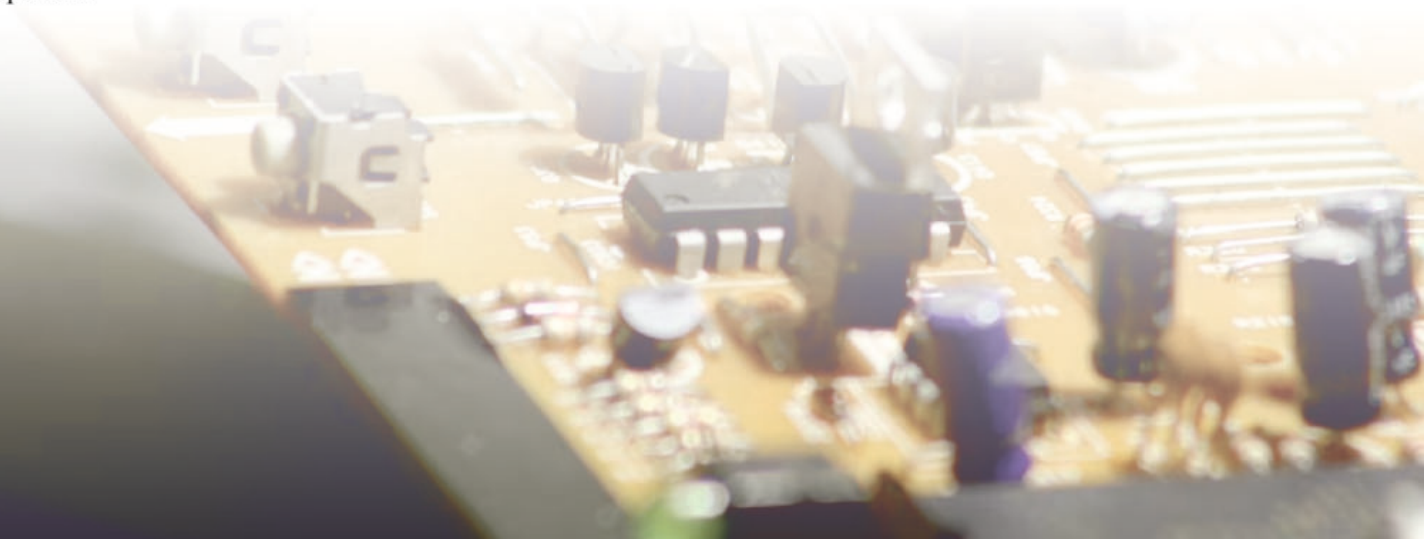
Principal's Message

Builders Engineering College is filled with immense pride and satisfaction to introduce the Newsletter, released by the Department of ECE. The College has made significant progress across academic and non-academic domains, as well as in fostering capacity-building efforts for both staff and students. I am hopeful that this edition of the Department Newsletter will resonate positively with faculty, students, and enthusiasts of technical education and technology-driven activities.

I extend my congratulations to the Editorial Board of the Newsletter, whose exceptional dedication has led to its timely completion.

I wish to express my sincere gratitude to Dr. S. Kumar, HoD/ECE, whose guidance has been pivotal in the successful execution of this technical endeavor within the specified timeframe.

Furthermore, I extend heartfelt congratulations to the staff members and students for their invaluable contributions.

Dr. S. Ramkumar
Principal

Words from Head of the Department

Dear ECE Community Members,

I am thrilled to extend my heartfelt congratulations on the release of the Electronics and Communication Engineering (ECE) Newsletter. This publication serves as a testament to the remarkable progress achieved across diverse realms, encompassing both academic and non-academic spheres. It also underscores the ongoing development of capabilities crucial to our esteemed staff and students. I commend the Editorial Board for their commendable role in accomplishing this task with remarkable efficiency and within a record timeframe. I would like to express my sincere gratitude to Mr. U. Rajasekaran, AP/ECE, for his invaluable guidance throughout this endeavor. Warmest congratulations to the dedicated staff members and enthusiastic students who have invested their time and effort into bringing this newsletter to fruition. Your collective contributions have undeniably played a pivotal role in the success of this publication.

Dr. S. Kumar
Head of the Department

Editor's Desk

Dear Readers,

Welcome to the latest edition of our Electronics and Communication Department Newsletter! As we navigate the dynamic and ever-evolving world of technology, we are thrilled to share with you the latest developments, achievements, and exciting projects from our department.

