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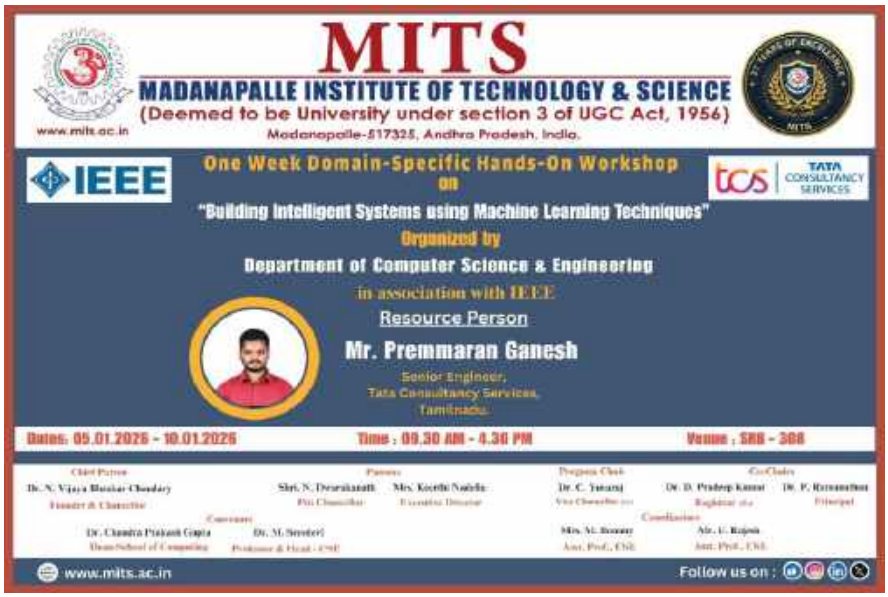
A Report on
One Week Domain-Specific Hands-On Workshop on "Building Intelligent Systems Using Machine Learning Techniques"
Organized by
Department of Computer Science & Engineering
In Association with IEEE



Date: 05.01.2026 to 10.01.2026
Mode of Conduct: Offline
Venue: SRB308
Total Participants: 71 (Internal)
Coordinators: Mrs. M. Bommy and Mr. E. Rajesh
Resource Person: Mr. Premmaran Ganesh, Senior Engineer, Tata Consultancy Services, Chennai.

Report Submitted by:
Mrs. Bommy M, Assistant Professor/CSE

Event Overview

Title: One Week Domain-Specific Hands-On Workshop on "Building Intelligent Systems Using Machine Learning Techniques"

The program commenced at 9:30 AM with a warm welcome address delivered by Mrs. M. Bommy, Assistant Professor, Department of CSE. She greeted the dignitaries, resource person, faculty members, and students, and briefly outlined the purpose of organizing the workshop.
Following the welcome address, **Dr. M. Sreedevi**, Professor and Head, Department of CSE, emphasized the growing significance of Machine Learning in today's technology-driven world. She highlighted the importance of conducting the workshop on "Building Intelligent Systems Using Machine Learning Techniques" to equip students with industry-relevant skills. She encouraged the participants to actively engage in the sessions, clarify their doubts, and make the best use of the hands-on learning opportunities provided during the workshop.
The session was then handed over to the resource person, Mr. Premmaran Ganesh. He began by expressing his sincere gratitude to the organizing committee, the Head of the Department, the Principal, and the Management of MITS Madanapalle for providing him with the opportunity to share his knowledge and expertise. He also appreciated the enthusiastic participation of the students. The resource person then introduced the core concepts of building intelligent systems using Machine Learning techniques and shared his insights on practical implementation, real-world applications, and emerging trends in the field.

Program Objectives:
The primary objectives of the program were:

- To introduce students to the fundamentals and advanced concepts of Machine Learning.
- To provide hands-on experience in building intelligent systems using real-world datasets.
- To bridge the gap between theoretical knowledge and practical implementation.
- To enable students to design, train, evaluate, and optimize ML models.
- To develop problem-solving skills through mini project development.
- To enhance placement readiness and research orientation in AI/ML domains.

