



JULY 2024



Estd. 1994

'Storm

Data Science, AI & Beyond

**Future-Tech
Breakthroughs**

**What to Know
About AI in 2024**

K.L.N. College of Engineering
Department of Information Technology



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:

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T.K.Hema(1st 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.*

DATA SCIENCE

Data Science is an interdisciplinary area that combines statistics, mathematics, programming, machine learning, and domain knowledge to analyze structured and unstructured data. It helps organizations discover patterns, predict future trends, and make data-driven decisions.

key areas of Data Science:

- 1☐ Data Collection – Gathering data from various sources.
- 2☐ Data Cleaning – Removing errors and handling missing values.
- 3☐ Statistics & Mathematics – Understanding patterns and relationships in data.
- 4☐ Programming Skills – Using languages like Python, R, and SQL.
- 5☐ Machine Learning – Building predictive models.

6☐ Data Visualization – Presenting data using charts and graphs.

7☐ Domain Knowledge – Understanding the industry or field.

8☐ Communication Skills – Explaining insights clearly to others.



Evolution of Data Science

1. Traditional Data Analysis

Focused on statistical methods and descriptive analytics.

2. Machine Learning Era

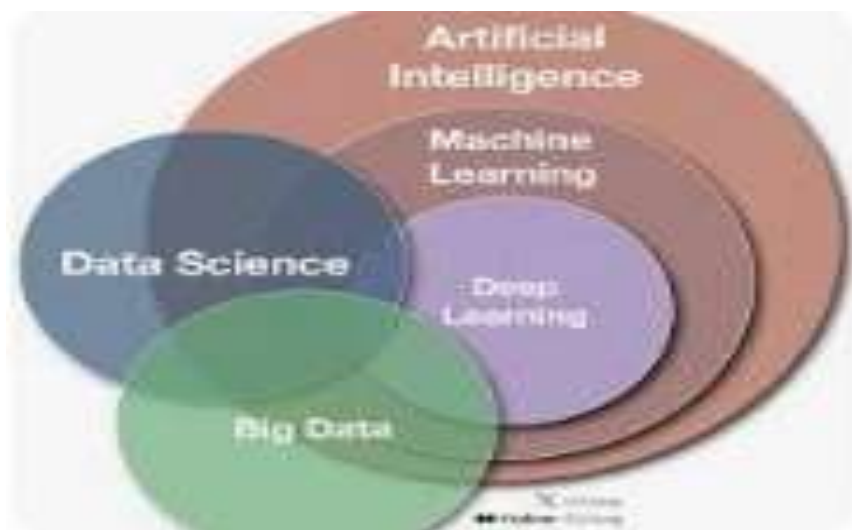
Introduction of predictive models and automation using algorithms.

3. Deep Learning Revolution

Use of neural networks, CNNs, RNNs, and Transformers for complex tasks such as image analysis and NLP.

4. Modern AI-Driven Data Science

Integration of Explainable AI, Cloud Computing, and Edge Intelligence.



John Tukey



John Tukey was a pioneer who laid the foundation for Data Science through his concept of Exploratory Data Analysis (EDA). In 1962, he emphasized analyzing real-world data instead of focusing only on theoretical statistics. He encouraged discovering patterns, trends, and anomalies directly from datasets. His approach shifted statistics toward practical problem-solving. These ideas became core principles in modern Data Science.

William S Cleveland



William S. Cleveland formally shaped Data Science as a separate discipline in 2001. He proposed expanding statistics to include computing, data visualization, and interdisciplinary collaboration. He argued that data analysis required technical and computational skills beyond traditional statistics. His action plan structured the academic growth of Data Science. His contribution helped establish it as a recognized field of study.

Data Science Lifecycle

Problem Definition

Data Collection

Data Cleaning

Feature Engineering

Model Building

Evaluation

Deployment

Monitoring and Maintenance



DJ Patil



•DJ Patil played a major role in popularizing the term “Data Scientist.” He helped define the skills required for handling large-scale data in industry. As the first U.S. Chief Data Scientist under Barack Obama, he promoted data-driven governance. He encouraged using data to improve public policy decisions. His work shaped Data Science as a professional career path worldwide.

