TECH HERTZ'22

NEWS LETTER

DEC 2021 - FEB 2022

DEPARTMENT OF
Electronics and Communication Engineering

ABOUT

J.N.N INSTITUTE OF ENGINEERING
AUTONOMOUS
NAAC 'A' Grade | Approved by AICTE | Affiliated to Anna University

- J.N.N Institute of Engineering has been at the forefront of imparting high-quality technical education in the state of Tamil Nadu. With state-of-the-art infrastructure in all branches of engineering, dedicated and qualified staff, a highly conducive environment for the teaching-learning process, and a lush green campus, J.N.N stands out as a professionally managed institution. The institute has consistently produced outstanding engineers who have excelled in their careers, occupying responsible positions in some of the best-known enterprises in India.
- Promoted by the Alamelu Ammaal Educational Trust, formed in memory of the Chairman's mother, J.N.N Institute of Engineering is located just 25 km away from the city of Chennai. It has well-connected routes frequented by city buses, making it accessible for students, staff members, the community, and visitors who enjoy the aesthetic view of the college with its green color shades.
- The institution provides university-level education through a wider and dynamic network, catering to the demands of both university-level education and the economic development of the region, with wider opportunities. The location and range of academic offerings at both UG and PG levels have lifted the intake capacity regionally and nationally. The infrastructural development also portrays enrollment growth.

- J.N.N strives to impart high patterns of discipline with futuristic techniques through dedicated staff members. It is a place for making students technologically superior and ethically strong. The environmentally friendly place of opportunities enhances skills and personal development. J.N.N has also signed Memorandums of Understanding with top-level industries and training providers to develop new skills and abilities.

VISION

- Cultivating innovative and entrepreneurial Electronics and Communication Engineering graduates to ethically address global challenges through quality teaching and learning practices.

MISSION

- To facilitate a state-of-the-art teaching-learning process, imparting comprehensive knowledge in electronics and communication engineering and related interdisciplinary areas.
- To foster a sense of curiosity, critical thinking and ethical practices in students, preparing them for a continuous learning.
- To instill innovative team work and industry collaboration for enhancing entrepreneurial skills, employability and research capabilities in graduates.

PROGRAMME OUTCOMES

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental

contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one‘s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO’S)

PEO1: Our graduates will have skills to become successful in academics, industries, or as entrepreneurs.

PEO2: Our graduates with a research inclination will be solving various complex social issues using advanced tools and technologies.

PEO3: Our graduates will practice engineering with ethics, human values, and environmental consciousness.

PROGRAMME SPECIFIC OBJECTIVES (PSO)

PSO1: Analyse and develop solutions in domains like IOT, Embedded, VLSI and other emerging technologies.

PSO2: Understand and architect wired and wireless analog and digital communication systems and products.

LEADERSHIPS

CHAIRMAN

Shri. S. Jayachandran B.Sc., B.L
Founder & Chairman,
N J.N.N Group of Institution,

We are committed in opening up high quality tertiary education to students and to provide opportunity to acquire, understand and apply disciplinary and inter-disciplinary knowledge as well as related skills and attitudes, to think rationally and to enhance their personal development. Situated in the capital city of Tamil Nadu, our college bridges the education and values in its relationship with business, government, research organizations and universities. I would like to reaffirm my sincere personal commitment to help each of you to succeed your academic endeavours. I would like to reaffirm our sincere personal commitment to help each to succeed in your academic endeavours. I heartily welcome our students and wish them the very best for a successful and glorious future.

VICE CHAIRMAN

Mr. Naveen Jayachandran
Vice-Chairman,
J.N.N Group of Institutions.

Our motto, "Learning Today. Leading Tomorrow", permeates every aspect and activity at J.N.N. Over the past 12 years, J.N.N Institute of Engineering has successfully imbibed several of the proven best practices from the best of engineering institutions around the world, adapted them to make them better suited to the ground realities and introduced many of its own innovations in engineering education. Together, these have ensured that an educational experience at J.N.N Institute of Engineering is truly transformational for thousands of aspiring young J.N N Institute of Engineering. has been very proactive in recognising the global and national trends in shifts in the technical landscape and has been pioneering several innovations in technical education. J.N.N is also embracing the latest technologies, teaching methodologies, well equipped facilities and understands the aspirations of the student community.

