



I' Storm

K.L.N. College of Engineering, Pottapalayam -630612

Department of Information Technology

September 2025



K.L.N. College of Engineering

i'Storm

Department of Information Technology



PRINCIPAL MESSAGE



It is a matter of great pride and satisfaction for K.L.N. COLLEGE OF ENGINEERING to bring out the News Letter 'I'STORM' Released from the Department of Information Technology. The College has made tremendous progress in all areas—academic, non-academics, capacity building relevant to staff and students. The College has achieved another milestone in getting NBA (National Board of Accreditation). I am confident that this issue of Department News Letter will send a positive signal to the staff, students and the person who are interested in the Technical education and Technology based activities. A News Letter is like a mirror which reflects the clear picture of all sorts of activities undertaken by a Department and develops writing skills among students in particular and teaching faculty in general. I congratulate the Editorial Board of this News Letter who have played wonderful role in accomplishing the task in Record time. I express my deep sense of gratitude to Dr. P.Ganesh Kumar, HOD/IT under whose guidance this Technical work has been undertaken and completed within the stipulated time. Also my heartfelt Congratulations to staff members and Students for their fruitful effort. With Best wishes.

PRINCIPAL

Dr. A.V. RAMPRASAD

THE EDITOR'S DESK



It gives me immense pleasure to note that response to this newsletter of our department i'STORM has been overwhelming. The wide- spectrum of articles in different sections gives me a sense of pride that our students and professors possess creative potential and original thinking in ample measures. Each article is entertaining, interesting and absorbing. I applaud the contributors for their stimulated thoughts and varied hues in articles contributed by them. Commendable job has also been done by the Editorial Board in planning for and producing the Newsletter. My congratulations to the team who took the responsibility for the arduous task most effectively. I am hopeful that this small piece of technical work shall not only develop the taste for reading among students but also develop a sense belonging to the institution as well.

H.O.D(IT)

Dr. P. GANESH KUMAR

NEWS LETTER EDITORIAL BOARD EDITOR-IN-CHIEF:

Dr. P. Ganesh kumar (HOD/IT)

STAFF INCHARGE:

Mrs I.Muthu Meenatchi (AP2)

STUDENT EDITORS:

SWETHA M S R (4th Year)

RUPASRI G K(4th Year)

OUR COLLEGE:

Vision

To become a Centre of Excellence in Technical Education and Research in producing Competent and Ethical professionals to the society.

Mission

To impart Value and Need based curriculum to the students with enriched skill development in the field of Engineering, Technology, Management and Entrepreneurship and to nurture their character with social concern and to pursue their career in the areas of Research and Industry.

OUR DEPARTMENT:

Vision

To emerge as a center of excellence through innovative technical education and research in Information Technology.

Mission

To produce competent Information Technology professionals to face the industrial and societal challenges by imparting quality education with ethical values.

K.L.N.COLLEGE OF ENGINEERING

POTTAPALAYAM, SIVAGANGA DISTRICT, TAMILNADU

AN AUTONOMOUS INSTITUTION | ACCREDITED BY NAAC

(APPROVED BY AICTE, NEW DELHI & AFFILIATED TO ANNA UNIVERSITY, CHENNAI)

DEPARTMENT OF INFORMATION TECHNOLOGY

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

1. *Engineering knowledge*: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. *Problem analysis*: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.
3. *Design/development of solutions*: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required.
4. *Conduct investigations of complex problems*: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modeling, analysis & interpretation of data to provide valid conclusions.
5. *Engineering tool usage*: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems.
6. *The engineer and the world*: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment.
7. *Ethics*: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws.
8. *Individual and Collaborative team work*: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
9. *Communication*: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences.
10. *Project management and finance*: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
11. *Life-long learning*: Recognize the need for, and have the preparation and ability for
 - i) independent and life-long learning
 - ii) adaptability to new and emerging technologies and
 - iii) critical thinking in the broadest context of technological change.