We are proud to highlight the accomplishments of our students and faculty, who continue to push the boundaries of knowledge and contribute to advancements in the field.

Our commitment to fostering a collaborative and forward-thinking community is evident in the various events and activities featured in this newsletter. From guest lectures by industry experts to workshops and hackathons, we strive to provide our students with opportunities to engage with real-world challenges and enhance their skills.

As we embark on another semester filled with promise and potential, we extend our gratitude to our dedicated faculty, enthusiastic students, and supportive community. Together, we are shaping the future of electronics and communication, and we are excited to have you join us on this journey.

Thank you for your continued interest and support. We hope you enjoy reading this edition of our newsletter and stay tuned for more updates from the Electronics and Communication Department.

Best regards,

Mr. U. Rajasekaran, AP/ECE
Managing Editor

Editorial Team

Editor in Chief:

Dr. S. Kumar, HoD/ECE

Managing Editor:

Mr. U. Rajasekaran, AP/ECE

Concept & Design:

Ms. V. Manimala, AP/ECE

Student-Chief Editor:

Mr. N. Soundar, IV Year

Associate Editors:

Ms. A. Gokulapriya, IV Year
Mr. M. Vidyasagar, III Year

EVENTS ORGANIZED

Association Inauguration
August 19, 2023

The Department of Electronics and Communication Engineering's GNAANA-Association recently organized its Association Inauguration, featuring a guest lecture on "Introduction to IoT and a world of new opportunities for Electrical Science Students." The event took place on August 19, 2023, from 10:00 a.m. to 12:30 p.m. at the Dheeran Chinnamalai Auditorium. The esteemed guest speaker for the occasion was Mr. Gobalakichenan Ganeshan, an Ex-IBMer, Freelance Tech Trainer, and Project Mentor based in Bangalore. Mr. Ganeshan shared valuable insights into the realm of IoT and its potential for electrical science students, providing them with a glimpse into the vast array of opportunities in this rapidly evolving field.

GATE Awareness Programme
August 26, 2023
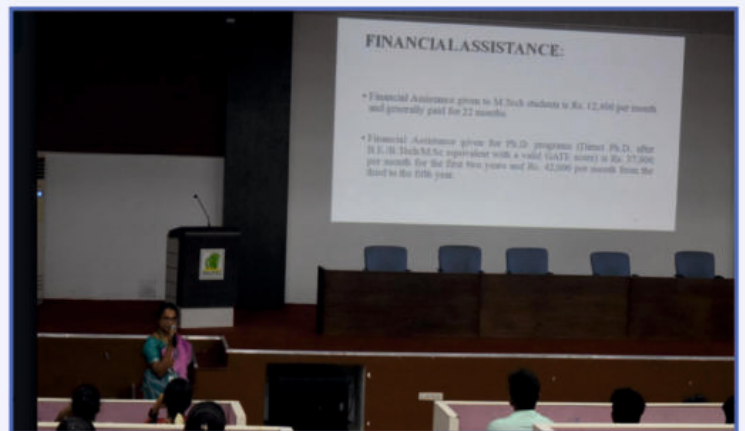
The Department of Electronics and Communication Engineering at Builders Engineering College hosted an event titled "Importance and Preparation for GATE-2024 Examination" on August 26, 2023, from 11:30 a.m. to 01:00 p.m. The event, held at the esteemed Dheeran Chinnamalai Auditorium, aimed to assist students in understanding the significance of the GATE-2024 examination and preparing effectively for it.

Ms. V. Manimala, an Assistant Professor in the Electronics and Communication Engineering department at Builders Engineering College, served as the resource person for the event. With her expertise and experience, Ms. Manimala provided valuable insights into the GATE examination process, its importance for future academic and career prospects, and effective preparation strategies.

Students had the opportunity to gain clarity on the examination pattern, syllabus coverage, and time management techniques, empowering them to approach the GATE-2024 examination with confidence and readiness.

Writing Standard Articles for Publication in Refered Journals
July 10, 2023

The Research and Development cell of Builders Engineering College conducted a seminar titled "Writing Standard Articles for Publication in Refereed Journals" on July 10, 2023, starting at 11:00 A.M. The three-hour program was tailored to equip participants, including 50 faculty members from all departments, with the essential skills and knowledge needed to compose high-quality research articles meeting the criteria of esteemed academic journals. Dr. R. Devi Priya, Professor and Head of the Department of Computer Science and Business Systems at KPR Institute of Engineering and Technology, served as the resource person. Her extensive expertise in academic writing undoubtedly enriched the seminar, offering valuable insights and guidance to attendees. The session aimed to empower faculty members with the tools and techniques necessary to contribute meaningfully to scholarly research and enhance the academic reputation of the institution.