PRINCPAL

Dr. A.V. Mayakannan

Since its inception in the year of 2008, the college has been striving towards maintaining high academic standards and excellence in many fields. We are committed to provide our students with a wide variety of opportunities in order to help them attain their highest potentials.

As the principal I am proud of my students who have achieved high standards in academics and various co-curriculum activities. Our objective is to turn the challenges of the changing world into wisdom of opportunity for the future. We have a dedicated team of faculty, striving hard to provide the students with the latest knowledge and skill that would help them to stand out in this fiercely competitive world. Our campus is vibrant with energy, enthusiasm and activity. It will be our endeavor to make your experience very enriching and memorable personal life. We are always here to address your queries and provide you with the best education possible.

HEAD OF THE DEPARTMENT

DR. D. Joseph Jeyakumar

Dear Students, Faculty, and Readers, It is my pleasure to share updates and achievements from the Department of Electronics and Communication Engineering (ECE). Our Department continues to uphold is commitment to academic excellence, innovative research, and fostering a vibrant learning environment. Thank you for your continuous support and enthusiasm together, we can achieve greater heights

“INNOVATION IS THE ABILITY TO SEE THE CHANGE AS AN OPPORTUNITY – NOT A THREAT”

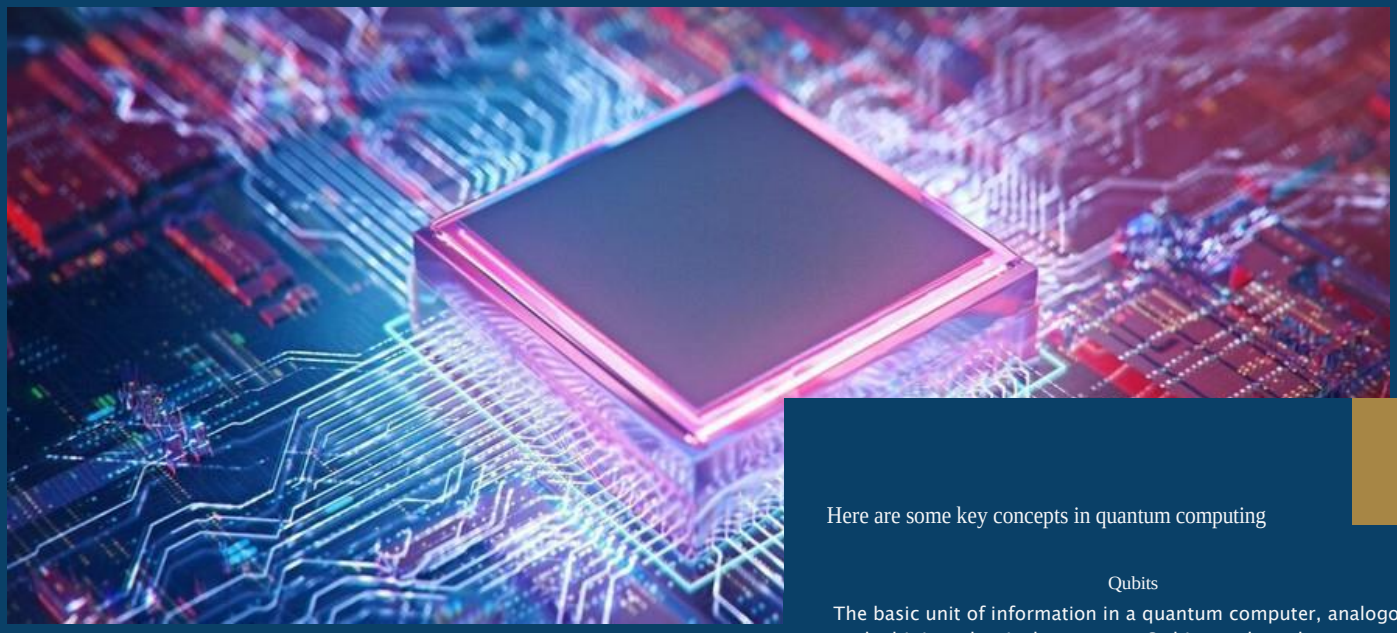
-STEVE JOBS

LIST OF FACULTY

S.NO	NAME OF THE FACULTY	QUALIFICATON	DESIGNATION
1.	Dr. D. Joseph Jeyakumar	M.E, Ph.D	Professor
2.	Mr. U. Siddharth Nambi	M.E	Associate Professor
3.	Mrs. N. Revathy	M.E	Associate Professor
4.	Dr. R. Senthil Rama	M.E, Ph.D	Associate Professor
5.	Dr. N. Hemalatha	M.E, Ph.D	Associate Professor
6.	Mrs. R. Nithya	M.E	Assistant Professor
7.	Mr. M. Mariselvam	M.E	Assistant Professor
8.	Mr. R. Partheepan	M.E	Assistant Professor
9.	Mrs. N. Malathy	M.E	Assistant Professor
10.	Mr. S. Tamilvanan	M.TECH	Assistant Professor

S.NO	NAME OF THE FACULTY	QUALIFICATON	DESIGNATION
11.	Ms. B. Shanmathi	M.E	Assistant Professor
12.	Mrs. P.B. Simtha	M.E	Assistant Professor
13.	Mrs. R. Rajarajeswari	M.E	Assistant Professor
14.	Dr. J. Vijay Anand	M.TECH, Ph.D	Associate Professor
15.	Mr. K.T. Pannerselvam	M.E	Assistant Professor
16.	Mrs. T. Indhumathi	M.E	Assistant Professor

QUANTUM COMPUTING AND VLSI



Here are some key concepts in quantum computing

Qubits

