



**SPECIALIZED PROGRAM IN  
ARTIFICIAL INTELLIGENCE &  
MACHINE LEARNING WITH DRONE TECH  
*FROM TiHAN, IIT HYDERABAD***

# About TiHAN, IIT Hyderabad

Dive into the future of transportation and technology at TiHAN, IIT Hyderabad India's groundbreaking hub for autonomous navigation (on land and in the sky!). Backed by the government's DST, TiHAN is a dynamic center driving innovation in smart mobility and data systems across vital sectors.

## Key Breakthroughs:

- **India's First Autonomous Navigation Testbed:** A cutting-edge facility for rigorous testing of self-driving vehicles and drones.
- **Launching Future Leaders:** Home to India's premier M.Tech program in Smart Mobility, shaping the next generation of experts.
- **Fueling Innovation:** Actively nurturing over 35 startups, accelerating entrepreneurial growth in autonomous tech.
- **Real-World Application:** Successfully deployed an autonomous shuttle right on the IIT Hyderabad campus.
- **Global Collaboration:** Partnering with leading industries and research bodies to translate innovation into reality.
- **IIT Hyderabad also holds a strong position in national rankings, notably ranking 12th Overall and 3rd in Innovation in the NIRF 2024 framework, reflecting the vibrant ecosystem that powers TiHAN's advancements.**



# Why Choose This Course?

- **Prestigious Certification:** Receive a Certificate of Completion with TiHAN, IIT Hyderabad, significantly enhancing your profile's value.
- **Build your expertise at the frontier of technology:** Learn Artificial Intelligence, Machine Learning, and the fast-growing field of Drone Technology - where smart systems meet the skies.
- **Expert Faculty & Industry Insights:** Learn from IIT faculty, industry experts and TiHAN faculties, bringing real-world insights to your learning journey.
- **Campus Immersion:** Immerse yourself in a 2 day campus experience at IIT Hyderabad, offering a deep dive into cutting-edge research.
- **Opportunity for TiHAN Interviews:** High-achieving students (CGPA 9+) will be eligible for interview opportunities with TiHAN - IIT Hyderabad.
- **Dedicated Placement Assistance:** Get comprehensive placement support from Masai School for students with CGPA 7 and above.
- **Real-World Capstone Project:** Work on capstone projects designed by TiHAN, IIT Hyderabad and Masai, solving practical business challenges.

## Course Details

**Course Duration**  
6 Months

**Certification**  
From TiHAN, IIT Hyderabad

**Weekly Commitment**  
8-10 hours per week

# Course Curriculum

## **Module 1:**

### **Introduction to AI, Python Basics, and Machine Learning Fundamentals**

- Understand AI concepts, types of learning (supervised, unsupervised, reinforcement), & core algorithms.
- Learn data types, functions, loops, and essential libraries like NumPy and Pandas for data handling.
- Master linear algebra, statistics, and probability tailored for machine learning applications.
- Explore Scikit-learn, TensorFlow, PyTorch, and understand autonomous drone systems.

## **Module 2:**

### **Data Handling, Visualization, and ML Techniques**

- Master data collection, cleaning, preprocessing, and handling missing values, outliers, and duplicates.
- Visualize data with Matplotlib and Seaborn, uncovering insights and patterns.
- Learn techniques for feature extraction, scaling, encoding, and transformation for ML models.
- Explore key regression and classification algorithms and understand sensor roles in Unmanned Aerial Vehicles (UAVs)."

## **Module 3:**

### **Predictive Modeling, Regression, and Evaluation**

- Models like linear regression, decision trees, and random forests learn from labeled data to predict outcomes.
- Techniques include simple/multiple linear and polynomial regression, evaluated by MSE, MAE, and  $R^2$ .
- Cross-validation, bias-variance trade-off, and generalization ensure robust model performance.
- AI/ML enable drones to perform tasks like navigation, object detection, and autonomous flight.

**Module 4:****Classification Algorithms and Deep Learning**

- Logistic regression, k-NN, SVM, and decision trees are used for classifying data into categories.
- Neural networks and deep learning architectures enable complex pattern recognition and feature learning.
- Models are trained using backpropagation, optimized through hyperparameter tuning, and evaluated for classification accuracy.
- Techniques like GPS, visual odometry, and sensor fusion are used to determine drone position and movement.

**Module 5:****Model Tuning, Ethics in AI, and AI Deployment**

- Techniques like grid and random search fine-tune hyperparameters for better performance.
- Regularization (L1/L2) and cross-validation ensure model generalization.
- Focuses on fairness, privacy, interpretability, and transparency in AI systems.
- Drones communicate wirelessly with control stations and each other via Wi-Fi, LTE, and radio frequencies.

**Module 6:****Capstone Project — SmartStream Recommender**

- Build a lightweight, Netflix-style engine that predicts what each user will read or watch next, then deploy it in a simple web app so classmates can try and critique your recommendations.

# Our Instructors



## **Varun Raste**

**Data Scientist AI ML**

A seasoned Analytics Professional with 5+ years of experience in Machine Learning, Data Science, and CPG Consulting, skilled in fraud modeling, time series forecasting, and Python automation. An active mentor and course creator on Coursera and Campus X, specializing in Python, Generative AI, and Data Science. An internationally rated chess player passionate about trekking, writing, and exploring data-driven solutions.



## **Arul Francis**

**Associate Director, DS & AI**

Data Science & AI expert with over 15 years of experience in discriminative and generative techniques which help attain organizational needs. Well built analytical, project management and association building skills.



## **Dr. Chandresh Maurya**

**Assistant Professor, Indian Institute of Technology, Indore**

Multimodal AI researcher with a strong focus on integrating text, image, video, and speech, inspired by human sensory perception. With a Ph.D. from IIT Roorkee in Big Data Anomaly Detection, he brings experience from top institutions like IBM Research, ELTE University, and NIT Delhi. Currently leading a research team at IIT Indore, he specializes in speech and language technologies using AI, ML, and deep learning. Strong academic and industry collaboration background, including work with Microsoft and Bosch.

# Admission Process



## Clear Qualifier Test

You must pass the exam to confirm your seat for the program.



## Complete Onboarding

Only shortlisted candidates go through the onboarding process.



## Start Learning

Learn from India's top educators and stand out from the crowd.

# Fees Structure

<b>Qualifier Test Fee</b> (Non-Refundable)	<b>₹99</b>
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	Option 1	Option 2
	Upfront	EMI Through our NBFC partners
<b>Secure Seat Fee</b> (Non-Refundable)	₹4,000	₹4,000
<b>Remaining Course Fee</b> (Non-Refundable)	₹56,000	₹6,844 x 9 months
<b>Total Program Fee</b>	₹60,000 + GST**	₹65,596 + GST**

\*\* GST at 18% extra, as applicable

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