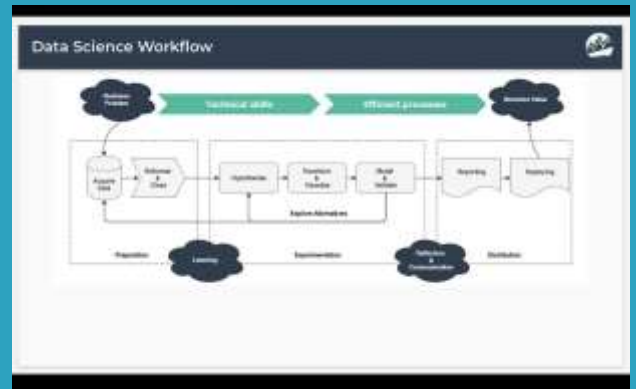
Jeff Wu



Jeff Wu contributed by proposing that statistics should be renamed as Data Science. In the 1990s, he highlighted the growing importance of data, computing, and practical applications. He emphasized that the field was evolving beyond traditional statistical theory. His proposal reflected the shift toward real-world data analysis. This idea influenced the modern identity and development of Data Science.

Key Features Of Data Science:

Data Science is a data-driven field that focuses on collecting, analyzing, and interpreting large volumes of data. It combines statistics, programming, and machine learning to identify patterns and make accurate predictions. It can handle both structured and unstructured data efficiently. Data visualization and communication are also key features, helping present insights clearly for better decision-making.



1 Data-Driven Approach

Data Science focuses on making decisions based on data rather than assumptions. It analyzes large volumes of information to support accurate and evidence-based conclusions.

2 Handling Large and Complex Data

It works with both structured (tables, databases) and unstructured data (text, images, videos). Data Science tools can manage big and complex datasets efficiently.

3☐ Use of Statistics and Mathematics

Statistical methods and mathematical models are used to identify patterns, relationships, and trends within data.

4☐ Machine Learning Integration

Data Science uses machine learning algorithms to build predictive and classification models that can learn from data automatically.

5☐ Data Cleaning and Preparation

A major feature of Data Science is preparing data by removing errors, duplicates, and missing values to ensure accuracy.

6☐ Data Visualization

Data is presented using charts, graphs, and dashboards to make complex insights easy to understand.

7☐ Predictive and Prescriptive Analysis

Data Science not only explains what happened (descriptive) but also predicts what will happen (predictive) and suggests actions (prescriptive).

8☐ Interdisciplinary Nature

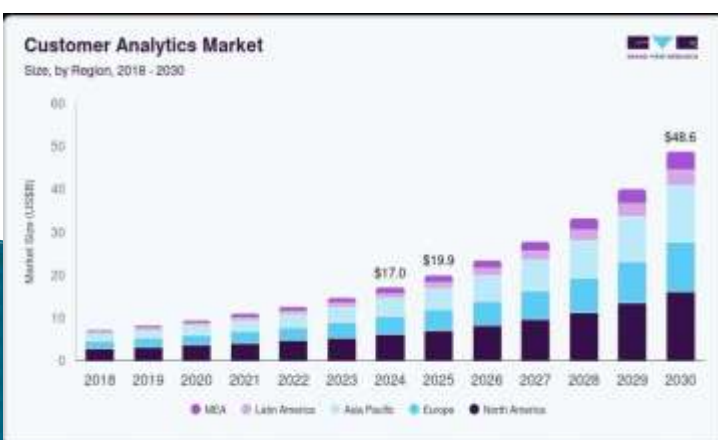
It combines programming, statistics, domain knowledge, and communication skills to deliver meaningful insights.



Benefits Of Data Science

✓ Better Decision-Making – Helps organizations make data-driven and accurate decisions.

📈 Predictive Analysis – Forecasts future trends and outcomes.



💰 Cost Reduction – Identifies inefficiencies and reduces operational costs.