The basic unit of information in a quantum computer, analogous to the bit in a classical computer. Qubits are based on quantum properties, which make them behave differently than bits.

Superposition

A fundamental concept in quantum mechanics, where a quantum system can be in multiple states at the same time. For example, an electron can have a right or left spin.

Entanglement

A physical phenomenon where two or more qubits are related in such a way that the state of one qubit cannot be described independently of the others. Changing the state of one qubit will instantly change the state of the other.

Quantum gates

Manipulate qubits during computation by altering their states through quantum logic operations.

Feature Quantum Computing Meets VLSI

Quantum computers relying on precise quantum states and specialized architectures, the role of VLSI in quantum hardware development is pivotal. Engineers are now designing high-performance integrated circuits to enable:

Cryogenic compatibility for quantum systems operating at near-zero temperatures.

Scalable qubit control systems for managing thousands of qubits.

Error-correcting hardware to ensure reliable quantum computation. By merging traditional semiconductor expertise with quantum hardware requirements, VLSI design is transforming how quantum processors are

Achievements in Quantum Technology

Current Trends

Hybrid Quantum-Classical Systems: Utilizing classical VLSI chips to manage quantum circuits and preprocess data is becoming a norm in quantum research labs.

CMOS Technology in Quantum: Researchers are adapting CMOS (Complementary Metal-Oxide-Semiconductor) technology, a staple in VLSI, to control quantum devices.

Quantum IC Prototypes: Integrated chips specifically for quantum systems are being tested by industry leaders like IBM, Google, and Rigetti.

CMOS Technology Driving Quantum Control

CMOS technology, a cornerstone of VLSI, is enabling precise control of quantum devices, fostering seamless interaction between classical and quantum systems.

Key Highlights

Quantum-VLSI Synergy

VLSI designs enable scalable qubit control, cryogenic-compatible hardware, and real-time error correction, ensuring reliable and efficient quantum computing systems.

Current Trends

Hybrid Systems: Combining quantum processors with classical VLSI chips for seamless integration.

CMOS for Quantum: Adapting CMOS technology for scalable quantum ICs.

Quantum Prototypes: Industry leaders are developing cutting-edge quantum-specific integrated circuits.

Applications:

Cryptography: Quantum-safe encryption powered by integrated VLSI chips.