Program Educational Objectives

1. *To excel in industrial or graduate work in Information Technology and multi-disciplinary Environments.*
2. *To adapt to ever changing technologies by applying Engineering Principles.*
3. *To practice professionalism conforming to ethical values, team work and Leadership.*

Program Specific Outcomes

1. *To create better learning environment in line with technological updation and research progress.*
2. *To give industry exposure through research and consultancy in Information and Communication Technologies.*

Quantum Algorithms

➤ Quantum computing is a revolutionary field that combines computer science with quantum physics to solve problems that are extremely difficult for classical computers. Unlike traditional computers that use bits (0 or 1), quantum computers use qubits, which can exist in multiple states at the same time due to quantum mechanical properties.

➤ Quantum algorithms are specially designed computational procedures that run on quantum computers and take advantage of superposition, entanglement, and quantum interference to perform calculations faster and

What Makes Quantum Algorithms Special?

➤ Quantum algorithms differ from classical algorithms because they process many possibilities simultaneously.

Key principles:

➤ Superposition – A qubit can be both 0 and 1 at the same time.

➤ Entanglement – Qubits become linked and share information instantly.

Interference – Correct answers are amplified while incorrect ones cancel out.

These properties allow quantum algorithms to achieve exponential speedups for certain problems.



How Quantum Computing Works

- ▶ Quantum computers process information using **qubits**, which behave according to the principles of quantum mechanics.
- ▶ The main building blocks are:
 - ▶ • **Qubits** – Quantum bits that can exist in multiple states simultaneously.
 - **Quantum Gates** – Operations that manipulate qubits.
 - **Quantum Circuits** – Sequences of gates performing computations.
 - **Measurement** – Converts quantum states into classical results.
- ▶ Quantum computers operate inside **cryogenic systems at temperatures close to absolute zero** to maintain qubit stability.



**ADVANCED QUANTUM COMPUTING
PROCESSOR**

Comparison – Classical vs Quantum Computing

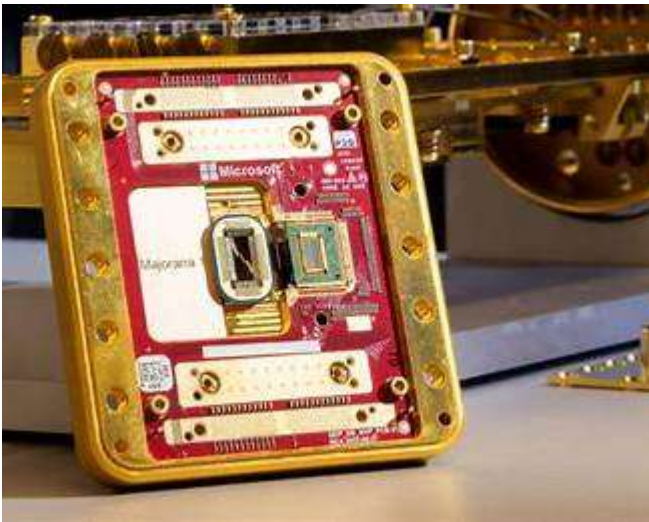
Feature	Classical Computer	Quantum Computer
Basic Unit	Bit (0 or 1)	Qubit (0,1 or both)
Processing	Sequential	Parallel possibilities
Algorithms	Deterministic	Probabilistic
Speed	Limited for complex problems	Exponential speedup for some tasks
Applications	General computing	Optimization, cryptography, simulation