🎯 Improved Customer Experience – Analyzes customer behavior for personalized services.

🔍 Fraud Detection & Risk Management – Detects unusual patterns and prevents fraud.

⚙️ Process Automation – Automates repetitive tasks and increases efficiency.

🚀 Competitive Advantage – Provides insights that help businesses stay ahead in the market.

Disadvantages Of Data Science



1 ☐ High Cost

Requires expensive tools, software, and infrastructure.

Hiring skilled data scientists can be costly.

2 ☐ Data Privacy and Security Risks

Sensitive information may be misused.

Risk of data breaches and cyberattacks.

3 ☐ Requires Skilled Professionals

Needs knowledge of programming, statistics, and machine learning.

Skilled experts are limited and in high demand.

4 ☐ Data Quality Issues

Poor or incomplete data leads to inaccurate results.

Data cleaning process is time-consuming.

5 ☐ Ethical Concerns

Algorithms may show bias or discrimination.

Misuse of personal data can affect individuals.

6 ☐ Complex Implementation

Requires proper infrastructure and management.

Difficult to integrate with existing systems.

Importance of Data Science

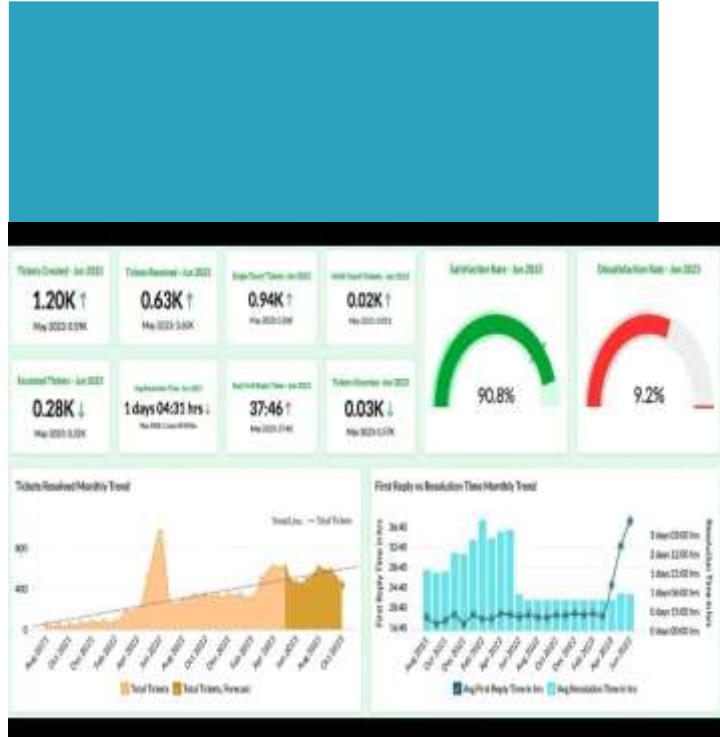


✓ Better Decision-Making – Helps organizations make accurate, data-based decisions.

📈 Predicts Future Trends – Uses historical data to forecast outcomes.

⚙️ Improves Efficiency – Optimizes processes and reduces waste.

💰 Increases Business Growth – Identifies new opportunities and strategies.



🎯 Enhances Customer Experience – Analyzes customer behavior for personalized services.

🔍 Risk and Fraud Detection – Detects unusual activities and prevents losses.

🚀 Supports Innovation – Encourages new product and service development.

Purpose of Data Science

- To extract insights from data.
It turns raw data into meaningful information.
- To support decision making.
It helps make accurate decisions based on evidence.
- To find patterns and trends.
It identifies hidden relationships in data.
- To predict future outcomes.
It uses models to forecast results.
- To improve efficiency.
It optimizes processes and reduces errors.



- To automate intelligent systems.
It enables machines to learn and make decisions automatically.
- To solve real-world problems.
It is applied across industries for better results.

Applications of Data Science

🛡️ Healthcare – Disease prediction, medical image analysis, patient data management.

🏦 Banking & Finance – Fraud detection, risk analysis, credit scoring.