FACULTY PUBLICATIONS

Faculty Name	Title of the programme	Name of the Journal/Conference
Mr. V. Kumar	Smart Crop Protection System Using Internet of Things	2nd International Conference on Management, Engineering, Science and Humanities, MESH-2023, Builders Engineering College, Kangeyam
Ms. S. Jayabratha, Ms. R. Preethi Mr. M. Prakash	IoT based Wearable Device for Children and Person with a Visual Deficiency	2nd International Conference on Management, Engineering, Science and Humanities, MESH-2023, Builders Engineering College, Kangeyam
Dr. A. Vasantharaj Ms. R. Preethi	Development of an Intelligent Clinical Decision Support System using Deep Learning and Data Analytics Techniques	National Conference on Revolutionary Applications of Nutraceuticals and Functional Foods as Next Generation Metabolites
Ms. V. Manimala	Experimental study on THz-FSS structures using SIW Technology	IEEE International Conference on Recent Advances in Science & Engineering Technology (ICRASET-2023)

FACULTY PARTICIPATION

Date	Faculty Name	Title of the programme
20.10.2023	Mr. V.Kumar	Outcome Based Education (OBE)
17.7.2023		CEC331-4G/5G Communication Networks
03.06.2023	Mrs. G.Vijayakumari	Analysis and Design of a High-Performance 28 GHz MIMO Antenna System for Mobile Applications
24.06.2023	Mr. M. Prakash	Intellectual Property Rights (IPR)
26.06.2023		Vlsi Design - Trends & Practices
03.07.2023		Artificial Intelligence & Its Applications
24.07.2023		Recent Trends in VLSI & Signal Processing
31.07.2023		Scientific Writing & Publishing
01.09.2023		Structural Health Monitoring Using IoT
25.09.2023		Introduction to C
31.07.2023	Ms. G.Vijayakumari	Scientific Writing & Publishing
24.07.2023		Recent Trends in VLSI & Signal Processing
10.07.2023		CO PO Mapping and CO PO Attainment
10.07.2023	Ms. R. Preethi	Structural Health Monitoring Using IoT
03.07.2023		Artifical Intelligence & Its Application
03.07.2023	Ms. S. Jayabratha	Artifical Intelligence & Its Application
24.07.2023	Ms. R. Preethi	Artificial Embedded Systems
24.07.2023	Ms. S. Jayabratha	Artificial Embedded Systems
24.07.2023	Mr. U. Rajasekaran	Recent Trends in VLSI & Signal Processing
17.07.2023		Artifical Intelligence & Machine Learning

Date	Faculty Name	Title of the programme
15.09.2023		ANSYS Academic Innovation Conference
31.07.2023	Ms. V. Manimala	Scientific Writing & Publishing
23.11.2023		2023 International Conference on Recent Advances in Science and Engineering Technology (ICRASET)

GUEST LECTURE DELIVERED

On July 11,2023, a Guest lecture was delivered by Mr. M. Prakash AP/ECE on circuit analysis, to the students of JKKN college of Engineering and Technology, Komarapalayam with a profound understanding of the foundational principles and practical applications in the realm of circuit analysis. the lecture covered essential topics, including Ohm's law, Kirchhoff's laws, Nodal and Mesh analysis, Thevenin and Norton Theorems, and Transient Analysis.

NPTEL CERTIFICATIONS

Name of the Faculty	Title of the Paper	Certificate
Ms. G. Vijayakumari AP/ECE	Digital Image Processing	
Ms. V. Manimala AP/ECE	Analysis & Design Principles of Microwave Antennas	
Ms. V. Manimala AP/ECE	Accreditation & Outcome Based Learning	

INDUSTRIAL VISIT

Industrial Visit on September 29, 2023

On September 29, 2023, our third-year students embarked on a valuable educational excursion to the Kerala Electricals & Allied Engineering Company Ltd. in Cochin, followed by a visit to Traco Cable Company Ltd. This endeavor aimed to augment our students' understanding of electronic components, bridging the gap between theoretical learning and practical application in anticipation of future technological advancements. During the visit, students had the opportunity to observe firsthand the operational processes and manufacturing techniques employed by these renowned companies. Engaging with professionals in the field, they gained insights into the intricacies of electronic component production and its role in shaping future technologies. Such immersive experiences not only broaden students' horizons but also equip them with the practical skills and knowledge necessary to thrive in the dynamic landscape of electronic engineering. The visit fostered a deeper appreciation for the real-world applications of theoretical concepts, empowering students to become adept practitioners in their field.

