



**RAMAIAH**  
Institute of Technology



DEPARTMENT OF AI AND DS

&

DEPARTMENT OF AI AND ML

PRESENTS

HANDS-ON SESSION ON USECASES OF Machine Learning

**CONDUCTED FROM**

**7TH DECEMBER 2024**

**HANDS-ON SESSION ON USECASES OF Machine Learning**

IN COLLABORATION

WITH IEEE-COMPUTATIONAL INTELLIGENCE SOCIETY



## ACKNOWLEDGEMENT

I would like to express my sincere gratitude to **Artificial Intelligence and Data Science & Artificial Intelligence and Machine Learning** for organizing the insightful and engaging hands-on session on Artificial Intelligence and Machine Learning.

A special thanks to **NISHANTH KRISHNA** and the entire team for their valuable guidance, practical demonstrations, and in-depth knowledge sharing. The session provided a great opportunity to enhance my understanding of AI/ML concepts, algorithms, and real-world applications.

I also extend my appreciation to my peers and fellow participants for their collaboration and engaging discussions, making this learning experience even more enriching.

Thank you once again for this wonderful opportunity.



## INTRODUCTION

Artificial Intelligence (AI) and Machine Learning (ML) are transforming industries by enabling intelligent decision-making, automation, and predictive analytics. The AI & ML with Advanced Intelligent Data Systems (AIDS) program is designed to provide participants with a deep understanding of fundamental and advanced concepts in AI/ML while integrating cutting-edge data-driven approaches.

This 8-session hands-on training will cover key topics such as machine learning algorithms, neural networks, deep learning, natural language processing, and AI-driven applications. Participants will engage in practical exercises, real-world case studies, and interactive discussions to enhance their technical proficiency and problem-solving skills.

By the end of the program, attendees will have gained hands-on experience in building AI/ML models, optimizing data workflows, and applying these technologies in various domains. This course is ideal for students, researchers, and professionals looking to enhance their expertise in AI/ML and its real-world application

---

## TARGET AUDIENCE

The undergraduate students at MS Ramaiah Institute of Technology.

---

## OBJECTIVES

The AI and Data Science program is designed to provide participants with a strong foundation in Artificial Intelligence (AI) and Data Science, equipping them with the necessary skills to analyze data, develop machine learning models, and derive meaningful insights for decision-making.

---

## VENUE

The event was held in the AI&ML and AI&DS CLASSROOMS AND LABS, MS Ramaiah Institute of Technology, MSR Nagar, Mathikere, Bengaluru- 560054, Karnataka, India.



## EVENT DAY

**DAY 1: Understanding fundamentals of AI & data science**

(Learn core concepts, real-world applications, and the role of AI in data-driven decision-making) date:

7/12/2024

time: 9:00am to 1:00 pm

**DAY 2: Explore Data Collection & Preprocessing Techniques**

(Gain hands-on experience in data wrangling, cleaning, and feature engineering) date:

12/12/2024

time: 6:00pm to 8:00pm

**DAY 3: Master Exploratory Data Analysis (EDA)**

(Learn statistical and visualization techniques to uncover patterns and trends in data.) date:

17/12/2024

time: 6:00pm to 8:00pm

**DAY 4: Learn Machine Learning Algorithms**

(Understand supervised and unsupervised learning techniques, including regression, classification, and clustering)

date: 19/12/2024

time: 6:00pm to 8:00pm

**DAY 5: Apply Deep Learning & Neural Networks**

(Explore advanced AI techniques such as deep learning, CNNs, and NLP.)

date: 21/12/2024

time: 6:00pm to 8:00pm

**DAY 6: Work on Real-World Data Science Projects**

( Apply AI and data science techniques to solve practical problems in industries like healthcare, finance, and marketing)

date: 24/12/2024

time: 6:00pm to 8:00pm

**DAY 7: Understand Model Evaluation & Optimization**

(Learn techniques to assess, fine-tune, and improve AI/ML models for better performance)

date: 26/12/2024

time: 6:00pm to 8:00pm



## KEY HIGHLIGHTS

### 1. Understanding the Fundamentals of AI and Data Science

Participants will start by learning about core AI and ML concepts, their real-world applications, and their impact across industries such as healthcare, finance, and automation. They will explore how AI is revolutionizing decision-making, improving efficiency, and driving innovation. This session will also focus on distinguishing AI from ML and deep learning, helping participants understand their interconnections. Moreover, participants will gain insights into how data serves as the backbone of AI, fueling intelligent models and automation.

Additionally, discussions on AI ethics, responsible AI, and the challenges of implementing AI in real-world scenarios will help participants build a solid foundation for their learning journey.

### 2. Exploring Data Collection and Preprocessing Techniques

A crucial step in AI and Data Science is data preprocessing. Participants will gain hands-on experience in handling raw data, performing data wrangling, cleaning, and transforming data into a structured format suitable for analysis. They will learn how to handle missing values, identify and eliminate outliers, and perform feature engineering to enhance model performance. Techniques such as normalization, standardization, and encoding categorical variables will be discussed in detail. This session will also introduce participants to essential Python libraries such as Pandas and NumPy, which are widely used for data manipulation and preprocessing.