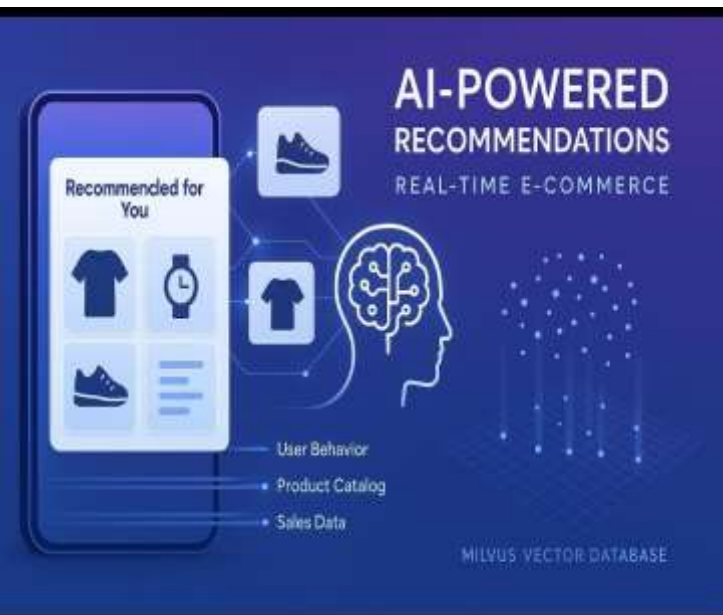
🛒 E-commerce – Product recommendations, customer behavior analysis.

🚗 Transportation – Route optimization, self-driving cars, traffic prediction.

📱 Social Media – Targeted advertising, sentiment analysis.

🏭 Manufacturing – Quality control and predictive maintenance.

🎓 Education – Student performance analysis and personalized learning.



Applications of Data Science

- ▶ **Healthcare**
- ▶ Disease prediction, medical image analysis, and personalized treatment systems.
- ▶ **Finance**
- ▶ Fraud detection, risk analysis, and algorithmic trading.
- ▶ **Education**
- ▶ Adaptive learning systems and performance analytics.
- ▶ **Smart Cities**
- ▶ Traffic prediction, energy optimization, and IoT analytics.

Emerging Trends in Data Science

- ▶ Explainable AI (XAI)
- ▶ Vision Transformers and Hybrid Models
- ▶ Automated Machine Learning (AutoML)
- ▶ Generative AI
- ▶ Edge AI and TinyML
- ▶ Responsible AI

Ethical Challenges in Data Science

- Data Privacy and Security
- Bias in Machine Learning Models
- Transparency and Interpretability
- Responsible Use of AI Systems

Popular Tools and Technologies

Programming Languages

Python

R

SQL

Frameworks and Libraries

TensorFlow

PyTorch

Scikit-learn

Pandas

NumPy

Visualization Tools

Tableau

Power BI

- ▶ Matplotlib
- ▶ Seaborn



Case Study: Data Science in Medical Imaging

- ▶ Deep learning models such as CNNs and Vision Transformers are widely used for medical image classification. Applications include pneumonia detection using chest X-ray datasets, where attention mechanisms improve model interpretability and performance.



Career Opportunities in Data Science

- ▶ Data Scientist
- ▶ Machine Learning Engineer
- ▶ AI Researcher
- ▶ Data Analyst
- ▶ Business Intelligence Developer

Skills Required

- Programming Skills
 - Statistical Knowledge
 - Deep Learning Concepts
 - Communication and Visualization Skills
- 

Glossary

- ▶ **Machine Learning:** Algorithms that learn patterns from data.
 - ▶ **Deep Learning:** Neural-network-based learning with multiple layers.
 - ▶ **Big Data:** Extremely large datasets requiring advanced processing tools.
 - ▶ **Feature Engineering:** Transforming raw data into meaningful inputs for models.
- 

Future of Data Science

- ▶ The future of data science lies in combining human intelligence with advanced AI systems. Hybrid architectures, real-time analytics, and explainable models will play a key role in sectors like healthcare, robotics, and autonomous systems.
- ▶ "Data is the new oil, but insights are the real power."