Industrial Visit on September 29, 2023

On September 29, 2023, our second-year students embarked on a significant educational journey to the Radio Astronomy Centre in Udhagamandalam. This visit aimed to augment our students' understanding of electronic components, providing a blend of theoretical insights and practical experiences essential for embracing future technologies. Interactions with professionals and exposure to advanced equipment enriched students' comprehension of electronic engineering principles. Such immersive experiences are pivotal in equipping students with the knowledge and skills necessary to navigate and contribute to the ever-evolving landscape of technology with confidence and competence.

PATENTS PUBLISHED

Solar Panel Cleaning Robot for Industrial Solar Power Plant

Authors:

- Mr. V. Kumar
- Mr. U. Rajasekaran
- Mr. M. Prakash
- Ms. V. Manimala

Application No.: 397725-001

Publication Date: 16.10.2023

Mouse with Stress Detection

Authors: Dr. A. Vasantharaj

Application No.: 6306551

Publication Date: 08.09.2023

IoT based Agricultural and Horticultural Sprayer

Authors: Mrs. G. Vijayakumari

Application No.: 383825-001

Publication Date: 25.09.2023

Low-Cost Solar-Powered Led Lighting System

Authors:

- Ms. S. Jayabratha
- Ms. R. Preethi
- Mr. M. Prakash

Application No.: 394446-001

Publication Date: 08.11.2023

STUDENTS CORNER

Edge Computing for Low Latency

by *Mr. M. Vidyasagar, III Year*

Edge computing refers to the practice of processing data near the source of generation rather than relying on a centralized cloud-based system. The goal of edge computing is to reduce latency, enhance real-time processing, and improve the overall efficiency of data-intensive applications. In the context of communication, edge computing plays a crucial role in minimizing latency, which is the delay between the initiation of a task and its completion.

Here's how edge computing contributes to low latency in communication:

Proximity to End-Users:

Edge computing involves deploying computing resources closer to the end-users or devices generating data. By reducing the physical distance that data needs to travel, edge computing significantly reduces latency, resulting in faster response times for communication applications.

Real-Time Processing:

Edge computing allows for real-time processing of data at or near the source. This is particularly beneficial for applications where immediate actions or responses are required, such as in video streaming, online gaming, and critical communication systems.

Reduced Network Congestion:

By processing data at the edge, less data needs to traverse the network to reach centralized data centers. This reduces network congestion and minimizes the chances of bottlenecks that can lead to increased latency.

Bandwidth Optimization:

Edge computing helps optimize bandwidth usage by processing data locally. Instead of sending raw, unprocessed data over the network, edge devices can transmit only relevant information or insights, reducing the amount of data that needs to be transferred.

Support for IoT Devices:

With the proliferation of IoT devices, edge computing is essential for managing the massive amounts of data generated by these devices. Processing data at the edge allows for quicker decision-making and action, which is crucial for IoT applications.

Enhanced Security and Privacy:

Edge computing can improve security and privacy by keeping sensitive data closer to its source. Instead of sending sensitive information over long distances, where it might be more vulnerable to interception, data can be processed locally, reducing the risk of security breaches.

Scalability and Flexibility:

Edge computing offers scalability and flexibility by distributing computational resources across a network. This allows for the efficient allocation of resources based on demand, ensuring that communication services remain responsive even during peak usage periods.

Edge Cloud Services:

The emergence of edge cloud services provides a framework for deploying and managing applications at the edge. These services enable developers to build and deploy applications with a focus on low latency and high performance.

FACULTY CORNER

Blockchain in Communication

by *Ms. V. Manimala, AP/ECE*

Blockchain technology is increasingly being explored and implemented in the field of communication for its potential to enhance security, transparency, and efficiency. Here are some key aspects of how blockchain is influencing communication:

Secure and Tamper-Resistant Communication:

Blockchain provides a decentralized and secure framework for communication. By using cryptographic techniques, it ensures that communication data is tamper-resistant, reducing the risk of unauthorized access or manipulation.

Immutable Record-Keeping:

Communication transactions recorded on a blockchain create an immutable and transparent ledger. This feature is valuable in maintaining an accurate and unchangeable record of communication activities, which can be useful for auditing and compliance purposes.