BIT
*Classical
Computing*



QUBIT
*Quantum
Computing*





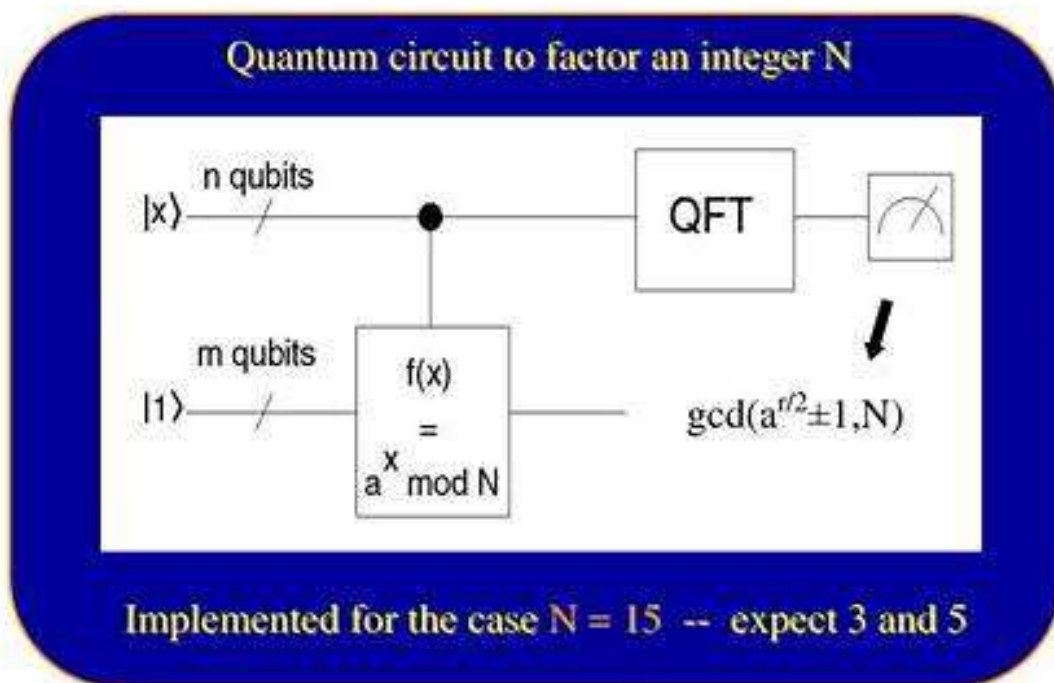
Quantum computers operate using highly sensitive quantum chips kept at extremely low temperatures. These machines manipulate qubits using quantum gates, forming quantum circuits similar to logic circuits in

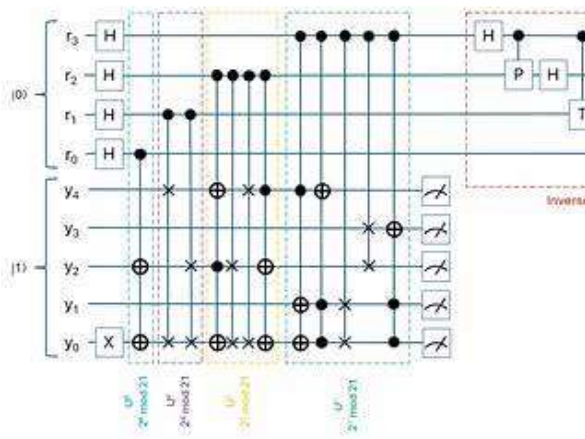
- Quantum algorithms run on quantum computers using qubits instead of classical bits.
- They use principles like superposition and entanglement to process information simultaneously.
- Provide faster computation for certain complex problems compared to classical algorithms.
- Useful for searching, optimization, and cryptography applications.
- Can solve mathematical problems that are difficult for traditional computers.

Major Quantum Algorithms

► Shor's Algorithm (Integer Factorization)

Shor's Factoring Algorithm





Proposed by Peter Shor in 1994, this algorithm can factor large numbers exponentially faster than classical algorithms.

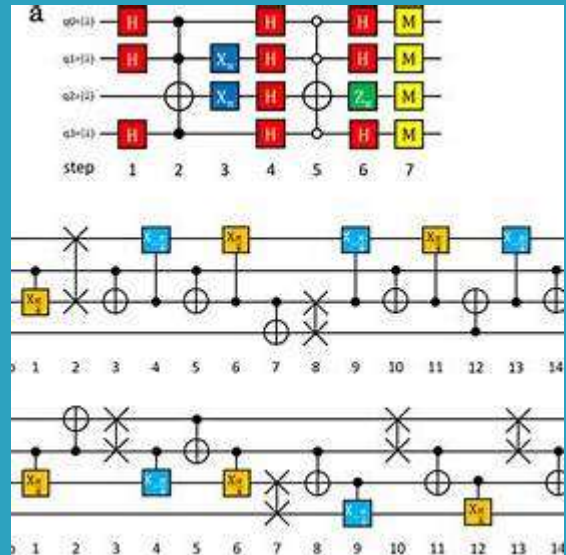
Why it matters:

- Breaks traditional encryption systems like RSA
- Impacts cybersecurity and cryptography
- Demonstrates quantum advantage clearly

Applications:

- Cryptanalysis
- Secure communication research
- Post-quantum cryptography development

Grover's Algorithm (Search Optimization)



Grover's algorithm provides a quadratic speedup for searching unsorted databases.

Classical search: $O(N)$

Quantum search: $O(\sqrt{N})$

Applications:

Database searching

AI optimization problems

Pattern matching

Decision-making systems

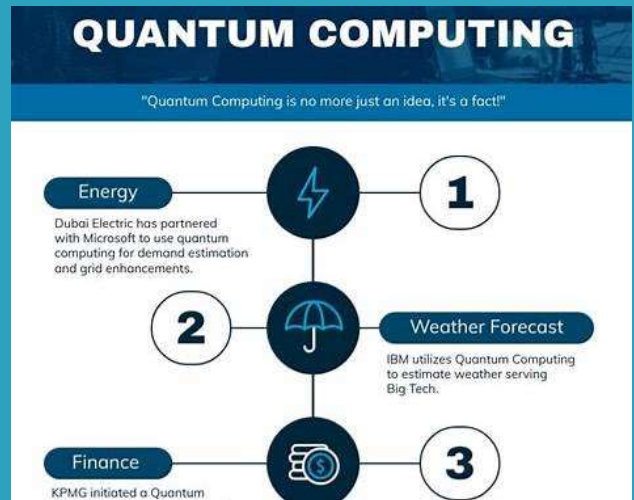
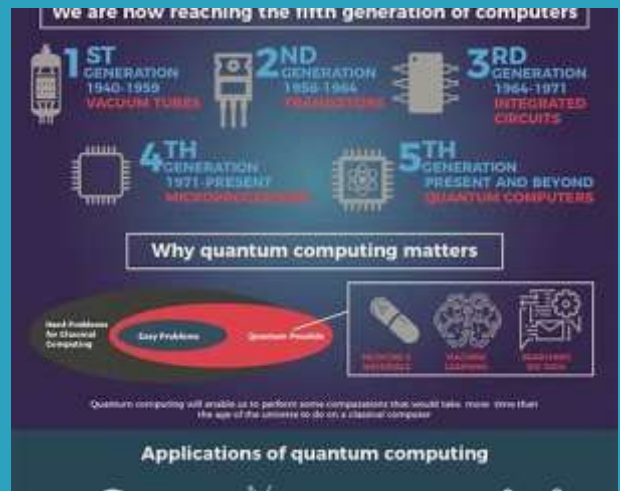
Quantum Simulation Algorithms

Quantum systems are naturally difficult to simulate using classical computers. Quantum algorithms can model molecular interactions accurately.

Applications:

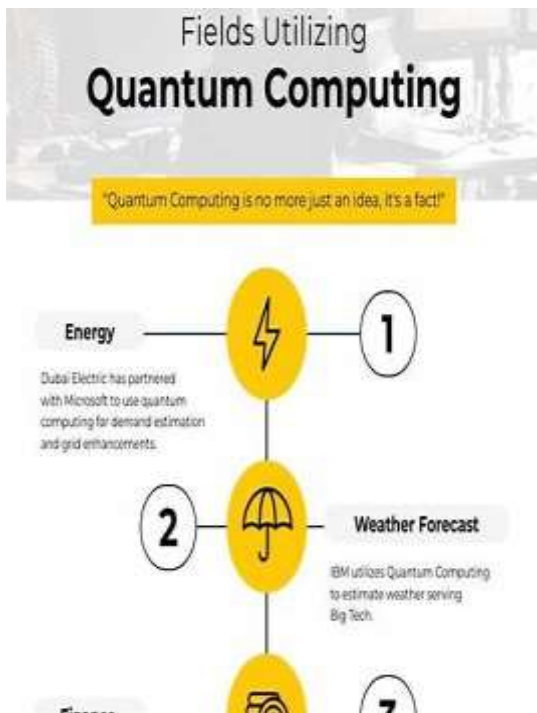
- Drug discovery
- Chemical reactions
- Material science
- Energy optimization