Students Achievements 2024-25

S.N.	Name of the Student	Name of the Event	State/National/International level	Date of Event	Name of the award if any
A1	S. Nagammai, IT	TechXcellence, Hackathon,AURO iTECH Digital Solutions Foundation	State	31 st January 2025	3 rd Prize
A2	K.S.Achuthen,IT	TechXcellence, Hackathon,AURO iTECH Digital Solutions Foundation	State	31 st January 2025	1 st Prize Cash Prize: Rs.20,000/-
A3	R.Dhanush,IT	TechXcellence, Hackathon,AURO iTECH Digital Solutions Foundation	State	31 st January 2025	1 st Prize Cash Prize: Rs.20,000/-
A4	R.S.Aakash,IT	TechXcellence, Hackathon,AURO iTECH Digital Solutions Foundation	State	31 st January 2025	1 st Prize Cash Prize: Rs.20,000/-

Students Achievements 2024-25



EVENTS ORGANIZED 2024-2025



S.NO	Name of the Event	National/ International level	Date of Event	No of Participant
1.	Accelerators/Incubation-Opportunities for Students & Faculties for early stages entrepreneurs Mr. Hari Prasath Founder & CEO, Thanvi Technologies	Institute	29 Aug 2024	60 (2022-26 Batch)
2.	Hands on Training on "College to Corporate-Navigate to Digital Reality" Mr.K.Daniel Praveen Kumar, Associate Project Manager- Expleo. Mr.G.Gnanaguru, Principal Consultant-Enterprise Architect, Hexaware Technologies.	Institute	28 Sep 2024	65 (2022-26 Batch)
3.	Hands-On Workshop On Internet Of Things Mrs.S.Indumathi Founder & CEO, Abhijith Electronic Solution	Institute	09-10 Sep 2024	80 (2022-26 Batch)
4.	Value Added Course On Cyber Security & Bug Bounty MR.SANKARRAJ SUBRAMANIAN FOUNDER-CEO PROMPT INFOTECH	Institute	20-25 Jan 2025	89 (2022-26 Batch)
5.	Motivational Session-Role Of IT Innovation On Design Thinking Mr.Prasanna Vijayan Senior Software Engineer, Freshworks- Chennai	Institute	26 th Feb 2025	80 (2022-26 Batch)
6.	Skill Bout-C, Java, Verbal Ability Training- Mr.Inba Vignesh & Team, Skill Bout	Institute	2-7-2024 to 16-7-2024	90 (2021-25 Batch)

PUBLICATIONS IN JOURNALS 2024-2025

Sl.No	TITLE Of The PAPER	Name Of The Journal, Vol No., Page No., Year Of Publication	Journal Category (Sci Indexed /Scopus Indexed / Ugc Listed / Other)	ISSN	Name Of The Author(S)
1.	A Fd-Edl And Novel Clustering-Based Intrusion Detection System Using G-Wefipo In Manet Environment	Transactions On Emerging Telecommunication Technologies (John Wiley & Sons), Vol 36, Issue 5,E70127, 2025.	SCI Indexed-Impact Factor 0.997	https://doi.org/10.1002/Ett.70127	Dr.P.Ganesh Kumar, Prof& Head/IT, Mrs.Rajeeve Dhammaraj
2.	Cluster-Based Routing Protocol Design Using Gated Fusion Adaptive Graph Neural Network In Wireless Sensor Networks	IETE Journal Of Research (Taylor & Francis)	SCI Indexed	Doi: 10.1080/03772063.2024.2428736	Dr.P.Ganesh Kumar, Prof& Head/IT, Mr.D.Praveen Kumar, Asp/Cse
3.	Implementation Of Optimal Routing In Heterogeneous Wireless Sensor Network WITH Multi-Channel Media Access Control Protocol Using Enhanced Henry Gas Solubility Optimizer	International Journal Of Communication Systems	SCI Indexed	https://doi.org/10.1002/Dac.5980	Dr.P.Ganesh Kumar, Prof& Head/IT, Mr.D.Praveen Kumar, Asp/Cse
4.	A Novel Methodology For Customer Attrition Prediction	International Journal For Research In Applied Science & Engineering Technology	Others	ISSN: 2321-9653 Volume 12, Issue VIII, August 2024	Mrs.I.Muthu Meenatchi, AP/IT, Mrs.A.Thirunirai Selvi, AP/IT Mrs.M.Akila, AP/IT