AI: Accelerating machine learning with hybrid quantum-VLSI systems.

Drug Discovery: Optimizing molecule simulations with

Opportunities for Professional

As the demand for expertise at the intersection of these fields grows, professionals can:

Explore roles in quantum hardware engineering, focusing on chip design for quantum systems.

Learn EDA tools (Electronic Design Automation) tailored for quantum circuits.

Participate in collaborative research programs in quantum-VLSI integration.

Entrepreneurship Development and Annual Events at Our Institution

1. The Role of Entrepreneurship Development: "Be a Part of the Solution, not a Part of the Pollution"

Date: 02/12/2021

Coordinator: Dr. T. Srihari, Professor & Coordinator of ED Cell

On December 2, 2021, the Entrepreneurship Development Cell (ED Cell) at our institution held an inspiring event focused on the role of entrepreneurship in solving pressing global challenges. The central theme was to encourage young entrepreneurs to think beyond profits and strive to be part of the solution, rather than contributing to the problems that society faces, especially environmental pollution. Dr. T. Srihari, a renowned professor and the coordinator of the ED Cell, led this session, emphasizing the importance of sustainable business practices and the need for innovation that benefits society and the environment. Students and faculty were encouraged to think creatively and implement eco-friendly solutions, ensuring that entrepreneurship becomes a driving force for positive change in the world.

2. The Role of Entrepreneurship Development (Continued Focus)

Date: 02/12/2021

Coordinator: Dr. T. Srihari, Professor & Coordinator of ED Cell

The continuous focus on entrepreneurship development was evident throughout the

event, where participants were urged to challenge traditional business models. The idea was to foster a mind-set that prioritizes environmental sustainability and social responsibility in every venture. By aligning entrepreneurship with the goal of reducing pollution and improving quality of life, the session provided invaluable insights into the future of responsible entrepreneurship. Dr. Srihari's dedication to shaping future business leaders with this forward-thinking approach continues to make a significant impact in the community.

3. Annual Sports Day - TRIUMPH Date: 21/02/2022 Chairperson: Mr.B. Janakiraman Manoharan, JUDO- Gold Medalist

Our institution’s Annual Sports Day, known as TRIUMPH, took place on February 21, 2022. The event was an exhilarating display of sportsmanship, enthusiasm, and team spirit.

Mr.B. Janakiraman Manoharan graced the occasion with his presence, motivating participants with his encouraging words. Students from various departments came together to compete in various athletic events, showcasing their skills and determination.

TRIUMPH was more than just a sports day; it was a celebration of unity, perseverance, and the importance of physical fitness in academic life. The event was not only a competition but a platform to foster a sense of community among students and faculty, creating memories that will last for years to come.

4. Multirate Signal Processing ADD-ON (Online) Date: 08/12/2021
Resource Person: Mr. Muhhamed Iliyas, Visiting Professor (IT Experts Systems)

On December 8, 2021, our institution organized an online session on "Multirate Signal Processing," conducted by Mr. Muhhamed Iliyas, a distinguished visiting professor and IT expert. The session focused on the techniques of processing signals at multiple rates, an important area of study for anyone pursuing a career in signal processing or telecommunications. The online event saw great participation from students, who had the opportunity to dive deep into the technicalities of multirate systems, learn about real-world applications, and interact with an expert in the field. Mr. Iliyas's insights and hands-on approach made the session both informative and engaging, enriching the students' knowledge of advanced signal processing techniques.

These events not only highlight the institution's commitment to academic excellence but also underscore the importance of holistic development—balancing technical knowledge with social responsibility, athletic prowess with teamwork, and innovative thinking with environmental stewardship. As we continue our journey, the focus remains on shaping well-rounded individuals who can lead with purpose and impact the world positively.

EDITORIAL BOARD

Academic Year	Name of the Magazine	Editorial Members
DEC-FEB 2021-2022	**TECH HERTZ'S 22**	**Faculty Coordinators:** Ms. B. Shanmathi **Student's Convenors:** Vignesh Rohith R Loghanandhini K Godson J