Applications of Quantum Algorithms



Quantum algorithms have potential applications across multiple industries:

- Healthcare – Faster drug development
- Finance – Portfolio optimization
- Weather Forecasting – Complex climate simulations



- **Logistics** – Route and traffic optimization
- **Artificial Intelligence** – Faster machine learning models

Challenges in Quantum Computing

- Despite their promise, quantum algorithms face several challenges:
- Qubits are highly sensitive to noise
- Error correction is complex
- Hardware is expensive
- Limited large-scale quantum computers exist today
- Researchers worldwide are working to overcome these limitations.

Future of Quantum Algorithms

- Quantum algorithms are expected to reshape computing in the coming decades
- As quantum hardware improves, industries may experience breakthroughs in optimization, security, artificial intelligence, and scientific discovery.
- Experts believe quantum computing will not replace classical computers but will work alongside them to solve specialized complex problems.

Case Study: Quantum Algorithms in Modern Computing

- ▶ Quantum algorithms use quantum mechanical principles such as **superposition, entanglement, and interference** to solve complex computational problems more efficiently than classical algorithms. These algorithms enable faster searching, secure cryptography analysis, and optimization solutions that are difficult for traditional computers.
 - ▶ Applications include database search acceleration, integer factorization for cryptography, and solving large-scale optimization problems using hybrid quantum–classical systems.
- 

Career Opportunities in Data Science

- ▶ Quantum Algorithm Researcher
- ▶ Quantum Software Developer
- ▶ Quantum Machine Learning Engineer
- ▶ Quantum Cryptography Specialist
- ▶ Quantum Computing Scientist
- ▶ Quantum Application Developer

Skills Required

- Strong foundation in **Quantum Mechanics basics**
 - Knowledge of **Linear Algebra & Probability**
 - Programming skills in **Python**
 - Analytical thinking and research skills
- 

Quantum Computing Companies & Technologies

- ▶ Leading companies developing quantum computers:
 - ▶ **IBM Quantum** – Cloud-based quantum processors
 - ▶ **Google Quantum AI** – Achieved quantum supremacy experiment
 - ▶ **Microsoft Azure Quantum** – Quantum cloud services
 - ▶ **D-Wave Systems** – Quantum annealing computers
 - ▶ **Intel Quantum Lab** – Silicon-based qubits
- 

Quantum Machine Learning

- ▶ **Quantum Machine Learning (QML)** combines quantum computing with artificial intelligence.

Applications include:

- ▶ Faster pattern recognition
 - ▶ Optimization of deep learning models
 - ▶ Quantum neural networks
 - ▶ High-dimensional data analysis
 - ▶ Quantum machine learning may significantly accelerate **AI model training** in the future.
- 

Real-World Applications of Quantum Computing

- ▶ **Cybersecurity** – Breaking and designing new cryptographic systems
 - ▶ **Drug Discovery** – Simulating molecules and proteins
 - ▶ **Logistics Optimization** – Traffic and supply chain planning
 - ▶ **Climate Modeling** – Accurate weather predictions
 - ▶ **Finance** – Portfolio risk analysis and trading strategies
 - ▶ **Artificial Intelligence** – Accelerating complex ML models
- 

Quantum Computing in India

- ▶ India launched the **National Quantum Mission (NQM)** to develop quantum technologies including:
 - ▶ Quantum communication
 - ▶ Quantum computing hardware
 - ▶ Quantum sensors
 - ▶ Quantum materials
- 