Understanding how to prepare high-quality data will ensure that participants can build more accurate and efficient AI models.

### 3. Mastering Exploratory Data Analysis (EDA)

A significant focus will be placed on exploratory data analysis, which is essential for understanding datasets before building machine learning models. Participants will learn how to explore and summarize data using statistical methods and visualization techniques. They will use libraries like Matplotlib and Seaborn to create visual representations of data, helping them uncover patterns, correlations, trends, and anomalies. They will also learn how to interpret descriptive statistics such as mean, median, variance, skewness, and kurtosis. This session will also introduce correlation matrices and pair plots to identify relationships between variables, as well as outlier detection methods to improve data quality.

### 4. Learning Machine Learning Algorithms

Participants will dive deep into machine learning algorithms, starting with supervised learning techniques such as regression and classification. They will understand the working of algorithms like Linear Regression, Decision Trees, Support Vector Machines (SVM), and Random Forests. The session will also introduce unsupervised learning methods, including clustering techniques like K-Means and hierarchical clustering. They will gain practical experience in implementing models using Scikit-Learn and evaluating them using metrics such as accuracy, precision, recall, and F1-score. Additionally, the session will cover important concepts such as bias-variance tradeoff, model overfitting, and regularization techniques for improving model performance.



#### 5. Applying Deep Learning and Neural Networks

Building on machine learning, participants will explore deep learning and its applications. They will learn about artificial neural networks (ANNs) and their architecture, including layers, neurons, activation functions, and backpropagation. Convolutional neural networks (CNNs) will be introduced for image recognition tasks, while recurrent neural networks (RNNs) will be discussed for processing sequential data. The session will also touch upon Natural Language Processing (NLP) and its real-world applications, such as text classification and sentiment analysis. Participants will implement deep learning models using TensorFlow and Keras, gaining hands-on experience in training and optimizing neural networks.

#### 6. Working on Real-World Data Science Projects

Participants will apply their knowledge by working on real-world projects using datasets from industries such as healthcare, finance, and e-commerce. They will experience the complete end-to-end project workflow, from data collection to model deployment. Case studies will include predictive analytics for business decision-making, customer segmentation, and fraud detection. They will also explore time-series forecasting models for applications like financial market prediction and demand forecasting. The session will emphasize best practices for structuring and documenting data science projects while promoting teamwork and collaborative problem-solving.

#### 7. Understanding Model Evaluation and Optimization

To build reliable AI models, participants must learn to evaluate and optimize them effectively. This session will cover various model evaluation techniques, such as confusion matrices for classification problems and RMSE (Root Mean Squared Error) for regression models. Participants will understand common issues like overfitting and underfitting and learn methods such as cross-validation and hyperparameter tuning to improve model performance. Additionally, ensemble learning techniques like bagging and boosting will be explored to enhance model accuracy and robustness.








## CONCLUSION

Over the past seven sessions, participants have developed a strong foundation in AI and Data Science, gaining hands-on experience in data collection, preprocessing, exploratory data analysis (EDA), machine learning algorithms, deep learning techniques, and real-world applications. They have learned how to clean and transform data, implement supervised and unsupervised learning models, optimize performance using evaluation techniques, and apply AI to solve industry-specific problems. The sessions provided valuable insights into neural networks, natural language processing (NLP), and best practices for model optimization. As we conclude, participants are now equipped with the skills to analyze data, build intelligent models, and drive AI-powered solutions. The final session will focus on deploying AI models, ensuring that participants can transition from development to real-world implementation, making a tangible impact in their respective domains.

## PHOTO GALLERY




### DEPARTMENT OF AI&DS AND AI&ML

## HANDS-ON SESSION ON USECASES OF AI AND DATA SCIENCE

BY  
**NISHANTH KRISHNA**

Nishant Krishna is a cybersecurity entrepreneur, inventor, and educator with 24+ years of expertise in tech innovation, IoT, and product scaling.

DATE	TIME
7/12/2024	09:00 AM - 01:00 PM
12/12/2024	06:00 PM - 08:00 PM
17/12/2024	09:00 AM - 11:00 AM
19/12/2024	02:00 PM - 04:00 PM
21/12/2024	09:00 AM - 01:00 PM
24/12/2024	09:00 AM - 11:00 AM
26/12/2024	02:00 PM - 04:00 PM



**Dr Vijaya kumar B P**  
Advisor, IEEE CIS, Bangalore section  
Professor and Head, AI and DS,  
RIT

**Dr Sumana M**  
Chair, IEEE CIS, Bangalore section  
Professor, ISE dept., RIT

**Dr. Jagadish S Kallimani**  
Professor and Head, AI and ML  
RIT









**RAMAIAH**  
Institute of Technology