Decentralized Identity Management:

Blockchain facilitates decentralized identity management, allowing users to have more control over their personal information. This can lead to more secure and private communication by reducing the reliance on centralized identity providers.

Smart Contracts for Automated Agreements:

Smart contracts, self-executing contracts with the terms of the agreement directly written into code, can automate and streamline communication processes. This can include automating contractual agreements, ensuring transparency and efficiency in communication workflows.

Enhanced Privacy through Encryption:

Blockchain networks often use advanced cryptographic techniques to secure transactions. When applied to communication, this encryption can enhance the privacy and security of messages, ensuring that only authorized parties can access the content.

Tokenization of Communication Services:

Blockchain facilitates the creation of tokens, which can represent ownership or access rights. In the context of communication, tokenization can be applied to services such as messaging or file sharing, providing a new model for compensation and access control.

Reducing Fraud and Spam:

Blockchain's decentralized and transparent nature can help reduce fraud and spam in communication systems. By establishing trust through the blockchain, it becomes more challenging for malicious actors to engage in deceptive practices.

Cross-Border Communication and Payments:

Blockchain can simplify cross-border communication by providing a decentralized and efficient method for secure transactions. This is particularly relevant in international communication where traditional payment and verification processes can be time-consuming.

Decentralized Communication Networks:

The decentralized nature of blockchain allows for the creation of communication networks that are not reliant on a central authority. This can lead to more resilient and censorship-resistant communication systems.

James Webb Space Telescope (JWST):

by *Mr. M. Prakash, AP/ECE*

The launch of the James Webb Space Telescope is highly anticipated. As the successor to the Hubble Space Telescope, JWST will observe the universe in infrared wavelengths, providing insights into the formation of galaxies, stars, and planetary systems.
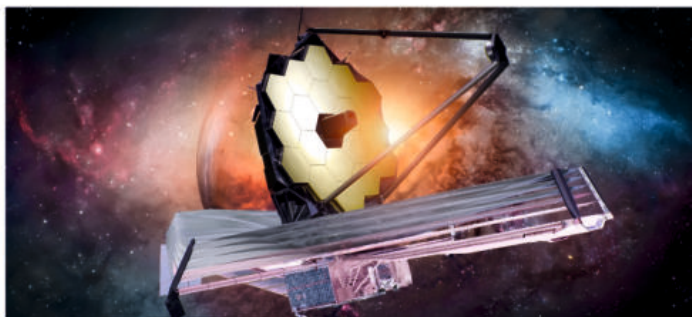
The James Webb Space Telescope (JWST) stands on the precipice of becoming a transformative force in observational astronomy. As the successor to the iconic Hubble Space Telescope, JWST is poised to revolutionize our understanding of the universe by exploring the cosmos in infrared wavelengths. This article delves into the significance of JWST, its advanced capabilities, and the scientific breakthroughs it is expected to facilitate.

Origins and Purpose

Named after James E. Webb, a prominent NASA administrator during the 1960s, JWST is a collaborative project involving NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA). The telescope's primary objectives are to address fundamental questions about the universe's origins, the formation of galaxies, the birth of stars, and the atmospheres of exoplanets.

Technical Advancements

Infrared Sensitivity:

Unlike the Hubble Space Telescope, which primarily observes in the visible and ultraviolet spectra, JWST is optimized for infrared observations. This sensitivity to longer wavelengths allows it to penetrate cosmic dust clouds and unveil hidden astronomical phenomena.

Large Sunshield:

To maintain its instruments at extremely low temperatures, JWST is equipped with a large, multi-layered sunshield. This sunshield, about the size of a tennis court, protects the telescope from the Sun's heat and minimizes interference with the faint infrared signals it aims to detect.

Gold-Coated Mirrors:

The telescope's mirrors are coated with a thin layer of gold to enhance their reflectivity in the infrared range. This gold coating allows JWST to efficiently capture and focus infrared light, optimizing its observational capabilities.

First Light and Reionization:

JWST will probe the universe's early epochs, aiming to capture the first light emitted after the Big Bang. It will also investigate the process of reionization, during which the universe transitioned from an opaque state to a more transparent one.

Conclusion

The anticipation surrounding the launch of the James Webb Space Telescope is palpable, as astronomers and space enthusiasts eagerly await the insights it will provide into the universe's infrared depths. JWST is poised to rewrite the astronomical playbook, building on the legacy of Hubble and paving the way for new discoveries.