Glossary

- ▶ **Qubit** – The basic unit of quantum information that can exist in multiple states simultaneously.
 - ▶ **Superposition** – A quantum property where a qubit can represent both 0 and 1 at the same time.
 - ▶ **Quantum Gate** – An operation that changes the state of qubits, similar to logic gates in classical computing.
- 

Future of Quantum Algorithms

- ▶ **Faster Problem Solving** – Quantum algorithms will solve complex problems much faster than classical computers, especially in optimization and simulations.
 - ▶ **Artificial Intelligence Enhancement** – Quantum machine learning algorithms will improve pattern recognition and large-scale data analysis.
 - ▶ **Hybrid Computing Era** – Future systems will combine classical and quantum algorithms for practical real-world applications.
- 

STUDENTS PARTICIPATION 2025-26



Internal Hackton for SIH'25
Total Participant:104 Teams
10TH ,11TH SEPTEMBER 2025

STUDENTS CONSULTANCY PROJECT 2025-2026

Sl. No	Title of the Project	Name of the Consultancy	Name of the Student(s)	Faculty Name	Date
1	ScanBuddy AI Powered Medical Scan Information System	Vinayaga Hospital, Madurai	Mohammed Ayub A (910622105041) Mukeshwaran A (910622105042)	I Muthu Meenatchi AP/IT	July-Nov 2025
2	EduEvent-Hub	KLNCE	Dharun S (910622105023) Kaviarasan D (91062105032)	Dr. S. Ilangovan Prof/IT	July-Nov 2025
3	Farm Leger	KD Vegetable Commission Agency, Madurai	Goberumarasu K (910622105024) Arul Sanjay B (910622105012)	M. Dharshini, AP/IT	July-Nov 2025
4	Car Fusion	Cars24	Velumurugan S (910622105081) Santhakumar A S (910622105061)	P. Nagalakshmi, AP/IT	July-Nov 2025

STUDENTS CONSULTANCY PROJECT 2025-2026

5	Smart Study Planner and Learning Analyzer	AIM Career Institute	Shobana Dharshini R S (910622105068) Sneha Priya T (910622105071)	Dr. G. Ramesh, Prof/IT	July-Nov 2025
6	Smart QR Based Self ordering System	Nexuex Fast Food	RuPasri G K (910622105057) Swetha M S R (910622105076)	Dr. Aniffa Begum, Associate Pro/IT	July-Nov 2025
7	Field Finder	Bags and Boots turf	Raghavv Lighath K (910622105055) Vishwah Kumar P S (910622105087)	P. Nagalakshmi, AP/IT	July-Nov 2025
8	E-commerce Platform Re-Architecture from Monolith to micro Services	Kumar Super market	Nivetha S (91062215049) Velentina V (910622105078)	PL. Subramanian, AP/It	July-Nov 2025
9	Smart customer Segmentation for business Optimization	Shanmugam Enterprise	Shivani S (910622105066) Varsha A (910622105079)	Rm. Suganya, AP/It	July-Nov 2025
10	Quick AI- AI Powered Saas Platform	Apex Tech	Ruban kumar V (910622105056) Nirendrasethupathi A (910622105046)	I Muthu Meenatchi AP/IT	July-Nov 2025
11	Real Inventory Control and Demand Forecasting	Alif Medical Hall	Sharoon Basha S (910622105065) Shanthosh A (910622105064)	N.S. Nagananthi, AP/It	July-Nov 2025
12	Smart Expense Tracker System	Shanmugam Enterprise	Salvina Jeslin A (910622105060) Vinusha T K S (910622105084)	A. Selvaraj (Sr.Gr)AP/IT	July-Nov 2025
13	Medi Check- Doctor Appointment booking	Jeya Clinic	Vignesh Babu T D (910622105082) VishwaJith K G (910622105086)	R. Pavithra Devi, AP/IT	July-Nov 2025