Day 1: Foundations of Intelligent Systems & Python for ML
Session Topics:

- Introduction to Artificial Intelligence and Machine Learning
- Understanding Intelligent Systems
- Applications of ML in Real-World Scenarios
- Python Programming for Machine Learning
- Introduction to NumPy and Pandas
- Data Types and Data Structures
- Data Loading and Basic Preprocessing

Hands-On Activities:

- Installing required libraries
- Working with datasets using Pandas
- Handling missing values
- Data cleaning techniques
- Basic data visualization using Matplotlib

Day 2: Supervised Learning – Regression Techniques
Session Topics:

- Introduction to Supervised Learning
- Understanding Regression Problems
- Linear Regression
- Multiple Linear Regression
- Model Training and Testing
- Cost Function and Gradient Descent (Conceptual)
- Model Evaluation Metrics (MSE, RMSE, R^2 Score)

Hands-On Activities:

- Implementing Linear Regression using Scikit-learn
- Splitting dataset into training and testing sets
- Visualizing regression line
- Evaluating regression model performance

Day 3: Supervised Learning – Classification Techniques
Session Topics:

- Introduction to Classification Problems
- Logistic Regression
- K-Nearest Neighbors (KNN)
- Decision Trees
- Naïve Bayes Classifier
- Confusion Matrix
- Precision, Recall, F1-Score

Hands-On Activities:

- Building classification models
- Evaluating model performance
- Comparing multiple algorithms
- Implementing a Spam Detection / Student Performance Prediction model

Day 4: Advanced Machine Learning & Feature Engineering
Session Topics:

- Feature Selection Techniques
- Feature Scaling (Normalization & Standardization)
- Support Vector Machines (SVM)
- Random Forest Algorithm
- Hyperparameter Tuning
- Cross-Validation
- Overfitting and Underfitting

Hands-On Activities:

- Applying feature scaling
- Training Random Forest model
- Performing cross-validation
- Model comparison and optimization

Day 5: Unsupervised Learning & Dimensionality Reduction

Session Topics:

- Introduction to Unsupervised Learning
- Clustering Concepts
- K-Means Clustering
- Hierarchical Clustering (Overview)
- Principal Component Analysis (PCA)
- Anomaly Detection Basics

Hands-On Activities:

- Implementing K-Means Clustering
- Visualizing clusters
- Applying PCA for dimensionality reduction
- Building a simple anomaly detection system

Day 6: End-to-End Intelligent System Development & Deployment

Session Topics:

- Machine Learning Pipeline
- Model Evaluation and Interpretation
- Introduction to Model Explainability
- Deployment Basics (Flask / Streamlit Overview)
- Real-World Case Studies
- Resume Building & Interview Preparation in ML Domain

Hands-On Activities:

- Developing an end-to-end ML project
- Integrating preprocessing with model and evaluation
- Deploying a simple ML application locally

Mini Project

Students developed an Intelligent System such as:

- Spam Detection System
- Intrusion Detection System
- Student Performance Prediction System
- House Price Prediction Model
- Customer Segmentation System
- Sentiment Analysis Application

Outcome of the Workshop:

The One Week Domain-Specific Hands-On Workshop on “Building Intelligent Systems Using Machine Learning Techniques” effectively fulfilled its planned objectives, resulting in the following key outcomes:

- Students gained a strong understanding of Machine Learning concepts and intelligent system design.
- Participants developed hands-on skills in data preprocessing, model building, and performance evaluation.
- Students successfully implemented regression, classification, and clustering algorithms on real-world datasets.
- The workshop enhanced problem-solving abilities and practical application skills in AI/ML domains.
- Participants improved their project development capability and placement readiness through mini project implementation.

The final day of the One Week Domain-Specific Hands-On Workshop on “Building Intelligent Systems Using Machine Learning Techniques” concluded with a formal valedictory session, marking the successful completion of the program. Feedback was collected through a structured questionnaire. Students felt that the workshop was highly informative, practical, and industry-relevant.

Later, Mr. E. Rajesh, Assistant Professor, Department of CSE delivered Vote of Thanks. He expressed his sincere gratitude to the Management, Principal, Head of the Department and the resource person for their support in making the workshop a grand success. He also appreciated the enthusiastic participation of the students throughout the six days. The program ended with the distribution of participation certificates and a positive note to conduct more such skill-oriented workshops in the future.