Sl.No	Title Of The PAPER	Name Of The Journal, Vol No., Page No., Year Of Publication	Journal Category (Sci Indexed /Scopus Indexed / Ugc Listed / Other)	ISSN	Name Of The Author(S)
6.	Detecting Floating Marine Macro Litter (Fmml) Using Deep Learning Models	International Journal Of Scientific Research In Engineering & Management	Others	ISSN: 2582-3930	Mr.A.Selvaraj, AP(Sr.Gr)/IT, V.NITish Kanna, Final Year IT, S.Shafrik, Final Year IT
7.	Movie Mania	International Journal Of Research Publication And Reviews	Others	ISSN 2582-7421	Mr.A.Selvaraj, AP(Sr.Gr)/IT, V.V.Ruban Kumar, Final Year IT, A.Nirendrasethupathi, Final Year IT, G.Praveen, Final Year IT
8.	Deep Learning For Vision Health: An Ai-Based Approach For Early Detection Of Retinal Diseases	International Journal Of Research Publication And Reviews	Others	ISSN : 2582-7421	Ms.Suganya.Rm, AP/IT, Mr.NITishkumar, N.C. Final Year/IT, Mr.Vishnu.K, Final Year/IT, Mr.Praveenkumarb.R. Final Year/IT
9.	Vehicle Rental App	International Journal Of Research Publication And Reviews	Others	ISSN 2582-7421	P.L. Subramanian1, T. J. NIThya Dharshini2, K. K. Poojashree3, S. V. Sri Divya Dharshini4
10	Intelligent Field Reservation System	International Journal Of Modernization In Engineering Technology And Science	Others	E-ISSN: 2582-5208 Volume:07/ Issue:05/May-2025," Doi : https://www.Doi.Org/10.56726/Ijmet76249"	Mrs.I.Muthu Meenatchi, AP/IT, Raghavv Lighath, Viswesh Kumar

Activate Windows

Go to Settings to activate Windows

INTERNSHIP DETAILS

2024-25



S. NO	COMPANY NAME	PERIOD	DURATION	PARTICIPANT
1.	SHASHONK PVT LTD	24-06-2025 to 24-07-2025	1 Month	Rishikesh B V
2.	SHASHONK PVT LTD	24-06-2025 to 24-07-2025	1 Month	Ragesh P
3.	SHASHONK PVT LTD	24-06-2025 to 24-07-2025	1 Month	Vijaya dhith A R
4.	SHASHONK PVT LTD	24-06-2025 to 24-07-2025	1 Month	Seenivasan R S
5.	SHASHONK PVT LTD	24-06-2025 to 24-07-2025	1 Month	Selva Harish J
6.	SYSTEM TRON	26-08-2024 to 22-09-2024	4 Week	Praveen Kumar B R
7.	CODERONE	20-12-2024 TO 20-1-2025	1 Month	Velentina V
8.	CONGNIFYZ TENCHNOLOGIES	22-02-2024	1 Month	Anand S
9.	CODTECH IT SOLUTIONS	10-03-2025 to 10-05-2025	3 Months	Praveen Kumar B R
10.	TARCIN ROBOTIC LLP	23-12-2024 to 23-01-2025	1 Month	Ramyadevi K R
11.	VISIONARY TECHNOLOGIES	17-10-2024	6 Months	Ajay M
12.	VISIONARY TECHNOLOGIES	17-10-2024	6 Months	Inzamam Ulhaq
13.	CODESOFT	25-06-2025 to 25-07-2025	1 Month	Madhankumar E G D