List of Faculties participated in FDP / STTP/ Refresher/Induction Programs

S.NO	Name of the Faculty	One Week FDP/online certification Short-Term Programs / Induction programs	Organized By	Date
1	Dr.S.ARIFFA BEGUM, ASP/IT	Crafting Comptitive Research Proposals:A Comprehensive FDP for Academic Excellence	Panimalar Engineering College, Chennai	23rd to 28th June 2025
		Quantum Computing, Artificial Intelligence, and Exploring Cutting Edge Technologies	School of Electronics Engineering (SENSE),VIT-AP University, Amaravati	08th to 12th July 2025
		Artificial Intelligence in Clinical Practice: Transforming Healthcare for Future	Coimbatore Institute of Technology	28th July to 1st August 2025
		Generative AI:From fundamentals to agentic and deployment	KLNCE	13th to 17th October 2025
		FOSS Tools in Natural Lanugage Processing	TCE, Madurai &IIT Bombay	22-09-25 and 27-09-25
2	Mr.A.SELVARAJ, AP(Sr.Gr) /IT	Faculty Development Programme on AI in Healthcare Management	Department of Computer Science and Engineering, PET Engineering College, Vallioor, Tamil Nadu	July 16, 2025 to July 22, 2025
		one-week National Level Faculty Development Programme on Recent Trends on AI - Text, Vision & Hardware Implementation Models	Department of ECE in Panimalar Engineering College	August 28th to September 2nd, 2025
		NPTEL- "Python for Data Science"	IIT Madras	July-August 2025

List of Faculties participated in FDP / STTP/ Refresher/Induction Programs

3	Mrs.S.VIJAYASHARMILA, AP/IT	(ATAL) Academy Faculty Development Program on "Exploratory Data Analytics Tools and Techniques	Velammal College of Engineering & Technology, Madurai	24th November 2025 to 29th November 2025
		Generative AI – From Fundamentals to Agentic Systems and Deployment	KLNCE	13th to 17th October 2025
		5 days Faculty Development Programme on "AI in Healthcare Management"	PET Engineering College, Vallioor,	16.07.25 to 22.07.25
		NPTEL- "Python for Data Science"	IIT Madras	July-August 2025
		NPTEL- "Learning Analytics Tools"	IIT Bombay	July-October 2025
4	Ms.RM.SUGANYA, AP/IT	FDP on "Empowering the Digital Era Through advances In Artificial Intelligence, Data Science and Automation"	Sri SaiRam Engineering College, Chennai	28.11.2025 to 04.12.2025
		FDP on NPTEL- "Python for Data Science"	IIT Madras	July-August 2025
		FDP on NPTEL- "Learning Analytics Tools"	IIT Bombay	July-October 2025
		Generative AI: From fundamentals to agentic systems and deployment	KLNCE	13th to 17th October 2025
		NPTEL- "Python for Data Science"	IIT Madras	July-August 2025
		NPTEL- "Learning Analytics Tools"	IIT Bombay	July-October 2025

EVENTS ORGANIZED 2025-2026

S.NO	Name of the Event	National/ International level	Organized by	Date of Event	No of Participant
1.	NextGen Innovators, Project Contest-2025 Resource Person: Mr. Gautam, V7Lancer Pvt Ltd	Institute	IIPC	21.9.2025	(Total Participant: 200) (2022-2026) (2023-2027) (2024-2028) (2025-2029)
2.	Internal Hackton for SIH'25	Institute	Dept of IT	10 th -11 th September 2025	(Total Participant: 104 teams) (2022-2026) (2023-2027) (2024-2028)
3.	Five Days Online Faculty Development Program on "Generative AI – from fundamentals to Agentic Systems and deployment	Institute	Dept of IT	13-17 th October 2025	(No of Faculties Participated : 150)
4.	Applied Deep Learning and Generative AI Resource Person: Rajeev Dhamaraj, Forgesprint	Institute	Open Source Innovation Club	13.10.2025 to 17.10.2025	90 students (2022-2026)
5.	Hands on session "Data Analyst Journey Gateway to IT success" Resource Person: G. Karthikeyan, Vinsup Infotech Pvt Ltd	Institute	Dept of IT	13.9.2025	90 students (2023-2027)

